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THE
HUMAN MIND

A TREATISE

IN

MENTAL PHILOSOPHY

BY

EDWARD JOHN HAMILTON, D.D.



NEW YORK
ROBERT CARTER & BROTHERS
530 BROADWAY
1883

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P R E F A C E .

The treatise now offered to the public, though the outgrowth of studies which the author has long pursued with pleasure, immediately originated from aims which have been entertained during the last ten or twelve years. First of all it has been his effort to compose a metaphysical system satisfactory to himself. Discontent with the various published theories of belief and conviction forced him to form new views on these fundamental topics; and, from this beginning, he was led on to attempt a general reconstruction of the philosophy of mind. While deeply conscious of imperfection both in the design and in the execution of this undertaking, he yet is confident that the leading doctrines advocated have been framed correctly, and cannot be set aside by future investigations.

Along with the desire of producing a satisfactory philosophy, the ambition arose to write a scientific book, such as every American gentleman should have for reading and for reference. During the composition of this treatise, the author has had in view those thousands of our people, whose education has interested them, more or less, in metaphysical studies. He felt assured that this considerable body of his fellow-citizens would welcome a volume in which the principal names and terms, questions and controversies, of mental philosophy might be compendiously presented and discussed. He sincerely

hopes that the system expounded in the following pages may secure the attention and approbation of learned professors, but the treatise has not been specially prepared for them.

Finally, the adaptation of the work for use in our higher educational institutions, has been a constant aim with the author. In furtherance of this end, he has distinguished separate dissertations by the numbering of sections, has indicated specific topics by side-headings, and has employed many logical divisions and definitions. The advocacy of new opinions renders the book larger than would be needful, if it were merely the digest of a finished science; yet the study of the whole volume is recommended in all cases in which this may be found practicable. At the same time, certain discussions, concerning matters which are not essential to a fair knowledge of psychology, and which are not commonly considered in text-books, may properly be passed over by those who do not wish to make a speciality of metaphysics.*

Owing to circumstances which the writer would have gladly altered, had he been able, the chapters of the *Human Mind* were composed without any assistance from friendly consultation or criticism. Had such advantages been available, probably some defects would have been avoided, which cannot now be rectified. It has, however, been a matter for felicitation that one's lot has been cast in an age which has inherited from preceding ages the works of many men of genius, and which has been distinguished by the talent of its own philosophers. So far as possible, the author has indicated his obligations to previous thinkers, in the course of his discussions. But he here acknowledges a special indebtedness to two writers, whose influence upon his speculations has been very pervasive. The undertaking

* See note, page 721.

now completed could not have been begun with any great confidence of success, had not the mind of the author been indoctrinated and stimulated by the productions of those great philosophers—the most eminent of living metaphysicians—the presidents of Yale and of Princeton.

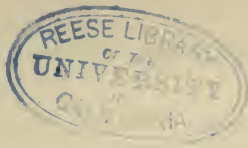
In conclusion, it would be ungrateful not to mention the fidelity, judgment, and skill with which Mr. John F. McCabe has superintended the manufacturing of the book. He has spared no pains in the effort to secure accurate typographical expression.

NEW YORK, *July 6, 1882.*

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THE HUMAN MIND.

CHAPTER I.

MENTAL PHILOSOPHY DEFINED AND RECOMMENDED.

Scientific knowledge. § 1. Mental philosophy is the science—that is, the accurate and systematized knowledge—of the intellect. When scientific knowledge is thorough and satisfactory, we know not only what a thing is, but also what it has to do with other things, and especially how it comes to be what it is. In other words, we know not only the nature of the object, but also its relations to other objects, and especially to the conditions of its existence. Mental philosophy, therefore, considers, not only thought in its various forms and developments, but also the conditions on which these depend, and all the various relations of thought.

Mind or intellect defined. This science is a department of psychology, which embraces, not only mental philosophy, but also the philosophy of sensation, and that of the emotional and motive powers of the soul, and that of the will. The mind or intellect is not an existence separate from the will, or from the heart, but, like each of these, it is simply the soul or the spirit viewed with exclusive reference to one set of its powers. It is natural to us to denominate the same object in different ways as it may be viewed in different lights. Thus the same person may be spoken of as the judge, the law-giver, and the king of a people. The word *intellect* was originally applied to that higher power of thought to which we commonly give the term *understanding*; and which is an ability to perceive, not merely objects and facts, but also the reasons and relations of things. Now, however, it is very frequently used so as to include every form and development of thought, from the highest to the lowest; and thus it corresponds exactly with the word *mind*.

Intellect is the power to think. In saying that mind or intellect is the power of thinking, we differ from an eminent authority who defines it as the power of knowing. This difference, perhaps, primarily regards terms, yet, even in this respect, has some importance. A wrong use of terms in philosophy is always perplexing, and frequently results in error. The words *knowing*, and *knowledge*, are not generically applicable to the

phenomena of intellect, because men generally are conscious of various states and acts of mind to which they never apply the term *knowledge*, and which they would deny to be knowledge; as, for example, suppositions and imaginings. But there is no mental state or operation which might not be characterized as thought, or thinking. It is true that the word *thought* is used in more specific senses, as well as with this general meaning. But it has the general meaning. We sometimes say that we think, but that we do not know, that so and so is the case. Thinking, when thus contrasted with knowledge, signifies a less confident and perfect conviction concerning truth. But we would also allow that, when we know, we have a thought—a conception—of that concerning which we know; and thinking, in this sense, is always a part of knowing. Again, the word *thought*, used emphatically, may signify an attentive and rational exercise of the intellect. We speak of persons as thoughtful and as thoughtless; just as we speak of a man of mind, and of a man without mind. We say, "Sits, fixed in thought, the mighty Stagirite." Here is another special sense which co-exists with the more general meaning of the word *thought*. For even the most thoughtless person is not without some form and degree of thinking.

The sphere of
mental science.

Psychology and mental philosophy are concerned properly only with the human soul and the human intellect. Yet there are laws common to man and to other beings both of a lower and of a higher grade of existence, and the philosopher should illustrate the study of the human mind by whatever information may be obtained from analogical instances. Important questions, too, respecting other than human beings may be incidentally treated in the course of psychological discussions.

Mental philosophy
recommended.

§ 2. With some persons of intelligence, mental philosophy, or at least that important portion of it, which concerns the fundamental elements of thought and of existence, and which has been named metaphysics, forms a subject of ridicule. These, mostly, are practical men who care little for abstract speculations and sometimes despise them as useless; or persons whose temperament renders them averse to the more rigorous exercises of the intellect; or those students of material nature to whom no knowledge is satisfactory save such as can be derived from physical observation and experiment. It must be allowed that the past history of philosophy has afforded proper subjects for the exercise of wit. Not only, in every age, have certain stupid students and teachers sought a reputation for wisdom by addicting themselves to mental science, and by uttering profound nonsense respecting abstruse questions, but even able and subtle thinkers, also, have been led, by the inherent difficulty and intricacy of metaphysical discussions, into paradoxical and absurd opinions. Nevertheless, notwithstanding egregious mistakes, in some of which the

whole thinking world has participated, the philosophy of the human spirit has always interested many able minds; and to-day, more than ever, it is worthy of their pursuit. For the progress in metaphysical knowledge, which began ages ago, has been particularly rapid during the last hundred years. We have now a well-ascertained body of mental science. And, what is of greater consequence, the true methods and tests of this branch of philosophy are now so well known, that a safe and steady advancement seems to be assured for the future.

It would be idle to expect metaphysical inquiry to afford pleasure to such as are radically unfitted or indisposed for mental application. But we can commend this study to those who have delight in convincing and satisfactory thought on hard subjects, and who would exercise, to the fullest extent, the high faculty of reason. And, beside the exhilaration arising from the vigorous employment of one's powers, the successful student of philosophy enjoys the acquisition of clear views respecting the workings of his own nature: he comprehends what, to other men, are mysteries. He feels, also, that the subject of his investigations is of the very highest dignity. An ancient author, quoted by Hamilton, has said, "On earth there is nothing great but man; in man, there is nothing great but mind"; and a modern poet, animated by this sentiment, teaches that "the proper study of mankind is man." These statements are true, whether we consider man's history and relations or contemplate that nature which, making him what he is, gives to him his exalted position and fits him for an immortal destiny. Man's physical structure, although this is that which allies him to the brutes and even to the inanimate creation, is the subject of a noble science. How much more elevated is the study of that psychical nature by which man is allied to spiritual intelligences, and to God Himself! For with reference, especially, to the endowments of the soul we read, "God created man in His own image."

Psychological studies, moreover, are as useful as they are noble. If, indeed, their only utility were to satisfy a thirst for knowledge and to occupy the mind with pure and elevating thoughts, this, of itself, would be a great benefit; but they have value in other respects. The mental strength to be obtained from metaphysical pursuits is one of their chief recommendations. Perhaps no other employment contributes so effectually to develop those powers of penetration and discrimination which are the chief elements of intellectual manliness and maturity. Then, too, psychology is the necessary foundation for those arts and sciences which pertain to the proper use of the various faculties of man. It is a study indispensable to those who would improve and perfect such sciences; and of great assistance to all who would obtain a satisfactory understanding of them. Logic, which treats of the correct use of the rational faculty, is a direct outgrowth of mental phi-

It satisfies and elevates the mind.

It has practical utility.

losophy; and is constantly receiving important modifications from the latter science. Ethics, also, especially in its more fundamental discussions, is based on a searching analysis of certain intellectual workings. Similar remarks apply to æsthetics, or the philosophy of taste, and to rhetoric, which is the science of the pleasing and the persuasive in human thought and speech. A wise system of education must be regulated by a true psychology. Whether we would establish efficient schools for the young, or, in a more general way, subject ourselves and others to wholesome formative influences, we should seek the advice of mental science. Psychology, too, throws great light on theology. The former science is the necessary servant of the latter. To understand Deity we must understand man. In short, every science which, in any way, involves a consideration of the laws of spiritual existence, finds a powerful assistant in the general philosophy of mind.

CHAPTER II.

THE TRUE METHOD OF PHILOSOPHICAL INVESTIGATION.

§ 3. Not every one is capable of clear opinions in philosophy. Some find it difficult to form any opinions at all; and many, even of the intelligent, find it necessary to adopt views at second hand, without any thorough investigation, accepting what may seem most probable. Nevertheless, so far as may be, we should seek for clear convictions, founded on good reasons. This duty is particularly incumbent on teachers of philosophy. He who has no opinions of his own, had better be a learner till he may become confident as to the truth. Moreover, an instructor should express his positive opinions in a positive way. Well-established beliefs should not be uttered as if they were unsettled questions of controversy. Otherwise truth is put on a par with falsehood, or, at least, the student is bewildered in dubious debate.

At the same time the true teacher avoids even the appearance of dogmatism; he would have nothing accepted simply on his own authority. So far as possible he gives reasons for his views; and he especially desires that others should know the method by which his convictions have been formed. For then they can judge whether the method be a correct one; and, if so, whether, in any case, he has departed from it.

Without method no satisfactory progress can be made in philosophical investigations. The importance of it cannot be over-estimated; and has always been acknowledged by thinking men; but more especially since the true method was illustrated and advocated by Lord

The duty of instructors.

The Baconian method.

Bacon. The system inaugurated by this distinguished man is founded on the evident truth, that, as philosophy aims to explain facts, so it should seek that explanation in a questioning of the facts themselves. From this principle two modes of work originate, the first and more rudimentary of which is preparatory and ministerial to the other. The primary philosophy merely observes facts and classifies those which are similar, and, in this way, obtains general facts which are also the expression of certain laws or modes of nature; the more advanced philosophy carries on the investigation by analyzing the general facts already secured and co-ordinating their essential elements. By means of it we reach more profound and satisfying laws. Thus Newton, analyzing those laws, of falling bodies, of planetary motions and of projectiles, with which he was already familiar, discovered the more fundamental law of gravitation, which enters into these, and which continually operates on matter everywhere. In like manner Sir Wm. Hamilton, following the suggestions of earlier writers, has resolved those various laws of the association of ideas, which careful observation had established, into the comprehensive law of redintegration, *i. e.*, that the mind tends to repeat fully any complex operation which it may formerly have experienced, and which it has now, in any degree, begun. In short, the laws of psychical, no less than those of physical nature, are to be learned through the ascertainment and co-ordination, the analysis and generalization, of facts. Such being the case, the student of philosophy may boldly question any doctrine, though upheld by the highest ability and learning, which can claim no record of experience or observation in its support; and as confidently hold any opinion sustained by accurately recorded and carefully analyzed phenomena.

§ 4. The statement that facts are the necessary foundation for philosophy may seem to some too evident to require emphasis. But the neglect of it in times past, and even in our own day, has been the source of many and great errors. The metaphysical worthlessness of almost all the ancient and of much of modern philosophy originates in the admission of high-sounding notions, the truth of which never was proved, and never could be proved, from any examination of things really existing. Only fanciful and unsatisfactory systems could be constructed after such beginnings. Plato and his followers, in ancient days, carried out the separation of philosophy from actuality more fully than any other class of thinkers; and, in modern times, this has been done most signally by the German Idealists. Plato adopted the principle that general or universal ideas are the only proper sources of knowledge and objects of study. The individual or specific he rejected as transitory and, in a sense, unreal. Such a commencement destroyed the possibility of progress. A revival of these Platonic views in an exaggerated form gave rise to the systems of Spinoza, Fichté, Schelling and Hegel, by

The importance of these principles. Platonism.

which the thought of continental Europe was powerfully debauched. These philosophers, being too wise to appeal to experience, sought truth by the "immediate beholding of reason;" and evolved it out of "the depths of their consciousness." The spirit of Hegelianism even at the present time may be inferred from the condemnation, by Dr. Schwegler, of Lord Bacon, as "the author of scientific empiricism," and by his contemptuous assertion regarding Locke's philosophy, that its "empiricism is clear as day." It seems a strange perversion of judgment when learned men condemn a philosophy on account of its chief excellence, and simply because it has been carefully deduced from facts! (See Schwegler's "History of Philosophy.")

Of those investigators, ancient and modern, who have rejected Platonic methods as dreamy and mystical, very few, until comparatively recent times, have systematically based their doctrines on the analysis of observed phenomena. Aristotle, the illustrious rival of Plato, did not do so. The acuteness of this great man cannot be over-estimated, but the intrinsic value of his metaphysical writings has been grossly over-estimated. He did, indeed, recognize the truth that all our general knowledge is an induction from the observation of particulars; yet he did not sufficiently perceive the practical importance of this principle—that it is the only true starting-point of all philosophy. The patient reader of his works can see that he has accepted from previous teachers many absurd doctrines which admit of no proof, and that he forms his own theories depending, first on his own penetration, then on the opinions of preceding philosophers, then on the logical support which other doctrines may give the one under discussion, and then, last and least of all, on facts. Remarks similar to these might be made respecting the Schoolmen of the Middle Ages, and regarding the authors of some famous systems of speculation. We might also trace the progress of the last few generations, in psychology, to a more faithful observation and a more patient analysis of mental phenomena, than were formerly attempted.

§ 5. The Baconian method of philosophizing is frequently termed "The Inductive System," because the induction of principles from facts is its distinguishing characteristic. This work largely consists in the observation and classification of facts as similar. But it includes more than this: it reaches from the past to the future, from that which has been seen to that which has not as yet been seen; and, indeed, the most essential part of it is the exercise of a power of judgment natural to us. Every fact, that is, every causal fact—for of such only we speak at present—consists of certain antecedents and consequents; and it is an intuition of the intellect that similar antecedents must be accompanied or followed by similar consequents. Whenever a fact seems to contradict this principle, it is because some element,

Aristotle and the Schoolmen.

Induction and analysis.

which should exist in the antecedent to make the case similar to one previously observed, has escaped observation, and is not seen to be wanting. Thus, by means of an intuition, the observation of facts results in the ascertainment of laws.

But, in the conjunction of circumstances which make up the antecedent in any particular fact, some circumstances only are essential elements of the antecedent: others are merely accidental and no part of the true cause. Hence the necessity of analysis—of discrimination—without which induction alone could not obtain the exact statement of any law. Moreover, as the laws of existence do not operate singly but in combination, there is yet more need of analysis to resolve these combinations, and, in this way, to ascertain laws which are simple and ultimate. In the ruder attainments of philosophy, induction is more prominent than analysis: the latter takes place spontaneously. But, in the more abstruse inquiries, this state of things is reversed. It is difficult to say whether of the two is more necessary to philosophical progress. They are equally the indispensable instruments of science; and all the rules of philosophizing simply assist and direct us to the successful employment of these two modes of thought.

CHAPTER III.

THE SOURCES OF PSYCHOLOGICAL INFORMATION.

§ 6. As science arises from the investigation of facts, an important question with respect to any department of knowledge is, whether there be abundant and reliable sources of information. In this respect the mental philosopher is peculiarly fortunate. The study of psychical phenomena demands attention and thoughtfulness; and it is found to be a work of special difficulty to those unaccustomed to it; just as reading or mental application of any kind is commonly irksome and laborious to uneducated persons. Yet the student of mind has this great advantage, that the operations and states of this wonderful agent are continually subject to his observation, and even, in a considerable measure, to his control. Besides, the facts thus submitted to him are those respecting the truth of which it is impossible to entertain a doubt. The most extravagant skeptic cannot question the existence of those thoughts, feelings, wishes and actions, which constitute his restless life of unbelief.

The radical source
of information.

The radical source of all information regarding mind is consciousness; or that immediate knowledge which the mind has of its own states and operations. All other means of knowledge are of use only as they co-operate with this. Our knowledge, through consciousness,

of the nature and workings of our own spirits is our only means of understanding the life of other spiritual beings and of comprehending the indications of their psychical activity. Each of us, knowing what passes within his own bosom, learns to understand the experience of others. A child not more than two or three years of age can speak of its thoughts and affections, wishes and pleasures, pains, hopes and disappointments; and knows, also, that others are similarly exercised. This statement can be easily verified: question the little prattler, and you will find that he uses terms expressive of mental, just as intelligently as those indicative of bodily, operations. And these cognitions of spirit, thus early begun, are continued throughout life, pertain to every form of experience, and are free from all uncertainty.

Two important difficulties are to be encountered in using the testimony of consciousness. In the *first* place, the changeful rapidity of our psychical operations interferes with the steadiness of our gaze. What the poet says of pleasures is true of mental phenomena in general; they are

“Like that Borealis race
Which flit e'er you can point their place.”

And even when the current of inward life is partially arrested, that special phase of experience which is made the object of scrutiny, often changes its nature while we are endeavoring to look upon it. The feeling grows cold; the mental image becomes dim; the concrete practical notion resolves itself into its elements. Psychological facts call for a keen and quick observation. They resemble those sea-birds which are ever on the wing; which move even while at rest, and must be shot while flying. The *second* hindrance experienced in using the testimony of consciousness, arises from the impossibility of proving the correctness of one's observation by exhibiting to others those phenomena which are visible directly only to one's self. This difficulty is more formidable in appearance than in reality. The earnest and patient student can generally sympathize sufficiently with his teacher to understand and appreciate an appeal to consciousness. Nevertheless there is here some opportunity for difference: the disputatious opponent, and even the honest inquirer, may sometimes say, “That may be your experience; but it is not mine.”

§ 7. Because, therefore, of the subtle and evanescent character of mental phenomena, and because of the impossibility of presenting the facts of consciousness to the immediate observation of others, great value attaches to certain indirect revelations of mind, which are subject to public and general scrutiny.

Secondary sources
of information.
Language.

The most important of these is language—that marvelous instrument, the expression and embodiment of human thought. Not only every word, but also every change, construction and combination of words, in language, represents some form or mood of man's intelligence. And so well suited is this instru-

ment for its office, that no idea, however delicate, which may have secured the interest of men, fails of expression in their speech. He who has mastered the vocabulary and linguistic forms of any people, has obtained a perfect measure of their mental development. Moreover, every word in any language has a certain fixed meaning, which can be ascertained; and this circumstance is of great assistance when we would study the thoughts of men. For the transitory idea is made fixed and permanent by its sign; and is shown also to be an existing reality. No matter how much we may question the truthfulness of any conceptions, we cannot deny the existence of the notions themselves if they only have become established in the speech of any people. The relations of words, also, illustrate the relations of ideas; so that many points, concerning the contents and combinations, changes and successions, agreements and differences, of thoughts, can be understood better through a critical study of language than in any other way.

Another source of information is found in those voluntary actions, labors and accomplishments, which result from mental activity. Every human being has the power of perceiving both his own actions and those of his companions; and, as he refers his own conduct to his own inward life as its cause, he intuitively adopts a similar rule with regard to the conduct of others. Moreover, as different thoughts and aims result in different actions corresponding to them, we learn to use specific deeds as the indicators of specific thoughts. Sometimes, the thoughts of men are even better understood from their actions than from their language. We not only trace actions to thoughts; we also ascribe accomplished results to actions. This is a yet greater exercise of mental penetration; and by means of it, we can perceive most plainly the former presence and activity of departed laborers. Beholding a field fenced and tilled, we are as sure that husbandmen have wrought in it, as if we had seen them with our eyes. Nor is it necessary to such a judgment that we should have previously witnessed the performance of a work in every respect the same as that submitted to our consideration. There is need only of an *essential* sameness or similarity. One who might be acquainted with the manufacture of locomotives, but who had never seen a steamship, could affirm, on an inspection of the latter, that it was the product of a similar exercise of intelligence, and intended for a similar purpose. In like manner we think that there is as much evidence of design in the sting of a wasp as in the barbed and poisoned arrow of a savage; and that there is more proof of skill and wisdom in the formation of the eye than in the construction of the telescope. All investigators of mind, from the earliest ages, have learned much respecting the existence and the activity of intellect from its manifestations in human life and history, and in the mightier works and ways of the Supreme Being.

The accomplish-
ments and deeds
of men.

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Works of literature.

Many data of mental science may be obtained from works of literature. These themselves are the productions of intellect, so that every volume may be studied as well with reference to the mind of the author, as with reference to the subjects treated. What wonderful powers, what interesting operations, are revealed in the orations of Cicero and Demosthenes, in the poems of Homer and Virgil, in the discussions of Plato and Aristotle! Besides, by the labors of men of genius, the varying phases of human thought and life, the history of man's past experience and achievements, and the peculiarities of the different races inhabiting the earth, have been carefully represented, recorded, and discussed. The writings of such men—poets, dramatists, historians, philosophers—yield to us great *direct* assistance.

Physiological phenomena as connected with psychical. Phrenology, etc.

The study of certain bodily phenomena, as being more or less closely connected with psychical states and operations, is another source of philosophic information; to which, however, some have ascribed undue importance. The influence of health and of disease upon mental vigor, the effect of severe study or of strong passion on the physical frame, the connection of sensation and of sense-perception with the nervous system, and the general dependence of psychical activity upon the condition of the brain, are topics deserving of earnest consideration. It is only through an investigation of these topics that we can determine those laws by which soul and body are united in one life. At the same time, we have the following remarks to make. First: it is clear that no study of physical phenomena can, of itself, reveal the phenomena of spirit. No thought, feeling, or desire can be discerned by any of the senses. No one has ever seen, touched, or handled these things; or made any approach to doing so. Our knowledge of the relations of soul and body is not founded on a perception of bodily changes alone, but quite as much on our consciousness of mental states and operations. If we were not first cognizant of inward experiences, we never could think of their connection with our outward and corporeal life. A scrutiny of the teachings of consciousness is, therefore, a necessary requisite for the successful prosecution of phrenological or similar studies. Mere anatomical investigations, however skillfully conducted, must be useless even for those purposes in mental science which they may properly promote, if the questioning of consciousness be carelessly or imperfectly performed.

In the next place, the psychical laws, connected with these physical phenomena, *are not the laws of spirit viewed simply as spirit, or essentially*; they are only the laws affecting the soul in its connection with the body. The former, which are the more numerous and influential, can be ascertained solely by the questioning of the facts of consciousness as directly or indirectly revealed; the main work of the mental philosopher has respect to them. The

latter, that is, the laws affecting the spirit as embodied, form only a secondary, though important topic of study.

Finally, it is to be noticed that, while the more general and fundamental laws of the causal connection between soul and body have been tolerably well ascertained, *little has been determined regarding the special modes in which these laws operate.* Sense-perception, on the one hand, handling and dissecting the body, and consciousness, on the other, reflecting on the soul and its activities, disclose to us two very different objects. Hence we distinguish mind from brain, and from aught else material, as clearly and as easily as we distinguish the coiled electric wire from that subtle agency which lives and works within it. After this, observation and induction show that soul and body, through different parts of the nervous system, are continually acting on each other in various ways. But when we ask *in what manner* brain and mind affect each other—by what means mental excitement may cause cerebral disturbance, and cerebral disturbance mental excitement—in what way each sensory nerve produces its peculiar and appropriate sensation—or what may be the several offices of the different ganglia and other portions of the brain, the investigation becomes difficult. The attempt to solve such questions as these has often resulted in discouragement to the patient investigator; and most of the answers which have been offered to any of them must be regarded as merely conjectures of greater or less probability.

We think, therefore, that those commit a mistake who say that certain physiological and anatomical researches are the only or chief sources of psychological knowledge. Such studies of themselves can impart no information as to the mind and its workings. Even when properly conducted they do not disclose any of the essential laws of spirit, but only those affecting the soul as embodied. And, so far as they concern specific instruments and modes of operation, they have, as yet, made very moderate progress. At the same time, while rejecting the doctrine of the dependence of mental philosophy on physiological facts or theories we would not be understood to deny the importance of the specific inquiries already mentioned, nor yet the indebtedness of psychology to anatomical science for much most valuable information.

§ 8. The beliefs and judgments of our fellow-men are frequently referred to by writers in mental science. These judgments often prove incorrect, and are not always reliable even in matters apparently simple. Yet the consideration of them is a source of assistance to which the true thinker, however self-reliant he may be, constantly and seriously applies. There are two ways in which a reference to the beliefs of men is of prime importance in philosophy. In the *first* place, we may regard these beliefs simply as psychological facts; and we may endeavor to ascertain them accurately and to explain the laws of their formation. It is from

The value and use of human beliefs simply as facts.

this point of view that we begin the work of solving that most fundamental problem of philosophy, namely, that of determining those general modes of conviction which, by reason of an innate intellectual necessity, are invariably followed by the human mind. And any law, regulating the formation of beliefs, and explaining the causes of error or the progress of knowledge, can be properly learned only by a critical examination of the facts of experience.

The authoritative value of the opinions of others. Of men in general. Of philosophers.

Again, the convictions of others are important to the investigator, not simply as facts for study, but as opinions endowed with more or less authority. This use is related to the first, but is clearly distinguishable from it. Very diverse estimates have been put, both on the views of learned and scientific men, and on the beliefs and judgments of men in general. Some have held to the absolute truth of any universally entertained opinion. They have asserted, too boldly, that the voice of the people is the voice of God. Others, despising the conceptions of the vulgar, as concerned only with the appearances of things, have ascribed wisdom to philosophers alone. Their doctrine is that the vision of the real, the true, the eternal is granted to wise men only; the mass of men see only the uncertain and transitory, and do not penetrate to the essence of things. The truth is, that, within certain limits, the convictions of mankind in general should have great authority; while, beyond those limits, the opinion of the people, as opposed to that of the learned, is of very little weight. Those facts (or phenomena), *which are immediately subject to the perception of sense or consciousness*, can be witnessed as well by the uneducated as by the scientific; and the general testimony of men concerning such facts must be received without question; provided only that it first be accurately ascertained and understood. For example, we must believe with all men that the world around us exists, and that we exist in it, that we have bodies gifted with certain powers and capable of certain affections, and that we have souls, also, which think and feel, resolve and act. These are matters of immediate as distinguished from discursive or rational knowledge.

Moreover, in such practical affairs as involve *questions of advantage and disadvantage which are not complicated*, the judgment of communities is commonly correct and wise. Interest sharpens the understanding for its own service; and, when questions of profit and loss have been determined by the best minds of a community, according to the teachings of experience, and in a way satisfactory to all, we can depend confidently on the result. The customs of a country, though sometimes ridiculous in the eyes of strangers, are generally just what that country needs. Travelers bear witness to the sagacity with which the modes of business even of barbarous tribes are adapted to their rude condition. The following is an extract from Dr. Livingstone's account of the Bakwains, who live in the interior of Africa.

“In general,” he says, “they were slow, like all African people hereafter to be described, in coming to a decision on religious subjects; but in questions affecting their worldly affairs, they were keenly alive to their own interests. They might be called stupid in matters which had not come within the sphere of their observation; but in other things they showed more intelligence than is to be met with in our own uneducated peasantry. They are remarkably accurate in their knowledge of cattle, sheep and goats, knowing exactly the kind of pasturage suited to each; and they select with great judgment the varieties of soil best suited to different kinds of grain. They are also familiar with the habits of wild animals; and, in general, are well up in the maxims which embody their ideas of political wisdom.” Public opinion, also, should have considerable weight in *moral* discussions; though, on account of various disturbing causes, it is not so reliable as in cases of interest. In consulting it on a question of duty we should especially inquire whether the conviction be, not only general, but also deliberate, disinterested and enlightened. But, clearly, those rules of right conduct which all men everywhere approve and uphold, must be founded on good reasons. In general, we may say that the farther questions are removed from facts of common observation, or from those more evident laws which are little more than the generalization of such facts, the less we can rely upon the utterances of the common voice. Hence the necessity, when appealing to what has been called “the common sense” of men, of distinguishing between the perception of phenomena, and the explanation of them. All men everywhere know of the existence of the sun, moon and stars, and of their daily and nightly appearance and disappearance. Their testimony as to the existence of these phenomena is reliable. But their judgment regarding the size of the heavenly bodies, and as to the nature of their motions, may be questioned. All men once believed that the sun revolved around our earth.

Those who can accept the views now expressed, regarding the convictions of the generality of mankind, will probably approve of views, somewhat corresponding to them, concerning *the opinions of scientific men*. We cannot join with those who despise philosophers as dreamers and theorizers, and who boast “common sense” and “experience” as their only guides. The vain self-sufficiency of such persons should be humbled by the consideration that almost all the great elements of modern civilization are the offspring of philosophy and science. The implements, the inventions, the usages and laws, the ideas and institutions, which distinguish us from savages, once were the property of only a few thinking men. The material, moral, and political progress of the world, depends, under God, on its men of thought and learning. While, therefore, the philosopher is no greater authority in matters of fact than his fellow-men; and while his practical judgment is often inferior to that of

men in active life; his opinions, concerning those general questions which he investigates, are not to be lightly rejected; and any general agreement in the world of philosophy is a very weighty presumption, indeed, either for or against a doctrine. Who now questions the Newtonian theory of the solar system? Who doubts the ordinary analyses of chemistry, or statements of geology? And who rejects the explanation of sense-perception, of dreams and phantasies, of general notions, and of the reasoning process, given by psychology? It is true that even the weightiest of human opinions have only a provisional authority; and that no one, who can investigate for himself, should accept, without examination, the statements of others. But for many this is impossible; they are otherwise and fully occupied; their talent lies in some other direction; or the means of research are not at their command. Besides, a knowledge of the achievements, and even of the failures, of preceding laborers is indispensable to those who would carry on a work which has already been begun. So that the philosopher himself, who seeks for independence and originality of view, must study with care the efforts of his predecessors. If he do not, in all probability he will neither avoid their mistakes nor equal their attainments.

CHAPTER IV.

THE POWERS OF THE SOUL CLASSIFIED.

Power and faculty distinguished.

§ 9. The word *power*, in mental philosophy, when used in its concrete sense, denotes any of those attributes in the exercise of which the soul shows itself a living being. It has nearly the same meaning as the term *faculty*, but it is of wider application. The latter word, which signifies a power of doing, gives prominence to the form of action, or doing, in which some power is manifested; but we speak simply of a power, when the potency exerted, rather than the thing done, is the prominent element of thought. As *doing* pertains to spiritual beings alone, the name *faculty* is applied only to attributes belonging to them; *power*, on the contrary, may indicate any potency, mental or material. In psychology the words are interchangeable, though sometimes one is more suitable than the other. It is more proper to say, "the power of attention and the faculty of observation," than to say, "the faculty of attention and the power of observation." Because, in the one case, the exercise of potency, in the other, the mode or result of that exercise, is the emphatic element. Both elements, however, are present in each case. As a rule, the *idea of doing*, i. e., of *intentional accomplishment*, is connected with the

term faculty; while the term power is not limited in this way. On this account the latter term is to be preferred as a general name for all the natural endowments of the soul.

Every system of philosophy must, of necessity, be constructed with reference to some classification of phenomena. Psychological systems, generally, have been constructed according to a classification of the powers of the soul derived from an observation of its activities. As these phenomena are simply the actings of powers, the classification of the powers is that also of the activities. The principle, therefore, of this classification may be accepted as satisfactory.

At the same time the divisions of psychical powers hitherto given seem somewhat open to the objection that they are *not sufficiently based on philosophic analysis*. They differ little, if any, from the more marked distinctions of common speech. But language is first formed for practical, not for scientific, purposes; its terms and notions do not result from that examination which seeks for simple and ultimate laws; and therefore the generalizations and distinctions of ordinary speech, though of great authority and generally correct, do not always set forth those radical differences of nature which scientific division should indicate.

The old division of psychical powers into the understanding and the will was that employed by the philosophers and theologians of the Middle Ages; and perhaps served sufficiently well for their peculiar discussions. Our earlier English writers, also, whose attention was devoted chiefly to the intellectual powers, contented themselves with this division. Locke did so; and Reid, the illustrious founder of the Scotch school of philosophy (he lectured in Glasgow during the middle of the eighteenth century), expresses himself thus: "There never has been any division of the powers of the mind proposed, which is not liable to considerable objections. We shall, therefore, take that general division, which is most common, into the powers of understanding and those of will." But, afterwards, in his second essay on the will, he condemns this division. "Some philosophers," he says, "represent desire, aversion, hope, fear, joy, sorrow, all our appetites, passions, and affections, as different modifications of the will; which, I think, tends to confound things which are very different:" and he remarks that things which have not a common nature should not be confounded under one name. The dissatisfaction, thus expressed, being generally felt, resulted in that threefold division which is now commonly made. "Our conscious acts or states," says Dr. Porter ("The Human Intellect," § 35), "are separated into the three broad and general divisions of states of knowledge, states of feeling, and states of will. To know, to feel, and to choose are the most obviously distinguishable states of the soul. These are referred to three powers or faculties, which are designated as the intellect, the sensibility, and the will. This threefold division is now

universally adopted by those who accept any division, or doctrine, of faculties."

Objections to the common division.
1st. No separate place for the power of sense.

Nevertheless, for several reasons, we cannot regard this threefold division as sufficient and satisfactory. *First* of all, it seems a serious defect that no separate place is allowed in it for the power of sensation, and that, on this account, the discussion of the subject of sense is made to fall under the head of intellect. The former of these powers presents objects to the latter and contributes a stimulus to its exercise; but they are radically different from each other. The treatment of them together, under the same division of thought, favors the materialistic doctrine that intellect is but a modification, or development, of sense.

Sensation, too, is essentially diverse from that emotional feeling which the perception or remembrance of objects often excites; although, we think, it might as well be classified with emotion as with intellect. It differs greatly, and perhaps equally, from both: and, if this be so, ought not sense to be reckoned an independent power?

2d. Motivity not sufficiently distinguished from emotion, on the one hand, or from exertion on the other.

Secondly, this division makes no distinct place for desire, or, using a more befitting and comprehensive term, for that motivity, by reason of the exercise of which the spirit of man seeks various ends. The motivities constitute a marked and important class of psychical phenomena; they include the instincts and appetites, the propensities and passions, the affections, and such active principles as self-interest, public spirit, rational benevolence, a sense of duty or of justice, and the love of what is right and good. Some authors, as Drs. Upham and Haven, place motive tendencies and emotions together under the head of Sensibilities. Sir Wm. Hamilton, on the other hand ("Metaphysics," Lect. XI.), unites will and desire together, as the third grand division of spiritual life; and calls them "the exertive faculties." He also employs the term "appetency" to signify "a genus comprehending under it both desires and volitions." Were a choice necessary, we would rather classify motivity with will than with the emotional power; and to this last, exclusively, we would assign the term sensibility. But we prefer to consider desire, or motivity, as itself an elementary power, which should be distinguished from every other.

3d. The will should not be regarded as a simple power.

This leads to a *third* objection. The threefold division is professedly a generic classification of our powers, not as these exist and operate in combination, but *as they are seen after an ultimate analysis*. In other words, it is given to represent only simple and undefinable elements of our conscious spiritual life. Now, with Brown and Hamilton and other older metaphysicians, we believe that there *is* something in volition of the nature of motive tendency. At the same time we hold that volition contains more than

motivity; that it is a combination of intellect and motivity under special and modifying conditions. For this reason we cannot regard volition as being a simple and fundamental power, nor even as being a specific form of such a power. Intellect comprehends sense-perception, consciousness, memory, reasoning, imagination, and so forth, but cannot include volition, determination, or purpose; because, although these last contain an intellectual element, they have also, essentially, a quality not intellectual. In like manner, motivity may be divided into appetite, propensity, affection, self-interest, public spirit, and so on, but must be separated from decisions, intentions, and resolutions; because these are characterized by a peculiar exercise of the intellect which distinguishes them from mere motivities. We might, indeed, with Hamilton, consider the will with exclusive reference to its motivity; and define it as the motive element of determination or purpose. But this would modify our accepted and proper notion of will. The better way is to exclude the will from our radical division of psychical powers, and to treat it as a complex faculty. Yet, if any hold fast to the belief that the will is a simple power, and, in its essential part, incapable of analysis, this view also leads to a more than threefold division. For, after sensation, intellect, emotion, and motivity, volition would come as the fifth radical mode of conscious life.

Again, we object to the common classification that it does not recognize, as a fundamental power, what may be called the faculty of exertion, or of action. For every exertion is an action when it is successful in accomplishing some result. This power is generally included under that of will. Dr. Haven thus describes "the third form of mental activity." "Thought and feeling lead to action. I resolve what to do. I lay down my book, and go forth to perform some act prompted by the emotion awakened within me. This power also I have; the faculty of voluntary action, or volition." But we distinguish, easily, the volition or determination to act from the action which we resolve and purpose to do. Intentions and deeds are things radically diverse. The language of Reid applies here: "Things that have no common nature ought not to be confounded under one name, or represented as different modifications of the same thing." Therefore, among the simple powers of the soul, we would place that of action or of exertion, or, to use terms of Hamilton's, the exertive or conative faculty. But it should be stated that while Hamilton employs this language, he does not specify any such power as that now mentioned. He rather *identifies* desire, volition, and conation, as to their essential nature, by making them the manifestations of the same general power. In our view, these activities, though closely connected with each other, differ radically as to their internal character.

4th. The distinctive character of exertion, or action, overlooked.

5th. The capability of pleasure and of pain should be recognized as a fundamental power.

Our *concluding* objection has reference to the phenomena of pleasure and pain, and to the power or capability which the mind has of experiencing these phenomena. This power has no proper place in the common division. It is true that pleasure and pain have not so independent an existence as the other activities of mind. Happiness is a kind of aroma which accompanies a well-ordered and well-sustained life; misery is the effluvia of an ill-regulated life. Nevertheless these phenomena should be distinguished from those which they attend, and especially from those to which they are most intimately related. For this reason we object to Hamilton's classification of them with our emotions or sensibilities. He discusses both of these elements of experience under the head of "Feelings," and makes no distinction at all between them. But the pleasure or pain of an emotion should be distinguished from the emotion itself, just as the pleasure or pain of a sensation should be distinguished from the sensation itself. In short these subtle concomitant modes of experience arise, not only from our sensations and emotions, but also from our thinkings, desires, volitions, and actions. That is, they flow from, and attend, every mode of psychical activity. If, then, we distinguish the experiences of sense and thought, of motive feeling and of exertion, from their attendant pleasures and pains, we certainly should make a similar distinction with reference to emotion. No investigation of psychology is more interesting than that which, commencing with pleasures and pains, goes on to seek the general nature and causes of happiness and misery; and perhaps none as yet is so undeveloped. Some theories have been proposed to solve its questions; but no doctrine has secured general approbation. The distinction of pleasure and pain from other phenomena, and the recognition of them as having a nature and laws of their own, are plainly a necessary condition of progress in this important philosophical inquiry.

§ 10. If the foregoing objections be well-founded, they call for a new enumeration of the fundamental powers of the soul. We propose the following six-fold division: *first*, sensation or sense; *secondly*, thought or intellect; *thirdly*, emotion or sensibility; *fourthly*, desire or motivity; *fifthly*, exertion or conation; and *sixthly*, the capability of pleasure and pain. Each of these powers has characteristics of its own. For example, sense is distinguished by its peculiar and inherent dependence upon material excitants and bodily organs. Intellect is the most prominent faculty of spirit, and is the condition of all psychical life, save that of sense only. Emotion is a psychical excitement produced by the perception or thought of some object, and has a correspondence to the nature of the object. Motivity is a more active principle than emotion, and is always a tendency towards some end. Exertion, or action, is an ability in the exercise of which the soul

A new division proposed.

voluntarily uses the mental and physical powers at her command. And the capability of pleasure and pain is manifested in that peculiar experience, or element of experience, which, under laws of its own, accompanies all the different forms of psychical activity.

The words *capability* and *capacity* defined.

This capability, perhaps, can be called a power only in that wide philosophic sense of the term which includes every inward source of spiritual life. For the potency which yields pleasure and pain, though really existing, is seldom a prominent element of thought. Our attention is naturally directed to the nature and degree of these experiences and to their exciting causes, rather than to our power of having them. Consequently we speak of the capacity (or passive power, as it has been called) of pleasure and pain, leaving the element of active potency entirely out of view; or of the capability of pleasure and pain, in which conception the idea of active potency combines, as a secondary element, with that of receptivity.

The foregoing enumeration of the powers of the soul has been sought from a careful analysis of the testimony of consciousness; and it is believed to be complete. Scientifically, however, the accuracy of a classification is of much more importance than the completeness of it. The former is necessary to clear thought and philosophic progress; the latter is only a desirable auxiliary. If our division be correct so far as it goes; if it gives only simple and ultimate powers, avoiding those which are either compound or of a specific character, our chief end has been attained.

Diversity of powers does not involve separateness of parts.

Here, perhaps, in order to avoid misconception, it may be well to remark that neither the foregoing, nor any other division of psychical powers, conflicts with the doctrine of the unity of the soul, or involves the idea that a spirit is composed of parts. Our activities not only belong to the one *ego*, or self; but they mingle and blend in the formation of one complex life. They neither exist nor operate separately; and it is only through philosophical analysis that they can be separately thought of. As a glassful of water may have weight, fluidity, incompressibility, transparency, temperature and other qualities, without being thereby divided into parts, so the possession of diverse powers is consistent with the fact that the soul is a yet more perfect unit than any material body is, or can be.

Secondary psychical powers whose operation modifies that of the primary.

Beside those powers, now enumerated, which show themselves directly in the individual acts of our spiritual life, there are other powers whose existence is inferred from a more or less extended observation of our experiences. These potencies manifest themselves in laws according to which the operation of our more conscious faculties is modified. Among these laws, those of habit and of growth may be mentioned; those also which pertain,

to mental soundness or disease; and those relating to the immediate, or to the gradual, effect of physical agencies upon the soul.

Habit and growth are nearly allied to each other; the former may be regarded as a special development of the latter. The law of habit is that any definite exercise of spiritual power has *the twofold effect* of increasing the ease with which that exercise may be repeated, and of creating a tendency towards its repetition. Growth includes every gradual increase of power, from whatever cause. The ascertainment of the conditions and limitations which regulate the operation of these, and other potencies such as have been mentioned, belongs to the more advanced work of the psychologist.

CHAPTER V.

THE INTELLECT DEFINED AND DIVIDED.

§ 11. The question, "Which of the human faculties is of the highest dignity and value?" has sometimes been raised; probably it should be settled in favor of the moral and affectional powers. But, when we ask, "Which is the most philosophically important, the most necessary to discuss and understand?" there can be but one answer: it is the intellect. Which reply is supported by such reasons as the following. In the *first* place, the study of the intellect prepares us for the confident and correct use of the great faculty of thought. It is through this faculty that we become consciously related to every part of the universe of existence, and especially to that world of life and intelligence, to which we ourselves belong, and by whose laws our destinies are determined. And, as man must conform himself to the laws of his existence, the ability to think correctly is the first condition of his prosperity, especially of his moral and spiritual prosperity. When that power of thought, whose office is to guide the soul, becomes confused and misled, how pitiable man's state becomes! The light that is in him turns to darkness; and the darkness is great indeed. Let us remember, too, that the evil of intellectual error, not only exists, but is widely spread. Multitudes of men, in all ages, have been oppressed and destroyed by it. For mistaken views, assuming the forms of philosophy and religion, may be found not only in academic and theological halls, but in every walk and sphere of life. Nor does it matter much whether they be set forth in pretentious scientific terms, or be expressed in homely language; they are always pernicious. Now a true philosophy is our defense and antidote against the false. It gives to man

Philosophically, the most important of our faculties.

a proper confidence in his natural convictions, delivers him from intellectual intricacies and errors, and guides him to a safe and satisfactory progress. Here we may allow that the study of our other psychical powers assists us in their proper guidance; but we must deny that it does so to the same extent that we are aided against intellectual imperfections by the science of mind. Error, when understood and exposed, is destroyed; deep-seated evil propensities need a stronger remedy.

In the *next* place, we may remark that there is comparatively little need of study to understand the laws of our other faculties. The complexity and subtlety of intellectual phenomena render special care and attention necessary for the understanding of them. And, *finally*, it is to be observed that most of those difficulties which do occur in other departments of psychology arise, either out of the connection of the intellect with our other powers, or in respect to forms of thought which can be understood only through an analysis of intellectual operations. The philosophy of emotion and of motivity is largely a definition of those modes of conception and of cognition which result in these experiences; that of volition discusses the nature and operation of final causes or psychical aims; and that of ethics is chiefly occupied with the origin, the essence, and the varieties, of our ideas of right and wrong. The science of intellect is the key to all the more abstruse questions of psychology; and therefore it possesses, not simply its own pre-eminent importance, but also shares largely in that of kindred studies.

§ 12. The intellect, like the other radical faculties of the soul, *cannot be analytically defined*. It is a psychical power characterized by a simple or in-complex peculiarity. But it may be defined by means of its relations. Should we say that the intellect is the power of thought, this might be regarded as merely a nominal definition in which the terms intellect and thought signified the same thing; and it certainly would be so, were the term thought taken in its most comprehensive signification; in this sense, it is the precise equivalent of intellect. But, should we mean by thought only the power of mental apprehension, as distinguished from those of belief and other intellectual functions, the statement would not be tautological; it would be a definition of intellect from its relation to its principal activity. *Again*, the intellect, though continually exercised along with other powers, is easily distinguished from them. Some philosophers have identified all the faculties of the soul with this power; but could any one save a philosopher confound thinking with sensation, emotion, desire, resolution, or exertion? In the natural consciousness these are distinct powers.

We notice, *further*, that, in the necessary or primary order of existence, the exercise of intellect comes after that of sense, but before our other experiences. Sense acts without the aid of thought, but thought is at first aroused, and afterwards in-

The intellect de-
fined.

errupted, guided, and stimulated by sensation. And every other psychical movement, excepting only the pain and pleasure of sensation, seems to involve thought as an antecedent.

The intellect is the quietest of our powers, but the most rapid in its operations and the most varied in its products. The results of intelligence, also, are to be seen in all of human life, but especially in the employments of men, in their language, and in their intercourse with one another. In *conclusion* we must mention the most striking characteristic of the power of thought, namely, that it is the agency which unites the soul, its possessor, with the universe. Intellect renders existence of every kind objective to man; and this fact is the foundation of all the important experiences and achievements of the soul. Other powers, especially motivity and conation, have objects, but things become objects to them only as having been first the objects of intellect. Hence it would be an excellent characterization of thought to say that it is the power through the exercise of which spiritual beings make the universe objective (or objectual) to themselves; meaning by the universe all cognizable existences. Our conception of the mind or intellect might be further determined by an enumeration of the subordinate faculties included in it; but the foregoing descriptions may suffice.

§ 13. Now, however, we proceed to the fundamental division of the faculty of intellect, for the purpose of presenting distinctly such generic conceptions of the powers and modes of mental activity as have resulted from critical inquiry. Such a division is of prime importance in the science of mind; for the subtlety of intellectual phenomena is so great that, without special care, some of the radical differences between them, may be overlooked. The history of psychological investigation fully illustrates this point. By division, also, we prepare for systematization of thought, knowledge and inquiry, an end subordinate, and partly subservient, to that just mentioned (of distinctness of conception), and very essential to scientific progress.

Logical divisions are commonly based on some one principle, which is called the "*fundamentum divisionis*," or *principle of division*. Thus mankind may be divided according to race, or language, or country, or degree of enlightenment, or religious creed, or sex, or age, or occupation. A new division arises according to every general aspect in which we may contemplate the members of the human family. Any principle of division becomes of philosophic value when it brings important differences to view; that is, differences which operate largely in the diverse production and characterization of phenomena. The perception, statement, and explication of divisions based on such principles is an important part of scientific work. By means of these divisions, the leading truths and ideas of a science are enunciated according to their most important relations and in the most instructive way.

The intellect divided.

Three Divisions.
1st. The primary
and the secondary
powers of intel-
lect.

There are three divisions of intellect which should be made the subjects of special study; each of them being founded on an important principle. The first of these is that into *the primary and the secondary powers of mind*; it finds its principle of division in the natural order of the operation of our intellectual powers. We say that thought and belief are the primary powers, because in their exercise intellect accomplishes its ultimate work, that which alone gives importance to all the rest. And we call attention, acquisition, association, synthesis, analysis, abstraction, and generalization, secondary powers, because their working is simply to modify the operation of the primary powers, and has all its consequence from this fact. Thought, and belief, no less than thought, are concerned with things—objects; whereas the other powers are essentially subjective in their operations, and cause certain modifications in our ideas and beliefs. The distinction between conception and conviction, between thought and belief, is clearly marked in the speech and consciousness of men; and is of the utmost importance in philosophy. For this reason it may seem strange that in most philosophical systems it has not been accorded any special prominence. In some systems it has been entirely disregarded.

2d. The three phases of intellect.

A second division of intellect has reference to the mode of the formation of mental states; and it sets forth *the several phases of intellectual life resulting from diverse modes of formation*. This division does not arise from so searching an analysis as that just mentioned. It recognizes the fact that certain complex manifestations of thought and of belief result from certain general causes; and it leads to the study of the forms of intellectual activity thus produced. These phases are three in number, and may be styled the perceptive, or presentational, the reproductive, or re-presentational, and the discursive, or rational, phases of intellect. Both thought and belief are exercised under each of these modes of intellect; as are also, though in different degrees, the various secondary powers of mind. The *perceptive* phase of mental life originates in, and is characterized by, the *immediate cognition* of objects. It is subdivided into sense-perception, consciousness, and concomitant perception; this last signifying that cognition of relations and the fundamenta of relations, which, without being included in sense-perception and consciousness, is exercised in connection with them. The *reproductive* phase arises from the *repetition, or reproduction*, by the mind, of the ideas and beliefs of immediate cognition. Its principal forms are the memory, the phantasy, and the imagination. The law, according to which our thoughts are reproduced, in whole or in part, is called the law of the association of ideas. The essential and distinguishing mark of the rational phase of intellect is the exercise of a peculiar degree of penetration and of comprehension. This results from a higher degree of mental power than is possessed by irrational creatures,

and is manifested, first, in the clear abstractive perception of things, and especially of relations, and, secondly, in connected logical thinking, or, as it has been named, the discourse of mind. When considered with exclusive reference to its primary perceptions and individual acts, reason is called intuitive; but when we refer also to the processes of thought to which these give rise, we speak of the discursive reason, or of the discursive faculty. (§ 187.)

The faculties, whose manifestations have been now described, should not be conceived of as so distinct from each other that they can have nothing in common; but rather as three modes of intellect, each of which is strongly marked by characteristics especially its own. For the modes of operation special to each faculty enter, to some extent, into the operations of the other two.

A third radical distinction in intellect finds its "fundamentum divisionis" in the diverse character of our convictions or beliefs, and of our ideas as connected with our beliefs. It is commonly indicated by the division of thought into its *intuitional and experiential elements*. For this analysis, though one of thought and not of belief, yet results from a distinction in our beliefs, and cannot be well understood save in connection with this distinction. All of human convictions are necessary in the sense that belief is not a voluntary action, but the inevitable result of the exercise of certain faculties, that is, of perception and judgment. But there is a special sense in which some beliefs are said to be necessary, and others not. For some are beliefs of things necessary, that is, of things which are of absolute necessity and which could not at all be otherwise; while others are of things contingent, that is, of things which are not, as they are, by this absolute necessity. This latter kind of conviction may be called the contingent; and the former the necessitudinal. For example, in the exercise of my faculties, I believe, and must believe, that I am now writing with pen and ink, and also that this writing does not take place without some power in me to do it. So also I am as fully convinced that I live in Hanover, as that I exist somewhere in the universe. Nevertheless my writing with a pen is perceived, not as a matter of necessity, but as a matter of fact; I might have written with a pencil, or not at all, while it is a matter of necessity that my writing, or any other operation which I may perform, should result from some power. In like manner it is absolutely necessary that, being existent, I should exist somewhere in space; but it is not necessary—it does not belong to the nature of things—that I should live in Hanover, or that I should have come into life at all. Again, it is simply a matter of fact and of contingent knowledge, that Hanover College is six miles from the city of Madison; for it might have been located at some nearer or more distant point; but it is perceived as a matter of necessity that the distance mentioned, being six miles, is not five or seven, or any number whatever

3d. The intuitional and experiential elements of thought.

other than six. For no multiple of any quantity can be equal to any other multiple of the same quantity. This distinction between necessitudinal and contingent perceptions and convictions occupies a prominent place in the history of philosophy. Questions respecting the distinctive nature of thought, the proper sphere of the exercise of reason, and the reliability of our faculties of knowledge in general, have been found intimately related to it.

Some speculators have so explained our necessitudinal beliefs as to leave no radical distinction between them and our contingent beliefs. They deny that we perceive any necessity external to the mind; they say that the only necessity in the case is a mental inability, resulting from habit, or association, or some other cause, to think concerning certain classes of facts differently from the way in which we have been accustomed to think. But the more satisfactory view seems to be that the external necessity really exists, and that we have the positive intellectual ability to perceive it; an ability which we cannot avoid exercising; and that there is a most important difference between contingent and necessitudinal perceptions or judgments, as there is also between the classes of facts which they set forth.

Those who hold the doctrine now stated constitute what is known as the intuitionist school in philosophy; because they teach that our first cognitions of things necessarily existing are intuitions, or immediate perceptions, of these existences, and not mere unfounded inferences, or imaginations of the mind. As our cognition of things contingent is as immediate as our perception of things necessary, there may be a question as to the propriety of confining the term intuition to the latter; but of late years eminent authors have used the word in this way (§ 225). The controversy as to the existence and nature of necessitudinal perceptions has led to an investigation of their matter or contents. It was found impossible to prove that we form intuitions concerning such objects as spaces, times, potencies, substances, and their mutual relations, without first considering carefully our conceptions of these objects. The peculiar character of our intuitive perceptions being of an objective nature, and not that of an inward necessity, the proper way of distinguishing necessitudinal from merely contingent perception must have reference to the ideas peculiar to the former, and also, through these ideas, to the objects corresponding to them. Moreover, investigation revealed that the conviction of necessity belonging to these judgments is not connected with the whole of their matter or thought, but only with one portion or element: and this led to the analysis of our thought for the purpose of eliminating all that is not essential to necessitudinal judgments as such, and of presenting, in clear and formal statement, that which is essential. The conceptions, thus distinguished as essential by a natural metonymy, have received the same name as the perceptions in which they are found: that

is, they have been called intuitions of the mind. Taken collectively, also, they have been styled the intuitional element of thought. The residual element, being that on which the necessitudinal character of a conviction does not depend, has been styled the experiential element of thought (§ 231). Experience is a befitting name for that power of perception by which we cognize matters of fact simply as such; and, accordingly, by the experiential element of thought, as distinguished from the intuitional, we mean that which is produced exclusively by experience or the experiential power of thought, and which, also, is never the basis of the necessitudinal character of any judgment. This division of belief and of thought into the intuitional and the experiential is essential to a satisfactory understanding of the working of the intellect. But it is difficult to apprehend and easily misunderstood. On this account, in discussions concerning the intuitions, we should be specially on our guard against confusion.

The divisions now given direct our attention to the three most important distinctions in the phenomena of intellect. They teach us, *first* of all, that some powers are primary and others secondary; in the *next* place, that thought assumes three diverse phases, according to the mode of its origination; and, *thirdly*, that two distinguishable elements are to be found under every phase of thought, the one of which is the condition upon which necessitudinal, and the other the condition upon which contingent, or mere matter-of-fact, beliefs specially depend. Probably a course of philosophy could be constructed in which one of these divisions might be employed as the principal guide in the arrangement of topics, the others being used in subordination to it. But, it may better serve our purpose to take these divisions successively, and in the order in which they have been presented, and to make each a starting-point for discussion. With this view, we propose the following course. We shall begin with *the power of sense*, and questions relating thereto: for this power, though to be distinguished from intellect, is the primary cause or condition of mental activity, and also furnishes the objects of a most important exercise of thought and belief. After this, proceeding to our first division of intellect, we shall consider the general character and laws of *thought and of belief*, and of thought as accompanied by belief. After that we shall study the nature of *those secondary faculties*, which, in their several ways, modify the operations of the primary. This will prepare us for an examination of the specific manifestations of thought and of belief, which are presented to us in the *three comprehensive phases of mental life*. And, should we once understand these, we shall be ready to appreciate properly the character and bearings of the distinction between *the intuitional and the experiential elements of thought*, and to discuss doctrines connected with this distinction.

A course of discussion proposed.

The foregoing series of subjects will bring before us for investigation all the phenomena of intellect which directly manifest themselves in consciousness. Those powers and laws whose operation on our intellectual life is a matter of inference rather than of immediate observation may present incidental subjects for our consideration.

CHAPTER VI.

SENSE AND ITS RELATIONS.

§ 14. The word *sense* is the Latin equivalent of the word *feeling*; and, like the latter term, it often includes not only pathemetic experience—or feeling, properly so called—but also that exercise of perception which this feeling either produces or accompanies. Thus one may have a sense of comfort, or a feeling of uneasiness; and, also, a sense of the nearness of danger, or the feeling of being fully protected. In modern psychology, however, the term *sense*, when used alone, has generally been confined in its application to our bodily feelings, as distinguished from the perceptions formed in connection with them. Moreover, as the word *sensation* indicates the exercise of these feelings, the name *sense* may very properly be restricted to our power of having them.

The word *sense*.
Sense a psychical power, and *sui generis*.
 When sensations are styled bodily feelings, the expression refers to their source rather than to their nature; for the power of sense belongs to the soul, and not to the body. As the soul uses the organs of locomotion, but is different from them, so it is affected by the organs of sense, and is different from them. Sensation, if it is true, belongs to the soul only as embodied; it is conditioned upon certain corporeal or nervous changes; but it is to be distinguished from these changes. In itself it is purely psychical.

This power, also, is not to be confounded with any other power of the exercise of which our spirits are conscious. Especially we should observe that sense is not intellect. That sensation and thought are things radically unlike is a proposition scarcely demanding proof. Who cannot distinguish the pain of a cut finger or a burnt hand from the thought of these things? or the satisfaction of a refreshing draught or a comfortable meal from the mere conception of these objects as matters of unrealized desire? Therefore, separating sensation on the one hand from corporeal affections, we separate it, on the other, from all the higher activities of spirit.

§ 15. Although sense is radically diverse from intellect, it has several intimate relations with the latter power. In the first place, sensation, or the exercise of sense, is a *natural excitant and occasion* of the exercise

The relations of sense to intellect.
 1st. The excitant.

of intellect. As the power of ignition and illumination, which resides in the lucifer match, is called into exercise by that rough rubbing which is followed by the flash of light, so the soul, on the occasion of the coarse experience of sense, awakens to the higher experience of thought. The opinion, too, seems well founded that our first intellectual activity is excited by the first sensations of the infant spirit. These views were well expressed by Patricius (an old writer, quoted by Hamilton) when he called the senses the "exordium," or starting-point, of knowledge. "Cognitio omnis," he says, "a mente primam originem; a sensibus exordium habet primum."

2d. *The object.* But sensation is more than the excitant of thought; it is also, and at the same time, *an important object*, of thought. For the mind, while perceiving its own sensations, is gifted, besides, with the power of perceiving certain relations and correlates of these sensations; and this is the origin of our knowledge of the external world. The intellect, acting upon, and in conjunction with, the experiences of sense, discerns the existence and the nature of material objects; and so, from small beginnings, ascends to the contemplation of the universe. The discussion of the relation of our knowledge of our own sensations to our knowledge of the material creation, forms an important chapter in the philosophy of mind.

3d. *The instrument.* Finally, the power of sense is employed by the intellect as *an instrument of inquiry and of guidance*.

We increase our knowledge of material existences through the intelligent use of the senses; and we direct our bodily actions by the information obtained through them. The highest of the physical sciences, such as geology and astronomy, are dependent on sensation for the ascertainment of their facts; and the most exquisite of the arts, such as painting, music and sculpture, seek guidance for their delicate movements from the same source. By sense, also, we are qualified for the ennobling faculty of speech. Because of these several functions—as the excitant, as the object, and as the instrument, of intellectual activity—the power of sensation has always occupied a prominent place in discussions concerning thought.

Sense defined. Sense is a simple power. That is, it is distinguished from our other psychical endowments by an incomplex peculiarity; and therefore, also, like intellect, it does not admit of analytical definition. Yet every important conception in philosophy, however simple it may be and incapable of description, can and should be determined circumstantially, or by means of its more prominent relations. If a number of balls hung in air, each of which was precisely similar to the others in size and shape, but possessed of a shade of color peculiar and unlike any color to be found elsewhere, we could not describe these balls, severally, to one who had never seen them. But we might determine the bearings of each ball from various fixed points of observation; and in this way we could

indicate the place of its existence and make it the object of intelligent apprehension. So it is not sufficient to say that such or such an object, being simple, cannot be defined; we should endeavor to show its prominent and distinguishing relations. This mode of defining, or, more strictly speaking, of determining, a conception, is equally satisfactory, and should be considered equally logical, with that which results from analysis. It may sufficiently define sense to say that it is a power the exercise of which is immediately consequent upon a corporeal affection, and which, though not thought, is related to thought as has been already described. We might add that sensation, like our other activities, is accompanied by the experience of pleasure and of pain. Various particular senses, each of them well known, also might be mentioned, according to that mode of determination which follows the relation of the general to the specific, and which is a special use of logical division.

Commonly we hear of five senses, taste, smell, hearing, touch, and sight. Philosophical discrimination adds to these at least two others—the organic and the muscular. The marked peculiarity of the five first-named is, that their bodily organs, being evidently constructed for their use, are easily perceived and distinguished. It should be noticed that, although only seven senses are enumerated, a countless variety of sensations are thus grouped into a few classes. What a vast number of odors there are! What innumerable sounds and voices, colors and sights! How many are the modifications of touch, especially when the exercise of this sense is combined with muscular or organic sensations! We feel the smooth and the rough, the warm and the cold, the hard and the soft, the solid, the liquid and many others. Muscular feelings are those internally accompanying muscular movements. They are the least varied of all, but they admit of a delicate mental estimate of the quantity of sensation; and this enables us to measure the amount of muscular power employed, or of physical force counteracted. The sensations experienced in one's opening his fingers or raising his hand, in lifting a weight or stopping a moving body, in resisting the flow of a stream of water or the violence of an excited animal, in exerting one's self in any physical labor, in short all sensations of corporeal effort and opposition, belong to this class. On the other hand, our organic sensations, which are those connected with our various bodily functions other than that of muscular movement, contain many specific classes. They, and indeed all our corporeal feelings, may be divided into the ordinary and the extraordinary, that is, those experienced during bodily soundness and health and those felt during bodily injury or disease. Some of them are more localized than others. Hunger, thirst, sleepiness, weariness, aches, pains, and the various feelings of sickness, together with the pleasant sensations experienced when we are relieved of any suffering or distress, are forms of organic sensation. To these we may add the feelings

Sense divided.

of heat and cold, and that of pressure; as when the hand lies on a table beneath a weight. As some of these experiences take place throughout the whole body, while no set of nerves are known to be specially devoted to their production, every part of the sensory system alike may be regarded as their organ; but this is pre-eminently true of those feelings of exhilaration and of depression resulting from bodily vigor or debility. The famous orator, Charles James Fox, as he inhaled the morning air, and looked abroad on the freshness of nature, was wont to exclaim, "What a glorious thing it is to live!" And these words seem to have been chiefly prompted by a sense of that exuberant vitality and vigor which pervaded the bodily organization of that great man.

If the foregoing statements be correct, it is evident The "sensorium." that the power of sense is diffused throughout the whole body. Some bodily growths, it is true—as the hair, the nails, the outer cuticle, and part of the bones—are void of sensation. But these are a small fraction of our physical person, and, through sensations of the adjacent and surrounding portions, they are brought practically within the sphere of sense. Every other part of the body is so minutely pervaded with muscular and organic sensations that the power of sense may be said to occupy our whole frame. The body, thus considered as the place throughout whose limits the soul is sentient, is called the "sensorium." This term, formed after the analogy of *dormitorium*, *oratorium*, and such words, which mean the places of sleeping, of prayer and of other uses, signifies the place or local organ of sensation. More correctly speaking, that system of sensitive nerves, centering in the brain and minutely pervading the body, should be styled *the sensorium*. For we have no feeling save so far as some nerve may be touched or excited, and the destruction or paralysis of a nerve destroys also the possibility of the sensation connected with it.

The immediate cause of sensation. § 16. This brings us to consider the cause or immediate condition of the exercise of the power of sense. Long before the discoveries of anatomy, men knew that sensations resulted from affections of the body. The soul by an immediate perception attributes sensation to itself; but it perceives also that every sensation is occasioned by something not itself. When one's finger is burned, or even when one suffers toothache, he needs no proof that he himself feels the pain; and he also is able to understand that the scorching fire or the decaying tooth is the cause of his experience. For, in all such cases, we find no occasion for the sensation in the preceding experience of the soul; yet we know that it must have some cause. Looking for this elsewhere, and discerning the peculiar affections of each bodily part, we soon find in these the invariable and necessary antecedents, and therefore, also, regard them as the occasions or causes of our sensations. We are assisted, moreover, to this conclusion by a peculiar power of judg-

ment whereby the mind discerns the place of its sensations as existing with reference to each other, in different parts of the body. For we naturally look for the cause where we may have found the effect. Hence we unhesitatingly place the experience and the occasion of the sensation of sight in the eye, those of the sensation of smell in the nostrils, those of hearing in the ear, and those of touch in the hands and in other parts of the surface of the body. We also confidently locate a headache or toothache or other internal pain, and ascribe it to some local corporeal affection.

The nature of nervous action unknown. Anatomical researches have thrown much light on this subject. They show that a certain class of nerves are the seat of those bodily affections which produce sensation. Moreover, inasmuch as all physical changes appear to involve motion, the opinion seems reasonable that motion of some kind is produced in the nerves by the action of their appropriate excitants; and that this motion, in some way, is the occasion of sensation. But nothing has ever been determined as to the nature of this motion, nor indeed, as to any element of that physical change which must precede the psychological experience. Those theories which speak of the movements of a subtle fluid, of the vibration of fibres or filaments, and of the action of molecules, must be regarded as merely scientific conjectures. The general and important fact, however, is beyond question that the cause of sensation is in the nerves.

The saying of Democritus. It is also clear that some physical body or agent must directly or indirectly affect our nerves before sensation can take place. The senses of sight and hearing present no exception to this statement, although their less immediate, but more noticeable, objects may be at a distance. The vibrations of light affect the optic nerve, and those of a sonorous medium the auricular, before we hear or see. This truth, centuries ago and in the infancy of philosophy, was emphasized by Democritus; at a time, too, when his statement must have appeared paradoxical. "All the senses," said he, "are but modifications of touch," a statement which cannot be accepted literally, yet is true in this modified sense, that some physical agent must actually affect some nerve before any sensation can be experienced. If there be any exception to the law thus announced, it is an exception which confirms the rule.

Speculative difficulties. The doctrine that sensation is the result of nervous action may seem too simple and evident to have ever been the occasion of difficulty. Yet perhaps no questions have more perplexed philosophers than those relating to the causal connection between body and soul. "Has matter any power to affect mind?" "Has mind any power to affect matter?" are inquiries over which able thinkers have been sorely tried. The principal obstacles which have prevented many from a perception of the truth have been two speculative convictions which have prevailed extensively.

First, it has been held that *material objects can come into contact only with material objects*. In the words of the ancient poet,

“Tangere enim et tangi nisi corpus nulla potest res.”

We accept this utterance as probably true in the sense that matter cannot affect mind in the same way as it affects other matter. In this sense a spirit is intangible. The properties of mind, so far as we know them, are so different from those of body, so far as we know them, that it would be unreasonable to suppose that the latter could affect the former just as it would a substance of its own nature. If either can operate on the other we must expect the result to be quite different from any affection properly incident to the nature of the operating agent. For, when two objects are diverse in character, they are incapable, to the extent of that diversity, of being acted upon in the same way. Therefore we hold that matter cannot come into collision with spirit as it can with other matter. We would as soon expect a collision between the atmosphere which surrounds our globe and the light of day which pervades the atmosphere. Spirit cannot be touched, as we touch material objects with our hands. At the same time it seems evident that mind can be placed to a considerable extent under the operation of a material body. The soul during the present life dwells within the body; wherever the latter may be conveyed or confined, there the former is carried and imprisoned likewise. If the body can thus inclose the spirit, and bear it wherever it may itself be borne, may it not also in other ways affect its inhabitant? And, indeed, has not the common sense of men good reason to affirm that it does?

The second conviction, from which speculative difficulties have resulted, refers, not to the general nature of spirit, but to a specific characteristic. *It is held that the soul is unextended*, and we are asked, “How can matter, the extended substance, have any causal connection with mind, a substance devoid of extension?” The argument runs thus: “Nothing can touch and be touched but what is extended; and, if the soul be unextended, it can have no connection by touch with the body: the physical influence, therefore, is inconceivable and impossible.” This reasoning, in which, however, the word *touch* signifies merely juxtaposition in space, implies the truth of two statements; first, that an unextended substance cannot affect, or be affected by, an extended substance; and secondly, that the soul is an unextended substance. The first of these statements, we think, may be accepted as correct, if by an unextended substance we mean one which does not in any way pervade or occupy space. For a substance which absolutely does not occupy or pervade any portion of space is inconceivable. We may conceive of a substance pervading space in such a way as not to interfere with the occupancy

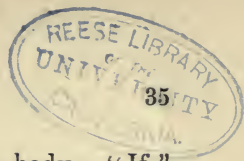
of the same space by other substances of a coarser nature; but no substance could exist without any room at all. Not even the most insignificant soul could exist within a mathematical point. If, therefore, by an unextended substance, we are to understand one which has no relations to space save those of position only, then we not merely admit that such an object could not be affected by material changes, but we deny that either the soul or anything else is a substance of this character. In short we reject the view of Descartes and many other learned men, that spirits do not in any sense occupy space, and incline to the belief that the soul in some subtle way pervades and possesses the sensory system.

The soul pervades the body. § 17. While uttering this opinion, which we present rather as a probable conjecture than as an established doctrine, we would not be supposed to entertain the idea that the soul has shape and parts like those of the body. For we would regard the soul not as a composite, but as a simple substance, endowed throughout with various powers. We also think that the soul, if not always present, is capable of being instantly present, either successively or simultaneously, at different points of the sensorium, as these may be affected by material agents; and we believe that it exercises in the part affected that mode of sensation which corresponds to the peculiar action of the nerves of that part. Possibly, however, in times of quiescence or of sleep the soul may be wholly in the brain.

Opinions quoted and discussed. This view, of the pervading presence of the soul, was taught by Aristotle and his followers, who held that the soul was all, that is, with all its powers, in every part of the body. And, in the early days of Christianity, it appears to have been accepted by believers and unbelievers alike. The epistle to Diognetus, an eloquent letter, probably written by Justin Martyr, but certainly addressed by some eminent Christian to an equally eminent pagan in the first or second century of our era, contains a passage in which the people of God as dwelling in the world are compared to the soul as inhabiting the body; and, while the passage throughout is an interesting exhibition of philosophical views, its opening words give evidence of the general entertainment of the opinion that the soul pervades the body. "That," says the author, "which the soul is in the body, the same are Christians in the world. For the soul is diffused through all the members of the body; and Christians through all the states of the world. The soul dwells indeed in the body, but is not of the body; and Christians dwell in the world, but are not of the world." This natural judgment of both the learned and the unlearned was injured by the subtleties of theological disputation, and was finally dispossessed of a place in the estimation of scholars through the influence of a great thinker. René Descartes, while residing in Holland during the second quarter of the

seventeenth century, discarded the too arbitrary and traditional dogmas of the Middle Ages, and boldly constructed for himself a new system of doctrine. For this reason, and because he sought earnestly for an ultimate and satisfactory ground of belief, he is justly honored as the originator of modern philosophy. Influenced, however, probably more than he supposed, by scholastic notions, he asserted that the essence of matter is extension, and that the essence of mind is thought—that matter is the extended unthinking substance, and that mind is the thinking unextended substance. This doctrine of Descartes was incorporated into the philosophy of Europe, and was firmly maintained as the proper opposite of materialism; though in reality it has no necessary relation to this latter form of opinion. The influence of it can be seen in the earlier teachings of the Scotch school. Dr. Reid, writing one hundred years after Descartes, in the eighth chapter of his second essay, expresses himself as follows: "A man says he feels pain in such a particular part of his body—in his toe, for instance. Now, reason assures us that pain, being a sensation, can only be in the sentient being as its subject, that is, in the mind. And though philosophers have disputed much about the place of the mind, yet none of them ever placed it in the toe. When we consider the sensation of pain by itself, without any respect to its cause, we cannot say with propriety that the toe is either the place or the subject of it. But it ought to be remembered that when we speak of pain in the toe, the sensation is combined in our thought with the cause of it, which really is in the toe. The cause and the effect are combined in one complex notion, and the same name serves for both. It is the business of the philosopher to analyze this complex notion, and to give different names to its different ingredients. He gives the name of pain to the sensation only, and the name of disorder to the unknown cause of it. Then it is evident that the disorder only is in the toe; and that it would be an error to think that the pain is in it."

Prof. Stewart perceived difficulties attending the Cartesian doctrine, and cautiously avoided the discussion of it. In the introduction to his "Elements of the Philosophy of the Human Mind," he says, "Whether it (the soul) be extended or unextended; whether or not it has any relation to place; and, if it has, whether it resides in the brain, or be spread over the body, by diffusion . . . are questions widely and obviously different from the view which I propose to take of the human mind in the following work." He also adds, in a statement which appears to us somewhat too strong, "that the metaphysical opinions which we may happen to have formed concerning the nature either of body or mind, and the efficient causes by which their phenomena are produced, have no necessary connection with our inquiries concerning the laws according to which these phenomena take place." Yet, in the 16th note to the 1st vol. of the Elements, he evidently con-



demns the opinion that the soul may pervade the body. "If," he says, "I strike my hand against a hard object, I naturally say that I feel pain in my hand. The philosophical truth is that I perceive the cause of the pain to be applied to that part of my body. The sensation itself I cannot refer in point of place to the hand, without conceiving the soul to be spread over the body by diffusion." Descartes denied that body and soul can influence one another in the least, yet could not but assign the soul an abode in the body. He supposed that the human spirit resided in the pineal gland, a small gland in the center of the brain; and he accounted for the correspondence of mental with bodily states by a peculiar hypothesis which we shall notice hereafter. But subsequent philosophers, who were convinced that the soul was directly influenced by corporeal affections, sought to explain this matter in a reasonable way. "The soul," said they, "may be compared to a spider seated in the center of its web. The moment the least agitation is caused at the extremity of this web, the insect is advertised and put upon the watch. In like manner the mind, situated in the brain, has a point on which all the nervous filaments converge; it is informed of what passes at the different parts of the body; and forthwith it takes its measures accordingly. The body thus acts with a real efficiency on the mind, and the mind acts with a real efficiency on the body."

These various statements of Descartes and of subsequent philosophers have not been found satisfactory. The conception of an absolutely unextended substance contains within itself a contradiction and cannot be accepted. Reid's assertion that we do not really judge the sensation, but only the cause of the sensation, to be in the part affected, is not in accordance with fact. Stewart's exclusion of certain metaphysical questions from mental science, is incapable of being faithfully carried out; and was used by himself only so far as to avoid the discussion of principles which he nevertheless assumed and asserted. And, finally, our perceptions of the place, size, distance, motion, and other space-attributes of material objects cannot well be accounted for on the supposition that the soul is an unextended substance inhabiting only a point, or even on the theory confining spiritual activities to the region of the brain. Hence Sir Wm. Hamilton, though himself in perplexity, annotates on Reid thus: "Both in ancient and modern times the opinion has been held that mind has as much a local presence in the toe as in the head. The doctrine long generally maintained was that, in relation to the body, *the soul is all in the whole and all in every part*. On the question of the seat of the soul, which has been marvelously perplexed, I cannot enter. I shall only say in general that the first condition of the possibility of an immediate intuitive or real perception of external things, which our consciousness assures us that we possess, is the immediate connection of the cognitive principle with every part of the corporeal organism." Again he remarks, "That the pain is where it is felt, is the doctrine of

common sense. We only feel inasmuch as we have a body and a soul; we only feel pain in the toe inasmuch as we have such a member, and inasmuch as the mind, or sentient principle, pervades it. We just as much feel in the toe, as we think in the head." These ideas are yet more fully presented in the "Metaphysics," (Lect. XXV.) President Porter also declares: "The mind is present in every part of the body so far as to act and be acted upon, and the real object of immediate perception is some part of the body as excited to a specific sensation." Elsewhere he says, our "several sensations, inasmuch as they are experienced by the soul in its connection with the extended sensorium, must be indefinitely but really separated from each other by distance and place." (Vide "Human Intellect," §§ 114, 193, 206.)

It is an essential part of the view presented by Hamilton and Porter that not merely the feeling but also the primary perception of it takes place where the bodily affection occurs. At the same time, as President Porter observes, this cognition, though as local as the sensation, is, of itself, extremely indefinite. It may be ranked among the lowest possible forms of intellectual action. The completed and measured estimate of the distances and directions of sensations from one another, and the exact determination of the places of feelings with reference to the parts of the body in which they are experienced, are judgments which follow upon the comparison or construing together of the primary perceptions of our sensations; and the formation of such judgments requires time and experience. These observations enable us to account for a phenomenon which has been used in argument against the theory of the pervading presence of the soul. The fact is incontestable that, after the amputation of limbs, persons experience sensations very similar to those which they have felt in the limbs previously to the amputation; it has often been difficult for one to realize at first that he has lost a hand or foot. From this some have drawn the inference that sensations really take place in the brain alone, and that they are only mentally referred to a cause in some other part of the body. But such facts are sufficiently explained by the statement that our primary perceptions of the places of our sensations are vague, though real and true, and that they become definite only through judgments resting upon the combined results of experience. The mind, while the body is yet whole, having used these secondary judgments and found them trustworthy, adopts them as rules of conclusion in regard to all sensations of a similar character which may take place in the same general region; and the habit of conclusion thus formed is not easily laid aside. We have conversed with individuals who say that the tendency to erroneous judgment did not in their case remain very long; and that they soon came to perceive the sensation to be located in the part of the limb which they still possessed. We can easily

An objection answered.

believe, however, that in other instances this tendency may have lasted for years. It would seem that the immediate, though indefinite, apprehension of the sensation, which takes place at the point where the feeling occurs, is the condition not only of the subsequent constructive determination of the position of the sensation, but also of that very tendency to error which has been held to militate against the theory of a localized experience.

CHAPTER VII.

THE EFFICIENCY PRODUCING SENSATION.

§ 18. Sir Wm. Hamilton, in the sixteenth lecture of his metaphysical course, shows what difficulties have arisen in philosophy concerning the causal connection between soul and body; and confesses that he himself, having failed of a satisfactory solution, had resolved to rest in a "contented ignorance." Before further discussion in regard to this connection, it may be instructive to consider briefly the strange hypotheses which those were driven to adopt, who, for various reasons, believed that neither agent can directly act upon the other. A full account of these theories may be found in the "Lectures" of Hamilton, and in the "Leçons de Philosophie" of Laromiguière. Beside the ancient Aristotelian doctrine of direct influence, which we regard as the correct view, three hypotheses have been devised.

The first of these, in point of time, was the hypothesis of the plastic medium. It is to be traced to Plato, who teaches "that the soul employs the body as its instrument; but that the energy or life and sense of the body, is the manifestation of a different substance—of a substance which holds a kind of intermediate existence between mind and matter." The Alexandrian Platonists specially elaborated this idea; and, "in their psychology, the *ὄχος*, or vehicle of the soul, the medium through which it is united to the body, is a prominent and distinctive principle." St. Augustine inclined to this view; and it has been adopted by some eminent modern philosophers.

The second hypothesis is that of occasional causes. By an occasional cause is meant a cause which is only the occasion of some effect, and which does not contribute at all to the efficiency producing the effect. This theory is also named the hypothesis of divine assistance, because God is regarded as the real causal agent between mind and body. According to this view, "the brain does not act immediately and really upon the soul; the soul has no direct cognizance of any modification of the brain: this is impossible. God Himself, by a law which He has established, when movements

are determined in the brain, produces analogous modifications in the conscious mind. In like manner, in case the mind has a volition to move the arm, this volition of itself would be inefficacious; but God, in virtue of the same law, causes the answering motion in the limb. The body, therefore, is not the real cause of the mental modifications; nor the mind the real cause of the bodily movements." This doctrine was first advocated by Malebranche and other followers of Descartes; Dr. Reid inclined to it, and it was maintained by Prof. Stewart.

Pre - established harmony. The third hypothesis, which is the most curious of all, is that of predetermined harmony. It was originated by Leibnitz. According to it soul and body have no communication, no mutual influence. "The soul passes from one state to another by virtue of its own nature. The body executes the series of its movements without any participation or interference of the soul in these. The soul and body are like two clocks, accurately regulated, which point to the same hour and minute, although the spring which moves the one is not that which moves the other. This harmony was established before the creation of man, and hence is called the pre-established or predetermined harmony."

We object to all these theories that they are mere hypotheses devised to meet a difficulty which originates in mistaken views, and that they are devoid of support save such as can be found from their fitness for that end. We can find no evidence of any medium of communication between soul and body, or of any divine interference to produce sensations and carry out volitions, or of that marvelous fore-ordained correspondence between corporeal changes and the life of the soul. On the contrary, both our natural convictions and our critical observations indicate that we actually are influenced by affections of the body. The mind refers its sensations to antecedents immediately present, yet outside of itself; our very conceptions of the sensible qualities and changes of matter are essentially conceptions of the causes of various forms of sensation as related to these effects; and we intuitively ascribe efficiency to these causes. Our sensations therefore are perceived as really resulting from the body and things affecting the body. When we handle a stone, its weight, hardness, roughness, and coldness, are real causes producing effects corresponding to them in us. All this we firmly believe, till we may have become confused by some philosophical subtlety. Let us remember that difficulties on this subject have resulted simply from an undue and excessive contrasting of mind and matter, of soul and body, as things different in nature; and we shall have no trouble in accepting the teachings of intuition. These two substances differ perhaps as far as substances can differ, but not so far as to be incapable of mutual influence. This whole subject brings before us one of those frequently recurring cases in which the best philosophy is found to accord with the ordinary convictions of mankind.

Three possible theories.

§ 19. Accepting the view that sensations are immediately occasioned by corporeal affections, we have yet to choose between several theories respecting the efficiency producing sensation.

First, it has been taught that the power producing sensation is exercised wholly by the body and that the *soul is wholly passive*. When lightning tears open the roof of some building, or the electric spark pierces the paper subjected to its passage, the roof or the paper does not actively contribute to the result. A stone flung into the air does not originate any of the force by which it is propelled; it is entirely recipient and devoid of exertion. So the soul might be considered wholly passive in sensation: it might be likened to a placid lifeless pool whose rippling motions are made by the breezes only.

Again, it has been contended that the *efficiency* producing sensation *resides wholly in the soul*, and does not rise at all from the affections of our sensory system. When a child becomes interested in some pretty toy and seeks it, the toy cannot be supposed to be the efficient cause of the excitement of the child's desires. These, indeed, without the view of the toy, could not have been formed and exercised; but the whole power in the case belongs to the infantile soul itself. As, therefore, the intellect and the motives of man act with an efficiency independent of their objects, so, it is argued, the power of sense acts without any external stimulus and simply on the occasion of changes in the nerves.

Finally, it may be conjectured that the *efficiency* producing sensation belongs *partly to the body and partly to the mind*. When a blow discharges a percussion cap the effect depends on the detonating powder quite as much as on the force of the blow. So, when a vessel of water at a low temperature and perfectly still, is shaken a little, it immediately turns to ice; and when certain solutions are mingled, they effervesce and form new compounds. In these cases the shaking and the mingling do not produce the effect so much as other causes which these bring into play. The question, therefore, suggests itself, whether our sensations, even though efficiently caused by bodily affections, are not also due partly to the active power of the soul.

The efficient cause of sensation is twofold.

Of these theories we prefer the last. We incline to the opinion that *the efficient cause of sensation* does not belong exclusively either to the body or to the mind, but is a combination, *partly physical, partly spiritual*. The motion of the bow of the violin produces that of the string, yet only in part: the tightness and elasticity of the string contribute. So nervous changes affect the mind, while yet this affection is not purely passive, but results also in part from a power of action belonging to the soul itself.

Partly external and physical.

That sensation is truly caused by physical changes is implied in those natural judgments which men continually make. We say that the wind makes us cold, that the fire warms us, that sound affects our ears,

scents our nostrils, light our eyes, and so forth. Thus we refer these feelings to various physical causes which act upon our bodily frame, and upon our souls as inhabiting the body. We also make an important distinction between what is merely an object of cognition, and what is a cause of sensation. In cognition the activity and its causation are regarded as wholly mental; in sensation, the prominent efficiency presented in perceptive thought is physical. And these natural judgments accord with critical inquiry. A scrutiny of the conditions of sensation easily produces instances in which no other antecedent can be found than some affection of the nervous system. Moreover, the researches of anatomy and surgery show, to a demonstration, on what branches and filaments of the sensory system our bodily feelings severally depend. In short, no fact of physical science is more certain than this, which belongs to mental science also, that sensation results from an excitement of the nerves.

At the same time some considerations support the belief that the soul is not wholly passive in sensation, but that it exercises an efficiency of its own.

This is suggested by the analogy of our other psychical operations. In thought, sensibility, desire and action, man is conscious of self-activity. He perceives that each of these modes of experience has no causal antecedents other than psychical, and can be ascribed to no efficiency other than that belonging to the soul itself. He therefore regards them as coming from a spring within. External objects may interrupt and modify the current of mental life, but they are not necessary to its continuance. The soul, once aroused to action, lives on with an activity perpetual and inherent. Moreover, although during man's earthly existence his psychical experience has been made dependent on bodily conditions, there is no evidence that it originates from them. On the contrary, easily distinguishing the spiritual activities, of which he is conscious, from all physical phenomena, man intuitively recognizes these activities and their powers as belonging not to his body, but to a substance other than his body, that is, to his true self, or spirit; and so, as we have said, he regards the soul as self-active, because the greater and essential part of its experience, however dependent upon corporeal conditions, is perceived to originate, not from them, but from the soul itself. But if every other psychical experience may be thus traced to the working of some inward power, may not sensation, likewise, be considered as resulting, in part at least, from the soul's own activity?

To this conclusion we are led, also, by the following consideration. When one substance acts on another which is perfectly passive, the effect is of the same general character with the action by which it is caused. One stone, for example, striking another, transmits its own mo-

Partly internal and psychical.
1st. Because of the analogy of our other powers.

2d. Because of the peculiarity of the effect.

tion and nothing more. But when the effect is of a new and peculiar character, we find the cause partly also in the substance affected. The cause of the explosion of the percussion cap is found more in the detonating powder than in the blow; and the new compound from mixed fluids results more from chemical affinities than from the commingling. Now the nature of sensation, like that of our other psychical experiences, is revealed to us through consciousness, without which power we could not have the remotest conception of spiritual things; and we know that sensation is something extremely dissimilar to physical changes of any kind; so much so that we can scarcely compare it with them in any way. What likeness does any material process bear to the pain of toothache or of rheumatism? And what chemical or mechanical operation can be compared to the satisfaction of hunger or the gratification of taste? Sometimes we describe a sensation by mentioning the physical action by which it may be produced,—as for example, the sensation of being struck or cut or burned—but we easily distinguish the outward action and the inward experience as being very different. Some generic likeness, perhaps, can be found in sensations to other and higher feelings with which pain and pleasure are also specially connected, such as joy, sorrow, hope, fear, love, hatred; but we can discover no resemblance in them to any physical phenomena. Such being the case, it seems reasonable to believe that sense is not merely a capacity, but a capability; and that the mind, the substance in which sense inheres, itself contributes to the efficiency producing sensation.

3d. Because of certain reactions of mind on body. Finally, the activity of the soul in sensation is suggested by certain reactions of mental upon physical life, which result in bodily feelings more or less defined. In certain exceptional cases, which can be easily distinguished, sensations seem to originate from psychical efficiency, no external excitant being present. For example, purely intellectual feelings, that is, those emotions which result from thought and which are not the consequence of bodily changes, are sometimes accompanied with sensations. Surprise causes a startling sensation; disappointment a sinking feeling in the breast; and fear produces chilliness. In short corporeal feelings generally attend any violent mental disturbance. Here it may be objected that in such cases sensation is not directly produced by psychical efficiency, but only indirectly and through an affection of the nerves. Possibly this may be so; though such instances certainly evince that the soul can act on the sensorium as well as the sensorium on the soul. It may be more to our purpose to remark that imaginative ideas in dreaming, and even in wakeful hours, sometimes cause sensations, as if some reality had taken place; and the sensations thus excited seem also to produce nervous changes such as at other times produce them. The order of causation appears to be reversed. Instead of nervous change, sensation, thought, we have thought, sensation, nervous change.

In dreams, especially, our sensations often appear to be more than mere imaginings; we experience, though in feeble measure, the pains and pleasures of real life. How often, too, we meet with those who assert that they have heard the voices or seen the faces, of absent friends, themselves creating what they hear or see! Various experiments may illustrate this power of the mind to originate its own sensations. For example, should a sharp needle be directed towards the middle of one's forehead, and advanced steadily, a singular feeling is experienced, at least by nervous people, at the place where the point of the needle is expected. This must result from the mind's own activity. Moreover, the soul when specially interested appears to have the power of adding to the natural keenness of any sense. When we listen or gaze, or even touch, taste, or smell attentively, new delicacy is given to the organ. It is said to be innervated; and this innervation is probably an increase of that efficiency which the soul exercises in sensation and is similar to the increase which special interest and effort produce in the energy of any other spiritual power.

Herbert Spencer ("Psych." part ii. chap. vii.) testifies to the fact that thought does sometimes produce sensation, though of course he does not use it as we have done. He says, "Ideas do, in some cases, arouse sensations. Several instances occur in my own experience. I cannot think of seeing a slate rubbed with a dry sponge without there running through me the same cold thrill that actually seeing it produces."

CHAPTER VIII.

CEREBRALISM OR MATERIALISM.

§ 20. The doctrine which makes spirit only a refined species of matter, is called materialism. It is naturally, though not necessarily, connected with the idea of a material origin of the soul. Tertullian, the eminent Christian father of the second century, taught that the soul is as much begotten as the body, and many of those who believe in the transmission of spiritual, as well as of corporeal, being from parents to children, and who are therefore called Traducianists, have expressed themselves in similar language. It matters not so much how we may consider the soul to have come into existence, if we only are not thereby led into wrong conceptions of its nature. We shall not deny that the Almighty, should He so determine, might make souls out of matter instead of creating them *de nihilo*; it is even conceivable that a decree of omnipotence might impart to infant bodies the power of producing a young spirit, and that this production might be the first work

Traducianism not necessarily materialism.

of the completed bodily organization. We shall not question the abstract possibility of these things. But we hold also that this power of spirit-production would be of a totally different character from any known material potency, or combination of potencies, and that *the analogy of nature would be outraged, if such an energy were lodged in such an agent.* The power in question would be so utterly diverse from any force or tendency ever perceived to exist in matter that only the strongest evidence could enable us to believe in it. In the absence of such evidence, we incline to the belief that souls are immediately created by a supra-material and divine power, acting in connection with matter, but according to laws of its own. We therefore do not accept the view of Tertullian, but we do not condemn it as materialism. For this latter doctrine does not provide for any supernatural transmutation of matter into spirit; it makes spirit merely a refined species of matter.

Materialism defined. Cerebralism. *The essential point in materialism is that sensation, thought, and spiritual experience generally, result simply from the operation of physical agents as such—or as acting in obedience to their own proper laws.* This idea has been expressed sometimes by comparing psychical operations to those phenomena of light, heat, and electricity which take place during chemical and vital processes. In other words, materialism teaches, not merely that spirit is extended and has other attributes in common with matter; not merely even that spirit has all the essential attributes of matter, although no one save a materialist would say this; but also, and especially, that the life of spirit is purely a development of material forces.

The modern adherents of this doctrine have frequently been styled Cerebralists, because they derive psychical phenomena from certain supposed qualities of the brain and nerves. Auguste Comte, the chief principle of whose "Positive Philosophy" is to distrust and condemn all facts save the physical and tangible, and to find in these an explanation of all phenomena, may be taken as a representative of this school. According to him, "The positive theory of the intellectual and affectional functions is simply a prolongation of animal physiology, from which it differs far less than this last differs from simple organic or vegetable physiology" ("Phil. Pos." Lect. XLV.). Herbert Spencer and Alexander Bain are English psychologists, and Professors Tyndall and Huxley English scientific writers, who, with some modifications of thought and phraseology, have ideas essentially similar to those of Comte.

We remark, further, that *the question presented by materialism is not identical with the question whether the soul and the body are two distinct existences.* If this were the case, it would be easily settled. In every act of sense-perception the ego, or self, or soul, intuitively distinguishes from itself the non-ego, or body, whose affections are the cause of our sensations. So also the ego immediately refers spiritual activities and powers to itself,

and sense-affecting operations and powers to the non-ego. Thus soul and body are at once distinguished and characterized. But the statement of these facts, although they have an important bearing on the argument, is not the proper opposite of the materialistic theory. For one may allow the distinct existence of soul and of body, and yet argue that the soul is a product of some corporeal function. Those who say that the brain produces mind just as the liver produces bile, might say that, as the bile is not the liver, so the mind is not the brain. The question therefore remains, Is not the soul an offspring of the body? For example, may it not be some subtle, active fluid secreted by the nervous system; and may not its experiences be the movements of this fluid?

We reject all such forms of belief, for the following reasons. In the first place, *though often advocated earnestly by philosophical speculators, materialism has always been condemned by the common sense—that is, the practical, spontaneous reason—of mankind.* Men in general do not inquire whether, or how far, mind and matter have a community of nature; or whether matter be the only extended substance or not; whether mind is capable of being enclosed in limits like the body; whether mobility and motion may be affirmed alike of both substances; and such questions. But they do hold that matter and spirit are radically, generically, different. So far as we can learn, no people, certainly no civilized people, have believed that the soul is simply a material product. This broad distinction which men make between spirit and matter probably should not be considered so simple and immediate as that primary distinction which they make between the soul and the body. It may be the product of considerable thought, and, in this respect, may be compared to that belief in the uniformity of nature which is now regarded as a conclusion naturally formed by the mind after the observation of many instances of actual uniformity. Nevertheless as mankind are constantly and intimately concerned both with spiritual and with material objects, and with each as these objects really exist, their judgment as to a radical diversity of nature is not to be esteemed lightly.

In the next place, *the fact that psychical states, at least during man's present life, are immediately conditioned on physical, does not prove that the former originate from the latter, or that they are of the same general nature with physical phenomena.* A good bed and a sufficient degree of warmth are the conditions of restful sleep, yet we do not, on that account, identify the bed and its warmth with the sleeper and his repose. So, after men perceive the intimate connection of soul and body, and the dependence of spiritual activity on the use of cerebral organs, the distinction is soon made between the conscious agent, on the one hand, and the physical conditions of his activity, on the other. They see that the agent may have an origin and an existence independent

Contrary to common sense.

Not proved by the dependence of psychical on physical states.

of the conditions to which his life is subjected; and they condemn the identification of the psychical with the physical as an undue, and even as an unreasonable, assumption. For when, in any case, some needful antecedent of a phenomenon seems unfit or inadequate for its production, we naturally say that it is only a condition and not the essential cause of the phenomenon in question. How easily, on this principle, we distinguish between any sensation and the affection of the sensorium on which it may depend; for example, between toothache and the irritation of the dental nerve! In the same way we distinguish between the whole nervous system and the soul dwelling within it.

The belief in immateriality an inductive judgment. This judgment of common sense, which affirms the unfitness of the physical to produce the psychical, as already intimated, seems really to be *an inductive conclusion concerning the general character of material agents and their operations*. Setting aside points of philosophical disputation, we may say that the conception of matter, as commonly and correctly entertained, includes those substances generally, or that part of substantial being, whose nature and operations are made known to us in the exercise of sense-perception, and through inquiries essentially dependent on this power; while spirit is that part of substantial being whose character and phenomena are perceived in the exercise of consciousness, and by means of investigations dependent thereupon. We believe, too, that any more complete and satisfactory definitions of these two substances must be worked out within the lines of thought indicated by these broad characterizations; which, however, are sufficient for our present purpose. We should also add that while matter, not mind, is the immediate object of sense-cognitions, and while mind, not matter, is the immediate object of consciousness, experience enables us to use each of these powers of perception in the service of inquiries dependent primarily on the other. Thus the sight of an improved country, through an exercise of sense-perception, witnesses the industry and intelligence of the inhabitants; and, in like manner, a sense of exhilaration attested by consciousness may indicate a salubrious and invigorating atmosphere.

Now, if our knowledge and conception of matter and its qualities be formed as we have stated, the materialistic controversy may be made to assume a definite shape. If matter be defined as the substance whose existence and attributes are known in the cognitions of sense, then the question for determination is, "Can the production of spirit and its activities be accounted for by any powers of matter similar to those discovered by sense-perception and physical investigation?" The question, thus stated, leads to a negative answer; for physical investigation—the examination of material properties and powers—can discover no phenomenon in nature similar to that production of psychical life which has been supposed to take place in the brain. We find in matter strict, but blind, obedience to

the laws of its own constitution, and look in vain for any development of mental life. Moreover, acting on the rational presumption that such life, if it existed, would certainly manifest itself in some way, we take the absence of manifestation as a satisfactory proof of the non-existence of the psychical activity. If, then, no material combination is ever known to produce spiritual life or aught save physical changes, is it probable that the cerebrum, a body composed of common and well-known elements, should be thus endowed? The passage from the ordinary and physical operations of matter to this extraordinary and psychical activity is a step which the mind refuses to take. It would be easier to accept the doctrine of the alchemists that base metals may be converted into gold, than to believe that any kind of matter is capable of the production of spirit and its phenomena. So far as can be seen, matter, acting upon matter, leaves it matter still.

No psychical life
in organized bod-
ies as such.

Some, we know, assert that the operations of organic life in vegetable and animal structures indicate an intelligence resident in such structures or originating from them. To us organic growths exhibit only peculiar physical and molecular powers with which the Creator has endowed various material combinations of His own formation. It is evident that the works of nature in general could not have originated the intelligence manifested in their constitution. To suppose that they did, would be to make them the source of that source from which they themselves have evidently been derived. Who can credit the assertion that this great universe, so filled with order and goodness and beauty, was not produced by a pre-existing Intelligence? Who can believe that any one of God's wonderful works—for instance, the physical frame of man, with the complicated adaptations of its organs to each other and to the conditions surrounding our life—is the offspring of an accidental concourse of unintelligent atoms? No absurdity could be greater than this. Lord Bacon, on purely philosophical grounds, exclaimed, "I had rather believe all the fables in the Legend and the Talmud and the Alcoran, than that this universal frame is without a Mind"; and he justly adds, "A little philosophy inclineth man's mind to atheism; but depth of philosophy bringeth men's minds about to religion." While it is thus clear that material organisms are the work of a pre-existing Mind, it is equally evident that they do not exhibit any power of psychical activity as resulting from the constitution given them by their Creator. Every operation of organic life can be explained as simply the unintelligent operation of physical forces. The genii of rivers and mountains, the souls of plants and trees, the angry spirits of the thunderbolt and the earthquake, are only ideas of the imagination. Moreover the tendrils, roots, and leaves of plants never exhibit more than a superficial resemblance to the actions of a living agent. Their movements may be, and are, accounted for as simply the result of certain laws of

molecular attraction and combination. The shrinkings of the sensitive shrub seem caused by a power which passes along its stems as heat passes along an iron rod. Insectivorous plants, of themselves, exhibit no more intelligence than a rat-trap. So far as can be discovered, all vegetable actions result from unthinking molecular forces; there is an utter absence of that freedom, variety, and adaptability which characterize the efforts of voluntary agents. In this connection we may notice the

The reflex action
of the nervous
system.

use made by cerebralists of the discoveries of Sir Charles Bell and others respecting *the action of afferent and efferent nerves*. It has been ascertained that frequently a physical influence being borne to the brain, or to some nerve-center, by an afferent nerve, results, through the agency of the corresponding efferent nerve, in some bodily action. Sneezing and coughing are familiar examples of such actions. They occur without any volition, sometimes without any consciousness, on our part, but evidently have always a useful end in view. The motion of the heart and of the muscles employed in breathing is maintained by a nervous influence, without any thought of ours; and such, also, seems somewhat the case with those bodily actions which may have become habitual. In all such movements, it is said, the work of mind is plainly performed by the nerves alone. But in the phenomena alluded to, we cannot find any evidence that the powers of the soul are identical with those of the sensory system, or even that they are of the same nature. On the contrary, as these nervous influences are not necessarily accompanied with any consciousness, we infer that they result from forces which are wholly physical, and to be distinguished from spiritual energies. So far from indicating a sameness between mental and molecular activity they rather suggest that the sensory system is an organized kingdom of vital but unconscious material agencies, made ready for the control and guidance of the intelligent soul.

We should also add that *no evidence has been discovered of any fluid in the nervous system possessing physical properties, with which mind might be supposed to be identical*. Physiologists incline to the opinion that the excitement of the nerves consists simply in the action of molecule upon molecule.

Summation of the
inductive argu-
ment.

To sum up what has been said, the chemical and mechanical, the vegetable and corporeal powers of the creation, all possess a common character.

They exhibit blind obedience to the laws controlling masses and molecules, and nothing more. But the domain of spirit discloses a new nature. Instead of composition and divisibility, there is an absolute and conscious unity, so that (were conjectures allowable on a point so removed from observation) we might suppose mind not to be composed of molecules, but to have perfect continuity of being; instead of a self-helplessness which acts only as acted upon, there is ceaseless self-activity; and, above all, instead of the powers of material objects variously to affect the senses, and

to act upon each other, there are such spiritual potencies as thought, sensibility, desire, affection, and moral principle and purpose. To hold that one of these natures with its powers can produce the other nature with its powers, is a worse than gratuitous assumption; it is the assignment of a phenomenon to an utterly inadequate cause.

Perceiving in all inorganic and organic substances an underlying sameness of nature, we are not surprised to see one department of the visible creation furnishing material and support for another. Mechanical powers operate everywhere; while chemical, vegetable, and corporeal changes contribute more or less to one another. But, because of the radical diversity of character between the spiritual and the material, the relation of the soul to the body cannot properly be compared to that of corporeal to vegetable structures or to that of vegetable bodies to the inorganic. It is wholly unlike these; and is so regarded in the general opinion of mankind.

§ 21. Now it may seem strange that *the leading cerebralists of our day admit the force of the foregoing reasonings*. Let us take Prof. Tyndall as a representative man. He publishes the conviction that "matter possesses the potency of every form and manifestation of life." He says, "Were not man's origin implicated, we should accept without a murmur the derivation of animal and vegetable life from what we call inorganic nature. The conclusion of pure reason points this way, and no other." In this statement we should notice that the expression "animal life" embraces, not merely corporeal vitality, but also all forms of psychical activity. Yet this same professor, speaking of the theory of "a natural evolution" of the universe from inorganic elements, uses the following language. "What are the core and essence of this hypothesis? Strip it naked and you stand face to face with the notion that not alone the more ignoble forms of animalcular or animal life, not alone the nobler forms of the horse and the lion, not alone the exquisite and wonderful mechanism of the human body, but that the human mind itself—emotion, intellect, will, and all their phenomena—were once latent in a fiery cloud. Surely the mere statement of such a notion is more than a refutation. I do not think that any holder of the evolution hypothesis would say that I overstate or overstrain it in any way. I merely strip it of all vagueness and bring before you, unclothed and unvarnished, the notions by which it must stand or fall. Surely these notions represent an absurdity too monstrous to be entertained by any sane mind." In 1868, before the British Association for the Promotion of Science, Tyndall said, "Were our minds and senses so expanded, strengthened and illuminated as to enable us to see and feel the very molecules of the brain; were we capable of following all their motions, all their groupings, all their electric discharges, if such there be; and

were we intimately connected with the corresponding states of thought and feeling, we should probably be as far as ever from the solution of the problem, 'How are these physical processes connected with the facts of consciousness?' The chasm between the two classes of phenomena would still remain intellectually impassable. Let the consciousness of love, for example, be associated with a right-handed spiral motion of the molecules of the brain, and the consciousness of hate with a left-handed spiral motion; we should then know when we love that the motion is in one direction, and when we hate that the motion is in another direction; but the why would still remain unanswered." And in 1875 he reiterates the statement, "You cannot satisfy the human understanding in its demand for logical continuity between molecular processes and the phenomena of the human mind."

We are naturally astonished at such utterances from one who finds every potency in matter; and we ask for an explanation of them. *This is to be found in a conception of matter, presented by Prof. Tyndall, which differs from that entertained by men in general.* Matter, as matter, *i. e.*, as possessed of those qualities commonly ascribed to it, cannot produce psychical life; but it is endowed with other and higher powers, and in the exercise of these it may and does produce the phenomena of mind. To show the reasonableness of this idea the professor dilates eloquently on material "potencies." "Think," he exclaims, "of the acorn, of the earth, and of the solar light and heat. Was ever such necromancy dreamt of as the production of that massive trunk, the swaying boughs, and whispering leaves, from the interaction of those three factors? In this interaction consists what we call life. . . . Consider for a moment this potency of matter. There is an experiment, first made by Wheatstone, where the music of a piano is transferred from its sound-board, through a thin wooden rod, across several silent rooms in succession, and poured out at a distance from the instrument. The strings of the piano vibrate, not singly but ten at a time. Every string subdivides, yielding not one note, but a dozen. All these vibrations and subvibrations are crowded together into a bit of deal not more than a quarter of a square inch in section. Yet no note is lost; each vibration asserts its rights; and all are at last shaken forth into the air by a second sound-board, against which the distant end of the rod presses. Thought ends in amazement as it seeks to realize the motions of that rod as the music flows through it. I turn to my tree, and observe its roots, its trunks, its branches, and its leaves. As the rod conveys the music and yields it up to the distant air, so does the trunk convey the matter and the motion—the shocks and pulses and other vital actions—which eventually emerge in the umbrageous foliage of the tree." In short, Prof. Tyndall holds that evolution and materialistic notions are "absurd in relation to the ideas concerning matter which were drilled into us when young.

Spirit and matter have ever been presented to us in the rudest contrast; the one as all-noble, the other as all-vile." But if we should come to "regard them as equally worthy and equally wonderful, to consider them, in fact, as two opposite faces of the same great mystery," our difficulties would disappear. He confesses that his theory calls for a "total revolution of the notions now prevalent," yet derives encouragement from the fact that "in many profoundly thoughtful minds such a revolution has already occurred."

Remarks on the views of Tyndall. In regard to these views of Prof. Tyndall we have the following remarks to make. First, *in his acknowledging that matter as commonly conceived of cannot produce mind or psychical phenomena, he yields the essential point in controversy.* If the production of spiritual phenomena result from powers different from those which matter is generally known to have, then these are produced by matter, not as matter, but as something of another nature; matter, in fact, becomes itself the creative or formative spirit of the universe. This doctrine is not materialism; it is a form of pantheism; and the adoption of it is the surrender of materialism, properly so called.

In the next place, although Tyndall calls for a "total revolution" of our conceptions concerning matter, *he fails to furnish any distinct basis for this change of view.* As already said, his language sometimes suggests that there are powers in matter different from those which we call material; yet, just as frequently, he makes these other powers only the ordinary powers of matter exalted and refined. After all his eloquent illustrations of the wonderful potencies of matter, we find it hard to tell whether his views be really materialistic or pantheistic. The powers which he specifically describes are purely physical and unintelligent. The only "revolution" which his language effects is one which brings us back to our starting-point, in a somewhat bewildered condition as to the meaning of the professor.

Finally, we say, that *the pantheistic view, which makes matter to be a kind of unconscious, yet thinking, agent, is a doctrine wholly unsupported by evidence, and even more absurd than the extremest materialism.* Mankind justly regard matter as devoid of the distinctive characteristics of mind; for it never manifests these characteristics, and indeed seems unfit to possess them. Nor could any opinion be more irrational than that the intelligence of creation and providence, which has solved problems of a complication and greatness far transcending the grasp of human faculties, is the attribute—the underived attribute—of an aggregate of material molecules; an aggregate, too, entirely unconscious of its own existence and its own activity.

We have now considered materialism with special reference to those facts upon which its advocates rely. We find that these, strictly interpreted, do not support this form of belief, but, on the contrary, indicate a radical diversity of nature between matter and spirit. The doctrine which we thus contrast with

materialism has sometimes been called dualism, because it asserts a duality of nature in those beings immediately perceived by us. It is opposed to materialism, on the one hand, and to idealism, on the other, which doctrines, and also pantheism, to which they severally lead, have been classed together under the title of monism. For they all assert that we are cognizant of only one kind of substance.

§ 22. Before closing our argument, *we must direct attention to the force of that great fact, which the positive philosophy vainly endeavors to ignore, and which, whether it be accepted or not, we think should be patent to every candid student of creation and providence.* To us, assuredly, those marvelous works of wisdom, power, and goodness, which alone ennoble the universe and make it glorious, manifest a Being infinite and almighty, yet possessed of attributes essentially similar to those which characterize our own spirits. But where is the brain that gave birth to the omnipresent and all-creative mind? What material origin can be imagined for that cosmical Intelligence which first fashioned and still sustains the system of which we form a part? The fact has already been noticed that much nervous action takes place without any psychical activity. Is not the intelligent activity of the Creator a case in which the attributes of spirit are exercised without any connection with cerebral or other material organs? And, if this be so, may we not conclude that the existence and life of finite spirits are not necessarily dependent upon material causes, but that, with some wise design, they have been subjected for the present to earthly and corporeal conditions?

Here the question arises, "*May not a material origin and nature be assigned at least to the spirits of the brute creation?*" We think not. So far as brutes exhibit intelligence, affection, and other psychical activities, they belong to the domain of spirit—not to that of matter. Our planet seems to be a theater, in which two diverse worlds of God's creation, the spiritual and the material, mingle their laws and forces, acting also upon one another. The substances composing one of these systems are so diverse in attributes from those composing the other, that neither world can be considered a derivative or modification of the other; nor can we by analogy infer the laws governing existence and activity in the one, from those governing existence and activity in the other. In the material world we find no absolute beginning or termination, increase or diminution, of substantial existence. This is no proof that the reverse may not be the case in the invisible and intangible realm of spiritual being. We find no difficulty in believing that the power of creation and of annihilation, which does not—which perhaps cannot—reside in finite existences, may belong to the Originator of all things. So far as we can discover and judge, all earthly spirits begin to exist at the commencement of the activity of their bodily organization. But, as the psychi-

The spirits of
brutes.

cal endowments of brutes are sufficient and suitable only for the direction and the enjoyment of their corporeal life, we should naturally expect their spiritual being to be extinguished at the end of their animal experience. Its proper purpose would then have been fulfilled. Man, on the contrary, has qualities which elevate him as far above the brute, as the brute is elevated above every form of senseless matter. He is capable, even now, of entering into the plans and thoughts of the Great Creator; and he has the capacity of endless development hereafter. For him the sages and philosophers of all ages have predicted immortality.

The connection of soul and body accounted for.

When we consider the godlike nature of the human soul, *we sometimes wonder that it should be burdened with the limitations of corporeal life.* All the various ends to be subserved by this arrangement may not be discoverable, but that the arrangement exists seems an altogether reasonable conviction. The soul, in the body, may be likened to a man incased in that strange armor, which is used by divers. When one, thus clothed, is let down into the sea, his activity for the time is subjected to conditions very different from those which belong to the freedom of his home. His movements are restricted and determined by his harness. His sphere of effort is limited by the necessity of communication with his associates on the surface of the water. The signals, by which his conduct and that of his friends are guided, come and go through a part of his apparatus. His covering, also, is the medium through which he receives impressions of surrounding objects, and the immediate instrument through which his work of exploration and salvage are accomplished. Moreover, so soon as the apparatus may need repair or readjustment, his submarine exertions are, of necessity, suspended. In short, while the armor greatly limits and changes his mode of life and labor, it is also the condition under which the ends of that mode of life and employment must be pursued, and may be accomplished. In like manner, it is reasonable to suppose that the same Wisdom which has evidently made so many benevolent arrangements for man's welfare, has, for good reasons, subjected our spirits, in this life, to the conditions and influences of a corporeal connection.

Moreover, *the principles of moral philosophy enable us to perceive some purposes which certainly, or probably, led to the investiture of the soul with its fleshly habitation and instrument.* For example, it is evident that many of those restraints by which man is withheld from vice, and of those incitements which prompt him to virtue, originate in the circumstances of our present being. Physical life is the necessary condition of civil government, of all arts and industries, of those temporal cares and employments by which the soul is wholesomely occupied, and of those modes of mutual helpfulness in which the morality and benevolence of mankind find obtrusive claims and frequent exercise. The birth of man into a state of weakness, and the manifest character of his subsequent dependence upon powers and agencies other than

his own, prepare him to repose that faith in divine assistance without which spiritual prosperity is impossible for any created being. The limitation of the intercourse of spirits, resulting from their embodiment, is favorable to the growth of a proper moral independence; which purpose, also, as to the successive generations of men, is served by the brevity of human life. In short, our present state of being, in whatever light we look upon it, appears to be specially adapted and designed for our best moral development. The operation, for a time, of some such system as that under which we live, seems necessary for the highest good of the human spirit.

CHAPTER IX.

SENSATIONALISM AND ASSOCIATIONALISM.

Sensationalism and associationalism defined. § 23. *Sensationalism is that form of belief which explains man's spiritual life as composed exclusively of those feelings which are excited by corporeal affections, and of modes of action resulting directly and wholly from these feelings. Associationalism teaches that the higher thinkings and actings of the soul result primarily from impressions and impulses of external origin, under the operation of that well-known law whereby mental states tend to recall one another after they have been experienced together.* In other words, it asserts that, not only some, but all, of our secondary psychical movements may be explained as simply associational conjunctions and sequences. These two forms of doctrine are the chief reliance of the materialistic psychologist in his endeavor to account for the various manifestations of spiritual life: and naturally so. For, supposing the psychical identical with the physical, it is difficult to see what better can be done than first to define sensation as the action of nerve-cells, then to make all spiritual activities modes of sensation, and finally to regard every conjunction and sequence of inward states as the association of modified sensations, that is, of reproduced molecular changes, with one another. These three forms of opinion—sensationalism associationalism and materialism—are allied, also, by reason of that mode of thinking in which they originate. It is essentially one-sided, exhibiting a keen, but exclusive, appreciation of one class or kind of phenomena and its laws, and an endeavor to explain all other related facts as having the same nature and laws as those observed. Materialism, disregarding that cumulative evidence by which mankind are convinced of the radical duality of substantial existence, confounds the life of intelligent and self-conscious spirit with those material changes with which, in human experience, it is immediately connected. In like manner, sensationalism, neglecting those marked characteristics

Related to materialism.

which prove our higher experiences to originate from peculiar and independent powers, makes them all, if not exactly material operations, yet mere modifications of impressions and impulses received from the outer world. And associationalism, fastening its eye on one easily observed law, and on the successiveness of spiritual phenomena, reduces all other laws to this one, ignoring or slurring over the radical peculiarities of various important mental operations.

Condillac, who wrote in France during the middle of the 18th century, while Reid was lecturing in Scotland, may be considered the founder of sensationalism. Representing man as a statue to which capacities of sensation had been imparted, he held that a statue thus qualified, and without any further endowment, would gradually manifest all the phenomena of mind. According to him the modifications of the soul from present objects are sensations; and these, when reproduced and refined by the memory, are ideas. Hartley, an English contemporary of Reid and Condillac, may be considered the founder of associationalism. He, at least, more formally than any of his predecessors, made association the one fundamental law of human thought and belief. James, and John Stuart, Mill (father and son) did much, by their talented authorship, to recommend Hartley's views. According to them, our most deep-seated convictions and principles are merely associations of ideas rendered inseparable by habit. At the present time, Herbert Spencer, uniting in one system the essential views of Comte, Condillac and Hartley, is the exponent at once of materialism, sensationalism, and associationalism. Spencer also is the apostle of evolution, that is, of the theory of the spontaneous self-development of the universe, from a condition of formless and diffused "homogeneity" into a condition of orderly and harmonized "heterogeneity." This development, according to Spencer, results from a restless tendency of the ultimate atoms of matter to combine with each other, and from the "survival of the fittest" combinations (which for some reason are always the strongest), while the worse and weaker disappear. He holds his other views in subordination to this main idea. Although Spencer asserts that we can know nothing of the real nature of either mind or matter, he also maintains that, so far as we do know them, they are identical. His language throughout is that of the extremest materialism; and, as the "conclusion" of his philosophy, he declares "that it is one and the same ultimate reality which is manifested to us subjectively and objectively." ("Psych." § 273.) Like Tyndall, he acknowledges that the development of the psychical from the physical is inconceivable, yet he considers that the intimate correspondence between mental and material phenomena should be accepted as a sufficient proof of it. Some extracts from Spencer may illustrate a style of psychology which, in some quarters, is strangely popular. Life ("Psych." § 131) "is the continuous adjustment of internal relations

Representative
men.

Spencer quoted.

to external relations;” and psychical life is thus “differentiated,” or developed, from physical. “Along with complexity of organization, there goes an increase in the number, range, speciality, and complexity of the adjustment of inner relations to outer relations. And in tracing up the increase, we find ourselves passing without break from the phenomena of bodily to the phenomena of mental life.” On hearing this statement, one cannot help exclaiming, “How great is the power of complexity!” Thought, as originating in the association and “consolidation” of sensations, is explained as follows (§§ 73-74)—“What is objectively a wave of molecular change, propagated through a nerve center, is subjectively a unit of feeling, akin in nature to what we call a nervous shock. When a rapid succession of such waves yield a rapid succession of such units of feeling, there results the continuous feeling known as a sensation. Mind is constituted when each sensation is assimilated to the faint forms of antecedent like sensations. The consolidation of successive units of feeling to form a sensation is paralleled in a larger way by the consolidation of successive sensations to form what we call the knowledge of the sensation as such—to form the smallest separable portion of what we call thought, as distinguished from mere confused sentiency.” “The cardinal fact” as to the “composition of mind” is that “while each vivid feeling is joined to, but distinguished from, other vivid feelings simultaneous and successive, it is joined to, and identified with, faint feelings that have resulted from foregoing vivid feelings. Each particular color, each special sound, each sensation of touch, taste, or smell is at once known as unlike other sensations that limit it in space or time, and known as like the faint forms of certain sensations that have preceded it in time—unites itself with foregoing sensations from which it does not differ in quality but only in intensity.

“On this law of composition depends the orderly structure of mind. Because of this tendency of vivid feelings severally to cohere with the faint forms of all preceding feelings like themselves, there arise what we call ideas.” Simple notions are formed in this way; complex conceptions are “clusters of feelings joined with the faint forms of preceding like clusters. An idea of an object or act is composed of groups of similar and similarly-related feelings, that have formed a consolidated series, of which the members have partially or completely lost their individualities.” Then “complexity,” with its wonderful power, produces the higher ideas of the soul. “Groups of groups coalesce with kindred groups of groups that preceded them; and, in the higher types of mind, tracts of consciousness of an excessively composite character are produced after the same manner. This method of composition remains the same throughout the entire fabric of mind, from the formation of its simplest feelings up to the formation of those immense and complex aggregates of feelings which characterize its highest developments.”

The simplicity and plausibility of these theories.

§ 24. Perhaps the only complete refutation of such philosophy as Spencer's is to be found in *the direct observation and impartial analysis of the facts of mental life*. A course of true psychological study reveals the exceeding inadequacy of all those theories which are founded on a one-sided appreciation of facts, and which owe their existence chiefly to the ingenuity of their authors. Yet, having already discussed materialism, we shall add a few observations on those kindred schools of opinion which have now been mentioned. First, we remark, that the strength of sensationalism and associationalism lies, mainly, in *the simplicity of their fundamental principles, and in their conformity to ordinary and objective thought*. Our minds naturally look with favor upon simple theories. Knowing that the ultimate is always simple, we incline to accept the simple as the ultimate. Explanations of this character, moreover, are quickly comprehended and easily applied; for which reason, if they can be supported by any argument, they are sure of some favor. The fact that sensation is closely related to our outwardly directed thinkings and often mingled with them, has led men to regard the sense-affection resulting from the influence of external objects as of the same nature with the perception and the memory of these objects; and, from this beginning, they have gone on to explain even the highest spiritual activities as the inward reproduction of sensations. Others, again, observing in the sequences of inward life the constant operation of that principle of association which is the most apparent of the laws of mind, have attempted the complete explanation of mental activity by means of this law. In physical science what would we think of the philosopher who should profess to explain all phenomena by means of the law of gravitation? In this strange attempt, as often happens in such cases, they have succeeded so far as to satisfy both themselves and many of their readers.

They fail as explanations of thought.

But, notwithstanding the simplicity and plausibility of the doctrines under consideration, the objections to any intelligent acceptance of them are insuperable. One principal difficulty is that *these theories fail grievously as explanations of the phenomena of thought*. Let us suppose, for a moment, that some of our ideas can be identified with bodily feelings and their modifications: it yet seems absurd to say that such conceptions as those of substances, spaces, times, powers, relations, numbers, and such ideas as those of person, agent, right, duty, interest, are merely "impressions" produced by the impact of external objects. These things are not the objects of any sense. We may be directly cognizant of them, but not physically sensible of them. Sensations cannot plausibly be identified with any notions save with those either of the sensations themselves or of the sense-affecting operations of matter, the agents, powers, places, times and other conditions involved being excluded. It is inconceivable that our ideas of these conditions should be constituted out of any feelings or clusterings of feelings. The

associationalists perceive this difficulty; but, instead of recognizing its insuperable character, *they discard some of the radical conceptions of the human mind as the illusions of unphilosophic ignorance; and give very inadequate accounts of others.* For example, the systems of Mill and Spencer make no place for the notion of substance. Mill defines mind, not as a conscious and intelligent substance, but as a “*series of states of consciousness*”; and Spencer, not as a substance having feelings, but as a series “*composed of feelings and of the relations between feelings,*” every such relation being itself “*a kind of feeling—the momentary feeling accompanying the transition from one conspicuous feeling to an adjacent conspicuous feeling.*” According to Mill, matter is, not an actual existence, much less a substance, but only “*the permanent possibility of sensation*”: while Spencer teaches that “*forces standing in certain correlations*”—that is, as externally opposing those forces which have taken the shape of mind—“*form the whole content of our idea of matter.*”

Spencer's account of our notions of relation, as feelings produced by the transition from one sensation to another, is wholly inept. Relations as such can produce no feelings. These come only from some actions or operations, in connection with which the relations are perceived. We hear two notes of music, but we do not hear their similarity, their simultaneousness, or their successiveness, or their equality or inequality in loudness, pitch, or length, or any other relation between them.

Then what singular conceptions of space and time are given by associationalism! “*Each relation of co-existence is classed with other like relations of co-existence and separated from relations of co-existence that are unlike it; and a kindred classing goes on among relations of sequence. Finally, by a further segregation, are formed that consolidated abstract of relations of co-existence which we know as space, and that consolidated abstract of relations of sequence which we know as time.*” Does it require much thought to see that space and time are not of the nature of relations, and that the former is not co-existence, nor the latter sequence? Not only so; it is inconceivable that any feelings, or association of feelings, could constitute even those conceptions of existence, of co-existence, and of sequence out of which Spencer would construct our notions of space and time. Such is the weakness of that analysis of the phenomena of thought which is consequent upon the self-imposed restrictions of sensationalism and associationalism.

The incompetency of these forms of philosophy may be further illustrated from *the account they give of the knowledge and belief of the soul.* While professing to explain these phenomena they really explain them away. According to these systems, memory is merely “*the revivability of feelings,*” while conviction is the association of ideal feelings so strongly that they cannot be dissociated by an act of the will. Clearly, the revival or

They fail to explain knowledge and belief, and especially our fundamental convictions.

repetition of ideas is not all, nor even the essential part, of memory. In addition to this reproduction, there is the belief—not merely the thought, but the belief—that the ideas now present were formerly experienced as perceptions of realities; and this belief is something distinct in nature both from the ideas in connection with which it is exercised, and from their attraction for each other in the co-existences and sequences of thought. So also our convictions in general, though mostly involving the union of two conceptions, always imply more than this union, and sometimes are exercised in connection with one conception only. In every case belief in the existence or non-existence of something is the essential element. When we say, “Grant exists,” there is as much belief as in saying “Grant is President;” and in all simple affirmations of existence, we cannot properly be said to conjoin two objects of thought, but only to express our belief in the existence of one. Thoughts, too, may be inseparably associated which are not the statement of any belief. The conceptions of an oft-repeated tale become as well linked together as if they constituted a true story; although, at the same time, they may be known to be purely fictitious. In short, neither feelings nor associations of feelings account for the phenomenon of belief.

Skeptical tendencies. But the exceeding evil of a superficial philosophy is manifest, when, in consequence of its incompetency to explain the true origin and nature of thought and of belief, it justifies the rejection of some of the fundamental convictions of the human mind. The logical thinker who starts with only the “impressions” of Hume, or the “feelings” of Spencer, is brought, at last, either to the skepticism of the one or to the nescience of the other. When ideas are defined as the reproduction of internal changes correspondent to external changes,—no element of existence being admitted save that of change,—there is left for us only the knowledge of appearances. What we perceive is no longer the phenomena, or varying phases of real things, but phenomena as distinguished and separated from realities. Whether there are such things as substances in which these phenomenal changes occur, or such a thing as power to produce them—in other words, whether beings and their attributes, properly so called, exist—are points about which we know and can know nothing. Such are the teachings of these systems. This taking away of the ideas of substantial being, of power, and attribute, and causation, eviscerates the body of human knowledge; it leaves no object of belief save a thin phantasmagoria of appearances, covering emptiness only. There are no powers, no beings in this showy shadowy universe; nor are there laws, save certain unexplained and inexplicable uniformities of co-existence and of sequence! And, in regard to the recurrence of “phenomena,” our only source of rational judgment is the tendency of frequently-repeated impressions to recall one another! It is astonishing that able men should propose to enlighten the world with such doctrines as these. To an unsophisticated mind the absurdity

of them is sufficient proof of the falsehood of the systems to which they belong.

They fall as explanations of emotion, and motivity. We need not, in further antagonism to these systems, consider *their inadequate explanation of the emotions and motivities of the soul*. Only strong attachment to preconceived theories can sustain the belief that our feelings—appreciative of the sublime and the beautiful, of the befitting and the ludicrous, of the right and the wrong, the joyful and the sad, the lovely and the hateful—are but modifications of impressions on the senses. And what associations of outwardly excited impressions or appetencies can be supposed to produce contempt, anger, pity, benevolence, the thirst for knowledge, the love of power, the earnest purposes of self-interest, and the high determinations of duty? A satisfactory account of these experiences calls for factors which the mere contact of the soul with outer things cannot furnish.

Are thoughts of sensations weak reproductions of sensations? § 25. Having now set forth, sufficiently, as we suppose, the philosophical inadequacy of sensationalism and associationalism, we shall close this chapter with an inquiry related to that already discussed, but much less general in its scope. Allowing that the deeper and more rational elements of our thought are not modifications of those feelings which are produced in us by the impact of external things, it may yet be asked, "*Are not the thoughts of our sensations, at least, of the same nature as these sensations themselves?*" It will be noticed that this question is not whether sensation constitutes all thought, but only whether a certain part or element of our thought, may not be identified with bodily feelings. In reply to it, we shall not go so far as to say, positively, *that there is no likeness between a sensation and our subsequent perception or remembrance of it*. We cannot conceive of any similarity between an external object and our idea corresponding to it; but, for aught we see, there might be some similarity between two mental states related to each other as those in question are. Let us imagine a mirror capable not only of reflecting the appearance of a present object, but of reproducing this appearance when the object should be absent. Might we not allow that in such a case, not merely a correspondence, but also a sort of similarity, would exist between the appearance in the mirror and the object represented? So, if any one believes that there is a likeness between a present or past feeling and our knowledge or remembrance of it, it would be difficult to disprove such an opinion. Nevertheless an object and the reflection of it, though in a certain respect similar, being totally unlike in their most radical and important characteristics, it would be absurd to affirm that they are things of the same nature; and, in like manner, even though some likeness, some similarity of formation, were supposed to exist between a sensation and our thought of it, this would not show them to be things of the same kind.

A certain similarity may exist.

But no proper community of nature. That they are not—that there is no proper community of nature between sensation and even that thought immediately concerned with it—seems evident from their contrary characteristics. Sensations are obtrusive and vivid experiences; when they enter into our consciousness, they occupy and control the mind; our conceptions of them, like our other thoughts, are comparatively quiet and unaffecting. Sensations are in great measure the passive effects of external causes; our recollection of them arises wholly from the mind's own activity. Sensations are not subject to the guidance of the will; our thoughts of them may be entertained or dismissed at pleasure. Sensations have all more or less defined places in the sensorium; our ideas of them are not fixed in these places; and if they have any special habitation, it is with our other thinkings in the brain. In short, sensations obey laws of their own; while our apprehension or remembrance of them is subjected to the laws of thought.

Consciousness of the distinction. Moreover, generally speaking, *the distinction between our sensation and our idea of it is easily made by the mind.* In most cases we can consciously discriminate between a bodily feeling and our present thought of it. When we are sick, hungry, or cold, we do not confound such feelings with our knowledge of them; and who that ever had headache, toothache, or rheumatism, could not distinguish these experiences from the thinking of them? This difference between thought and feeling is yet more evident when they take place separately from each other. We never incline to consider our remembrances of roughness and smoothness, of weight and pressure, of effort and resistance, of tastes and smells, as merely weak reproductions of the sensations. The compassionate man, without any present experience of suffering, may have a clear conception of the pain or sorrow of those to whom he ministers; and imaginations of relief and of satisfactions not yet attained—perhaps unattainable,—occur frequently to the minds of the distressed and needy.

Recollections of sight and hearing. Here, however, it is to be acknowledged that certain of our sense-conceptions—that is, *our conceptions of things seen and heard—are not contrasted with the sensations corresponding to them so distinctly as ideas derived from our other senses are contrasted with their corresponding sensations.* This is so much the case that, were all our sense-perceptions similar in delicacy to those of vision and of sound, it might be difficult to prove the difference in nature between a sensation and our idea of it. We believe that this difference really exists in the experiences of these senses as well as in those of our other senses; but that, in the case of sight and hearing, several causes conspire to obscure this distinction. The most noticeable of these are the comparative weakness of our auditory and visual sensations, and the complexity and activity of that perceptive thought which is exercised in con-

nection with them. Considering our senses attentively we see that some of them serve chiefly to produce feeling; while others are mainly instruments of observation. Organic sensations have the least intellectual employment; touch, taste, and smell occupy an intermediate position; while sight and hearing far surpass all our other senses in their delicate and varied indications. Moreover, this wise adjustment may be noticed that, just in proportion to the intellectual service of any sense, is the weakness of its sensations; an arrangement evidently designed to free the action of the thinking power from undue sensual disturbance. Thus it is that sight and hearing, having not sensation, but perception, as the end of their existence, ordinarily have a minimum of feeling in their action. While they have a multitude of delicate modifications, these as sensations are weak, and are suitable rather to be noticed than to be felt. Sometimes, indeed, our sensations of light and sound are harsh, powerful, and even painful; and then, according to the analogy of our grosser feelings, we easily distinguish between them and our thoughts of them. Ordinarily, the delicate movements of these senses are so little regarded, save as indicators of fact, and are so neglected because of the preponderant activity of thought connected with them, that they scarcely seem to have a distinguishable character. To this we may add that very possibly, in the more vivid representations of past experiences, the intellect may react on the power of sense so as to produce a slight activity similar to the original feeling. We refer to those extreme cases in which imagination borders on hallucination, and recalls wonderfully scenes and faces, sounds, voices and melodies, of the distant and the past.

An objection answered.

The objection that *the pleasure and pain accompanying recollected or imaginary sensations seems to be of the same nature with that originally experienced* is not so serious a difficulty as that just considered. The fact may be admitted. The aged and blind Niebuhr, thinking of the deep bright heavens of the orient, doubtless had a repetition of his original delight. The deaf musician, reading the work of some great composer, has a rapture similar to that once received from hearing the actual performance of it. Such instances as these do not prove the real recurrence of the sensation. They may be accounted for by that marvelous power of the imagination which causes the mere conceptions of things to affect us in a way similar to the reality. Reminiscence and anticipation give us pain and pleasure; from them, in part at least, arise grief and sorrow, delight and disgust, hope and fear. Yet mere remembrance and foreknowledge, as such and of themselves, do not affect us. The law seems to be that ideas once associated with feelings of pleasure or pain are afterwards accompanied by similar feelings to a greater or less degree. Hence the scenes, persons, actions and events of well-written history, and even the fictions of romance or tragedy, affect us in the same

way as perceived realities. May not also fictitious sensations—that is, remembered or imagined sensations—which are not sensations, but merely thoughts of them, affect us in like manner? We conclude, therefore, that even in the case of sight and hearing there is no sufficient reason to regard our sensations and our ideas of them as things of the same nature.

CHAPTER X.

THE ACTIVITY OF MIND.

§ 26. Having dwelt, at sufficient length, on the subject of sense, and questions connected with it, we proceed to the direct study of mind. We are to contemplate this power in its most general character first. Viewing its phenomena in this way, we find that they may be regarded either subjectively or objectively; that is, either merely as modes of psychical life, or as being also related to their appropriate objects. From either aspect interesting discussions arise. For example, considering the intellect subjectively, two questions present themselves concerning its activity.

One is, "*Are we always consciously active?*" and the other is, "*Are we ever unconsciously active?*" Sir Wm. Hamilton answers both affirmatively. He thinks that the mind never ceases from conscious thought even in the deepest swoon or the soundest sleep; and that, in addition to this conscious activity, there are many mental movements of which we are unconscious. We incline to a negative answer in both cases; although we would allow that the questions belong to a class which calls for moderation in our opinions.

Are we always consciously active? Opinions quoted. In ancient times the doctrine of ceaseless conscious activity was taught by the Platonists, because, by means of it, they more perfectly contrasted ethereal spirit with senseless, inert matter. It was rejected by the Aristotelians, who made less use of assumptions and more of facts. Descartes held that the very essence of the soul consists in thought, or rather in conscious life; and therefore explained our continued existence as consisting in our continued activity. Leibnitz taught the doctrine of monads, that the whole universe, both material and spiritual, is composed of ceaselessly active and energetic atoms: this determined his view of the soul. He supposed, however, that our spirits, though always active, are not always conscious. Dr. Porter maintains the view that the soul is constantly active, whether it be awake or asleep, and says that modern psychologists, excepting materialists only, are nearly unanimous in this opinion. Locke, on the other hand, contends that some men never dream

at all, and that none are conscious that they dream continuously; while Dr. Reid gives his own experience, as follows. Having mentioned how, in his early days, by a determined effort, he had freed himself from a habit of uneasy dreaming, he adds: "For at least forty years after, I dreamed none, to the best of my remembrance; and, finding, from the testimony of others, that this is somewhat uncommon, I have often, as soon as I awoke, endeavored to recollect, without being able to recollect, anything that passed in my sleep." Reid's philosophy of our activity during sleep may be understood from his further remarks. "I am apt to think," he says, "that, as there is a state of sleep and a state wherein we are awake, so there is an intermediate state which partakes of the other two. If a man peremptorily resolves to rise at an early hour for some interesting purpose, he will of himself awake at that hour. A sick-nurse gets the habit of sleeping in such a manner that she hears the least whisper of the sick person, and yet is refreshed by this kind of half-sleep. The same is the case of a nurse who sleeps with a child in her arms. I have slept on horseback, but so as to preserve my balance; and, if the horse stumbled, I could make the exertion necessary to save me from a fall, as if I was awake." (McCosh's "Scottish Phil.," p. 196.)

Opinions criticised. In regard to this question, we remark, first, that *the opinions of philosophers in favor of the unremitting conscious activity are not only offset by contrary opinions, but also lose somewhat of their authority by reason of their connection, severally, with unfounded notions.* The Platonists would find it difficult to show that an ethereal being might not rest as well as one of a gross nature. Descartes evidently errs in saying that the soul is thought; it is the substance which exercises thought. Leibnitz can give no proof for the existence of his monads. And the ceaseless activity of mind is not, as the words of Porter suggest, necessarily involved in its absolute immateriality. In the next place, the facts adduced in favor of the theory of unremittent and conscious action are easily reconciled with the opposite opinion. The marching of soldiers and the watching of nurses, while slumbering, and that consciousness of passing time which enables some to rouse themselves with tolerable correctness at a prescribed hour, occur when sleep is not sufficiently profound to prevent all mental activity. A greater degree of somnolency than that experienced during such performances takes away the capability for them. So also in dreaming and in somnambulism, the current of life is evidently moving; and the sleep also is not perfect. Hamilton, after experiments made upon himself, alleges that if one is aroused while falling asleep, he can always discover that he was in the commencement of a dream; and that, if awakened suddenly at any time during sleep, he finds himself in the middle of a dream. To this we may reply that absolutely undisturbed sleep is probably of rare occurrence—that Reid and others testify to an experience different from

that of Hamilton—and that in those cases in which persons roused from deep sleep may find themselves dreaming, the dream may possibly have begun with the first beginning of the disturbance. In most instances when we judge ourselves to have been dreaming long, our rest, probably, has not been very sound; but it is also well known that a dream of hours can take place within a few moments. Jouffroy, the eminent French contemporary of Hamilton, comments on the fact that unusual noises or disturbances, even though slight, frequently prevent or break our repose; while customary sounds or movements have no such effect. It is difficult at first to sleep amid the clatter and shaking of a railway train; but custom renders this easy. "See," says Jouffroy, "the mind—the judgment, ever-wakeful, when alarmed by the unusual indications which come through the torpid senses, arouses or keeps alive the whole sensorium also." But here again there is only that partial sleep—that intermediate state between sleeping and waking—of which Reid speaks. Any inward feeling of novelty, danger, or uneasiness acts upon the senses, just as the senses act upon the mind, so as to prevent perfect repose. The phenomena observed by Jouffroy suggest that body and spirit tend to wake or to sleep together—the one with the other—rather than that the one slumbers while the other is awake. For, if the body—or rather the bodily senses, were entirely dormant, the soul could not receive any indications whatever from without; while our consciousness of psychical action during sleep generally shows a reduced activity of the higher powers of thought fully equal to that exhibited by the powers of sense.

But, while the facts adduced in evidence seem insufficient to establish the doctrine of ceaseless activity, they certainly support the belief that the mind is active, though with but feeble energy, during much the greater part of sleep. They also agree with the opinion that spirit never rests of itself, but always and only because of its subjection to bodily conditions. When the wearied brain ceases from working, then the soul sleeps: possibly then only. It may be that disembodied spirits never tire.

The common opinion, that the deepest sleep is entirely dreamless and thoughtless, is sustained by the fact that our repose becomes more profound in proportion to the exhaustion of nervous energy, provided this fall short of excess and injury. The action of the soul, so far as it can be observed by consciousness, obeys this law; and it is natural for us to expect an increasing slowness of motion to terminate in absolute rest.

Then, too, in swoons, and in the insensibility produced by powerful anæsthetics, the mind seems to be perfectly inactive. In such cases, the most severe operations performed on one's body excite no sensations or other psychical movements. Mental life is arrested for the want of those corporeal conditions which have been imposed on its present exercise. But, so soon as these return, it springs again into activity. In view of such facts as

these, it is difficult to believe that the soul is always consciously active.

§ 27. We now come to the inquiry, *whether the soul is ever unconsciously active*. This question is not whether experiences of thought or of motivity may not unconsciously impress the mind with tendencies to similar modes of experience. This is admitted; and it proves the existence of a power which is very different from those which directly manifest themselves in consciousness, but which perhaps operates only in immediate connection with the activities of our conscious powers.

Nor do we now ask whether there are "mental modifications" attended with a very slight degree of consciousness. No one denies that. Often trains of thought pass through our minds which engage our interest so little that, if asked what we are thinking about, we reply that we are thinking of nothing. The mental energy has been so feeble that we cannot recall a single idea. For a similar reason, most dreams are immediately forgotten; so that frequently, even when we can say that we have been dreaming, we find it impossible to tell what we have been dreaming about.

The question is, whether there be mental activities of a similar nature to those of conscious life, of which, however, we are utterly unconscious at the time of their taking place, and which are manifested afterwards through effects of which we are conscious? We state the question in this way, because the idea of mental movements which never manifest results in consciousness, may be set down as highly improbable; and because the faculty of consciousness is so close a beholder of psychical changes that positive evidence is needed of the occurrence of activities without its sphere of observation. These considerations throw the "burden of proof" on the advocates of unconscious "modifications": and this burden has been accepted by them.

Hamilton ("Metaph.," Lect. XVIII.) uses three arguments in support of his position. The first is founded on the fact that *no sense can consciously perceive any object smaller than a certain minimum*. Vision results from the reflection of light; but, if the surface of an object be diminished beyond a given limit, the object becomes invisible. "Therefore," argues Hamilton, "each part must act so as to make up the visibility of the whole. Here, consequently, are minute modifications of mind of which we are entirely unconscious. We cannot see one forest leaf at a distance, but the multitude of them together produces an extended view. The distant murmur of the sea is made up of parts, any one of which by itself would be entirely inaudible. The taste of sweetmeats, the odor of flowers, the soft touch of velvet or of down, may each be considered as the result of an infinity of unfelt modifications." This reasoning is well met, as we think, *by a distinction made by Dr. Porter*, between the affection of the organ of sense, and the affection of the mind consequent upon it. The united influence of many leaves or waves or particles may be

needful to bring the organ into a condition which qualifies it to excite a sensation in the mind. But anything less than the perceptible minimum might produce its attenuated effect upon the nerve without moving the mind in the least. In like manner, during swoons and times of absolute insensibility, there is an action of the nervous system too weak to affect the mind, yet sufficient to sustain various functions of the body. Then, also, in addition to the foregoing, we may question whether an infinitesimal force can produce any movement even in the nerves.

Hamilton's *second argument* is connected with the law of *the association of ideas*. Let A, B, and C be three thoughts, of which the first and the last have each been associated with the second, but never yet with each other. In this case A may suggest B, and B may suggest C; but A cannot suggest C, save by first suggesting B. Now it may happen, says Hamilton, that A suggests C without our having any consciousness of B. This last-named thought, therefore, must have taken place as a latent modification of mind. If one billiard ball strike another at the end of a row of similar balls arranged in a straight line and touching each other,—the blow being given in the exact direction of the line,—the intermediate balls do not move; only the farthest ball is propelled forward. After this fashion one idea suggests another, “the suggestion passing through one or more ideas which do not themselves rise into consciousness.” Sir William, thinking of Ben Lomond, instantly thought of Prussian education; and could not imagine why. After reflection, he remembered that he had met a German gentleman on the top of that mountain: this remembrance appeared to him to furnish the lost link by which his conceptions had been unconsciously connected. We do not question the fact of the immediate successiveness of the ideas in the mind of so accurate and so philosophic an observer; but can we be sure that the mountain summit and Prussian education had not previously, at all, been connected in his thinking? Is it not possible that the subject of Prussian education, having been suggested by the appearance of the German traveler, had engaged the professor's consideration somewhat, at the time when he met the gentleman on the mountain? Nothing could be more natural than this in the case of Sir William. But, if this were so, the instance cited would only be one of the ordinary association of thought. In short, we would account for the apparent want of connection, often noticed between successive ideas, either by reference to a previous and temporarily forgotten association, or else by that rapid oblivion which frequently overtakes such links of thought as do not, while passing, secure our interest and attention. It is difficult to conceive how the mind can think, even in the feeblest way, without at the same time knowing that it thinks; this, of course, also in a way correspondingly feeble.

The *last argument* of Hamilton is derived from *our acquired*

dexterities. When one plays rapidly on a piano, or other musical instrument, he seems to strike many notes—especially in a familiar piece—from habit, and without thought of the individual motions. At times even the chief attention of a practiced performer may be occupied with objects not at all related to his playing. Some have accounted for this by ascribing the activity wholly, or nearly so, to the body, acting automatically and under the influence, though not under the direction, of the mind. This explanation excludes mental modifications, whether conscious or unconscious. But it is incredible. We would accept the idea of latent modifications in preference to it. There is always, we believe, something intellectual in our dexterities; their apparent automatism is similar to what takes place when one reads aloud to others sentences, and even passages, which make no impression on his own mind—that is, no impression such as can be recalled. Drs. Reid and Hartley endeavor to explain these activities by a force of habit—a proneness of spirit—operating without thought. They liken this to instinct. But we question whether even instinct acts without any thought. There is no understanding of its end; but we believe there is some notion of its immediate work.

The views of Prof. Stewart on this subject seem on the whole preferable to any others. He holds that actions originally voluntary (and therefore also intellectual) always continue so; though we may not be able to recollect every particular volition of a series. He thinks that an act of the will precedes every motion of every finger of the musician; and compares the skill of the player to that of the accountant who sums up, almost at a glance, a long column of numbers, retaining no knowledge of the individual figures. The instantaneous forgetfulness accompanying such mental work is experienced by every student. How often, after a page has been rapidly perused, it is difficult to repeat one sentence—nay, even one word,—the author's matter, only, remaining in the memory! This inability to recall the details of each successive act of mind, is to be explained by reason of the exceeding ease and quickness of the intellectual performance, and from the corresponding slightness of attention given to each particular; it is not the result of any unconsciousness. So, likewise, when we say that an earnest speaker is unconscious of his delivery, we mean that he pays no attention to it whatever, and that his consciousness of it is both extremely weak and also entirely disregarded and without effect; but not, in the strict sense, that he has no consciousness of it at all. That there is a slight consciousness is evident. For if some accessory on which he has been accustomed to depend—a pencil, a watch-chain, a buttonhole, a pocket-handkerchief, a coat-tail—be removed from reach, it is instantly missed; and some time passes before the previous degree of unconsciousness is regained. In like manner, should some key of the piano become accidentally broken, and fail to respond to the quick touch; should

some figure in the column of addition be found illegible or meaningless; should some word be omitted, or even wrongly spelled, on the printed page;—the want would be immediately perceived, and would induce a more attentive and deliberate consciousness.

One qualification, perhaps, might render Prof. Stewart's explanation more entirely satisfactory. He says that the slow and the rapid operations "are carried on in precisely the same manner, and differ only in the degree of rapidity." This rapidity is the chief difference; but we believe that there is also somewhat of a change in the mode of the mind's thinking. We are of opinion that combinations, which at first furnish the objects of several successive thoughts, often come to be comprehended *in one complex idea, or in one complexity of co-existing ideas*, and that this remains and operates in the mind till it has been fully realized in action. Thus a whole bar of music before its execution, or a whole sentence before its utterance, may be included in one easy apprehension. But, in the case of any complex conception, our attention does not rest successively on its several parts, but on the conception as a whole. This suggests that, although minute actions are objects of thought, they yet may not be the objects of separate and independent thought; and, if such be the case, there is still less room for wonder that they are not individually remembered.

Finally, supposing—what we do not believe—that some psychological operations entirely escape our observation, this would not prove that such operations occur outside of the sphere of consciousness, but only that they have been overpassed and neglected within it. If such a doctrine could be proved, it would show that our power of internal cognition, like our power of external cognition, may wholly lose sight of familiar objects because of the presence of others more interesting and impressive. Some show of argument could be made for this theory. But there is no evidence for the assertion of Hamilton, that "the sphere of our conscious modifications is only a small circle in the center of a far wider sphere of action and passion, of which we are only conscious through its effects."

CHAPTER XI.

MENTAL STATES AND MENTAL ACTIONS.

§ 28. Frequently, both in philosophic and in ordinary discourse, we distinguish between *the states and the actions*, and also between *the processes and products* of the intellect. The consideration of these distinctions may contribute to clearness of

thought; and, with a similar end in view, we may profitably discuss the question, whether *the mind is capable of having a plurality of states*, or of performing a plurality of actions, *simultaneously*.

Question defined.
Action and state
distinguished.

In speaking of states, we do not refer to those more or less permanent conditions of our psychical powers which manifest themselves in modifications of our activity, and which exist during our inactivity. There are such states; for example, those of vigor and of feebleness, of liveliness and of dullness, of soundness and of insanity, of immaturity and of development. We now refer only to those states of mind of which we are immediately conscious, and which themselves are the manifestations of our immanent faculties and dispositions. Doubt, certainty, conviction, belief, knowledge, ignorance, are states; perceiving, recollecting, judging, imagining, are actions.

The distinction thus presented between mental states and mental actions is a real one, yet is neither so great nor of the same character as that between action and state in the material world. It is not, for instance, like that between the action of chemical agents, and their state or condition after their action on each other has taken place. It is more like that between seeing and beholding; between merely touching some object and feeling it. In short an intellectual state may be regarded as a continuous activity, and an intellectual action as a momentary one. The latter either terminates at once or is the beginning of a mental state. We believe that consciousness reveals activity in every psychical condition, and that when any conception or subject occupies the mind, there is elicited a continued exercise of power. There is something analogous to that condition of excitement—that state of motion—produced in the luminiferous ether by a light-giving or a light-reflecting body. As the retina of the eye is continuously affected by the rapidly successive waves of light, so the idea of the object obtained through vision appears to be a continuous or rapidly repeated mental activity. The thoughts awakened and maintained in the mind by the sense of sight, when we may be attentively regarding the objects corresponding to them, may properly illustrate all intellectual states. Gazing, for example, at a flaming candle or a flying arrow, we see the slightest variations in its figure or place, its most delicate flickerings and motions. And from such observations we infer that continuous thoughts resemble the reflections of a mirror rather than any states of positive rest.

Process and product.

The distinction between the processes and the products of the intellect is somewhat similar to that just discussed, and presents an important difference in modes of mental activity. It is the distinction commonly made between *forming an idea*, or conception, of an object and *the idea when formed*; and it is paralleled in the difference between forming an aversion or an attachment and the aversion or attach-

ment when formed. Both processes and products are modes of thought, and do not differ radically in nature. They are not related to each other as mechanical processes and their products are. The carpenter's skillful use of tools and the desk or table which he may make, are things of totally different natures. But Defoe's final and fixed conception of Robinson Crusoe's castle, and the various thinkings of his mind which resulted in that conception were not essentially unlike: they were both mental activities. Yet we easily distinguish the process and the product. The former always precedes the latter, and may be so imperfect or feeble as to fail of a result; in which case there is no product. The process is composed of successive parts; the product has a more perfect unity; its parts constitute one thought. The product often can be easily and fully recalled, when the process may have been forgotten and lost in obscurity. The process consists commonly of a series of actions; when any of these is prolonged into a state, it may be regarded as a partial product, awaiting the union of other parts. The product, though it may be employed and then immediately dismissed, is frequently used as a mental state around which other thoughts arise. Sometimes in experience it is easy to distinguish the product from the process; in other cases this is difficult, because of the rapid transition of the one into the other. In adult sense-perception the result is so instantaneous that no process is ordinarily perceptible. Yet undoubtedly the infantile mind in forming ideas of material objects employs a series of sensations and judgments, some of the latter also being the gradual acquisitions of experience. The instantaneous sight of a man, a tree, a house, an animal, is the work of trained or educated perception. The processes which precede mental products are perhaps more discernible in the workings of the rational faculty than in those of any other. We see plainly how the thoughts which follow one another in a definition coalesce so as to form the notion defined; and how, after the frequent use of an attributive judgment, its elements unite so as to produce a changed or an enlarged conception. Thus, having several times opened a certain book and found it printed in the German language, we thereafter, on seeing it, think of it always as a German book.

Product and object distinguished.

We should be careful not to confound the distinction between *process and product* with that between *the process, or act, and the object*, either of perception, or of conception, or of any other exercise of thought. Sir Wm. Hamilton, following continental authorities, and others, following Hamilton, have fallen into this error. We may cite one passage out of many. In his "Logic" (Lect. III.), having stated that ordinarily "conception means both the act of conceiving and the object conceived," Sir William adds, "I shall use the expression *concept* for the *object* of conception; and *conception* I shall exclusively employ to designate the *act* of conceiving." In these and similar statements the product and the object of thought are

plainly identified; which is yet more evident from the fact that the term *concept* is avowedly and invariably used by Hamilton as the equivalent of the term *notion*. This mistake is palliated by its connection with difficulties which we shall consider hereafter, pertaining to "ideal objects"; yet it is undoubtedly a mistake. A mental product, no less than a mental act or process, is simply a mode of thought, and is not the object of its own exercise of thought.

This power of the intellect to put the result of its thinkings into permanent, or rather reproducible, ideas is of the highest necessity and utility. Without it, progressive science, and even fixed knowledge of any kind, would be impossible. Our conceptions would be in the perpetual confusion of formation and of dissolution. No work could be accomplished by the imagination; the materials would fall to pieces as soon as they had been put together. Memory, too, if it acted at all, would present fleeting and formless elements of thought, rather than serviceable recollections. And the rational faculty, being deprived of fixed notions, would strive in vain after any knowledge of the universe. The ability to form mental products might very properly be called the acquisitive power of the mind. It has not till lately received due attention from psychologists. As Pres. Porter remarks, it is "clearly distinguishable from the power to know, or to think. It should certainly be reckoned among the subsidiary or secondary powers of the intellect.

§ 29. Philosophers in past times have been greatly divided as to the number of states or actions possible for the mind at any one time. The saying is a common one that we cannot attend to more than one thing at once; and it certainly is true that the human mind is incapable of considering different subjects simultaneously. This useful practical observation, and certain supposed requirements of the doctrine of the essential oneness and simplicity of spirit, have led to some extreme opinions. Dr. Thomas Brown, the eloquent colleague and successor of Prof. Stewart in the chair of philosophy at Edinburgh, in his eleventh lecture, says, "If the mind of man, and all the changes which take place in it from the first feeling with which life commenced to the last with which it closes, could be made visible to any other thinking being, a certain series of feelings alone, that is to say, a certain number of successive states of mind, would be distinguishable in it, forming, indeed, a variety of sensations and thoughts and passions as momentary states of the mind, but all of them existing individually and successively to each other." The views of Stewart, though differently expressed from those of Brown, were radically the same. With characteristic moderation he teaches that we cannot "attend at one and the same instant to objects which we can attend to separately." He thinks that the "astonishing rapidity" of thought is sufficient to explain the apparent simultaneity of mental operations. He asserts that a

Can we have more thoughts than one at once? Opinions quoted.

good musician does not attend to the different parts of a harmony at once, but varies his attention from one part to another, his thoughts being so quick as to allow no perception of intervals of time. According to his theory, when one plays rapidly on the piano, and also sings, reading both song and music from a book, his perception of the notes, his reading of the words, his execution on the instrument, his vocalization of the language, his hearing of the music and of the poetry, his enjoyment and understanding of the melody and of the sentiment, and the various thoughts and feelings which accompany these things, are all, not simultaneous, but successive. So, too, when the complete figure of an object is painted on the retina, the mind perceives it only by a great number of different acts of attention performed with marvelous celerity. "For," says Stewart, "as no two points of the outline are in the same direction, every point by itself constitutes just as distinct an object of attention, as if it were separated by an interval of empty space from all the rest."

The assumption that the attention of the mind can act only along one geometrical straight line at a time, and therefore not on a surface or an outline, seems entirely without probability. Stewart says that, if this were not so, "we should, at the first glance, have as distinct an idea of a figure of a thousand sides as of a triangle or a square." But does this follow? Surely the power to perceive three, four, five, or six objects at a time, and to give them each some measure of attention, does not imply a similar power as to a hundred or a thousand? The opinions of these distinguished Scotch professors appear to have been handed down from disputations of the Schoolmen. Thomas Aquinas, Albertus Magnus and others upheld the affirmative of the question, "Possitne intellectus noster plura simul intelligere?" The negative was maintained by Duns Scotus, Occam the Invincible, and others.

Hamilton's discussion is very complete. He approves of the opinion of some French philosophers, that we can perceive distinctly six separate objects, or six separate groups of objects, at once. "If," he says, (Lect. XIV.) "you throw a handful of marbles on the floor, you will find it difficult to view at once more than six or seven; but if you group them into twos or threes or fives, you can comprehend as many groups as you can units; because the mind considers these groups only as units. It views them as wholes, and throws their parts out of consideration."

The affirmative is capable of a simultaneous plurality of states or activities; and this view agrees with experience.

We undoubtedly can perform several actions at once. If this be so, may not the ideas which cause them be simultaneous too? When we rub one hand upon the other, the sensations as well as the actions appear to exist together. When one looks at the

The affirmative maintained and illustrated.

branches of a tree, the boards of a fence, or even a group of persons, only metaphysical subtlety can suggest that they are not seen at once. The stress of thought may easily be concentrated on one of the objects; but, so long as no special interest is excited, all are viewed alike. The perception of relations, also, requires a single comprehensive perception of the objects related. How could we form any idea of a relation, if we did not at the same time think of the objects between which the relation may exist? Who could conceive of marriage without also having both husband and wife in mind? In like manner, every sentence, with its subject, predicate, copula, and modifying words, must be considered as the expression of one complexity of ideas. We may, it is true, compose part of a sentence without having a definite conception of the remaining part; but it is also true that we could not even begin the construction of a sentence, if we did not, from the first, have thoughts, more or less definite, of the plurality of objects involved, and of their mutual relations. When Cicero, in the commencement of his oration for Archias, said: "Si in me est ingenium, iudices," he certainly understood well in what way he was about to continue and to terminate that long, graceful sentence, and had in view the several parts of it and their mutual connections. A simple experiment, illustrative of this point, can easily be tried by any one. Let him take some statement, the sense of which he fully comprehends, and let him think only one thought in it at a time. He will find that, in doing so, he loses also the meaning of the statement. For example, in the sentence, "Cæsar conquered the Gauls," we may think of Cæsar, of conquest, and of the Gauls, separately, but we fail to possess ourselves of the assertion if we do not think all three thoughts together. Moreover, those mental products which we call *complex ideas* are composed of many constituents, each of them an idea by itself, but all of them existing simultaneously in composition. The vast majority of our thoughts are such combinations. Nor can we find any important difference between them and the collection of ideas contained in them, save this only, that the constituent ideas exist and adhere together. The analysis of any common conception—that, for instance, of a coin, a knife, a book, or a pen—will illustrate this remark. We think, therefore, that a belief in the co-existence of mental states is conformable with facts. And why should it not be so? A ball of iron may, at the same time, receive and transmit heat, be influenced by gravitation, attract the magnetic needle, move onward through the air, displace opposing obstacles, and perform many other functions. Why may not the soul, an infinitely more subtle substance, act in many ways at once? Indeed, to one exercising attentive consideration, the question arises whether the possible rapidity of the soul's successive movements be not surpassed in wonderfulness by the possible multitude of its co-existent activities.

Attention distinguished from thought.

At the same time, we are far from saying that the mind has the power of directing its attention equally to many objects at once. Not every act of intellect is accompanied with that special exercise of vigor which is commonly called attention. Hence the inquiry, whether we can attend to many things simultaneously, is to be distinguished from the inquiry, whether we can think of many things simultaneously. As a good sportsman can only bring down one or two or three birds at a time, though a whole covey may rise before him, so the mind, while many thoughts may be present to it, can address itself to the consideration only of a few. It is to be noticed, also, that a concentration of the power of thinking on one object sensibly withdraws it from other objects. While one looks carelessly upon his open hand, all the fingers may be seen distinctly; but, if he attend particularly to a point or mark on one finger, the perception of the others is immediately weakened. In the case of complex ideas, in which a whole is formed out of several constituents, the full attention of the mind, probably, can be given to the conception in all its parts; generally, however, one element becomes specially prominent; and this appears to be always the case where the conception is made a subject of study. Every human mind has a certain limited amount of intellectual energy. This can be devoted almost entirely to one thought, leaving but a small residuum for division among other thoughts that may exist within one's consciousness. Or, if the energy be directed towards several objects, the share given to each is less in proportion to their number. We can conceive, however, of a mind of infinite energy, whose knowledge, most perfectly and fully, and at the same instant of time, comprehends every object, and every part of every object, in the wide universe.

CHAPTER XII.

THE OBJECTIVITY OF THOUGHT.

§ 30. The chief importance of thought does not arise from its character as a mental experience, but from the fact that it is the instrument of knowledge—the agency by which the soul is brought into conscious relations with the universe. The whole wonderful life of man as a spiritual being originates from thought; and this, too, simply because thought brings the soul into connection with *being* in its various forms.

It is of the very nature of thought to have that peculiar relation to existence which is indicated in saying that thought is the reflex of existence: every thought, however feeble, is thus related to some being or form of being, which is, therefore, styled the object of the thought. That essential characteristic

of thought by reason of which it is correspondent to existence, may be called the objectivity of thought.

Being and existence are terms exactly equivalent to each other in their proper and original use; and, as such, they are employed in two different senses.

Their abstract meaning is expressed when we speak of the being or existence of anything, or when we predicate being or existence of anything, saying, It is, It exists, or, It has being, It has existence. Thus, if asked about the Emperor of China, we might say that we know that there is such a person, or that such a person exists. With this abstract sense of these terms we shall have more to do hereafter. Their other meaning is that which they have when employed concretely. They then signify, not the attribute of being or existence, but whatever possesses this attribute as having it; in other words, *anything which exists*. The human body is a material, and the human soul a spiritual, existence; and we speak of an existence and of existences, of a being and of beings, and, using the terms collectively, of existence in general, and of being in general. In this concrete sense, the terms are employed both with a narrower and with a wider application. In the narrower they signify any kind of substantial existence, whether spiritual or material. God, angels, men, mountains, seas, plains, are beings or existences. But it is to be noticed that in this signification the term *being* is not used so freely as *existence* for every kind of substance; it is generally restricted to living beings. In the wider application being and existence signify anything whatever that exists; and in this sense the word *existence* is generally preferred to the word *being*. Thus space, time, power, actions, changes, and relations, as well as material and spiritual substances, are existences. And all things whatever, taken collectively, constitute existence in general. Now, when we say that every thought has objectivity and is related to some form of being or existence, we use these terms, not in their abstract, but in their concrete sense, and that, too, in this last and most unrestricted application. For there is no form of existence which does not find its reflex in a corresponding form of thought.

The relation between thought and objects of thought. § 31. This relation between thought and the existence, or form of existence, to which it corresponds, is of a peculiar nature, and should be distinguished from all other relations. It is not the relation of an effect to a cause; for the object of thought is wholly inactive, and the exercise of intelligence is the work of the mind itself. Neither is it that of the conditioned to the condition: existence is a condition of thought, in a certain sense; but the correspondence in question is a relation other than this. A mirror cannot form a reflection without an object, but the correspondence between reflection and object is distinguishable from the dependence of the former upon the latter. Again, the relation of thought and object is not that of similarity. Things which are utterly unlike may yet correspond. One part of an invention may correspond to an-

other, as a key to a lock; an instrument may correspond to its use, as an oar to rowing; or a sign may correspond to the thing signified, as a printed to a spoken word. But this does not involve any similarity. The correspondence between thought and its objects is probably closer and more minute than any other correspondence; but, so far as we can judge, there is no likeness between them. What resemblance can there be between hardness and the idea of hardness, sharpness and the idea of sharpness, weight and the idea of weight, solidity and the idea of solidity? What similarity is there between the Roman people, with their history of war and empire, and our knowledge of that people? Mind is so different from matter that we cannot suppose our conceptions of material things to be like the things themselves; and, as for psychical objects, we know that our ideas of actions, desires, emotions, virtues, vices, weaknesses and abilities, have no likeness to these things. The only thought in which we can discover any similarity to its object is *the thought of a thought*, for in such a conception the original thought is repeated and incorporated. This likeness, however, is accidental. Moreover, it is insufficient to say that the relation between thought and its objects is one of correspondence. To say that food is useful to man does not express its peculiar mode of usefulness. So in this case the term *correspondence* does not express the full essence of the matter; there is also a simple and undefinable peculiarity. At the same time the nature of the relation in question is well-known and easily understood. When a merchant says he is thinking of some enterprise, we know what he means; we understand the nature of the relation between the enterprise and his thought. We see, too, how this relation arises out of, and belongs to, the very nature of thought, and how it contributes to make thought a moving and impelling power.

The terms *objectivity* and *objectivity*.

We give the name *objectivity* to that characteristic of thought which we regard as the most essential and distinguishing, because we can find no other name more appropriate. It may, however, be said that the term is more properly applicable to that which is the object of thought than to thought itself. To this we reply that thought itself as related to its object is in a certain sense connected with it, and therefore is sometimes styled objective. For example, speaking of some idea of the imagination, we may say that, although of subjective origin, it has in it, nevertheless, an objective reference. If authority be needed to justify our use of language, that of Sir Wm. Hamilton may suffice. In his "Logic" (Lect. XXVII.), distinguishing two inward experiences, knowledge and belief, he says, "The one is perspicuous and objective; the other is obscure and subjective;" and in Lect. XXVIII. he teaches that error often arises "from the commutation of what is subjective with what is objective in thought." In these statements the term *objective* corresponds exactly with our *objectivity*. Could another and better term be found, we would gladly use it. *Rel-*

ativity has been thought of, but is too general to serve our purpose, and has already been employed by Hamilton and others in a special application. It would be advantageous, however, if we could distinguish between the character of thought as related to its object, and the character of any object, or part or quality of an object, as related to our thought of it. When it should be desirable to indicate the latter character unequivocally, we would suggest the use of the word *objectuality*. We might then say that thought as such has objectivity, but not objectuality; and that existences, as the objects of thought, have objectuality, but not objectivity.

Our doctrine specifically stated.

In saying that thought always has objectivity as a part of its essence, we do not mean to affirm, literally, that thought always has objects. We often have thoughts without any true or real objects whatever; and we sometimes have conceptions to which no reality ever has corresponded, or ever shall correspond. We mean only that the nature or form of thought has that peculiar correspondence already mentioned with the nature or form of things; and that, so far as we have thought, it corresponds in its forms with forms of existence. This statement would hold though the universe were annihilated or had never been created. The conception of a universe yet to be, would correspond with the nature of that universe. An infinite mind might conceive of ten thousand systems, each extremely different from the existing cosmos, and having marked peculiarities of its own, yet in every case, the conception would correspond in its formation with the formation of a system of things. Any psychical state which should have in it no reference to any form or mode of existence could not be a thought, but would be something totally different. Objectivity belongs to the very essence of thought.

Proved inductively, and from the cognitional origin of all our ideas.

§ 32. The foregoing doctrine is so easily and immediately inferred from an examination of our thinkings that formal proof of it seems scarcely needed.

Let any one make the trial; he will find that he cannot think at all if he do not either think of something or as if of something. Yet this truth may be further illustrated, and may be maintained against objections, by one or two confirmatory statements. The objectivity of thought is involved in the fact that the elementary origin of all our ideas is to be found in our perceptions of actual existence. Study shows that the constituent elements of our most fanciful and our most abstract, no less than those of our more common and matter-of-fact conceptions, are all derived from our cognitions of the real and actual. Imagination is a constructive faculty, and can work only with materials furnished by the powers of immediate knowledge. The most extravagant combinations of poetry and romance are formed from thoughts acquired in actual experience. In like manner our abstract notions and our general fundamental principles are all obtained from cognitive thought by certain mental operations.

Sometimes conceptions are thus formed to which no real objects agree—whose correlatives, in one sense at least, would be more perfect than any real objects: but this is done by certain intellectual diminutions and additions whereby we lessen the degree of some attributes and add to the degree of others—not by the creation of new elements of thought. So also, by the well-known process of generalization, the mind forms its fundamental ideas and judgments from immediate and concrete cognitions. Such thoughts as space, power, time, change, substance, and our judgments setting forth the necessary relations of these things, are first entertained by the intellect, not as general notions or truths, but as elements in the perception of particular facts and objects.

Modern philosophy has done a great service to mankind in establishing the doctrine that general ideas and truths are, in all cases, derived from the actual and the particular. This was one immediate result of the investigations of a famous man, a junior contemporary of Descartes, and an equally independent thinker. John Locke, about the year 1660, abandoning the scholastic philosophy in which he had been educated at Oxford, sought for a more satisfactory theory of thought and knowledge. With strong native good sense he accepted as ultimate the reliability of our immediate perceptions and found the source of all knowledge in what he called "sensation and reflection," that is, in our external and our internal cognitions. In so doing, he struck the true line in which all satisfactory progress in modern metaphysics has been made. As to the special point under discussion Locke expresses himself as follows: "The dominion of man in this little world of his own understanding is much the same as in the great world of visible things; wherein his power, however managed by art and skill, reaches no further than to compound and divide the materials that are made to his hand, but can do nothing towards making the least particle of matter, or destroying one atom already in being. The same inability will any one find in himself to fashion in his understanding any simple idea not received by the powers which God has given him."

Proved from an analysis of the constructions of the imagination.

§ 33. Again, that forms of thought are correspondent with forms of existence is evidenced by the fact that not only every idea, but also every construction of ideas, so far as really and distinctly made, is of that which is possible to be. So far as elementary conceptions are concerned, this would follow from the fact just considered, that such conceptions are derived from cognitions of the actual. The actual is always possible. On the same ground it is clear that any combination of ideas must be made up of constituents corresponding to various simple modes of existence; and that all our ideas, therefore, at least so far as respects their materials, have objectivity. The question, however, remains, whether our complex conceptions *as wholes* are always of things possible; and this inquiry is important. For, if only the possi-

ble is conceivable, then possible constructions of thought are limited to possible constructions of existence; and this would give an additional significance to the doctrine of objectivity. Nor is the proof of this point so difficult as might be supposed. In our cognitions of fact we perceive in actual operation the laws of the necessary and the possible; and, in this way, we become able to judge in any case whether things corresponding to our conceptions would conform to those laws or not. We hold that intellectual constructions, so far as they may be actually and distinctly made, always represent possibilities. Complex conceptions may, indeed, be formed whose parts may be more or less contradictory, and which could not therefore have any reality corresponding to them. But we believe that in such cases the contradiction is left out of the conception; and the construction of thought, so far as it really takes place, is of the possible. By reason of certain laws of nature, a man could not live with mermaids under water in the caves of the sea; but, should we leave those obstructive laws out of consideration, the conception presents a certain kind or degree of possibility. On this the imagination builds. It is the duty of a poet, first to avoid absurdities, but, if this cannot be, then to conceal them with all the art at his command. He can combine only ideas of things possible. That pure impossibilities are inconceivable may be shown by experiment. Try to conceive—that is, to think fully and distinctly—of two neighboring mountains without any valley between them; of the co-existence in duration of the first and the last moments of an hour, or days of a year, or years of a century; or of an equilateral quadrilateral, one of whose angles only is a right angle, the rest being either acute or obtuse. Endeavor to suppose that three dollars might be equal to five, or that they might be less or more than three; that a man might literally be another man, or might not be himself; that a traveler might go from one city to another, or an angel from one star to another, without passing through the intermediate space; that a statement can, at the same time and in the same particulars, be both true and false; or that a substance can be both existent and non-existent at once. Such trials as these will convince one that the conception of the impossible is itself an impossibility, and that consequently conceptions of the possible are the only possible conceptions. In other words, and more explicitly, we can think of things only so far as the existence of them would harmonize with the necessary laws of being.

Reid's opinion controverted.

Dr. Reid, in the third chapter of his fourth essay, argues against the doctrine that we can conceive only of the possible. His chief reliance is the fact that we can understand the statement of an impossibility when made in the form of a proposition. He would admit that we could not conceive distinctly of a triangle, two of whose sides taken together would be exactly equal to the third side. But he says, "I understand as distinctly the meaning of this pro-

position, 'Any two sides of a triangle are together equal to the third,' as of this, 'Any two sides of a triangle are together greater than the third.'" It must be allowed that many statements of things impossible are intelligible, and also that there is no radical difference between understanding a proposition and conceiving it, or constructing its thoughts into one notion. Nevertheless we think that there are two different degrees or modes of understanding a statement: the one partial and superficial, the other thorough and complete. According to the former, we conceive that a thing is or may be so; according to the latter, not merely that it is so, but also how it is so. And we believe that propositions or conceptions involving impossibilities are constructed by the mind only partially, and only so far as they may contain elements of possibility. We can say, "A man dwelt twenty years among the mermaids," or we can think of "A man dwelling twenty years among the mermaids," notwithstanding all the absurdity connected with the supposed existence of such creatures and the living of a man in their submarine abodes. But, in doing so, all that is impossible or incredible in the case is treated with neglect. In the same way, when constructing the proposition, "Any two sides of a triangle are together equal to the third," we do not think closely or fully of the sides and their relations. Regarding the two sides simply as two lines we find nothing absurd in the idea that, as two lines, they are equal to a third line; and although we recognize all the lines as sides of a triangle, we for the time leave out of view the necessity as to their comparative length which results from the shape of the figure. That things impossible can be conceived of only as now described, is evident also from the fact that the difficulty of understanding a proposition increases in proportion to its flagrant absurdity, and that a statement which has in it no element of possibility is utterly unintelligible and void of sense. The mind wholly refuses to construct the conception of three and two being six, even though two numbers often by addition make a third. In like manner the assertion that "the three sides of a triangle are equal to a pound of butter, a loaf of bread and a beefsteak," cannot be understood at all. Why? Because it has in it no element of possibility. It would be a dangerous rule to say that whatever can be imagined distinctly is possible, as some philosophers have taught; but undoubtedly nothing can be conceived of which has not in it some element of possibility, whether it have also elements of impossibility or not: and it can be thought of only so far as it has elements of possibility, the impossibilities being left out of view. Since, therefore, all our ideas concern either the actual, in the perception of which they originate, or the possible, or the impossible only so far as it may contain elements of possibility, it is clear that all thought has that peculiar correspondence with the forms of existence which we have called objectivity.

CHAPTER XIII.

THE ULTIMATE IN THOUGHT.

§ 34. Viewing thought in general as objective and without reference to any difference in faculties or in objects, the question arises, "Is it exercised in one mode only, or in several?" In other words, "What are the ultimate modes of thought?" We are of opinion that there are three such modes, that *we can think of things, first, as existing, secondly as non-existent, and thirdly, without reference either to their existence or their non-existence;* and we regard this statement as a cardinal point in the philosophy of mind.

Opinions quoted.
Hamilton, Porter,
Bowen, Reid.

The doctrine generally taught at the present day, is different from the foregoing, and allows only one ultimate mode of thought, namely, the thinking of things as existent. For example, Sir Wm. Hamilton says ("Metaphysics," Lect. XXXIX.)—"No thought is possible except under the category of existence. All that we perceive or imagine as different from us, we perceive or imagine as objectively existent. All that we are conscious of as an act or modification of self, we are conscious of only as subjectively existent. All thought, therefore, implies the thought of existence. Thinking an object, I cannot but think it to exist; in other words I cannot annihilate it in thought. I may think away from it; I may turn to other things; and I can thus exclude it from my consciousness; but actually thinking it, I cannot think it as non-existent; for, as it is thought, so it is thought existent." President Porter, in the "preliminary" chapter of his "Human Intellect" (§§ 46-48), expresses similar views; and, in chapter iii., part iv., of the same great work, reiterates them. He even asserts (§ 542) that all thought, or "knowledge," as he terms it, involves *the affirmation* of existence. He says, "After every property or relation which we know of an object is set aside from any existing thought or thing, there remains the affirmation, it is. This cannot be thought away." Prof. Bowen of Harvard also ("Log." chap. iv.) writes, "There are but two kinds of being or existence, one of which is necessarily presupposed in thought, viz., real, and imaginary or potential. One or the other must enter into every concept, not as attributed to it, but as presupposed in forming it." Against these and other authorities, we can quote only an old paper of Reid's, recently published by Dr. McCosh in his "Scottish Philosophy," (p. 475). In order to illustrate a distinction in axiomatic principles, and without attaching any special importance to his illustrations, Reid says, "There are other first principles in which the predicate is not contained in the notion of the sub-

ject, as where we affirm that a thing which begins to exist must have a cause. Here the beginning of existence and causation are really different notions, nor does the first include the latter. Again, when I affirm that the body which I see and feel really exists, existence is not included in the notion of the body. I can have the notion of it as distinct when it is annihilated. . . . Existence is not included in the notion of anything."

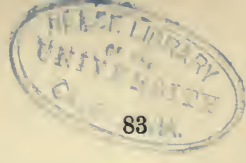
Some terms defined.
Existence.

§ 35. Before proceeding further with this discussion, it may contribute to clearness of statement should we define our use of several terms, each of which frequently occurs in metaphysical writings. And first, as to *that existence which we have distinguished as attributive*. Nothing can add to the simplicity of this idea or make it more intelligible than it is to every mind. But we may remark that, though called attributive, this abstract existence has not a common nature with those attributes which are said to exist in existing subjects. These attributes are entities, which existence is not; and, in predicating them, we presuppose both their existence and that of their subjects. Nevertheless as existence, like an ordinary attribute, belongs to a subject and may be predicated of it, this fact may be properly indicated by the term *attributive*. There are not two kinds or modes of attributive existence, but, as we shall see more fully hereafter, only one, that is, real or actual existence. *Imaginary existence* is merely a figurative or secondary expression which states that we have the thought of the existence of some object which does not exist. *Potential existence*, has nearly the same meaning, but implies also that the object, though non-existent, may or can exist.

Entity.
Another term to be defined is *entity*. The difference between abstract, or attributive, and concrete existence has been already noticed. It is often desirable to express this difference by using two different names; and for this reason the term *entity* has been employed to signify concrete existence; that is, not existence, but that which exists; while the term *existence* has been used exclusively to designate the being of any entity as predicable of it. The word *entity* signifies the same as the word *thing* in the widest application of the latter term, according to which we speak of all things or existences. This distinction between the terms *entity* and *existence* is useful, and will be maintained in the remainder of our discussion. Again, the term *non-existence* expresses a notion of great philosophical importance.

Non-existence.

In our view this notion is as simple and underived as that of existence, and is expressed by the relative name *non-existence*—signifying that which is not existence, or which is diverse from existence—because the whole importance of non-existence lies in the fact of this diversity; while existence has importance *per se*. Were this not so, our method of naming these two things might be reversed. In thus speaking of ex-



istence and non-existence as if they were *things*, or entities, we simply yield to necessity; language affords no other mode of expression. All other objects of thought than these two have that in them which is not existence but which exists, and are, therefore, things or entities; these are *sui generis*. Hence we do not regard existence—much less non-existence—as an entity. Yet we cannot deny that they have a true objectuality and are therefore, in a sense, objects. For, in a case of existence, we can positively perceive and say that something is, and in a case of non-existence we can perceive, just as positively, that something is not, or that there is nothing. Here, in passing, we may notice the contradiction apparently involved in these last expressions which seem to assert that an existence does not exist and that a non-existence does exist. This difficulty is avoided by the explicit utterances of those languages which employ a double method of negation and say “nothing is not,” or “there is not nothing.” In reality the absurdity is only apparent; in assertions of non-existence in languages of the same usage with ours, the negation really covers the whole sentence and applies to both verb and subject, the negative particle being attached to either, sometimes indifferently, and sometimes according to a certain variable emphasis of thought. The expressions, “There is no bread,” and “There is not any bread,” differ very slightly. Existence and non-existence are related to each other somewhat as emptiness and fullness, or presence and absence, are related to each other. They are things mutually contradictory, yet have also a certain independence of each other.

Form is another term of which we shall make use

Form.

in the present discussion. We shall signify by it anything viewed as to its constituent elements and

characteristics, but without reference to its existence or non-existence. The *form*, therefore, includes all that is included in any object, save its existence only. We cannot now inquire how far this use of a word famous in metaphysics may agree with any of the meanings in which it has heretofore been employed; the discussion would be too extensive. But as, in ordinary speech, the structure of an object—for example, of a steam-engine—is sometimes distinguished from its material, and is called its form, so it may be allowable, in philosophy, to distinguish the *whole* constitution of an entity from its *existence*, and call the former the form. Whether or not philosophic usage favor such an employment of language, we greatly feel the need of it. Forms, as thus defined, may, with reference to the conception of the mind, be distinguished as either complete or partial; the complete form being the thing itself conceived of exactly and fully as it exists, and the partial being also the whole thing, but only as it may be known or thought of by us. A more explicit mode of designation would be to speak of forms of complete and of partial conception. Thus, according to our present use of terms, the partial form no less than the complete includes all in anything, so far

as it may be the object of our thought, save its existence only. Complete forms are the objects only of absolute and perfect knowledge; therefore human conceptions, even when most correct, are chiefly, if not entirely, of the partial. Again, we conceive and speak both of singular forms, or those peculiar to individuals, and of general, or those which may be "common" to a number of entities; the former of these comprise both complete and partial forms, the latter partial, only. Thus, did we know of some object simply that it was a house or a horse, we would conceive it as corresponding to a certain general form. Further distinctions than the foregoing might be made, but we have defined form, at present, only to embody the doctrine that *we can think of things without thinking of their existence*. Forms, of course, exist and may be conceived to exist, but the thought of the existence is no part of the thought of the form. Those who hold that the notion of existence is an element in all thought, must deny that we can conceive of forms in the sense now described; we think that the mind frequently uses just such conceptions.

§ 36. We are now ready for a detailed presentation of the doctrine that there are three ultimate modes of thinking, and that the human mind uses its conceptions now in combination with the thought of existence, again in combination with the thought of non-existence, and yet again without the addition of either of these thoughts.

First, then, it is not disputed that *the majority of our conceptions do contain the idea of existence as a constituent element*. This happens whenever we think of any of the contents of the actual universe as such; whether substances or powers, actions or changes, spaces or times, quantities or relations. These are thought of as having past, present, or future existence. So also, in positive *conceptions unaccompanied by belief*, the thought of attribute existence, united to some formal idea, gives to us the conception of "an existing thing," when no such thing exists. As we can have the idea of the horse Pegasus when there is nothing to correspond to it, so we can have the idea of the existence of Pegasus although he never existed, and we can combine these in one conception. In this way, without any belief, we think of the heathen gods—Mercury, for instance—as beings or entities. Thoughts thus formed are said to be conceptions of ideal beings, or of beings in idea; by which language we signify that there is no true existence in the case, but only the idea of existence.

This thought of existence is also united, more or less loosely, to the conception of an object, when we may be in a doubt, or have only a probable conviction, of the reality of something. For example, when one may be digging a well, the idea of water, until a spring may be struck, is not a sure conviction, but only a hope, a belief, of greater or less probability, formed out of the conception of water as existing. Once more, we have

Positive conceptions.

conceptions of things as existing whenever we regard them as possible or as necessary. Thus we may think of space as a necessary existence, and of death as an event possible at any time. The ideas of possibility and of necessity always involve that of existence; for that only is necessary or possible which is necessary or possible to be. The thought of existence, therefore, enters into our conceptions of the actually existing, of the supposed or imagined, of the probable or doubtful, and of the necessary or the possible. Here, however, we must remark that not even all these conceptions involve that "*affirmation*" of existence which Pres. Porter teaches to be an element of all thought. This is only to be found in our knowledge of things as actual or actually necessary. It is true that we cannot have any conception without knowing of the existence of the conception, but the idea of the existence of the conception is no part of the conception itself. When we perceive some object, we have a conviction both as to the existence of it and as to the existence of our idea of it. But the thought of the existence of the object is a part of our conception of the object, while the thought of the existence of the conception of the object is no part of that conception. We cannot say that all thought involves the affirmation of existence because all thought is accompanied by the knowledge of its own existence. There is no affirmation of existence in the conception of the flying horse in the Arabian Nights, though one may be sure that he entertains this conception.

Negative conceptions. In the next place, *we have ideas in which the thought of non-existence, instead of that of existence, is combined with our conceptions of the forms of entity.* Let us suppose that a lambent flame is floating in the center of the dome of St. Paul's Cathedral. In this case, of course, no flame exists, and there is no belief or affirmation of its existence. There is simply the conception of the flame and its existence; and this is connected with the thought of the cathedral. Let us now substitute for the foregoing another conception; let us suppose that *there is no flame floating in the dome.* What is the difference between these two suppositions? Simply this: in the positive conception the thought of existence is attached to that of the flame, while, in the negative conception, it is left out and replaced by that of non-existence. In like manner, without any polytheistic belief, we might couple the idea of existence, and then that of non-existence, with the formal conception of a banquet of the immortal gods on the summit of Olympus; and we would do the one or the other according to the use that we might wish to make, in thought or fancy, of that celebrated mountain. But, in general, we may say that the use of negative, is parallel with that of positive, conceptions; so that the former, like the latter, may be met with in statements both of fact, and of supposition, of probability, of necessity (that is, of impossibility) and of possibility.

Here, however, we should remark that the idea of non-existence, although having a nature of its own, is seldom or never used *save with some accompanying reference* to its diversity from existence; just as emptiness, when mentioned, suggests fullness. When one says that his purse is empty, or that there is no money in it, his words naturally excite a reference to another and more desirable state of affairs. But it is still true that, in thinking of non-existing objects, we do not think of them as existing or as if existing, even though we may not think of them without some reference to an existence which they have not, in fact, or in supposition. The reference to existence, in such cases, is no part of our negative conceptions, but only an accompaniment.

Neither does it conflict with the views now advocated, that *negative conceptions are all necessarily derived from positive*; in other words, that our ideas of things as non-existent are all formed from our ideas of things as existent. This is involved in the doctrine already taught that all our thoughts originate in the perception of things actual. The only difference between a positive and a negative conception is that, in the latter, the idea of non-existence takes the place of the idea of existence in the former. Thus only we distinguish between "a flame of fire," and "no flame of fire." Even our most general negative conceptions are formed in this way. "None" comes from "no one"; "nothing" from "no thing"; "nemo" from "ne homo"; "nullus" from "ne ullus"; "οὐδείς" from "οὐ εἷς"; and so forth. What is common to both modes of conception is the formal thought, that is, the thought of the forms of things. For this thought, once secured, is retained and employed even when the forms themselves may have ceased to exist. It is further to be noticed that our minds, *even while using conceptions negatively, tend also to use them positively*. Non-entities—that is cases of non-existence—of themselves never affect us. No man ever sought or avoided emptiness for its own sake. All power and life reside in entities; and non-entities, as such, interest us, not because they *are* non-entities, but because they are *not* entities. Only for this reason do they become objects of either aversion or desire. Hence the tendency of the mind, especially when dwelling directly on any conception, to construe it positively. This may be accepted as an ultimate law of spiritual life; and it explains, not only why we so frequently think of things that are not as though they were, but why, even while thinking of non-existences as such, we tend also to think of them as things at least that may be. Such thought, however, is distinguishable from the negative conceptions to which it is related.

Finally, we seem in certain cases *to think simply of the forms of objects*, that is, we think of objects, without thinking of them either as existent or as non-existent. This mode of thought, it is to be acknowledged, is, for several reasons, difficult of deliberate realization. The en-

Fontes solu-
tionum.

Formal concep-
tions.

deavor to think two thoughts—the thought of the object (or form) and that of its existence—apart, involves the necessity of thinking them both at once, so long as this endeavor may be intentionally continued. Such an attempt, however, may settle the question whether we can clearly distinguish the two thoughts; and, if this be answered affirmatively, it is likely that we can think them separately. Then that strong inclination, already mentioned, towards the exercise of positive thought, militates against formal, even more than against negative conceptions, and causes the mind to strengthen the former with the idea of existence. The difficulty, thus produced, of deliberately thinking a formal conception is similar to that experienced when we set ourselves to think of the general or the indefinite; the thought of existence unites itself to our other ideas, unless the necessity of the case enforces an analysis for the time. Hence our formal conceptions may be likened to those material elements which are seldom to be found save in combination with others, and which can be brought to view in separate existence only by special care. Language, also, increases our perplexity, because we have to use the same words and expressions for forms and for their corresponding beings.

Nevertheless, if we should recall and examine certain modifications of thought in which conceptions merely formal are used, we may renew these conceptions, and may, perhaps, be able to distinguish them from those of entities and of non-entities, somewhat in the same way that we distinguish the idea of man, viewed simply, from those of man as a citizen and as an alien, that is, as being, and as not being, a member of some state. These modifications especially occur in those comparisons of real or supposed entities, in which the nature (not the fact) of some difference, is set forth; in assertions which answer the question whether an object exists or not; in those statements which contrast the existence of an entity with its constitution or characteristics; and, in general, when we are exclusively interested to know, not that

Formal conceptions are found in certain assertions of difference—and of existence or non-existence.

anything is, or is not, but simply what, or what kind of thing, it may be. For example, should we compare two apples, both of which equally exist in all their parts and qualities, and say that they differ, the one being sweet and the other sour, we could scarcely be said to think of the existence of the sweetness or the sourness; for the apples differ not at all as to the existence, but only as to the form or nature, of their qualities. Again, in the majority of statements, the idea of existence, real or supposed, enters into our conception of the subject. When we say, "Cæsar was the greatest of the Romans," and when we say, "Romeo loved Juliet," Cæsar is a real, and Romeo, an imaginary, being. But *when the previously unknown existence of an object is asserted*, the logical subject seems to include the conception of the form only. Respecting a known entity we may interpret the expression, "This pen exists," as an analytical judgment; but

when the existence is a matter of new information, and we say, "Eyeless fishes exist in the Mammoth Cave," the statement seems to be ampliative, adding to the subject an existence not previously recognized as belonging to it. A similar explanation would hold respecting the negative assertion that eyeless fishes do not exist in the Mammoth Cave.

It may be said, however, that, in the formation of such statements, the subject is conceived of as existing, and that the assertion then states whether the existence is real or not. According to this, the thought, explicitly expressed, is, "Eyeless fishes, conceived of as existing, do (or do not) *really* exist." Such forms of thought probably occur and are similar in nature to the assertion respecting a proposition, *that it is true, or not true*. But they have in them a reflex turn which our more simple and common statements have not. We commonly think, believe and say, "The man walks," and not, "The man, conceived of as walking, does walk." This secondary construction of ideas would arise naturally only after some discussion during which the elements of thought had entered into combination.

Formal conceptions found in the distinction of nature and existence—and in attributive or adjective notions.

In the next place, *we can distinguish the nature of an entity*—that, for example, of a man or of man in general—from *the existence of the entity*; and, in this case, the conception of the nature seems to be purely formal. We might contrast the rationality of the human spirit with its immortality; and, al-

though the rationality exists, this existence would not be any proper part of the object of our thought. In a similar way when we are taught that God is, and is the rewarder of those that seek Him, we are led to distinguish His being from His character, and to think of the nature, rather than of the existence, of the latter. Lastly, in *propositions or words purely attributive or adjective*, forms are conceived of as such. In propositions of identity, as when we say, "The man is a coward," the thought of existence may be discoverable in both subject and predicate; but when we say, "The man is cowardly," the predicate appears to indicate merely form or quality. This mode of conception is still more easily discerned when a word is used adjectively, as in the expression, "The cowardly man;" for in such expressions the thought of existence attaches itself primarily to the substantive, being needed only there.

The doctrine of three ultimate modes of thought, which we have now presented, strikingly illustrates that wonderful power of analysis exercised by the human mind, by means of which things absolutely inseparable in fact are frequently separated in thought. It also prepares for an understanding of the true nature of predication, a subject on which some misconception exists. As we shall see hereafter, predication always consists in the setting forth of something as existing or as not existing; that is, *it is a uniting of the thought of existence or that of non-existence to some formal conception*. More-

The bearings of our doctrine.

over, in learning that not even the idea, much less the affirmation, of existence, is a necessary constituent of our conceptions, we obtain an excellent counteractive to the natural tendency of our minds towards those idealistic errors which have played a part so extensive and so pernicious in the speculations of mankind. At present, however, we shall use the doctrine of the ultimate modes of thought simply to supplement the statement already given of the doctrine of the objectivity of thought. This statement was that all thought corresponds in its forms with the forms of existence; and its exact significance can now be fully appreciated. The word *existence*, of course, here stands for existence in the concrete sense, that is, for entity, as we use this latter term. By the expression, *forms of existence*, in which form is distinguished from entity as such, it is taught that we often think of things without thinking of their existence. Thus the intelligible assertion, made in common language, that thought corresponds, not always with things, but always with the form, or the constitution, or the nature, of things, justifies our philosophic definition and use of the word *form*, and the doctrine underlying that definition. Hence, too, when it is said that one cannot think save as he thinks of something, or as if of something, it is not meant that we cannot think save of, or as if of, something as existent; but merely that we can think only so far as we think of, or as if of, the *form* of something. Moreover, in saying that we always think of, or as if of, the form of something, we mean that we always think either of an existent form or as we would think if we were thinking of an existing form. In the looseness of common language we might say, simply, that we cannot think save as we think of the forms of things; a double thought, however, would then be expressed by the word *form*; since this term would then cover both real and "imaginary" forms. The peculiar though frequent use of language involved in this last expression will be considered in a subsequent discussion on the subject of "Ideal Existences." The doctrine of the objectivity of thought, therefore, if stated in the strictest and most literal way, might be given as follows: we always, save when thinking merely of existence or non-existence in the abstract, think either, first, of, or as if of, the forms of entity *per se* (that is *of them* when they exist, and *as if of them* when they do not exist); or, secondly, of, or as if of, the forms of entity as existent (that is, *of them* when they exist and *as if of them* when they do not exist); or, finally, of, or as if of, the forms of entity in connection with the idea or the perception, as the case may be, of non-existence, (that is, *of them* when the forms exist but are supposed not to exist, and *as if of them* when they really do not exist). This statement, it will be seen, allows for the fact which should never be disregarded, that we really perceive and think of non-existence as well as existence. Its details, however, savor of metaphysical refinement, and they are not necessary except for the purpose of meeting certain meta-

physical difficulties. A more simple expression of the truth may be preferred. Perhaps it would be enough to say that all thought corresponds, or has a possibility of correspondence, with the forms of entity and their existence or non-existence. Or even, should we adhere to the simple original statement that all thought corresponds with existence and its forms, this declaration might be justified as sufficiently correct to express the main doctrine. We call our world the *earth*, though a considerable portion of it is not earth, but water; for the water, though really a part of the planet, is of no interest and importance save as being related to the islands and continents. We describe our country—our *land*—as including lakes, harbors, and rivers: the latter are covered by a name not belonging to them, because they have all their importance from the solid ground surrounding them. Also, in speaking of the human body, we generally comprehend under that term certain cavities of the mouth, nostrils, ears, brain, chest, and so forth, as if these were literally parts of the body. The Greeks called the abdomen “*κοιλια*,” or the hollow place. Such an employment of language is at once useful and unavoidable. Just in this way, in certain general statements, we may include cases of non-existence under the head of cases of existence, because the latter occupy the greater part of our thought, and supply all our forms of conception; and because the former, when thought of, derive all their interest from their relation to existence or to the possibility of existence. (With this Chap. compare Chap. XXI. § 69.)

CHAPTER XIV.

IDEAL EXISTENCES.

§ 37. The doctrine of the objectivity of thought has sometimes been stated too strongly. It has been said that thought is the reflex or the correlative of being, and that every thought therefore has a being, or entity, as its object. In opposition to such teaching we hold that we have many thoughts which have no objects whatever to correspond to them. There never were races of beings such as the dwarfish Lilliputians and the gigantic inhabitants of Brobdingnag. The wonderful stories of the “Arabian Nights” are mere conceptions to which no actualities ever corresponded. Novels, poems, dramas, are combinations which either refer but remotely to historical facts, or have no such reference at all. Even in daily life, the golden prospects of youthful fancy and the more sedate anticipations of mature days, are always of that which never has been, and very frequently of that which never comes to pass. It is clear that thought does not need the existence of an object apart from itself for its own ex-

istence, and that it often actually takes place without the presentation of any object whatever. The doctrine of objectivity implies only that thought in all cases *might* correspond with entity, not that it always does.

At the same time it is to be noticed that human language seems to imply that often, when there are no objects of thought, thought provides objects of its own. We speak of *ideal existences, imaginary beings, fictitious scenes, supposed objects*; and, in connection with the ideas thus expressed, we employ the same names and make the same statements, that we would regarding true and literal existences. We say that Falstaff was an old courtier, fat, witty and unprincipled; that Othello, the Moor, was a dangerous, passionate man; that Hamlet had a very discreet madness; that Lear was a sad wreck of royalty. We express ourselves in this way while knowing that no Falstaff, Othello, Hamlet or Lear, such as we think of, ever existed. Such language, at first, seems capable of easy explanation; it is quite common, and the thought conveyed by it is easily understood. Yet philosophers, when asked to define exactly an imaginary object, or an ideal entity—that is, to state, in literal language, what we mean in speaking of Hamlet, the Prince, or Lear, the King—have found themselves at a loss. It is certain that these objects and beings have no existence apart from the ideas of the mind, and also that, if they exist in connection with our ideas, they must be those ideas themselves. We cannot recognize any other entities, that is, true and literal entities, in the case, save our own thoughts or thinkings. The question, then, arises, “Are these ideal existences to be identified with our ideas of them?” This solution has authority in its favor; but there are difficulties in the way of accepting it. We believe that nothing exists, in the case of an imaginary entity, save the mental state or operation; yet we find it impossible to regard the ideal object and the mental state as the same. When one tries to believe—not that the thought of Hamlet, but—that Hamlet himself is or was an idea, the mind refuses to act. We say, “Hamlet had a discreet madness.” Did an idea have the discreet madness? Could an idea be fat and unprincipled? Could it be a revengeful Moor, or a crazed old king? It may be said that the ideal beings had such characteristics only in imagination. But this does not help the matter. Ideas cannot have such characteristics even in imagination.

The difficulty here is deep-seated. It lies in the very nature of our modes of thought. When we think of Hamlet as an ideal being, we do, indeed, have the idea of his existence as a man and a prince. This idea, unaccompanied by any belief, is a part of our conception of Hamlet. But, in thus thinking of Hamlet, *we have no thought of the conception of Hamlet and of its existence.* This thought may accompany or follow the other, but is distinct from it. Moreover, the thought of the conception is always attended with belief; for the conception really exists; but the conception

A difficulty in philosophy.

itself, of Hamlet, is not attended with belief. Those, therefore, who say that Hamlet, as an ideal existence, is the idea of Hamlet, or the idea "Hamlet," attempt to unite two incongruous conceptions. They try to identify that in connection with which we have the thought of existence (the belief being excluded) with that in connection with which we have the belief of its existence. Such an endeavor must terminate in failure.

We can, indeed, say that Hamlet is a conception of Shakespeare; but, in such a sentence, *Hamlet* does not signify the ideal existence, the prince of Denmark. The word is used in a secondary sense; as, when we say, "Theft is a bad idea," we mean that the idea of theft—not theft itself—is a bad idea.

In short, we hold that any philosophical definition of an ideal existence is an impossibility. When we ask what an ideal object is, we mean, "With what can it be literally identified?" This takes for granted that an ideal object can be, and is, an existing object. Hence the absurdity of the question, and the impossibility of an answer. Speaking soberly and philosophically, there are no such things as ideal objects and existences; they cannot be identified with anything; and it is vain to inquire what they are.

At the same time, when we speak and think of ideal things and beings—of the heroes and events of poetry and romance—our expressions and our ideas are actualities; and philosophy may properly be called to explain this peculiar use of thoughts and words, and the perplexity which we experience in its critical consideration.

Imagination is the power—the marvelous power—of the mind to think thoughts as if there were entities to correspond to them, even when there are no such entities. Though imaginative, or suppositive, thought differs from knowledge, or cognitive thought, as to pliability and permanency and motive force, and, in the full normal working of the soul, is especially distinguished by its want of any concomitant belief, yet, after all, *as thought*, it is essentially of the same character with other thought. Suppositive is accompanied with cognitive thought when we are conscious of imagining; but this consciousness is not an element of the act of imagining. In suppositive thought we think an idea—say Hamlet—but we do not think *of* it at all. Imagination makes no subjective reference, but simply entertains thought so far as it might possibly correspond with objects. It endeavors to construct conceptions as nearly like those of cognition as possible, and succeeds admirably. These acts of the imagination affect us more or less in a way similar to that in which cognitions or remembrances affect us. The life-like experiences of Robinson Crusoe, and even the incredible adventures of Baron Munchausen, move us in the same way, though not to the same degree, as if we knew them to be realities. Some explain this power of the imagination as the result of a momentary belief in the existence of objects corresponding to our thoughts—a belief

which Prof. Stewart maintains always to occur and to be corrected only by our more sober judgment. ("Phil." chap. iii.) Probably the imagination itself, without the belief, has power to affect us. But however it is to be accounted for, the fact that we are affected, is beyond dispute. Now when, without any presentation of fact to our minds, we think the same thoughts and are moved in the same way as when we perceive or remember existing things, and then seek to express and communicate our thoughts, we naturally, spontaneously, use precisely the same language as that in which we utter cognitive ideas. But the thought and the language thus employed are not the statement of facts and do not concern existences; they are simply the exercise and the expression of the imagination. We think and speak in the same way as if we were thinking and speaking of things, and therefore *seem* to be thinking and speaking of things. Whole stories are formed and told after this manner. Yet, in sober truth, we are not thinking or speaking of things at all. Strictly and in fact, we are not thinking of anything; for no object exists: we are only thinking.

If the foregoing account be correct, it is plain that our difficulties concerning hypothetical existences, ideal things, or imaginary beings, arise chiefly from our taking thought and language according to its primary use, when it should have been taken according to a secondary use; in other words, from assuming, without reason, that things exist corresponding to imaginative thought and speech. We employ ideas and terms properly pertaining to real entities—as when we speak of the little men and women in the land of the fairies—while there are no entities of a kind corresponding to our thought. We have the names and the conceptions, Macbeth, Hamlet, Lear, while there are no such beings. Hence the expression that we think *of* ideal objects is not literally true. It is a metaphor founded on the similarity of suppositive to cognitive thought. The fact, literally stated, is that we think *in the same way as if* we were thinking of objects. To say, "I think of Hamlet," means only, "I think as I would think if there were a Hamlet."

This leads to the remark that imaginative thought and its expression are rendered doubly perplexing and delusive from the fact that we unite them intimately with cognitive thought and its expression. For example, should one say that he has been thinking of Hamlet and of Shakespeare, there would be a double meaning, not very easy to detect, in the expression "thinking of."

A similar conjunction of suppositive and of cognitive thought takes place when we say that such and such objects—the fairies, for instance,—exist in imagination, but not in fact. The word *exist* here has a double sense, or rather a double meaning. It is taken suppositively in the affirmative, and cognitively in the negative, part of the sentence. This difference in use is indicated by the phrases *in imagination* and *in fact*. The full import of the sentence is that the statement, "the fairies exist,"

is one of suppositive thought, and not of fact, or of cognitive thought. But this meaning is given by the use of *suppositive thought itself* in the affirmative clause, accompanied by an indication of its true character, and of *cognitive thought* in the negative clause, similarly accompanied. The expression *in fact*, which shows the cognitive or assertive use of thought, is an emphatic repetition of the idea of existence, whereby we signify that it is used literally. To say that a thing *does not exist in fact*, is simply to say that, speaking literally and truly, it does not exist.

Again, it seems plain language to say, "Hamlet is an ideal existence," or "Hamlet is one of Shakespeare's heroes." Yet these statements are compounded partly of suppositive and partly of actualistic thought. We say, "Hamlet is an existence," "Hamlet is a hero," suppositively; and then, in the first we add actualistically the thought "ideal," to indicate, not the nature of any object, but the suppositive character of our thinking, and, in the second, we use Shakespeare's name in the same way, to show both the suppositive character and the authorship of our conception of Hamlet. Such is the only rational account of these and similar statements; to interpret them throughout as the language of fact, or of belief, involves absurdities.

Recapitulation.
Pres. Porter
quoted.

§ 38. We have now discussed the question of ideal objects or existences. Respecting this subject, Pres. Porter says, "Scarcely any single topic has been more vexed in ancient or mediæval philosophy," adding that the controversy concerning it either includes or trenches upon almost every possible question in metaphysics. ("The Human Intellect," § 224.) Many notable and fundamental errors have originated in connection with this topic, and can be fully understood and met only through a satisfactory understanding of it. The question, completely stated, may be presented as a dilemma. "*Do ideal objects exist? If they do, what are they? If they do not, why do we call them existences and speak of them as such?*" We assert that they do not exist, and that we call them existences, and speak of them as such, while knowing that they do not exist; or, expressing ourselves more accurately, *we use the same thought and the same language that we employ respecting existing things, while we know that there are no existing things to correspond with our thought and language.* We, therefore, free ourselves from the question, "What are they?" But when asked, "How do we come to think and speak as if there were entities?" we answer that the human soul has a native power and tendency to exercise itself in such thought and language. This imaginative, or better, imaginal, use of thought seems sometimes wholly to occupy the attention of the mind, but sometimes it is sensibly accompanied, and sometimes it is mingled and united, with actualistic thought. It can always, however, be distinguished from the latter.

Three principal causes have co-operated to mislead critical inquiry as to the prior question, "Do ideal objects exist?" and

thus error and confusion have resulted, through an affirmative answer. First, the difference between imaginative and cognitive thought, and especially *our power to conceive of existence and of existing things or entities, without any attendant belief in their existence*, have not been fully recognized. Secondly, our imaginations often, if not always, *are accompanied with a delusive belief, or rather tendency to belief, in the existence of such objects as would correspond to them*. This tendency works unobstructed in dreaming. And, thirdly, *suppositive ideas and expressions are frequently so conjoined with those of knowledge or fact that, finding ourselves thinking and speaking continuously, we lose sight of the diversity in our thought*. But the truth always is that the language of the imagination, whatever it may seem to say or to imply, does not express knowledge or assertion, but suppositive thought only. Such is to us a satisfactory account of the whole matter.

This explanation may be further illustrated and tested, should we compare it with all others that are possible; and such a comparison may properly conclude this discussion. If ideal objects exist, then they must do so in some one of three conceivable ways. First, they may be some kind of images, or appearances, which are not thoughts but the immediate objects of thought, that is, *ideas or species such as were described in ancient philosophy*; or, secondly, they may be said to be, if not existences or entities in the full sense of the term, yet *existing possibilities*; or, finally, they may be identified, as they are very often, with *the more fixed conceptions of imaginative thought itself*. No hypothesis other than one of these seems conceivable.

As to the first, we remark that the doctrine of sensible and intelligible species or ideas, as they were called, was developed, not by Aristotle, but by his followers. It would probably have been rejected by the master himself, as it accords only with his more unsettled utterances. It was founded on two assumptions. First, it was held that *the objects of sense, and particularly of sight and hearing, being at a distance from us, must affect our minds by throwing off filmy shapes or forms, which enter by the avenues of sense and are then immediately perceived and thought of*. Secondly, it was taught that we are able to think correctly of objects because of *a resemblance existing between these images, ideas, or species, and the objects themselves*. In this way the fact was accounted for that a distant object, when we come to handle it, is found to be such as we had seen it to be. In like manner, memory and imagination were explained as resulting from a retention of species in the mind. This ancient doctrine was exploded by Descartes. He, however, held the view that there can be no direct communication of influence between matter and spirit, and that, in thinking, we consider, not objects, immediately, but ideas, which are neither obtained from, nor similar to, objects, but which correspond to them. He did not teach that ideas are not themselves objects, but simply the states of the mind itself in thinking. Locke followed, deriving

ideas partly from sensation, and partly from reflection, but still carelessly speaking of them as if they were the immediate objects of thought. Berkeley and Hume, with unanswerable argument, showed that, if ideas are the immediate objects of perception, then we have no evidence of the existence of anything else than the ideas. The powerful pantheistic thinkers of Germany unconsciously completed the proof of the falsity of idealism, by systems at once strictly logical and stupendously absurd. Finally, the sturdy common sense of Reid and the keener analysis of more methodical philosophers, have established for ever the true theory of the cognition of external objects. The doctrine of ideas or species, as the media of perception and the objects of imagination and memory, belongs now to the history of speculative thought.

As to the second hypothesis, we remark that we need not now discuss the nature of possibility—whether the true idea of it be essentially a positive or a negative conception, and how far our cognition of possibility may involve, and be qualified by, suppositive thinking. We also allow that there is, at least in a certain sense or to a certain extent, the possibility of an existence corresponding to every exercise of imaginative thought. But at the same time we maintain that, *in imaginative thought, we do not think of this possibility at all.* As we can *perceive* real objects and their existence without thinking of their possibility, so we can *conceive* imaginary objects without thinking of *their* possibility. We do not think of the possibility of such beings as Hamlet and Lear—that is, when we form conceptions of them—but we think the same thoughts (though without belief) as if Hamlet and Lear had really existed. We may, indeed, think of the possibility of such beings, but in doing so we would exercise cognitive, or rather assertive, thought. In imaginative thought, we think *of the beings themselves*, that is, we form conceptions which would correspond to such beings if they existed; and, plainly, such thinking is not concerning any possibility which does exist, but about the objects themselves, *which do not exist at all*, that is, as if about such objects. Here it may be said, by way of stating the matter more correctly, that we think not of a possibility or possibilities of existence, but of a *possible existence or possible existences*. Strictly speaking, however, there is no such thing as a possible existence, no such thing as an entity, not real, but merely possible. This combination of thought and language is of a nature similar to those already discussed—“ideal existence,” “supposed entities,” “imaginary beings.” The word *possible* conveys assertive, the word *existence* suppositive, thought. In this phrase we first employ a conception to which some object might correspond, and then add the assertion of the possibility of such an object. But, in this very conjunction of ideas, we easily distinguish the conception of the object from the thought of its possibility. The latter is an added thought.

§ 39. The only remaining hypothesis is that which identifies ideal objects with the thoughts or ideas of the mind in thinking of them. This view is maintained by Sir Wm. Hamilton, President Porter, and other eminent men; and, although it has now been discussed at length, it may be well, in a few words, to quote their reasonings in support of it. To appreciate Hamilton's argument, we must first understand the views of Reid. The latter, in his first "Essay," referring to ideal objects, says, "We can give names to such creatures of the imagination, conceive them distinctly, and reason consequently concerning them, though *they never had an existence*. They were conceived by their creators and they may be conceived by others; but *they never existed*." In the same essay he speaks of the geometrical conception of a circle. "What," he says, "is the idea of a circle? I answer, it is the conception of a circle. What is the immediate object of this conception? *The immediate and only object of it is a circle*. But where is this circle? *It is nowhere*." Again he says, "When we conceive anything, there is a real act or operation of the mind; of this we are conscious and can have no doubt of its existence. But *every such act must have an object; for he that conceives must conceive something*. Suppose he conceives a centaur; he may have a distinct conception of this object, though *no centaur ever existed*." These statements show a keen sense, rather than a clear perception, of the truth: for they suggest the inquiry, "*If every act of conception must have an object, how is it that we can conceive when there is no object?*" Reid simply ignored this difficulty. Therefore Hamilton, in his "Supplementary Dissertations," (Note B, § 2) reasoned conclusively on the erroneous premise which the great master had carelessly conceded. He argues thus, "Take an imaginary object, and Reid's own instance, a centaur. Here he says '*The sole object of conception is an animal which I believe never existed*.' It '*never existed*'; that is, never really, never in nature, never externally existed. But it is '*an object of imagination*.' It is not, therefore, a mere non-existence; for if it had no kind of existence, it could not possibly be the positive object of any kind of thought. For were it an absolute nothing, it could have no qualities (*non-entis nulla sunt attributa*); but the object we are conscious of as a centaur has qualities—qualities which constitute it a determinate something and distinguish it from every other entity whatsoever. We must therefore perforce allow it some sort of imaginary, ideal, representative, or (in the older meaning of the word) *objective* existence in the mind. Now this existence can only be one or other of two sorts; for such object in the mind either *is* or *is not*, a mode of mind. Of these alternatives the latter cannot be supposed; for this would be an affirmation of the crudest kind of non-egoistical representations—the very hypothesis against which Reid strenuously contends. The former alternative remains—that it is a mode of the imagining mind; that it is, in fact, the plastic act of imagination considered

The opinions of
 Reid, Hamilton,
 and Porter.

as representing to itself a certain possible form,—a centaur. But then Reid's assertion that there is always an object distinct from the operation of the mind conversant about it, the act being one thing, the object of the act another, must be surrendered. *For the object and the act are here only one and the same thing in two several relations.*"

In order to understand the statements of Dr. Porter, it is quite requisite that we should bear in mind his terminology. Defining the intellect as the power to know, he styles every exercise of thought, whether of cognition or of imagination, *an act of knowledge*. ("Human Intellect," § 46.) Such being his use of language, the following extract, from the forty-eighth section of his work, fairly illustrates the theory which pervades the volume. "Knowledge and being are correlative to one another. There must be being in order that there may be knowledge. . . . We must distinguish different kinds of objects and different kinds of reality. Objects may be *psychical* or *material*. They may be formed by the mind and exist for the mind that forms them; or they may exist in fact and in space for all minds; and yet, in each case, they are equally objects. Their reality may be *mental* and *internal*, or *material* and *external*, but in each case it is equally a reality. . . . It is true, one kind of existence is not as important to us as is the other; we dignify the one as *real* and call the other *unreal*. . . . We call some of these objects *realities* and others *shadows* and *unreal*. But, philosophically speaking, and so far as the act of knowledge is concerned, they are alike *real* and alike *known to be*. . . . We often err in making one kind of reality indicate another. We think an air-drawn dagger will pierce us to the heart. We believe that the spirit which our distracted phantasy conjures into being has veritable flesh and bones. But mistakes like these, so far from proving that what we know has no existence, demonstrate precisely the opposite. *For how could we mistake one object for another if the first object did not exist and were not known to be?*" In the foregoing extracts (if our views be correct), but especially in such sentences as that last quoted, we see how acute thinkers have erred in their interpretation of suppositive, while united with assertive, language. Clearly the dreamer, however he may express himself, does not mistake one dagger for another, an imaginary object for an actual one. We cannot mistake an ideal for a real entity, because no ideal entity ever existed. Properly, strictly speaking, the mistake lies *in taking suppositive for cognitive thought*; in other words, in exercising belief, without sufficient reason, in connection with an act of the imagination.

CHAPTER XV.

BELIEF DEFINED.

§ 40. We name thought and belief the *primary* powers of intellect chiefly because the importance of those powers which we call *secondary* is that they modify the workings and results of thought and belief, while that of thought and belief lies in the very working and results of these powers themselves. The analysis and synthesis of ideas and of facts, the association of fancies and memories, the abstraction and generalization of notions and of truths, the formation from a transitory process of a reproducible product of conception or conviction, are all operations subsidiary to the main work of the intellect. The exercise of thought and belief is itself this work. Of these two, however, we may add that thought has a priority over belief: for it is possible to exercise the former without the latter, but belief takes place only in connection with thought.

The philosophical importance of belief.

It may be asked, "Which of these forms of mental life is of the greater consequence?" In philosophy, thought is, perhaps, the more important; because safe and satisfactory progress in every department of scientific investigation is attained chiefly through an understanding of the nature and modes of thought. On the other hand, practical benefits proceed more abundantly from belief; all the strength, nobility, success and happiness attainable by man, depend on his realization of fact and truth. Even philosophically, also, belief is of importance. Many questions relating to the trustworthiness of our faculties, the origin of our knowledge, and the processes of reason, necessarily concern belief. On this account we wonder that various distinguished authors make no formal place for belief in their systems, and speak of it as if it were merely a modification of thought. Some even—as Sir Wm. Hamilton, Prof. Bowen and Dr. Thomson—define Logic as the science of the laws of thought, though evidently this science is occupied, essentially, with the laws of rational conviction, and with thought only so far as instrumental to conviction. This want of distinctness in conception and statement has arisen probably from the concreteness and the ambiguity with which common language expresses the phenomena of mind. Since belief is exercised only along with thought, the same word often covers the combined exercise of the two powers; such terms, for example, as perception, judgment, inference, always signify such a combined exercise; while other terms, such as belief and conviction, apprehension and thought, which specially belong to the one power or the other, through metonymical extensions or transitions, become positively ambiguous. The ensuing discussion will illustrate these

remarks. Yet we believe that the common intellect of men does not at all confound these powers; it simply does not emphasize the distinction between them.

Thought and belief to be carefully distinguished. In distinguishing thought and belief, as primary, from each other and from the secondary or subsidiary, powers of intellect, and in pointing out the dependence of belief on thought, we somewhat determine our conception of both these powers. In other words, we partly define each through an enumeration of characterizing relations; which is the only way in which any simple mental power can be defined. We now repeat that the belief, of which we speak, is something different in nature from thought, as it also is less complex in its manifestations than the latter power, and admits of a more noticeable variety of degrees. This difference should be noted, because, as we have said, the terms *belief* and *believing* stand often for a *combination* of thought and belief, and not for *belief simply*. We sometimes even use the noun *belief*, to indicate, not belief itself, but *the form of thought* which it may accompany. For example, we speak of the religious beliefs of mankind, and we say that such a religious belief is entertained by such a person. This use of language exhibits the complete transition of a term from one conception to another nearly related. More frequently, words indicating belief have merely an expansion of significance, so that they cover the united exercise of both the primary powers of the intellect. As, when one says he *thinks* that such is the case, he intends to say that he *both thinks and believes* that such is the case, so we can scarcely deny that the statement, "*I believe* that such is the case," may mean that one *both thinks and believes* as stated. In like manner, the assertion, "Lincoln cherished belief—or a belief—in the doctrine of Divine Providence," may easily mean that he cherished both a conception of the doctrine and a reliance in its truth. Similar variations of signification might be observed in other words which express credence; such as faith, confidence, trust. Nevertheless we hold that thought and belief are different things, and we would maintain this to be true even if they were never distinguished and opposed in ordinary speech, and were separated only in philosophical analysis. They are, however, often contrasted in the statements of common life. For instance, were a man accused of theft without any evidence, men would allow that they had the thought of that evil action without any accompanying belief; and, if proper proof were presented, they would agree that they not only understood the charge but believed it. In this way the two things would be presented as clearly distinguishable.

§ 41. Belief, as thus distinguished, might be called *belief-proper*. It is that belief which is sometimes described as "the *receiving, taking, accepting or holding a thing as true*": that is, the *action* of the power of belief is thus styled; for in this, as in other similar cases, the power and its action go by the same name.

Belief-proper defined. Includes every degree of conviction.

In the above statement the word *thing* does not signify the *fact*, which may be the object of thought, but only the conception of the fact; for, not the fact, but only our conception of it, can be taken or accepted as true. This is said to be received and held by the mind, because, in exercising belief, we think the thought of the object with an increase of attention and interest and purpose. And yet, even this grasping of a conception does not appear to be the essence of believing, but rather a characteristic result or accompaniment. The statement that the mind in credence *rests or reposes on a thing as true* is analogical also, and marks the intellectual act by that cessation from doubt and inquiry, which follows the acceptance of a proposition as true. No figurative expression, however, can indicate exactly the conception of belief, or even convey this conception, to any one who may not be already possessed of it. It is a peculiar and simple thought.

Again, we remark, that *belief*, in the generic sense now contemplated, *includes every degree of conviction from the feeblest to the strongest*. The merest presumption and the most absolute certainty are alike manifestations of this power. This is to be noticed, because when the degree, and not simply the nature, of intellectual confidence is prominent in our thought, the word *belief* frequently becomes limited in its application and indicates a conviction not so strong as certainty, yet stronger than suspicion or presumption. Men say in regard to some statement that they believe it, perhaps firmly believe it, and yet are not perfectly certain of it; or, on the other hand, that they have a mere surmise or conjecture, and not a positive belief, concerning it. The various degrees of credence are indicated by such words as *presuming, conjecturing, guessing, supposing, trusting, thinking, believing, apprehending, seeing, knowing* and the like; most of which terms, however, evidently cover more than mere intellectual confidence. Yet, while the term *belief* expresses this moderate degree of conviction, it is also used for conviction in general; and these uses can easily be distinguished. The word *conviction* has nearly the same meaning as *belief*; but strictly it signifies belief regarded, not simply *per se*, but as produced by the contemplation of evidence; for which reason it is seldom used in cases in which the evidence may be very slight.

Belief and knowledge variously contrasted.
An erroneous distinction.

At this point it may illustrate our subject and clear away some perplexities, to consider three several distinctions which have been expressed by the opposition of the term *belief* to other terms, and principally to the term *knowledge*. The first has just been suggested. According to it, *knowledge is the most perfect form of conviction, being both absolute and well-founded*; while *belief is a less assured confidence*. Knowledge of this description—such, for example, as that of one's own existence or of the existence of Queen Victoria—is closely allied to certainty; for, when one is fully certain of a thing, no evidence can add to the strength of his conviction. We may, however, be certain on in-

sufficient evidence, and then we do not know, but only think we know. We may be certain of what is not the fact; and such certainty is not knowledge. But, when we have certainty, that is, full and absolute belief, and this certainty rests on good and sufficient evidence, then we have knowledge. Knowledge is simply *well-founded certainty*; and belief, as contrasted with this knowledge, is conviction of some degree falling short of certainty. Plainly, these two things are of the same radical nature; both are modes of belief in the generic sense. This is taught in the saying that "to see is to believe"; for to see is also to know.

According to the second distinction, no less than according to the first, knowledge and belief divide between them the sphere of conviction, or of belief in general. Indeed the second distinction seems to have originated from the first. For, because we are certain of things immediately perceived, while generally our belief is less confident respecting things learned through testimony or rational proof, *the conviction of immediate cognition, or that nearly immediate, has been called KNOWLEDGE, while that based on testimony or on evidence not immediate or obtrusive is called BELIEF.* This distinction is important and clearly different from the one already mentioned. It is that which the Bible makes between faith and sight. It may be roughly expressed by saying that knowledge is immediate, and belief mediate, conviction. But it is to be noticed that the faith or belief of this second distinction may—through sufficient and well-considered evidence—become the knowledge of the first distinction; in other words, perfect and well-grounded assurance. For, if the evidence of a distant and unseen fact—as, for example, of the existence of Queen Victoria—be faultless, there is no reason why we should not be absolutely certain of it; and this is knowledge. In the exercise of such faith, the man of God can say, "I know that my Redeemer liveth."

Beside the foregoing distinctions, in which belief is contrasted with knowledge, there is another, *in which it is opposed to both thought and knowledge, and indeed to every accepted mode of mental activity.* It is a distinction advocated by those who follow the teachings of Kant concerning the limitations of the thinkable and the knowable. Hamilton, Mansel, and others, hold that the human mind cannot even conceive of things infinite, and, consequently, that we can have no knowledge or belief, such as we have already considered, and such as we commonly exercise, concerning God. To make room for the possibility of religion, they assert that there is a feeling or faith or belief, different from knowledge and independent of all thought, by which, in some way, man apprehends or lays hold upon the Infinite. This conception of faith, or belief, is little more than a device for the purpose of escaping from the consequences of an erroneous doctrine. It is not true that we cannot have correct ideas concerning God, and even concerning His Infinity. The

thought of an infinite or unlimited entity is by no means an impossibility. We can conceive of some object admitting of quantity—space or time, for example—as *bounded*; and after that we can conceive of it *as not-bounded*, replacing the positive by a negative characteristic. Ideas, thus formed, of things infinite, especially occur in mathematics; and they are neither futile attempts at thought, nor yet mere negative conceptions, but positive conceptions with negative characteristics. It is true, we cannot conceive of any infinite entity as being finite in those respects in which it is infinite; and, therefore, we cannot think of it as having various boundaries such as must always enter into our conceptions of finite objects. To attempt this may be natural for us, as it is in the line of our ordinary modes of thought, but it is a waste of effort. Endeavoring to imagine infinite space as a vast hollow sphere, or firmament, bounded by a surface, we inevitably fail. But this is not a failure to form a conception of the infinite. We, therefore, reject this so-called belief or faith, as a useless,—and worse than useless—fiction. The adoption of it, without evidence, in order to escape difficulties which originate in error, can afford no lasting refuge from perplexity. Like that huge fish on which Sindbad the sailor built a fire, supposing himself on solid land, and which soon left him to buffet with the waves, this faith can only afford a temporary resting-place for distressed philosophers.

§ 42. We now recur to that radical conception of belief which includes conviction of whatever degree and of whatever origin. This power is not only secondary to thought in the manner already described, but is also related to thought in a peculiar way, so much so that an understanding of this relation determines our conception of belief, as fully as an understanding of the relation of objectivity determines our conception of thought. There is a sense in which *belief may be said to have objects*. There are things which we believe, and whatever we believe may be called the objects of our belief. At the same time, credence, like conception, is a purely intransitive action; it does not directly affect its object. When a boy perceives an apple, he both forms an idea respecting it and exercises belief as to its existence; but in neither case does his action affect the apple or its existence, as when he afterwards plucks and eats it. In like manner, when we believe something, we only believe *in relation to it*. This is indicated in the ordinary phrase that we believe *in* a thing, which presents the action as intransitive. The transitive construction, however, calls for explanation, *first* as to its use after verbs denoting perception and the knowledge or absolute conviction consequent upon perception, and, *secondly*, as to its use with verbs denoting belief generally. Why do we say that *we see and know things and facts*? The reason probably is that perception, or cognition, though not affecting its object directly, yet brings it into the sphere of practical relations to the percipient

Belief an intransitive action. Yet has objects.

person. An entity perceived, or a fact known, is thereby subjected to our use so far as we may have power to use it. In all such cases the object of the thought is a real entity, and that of the belief is the real existence of this entity.

But we also say that *we believe some statement* (for example, that the man is honest), or that *we hold some doctrine* (for example, the Copernican conception of the solar system). Such language may have an origin similar to that of the expressions just considered; for we must believe things believable before we can apply them to any practical service; but, more likely, it is chiefly due to the fact, already noticed, that *belief* and such terms very commonly indicate a combination of conception and credence, so that to believe a statement means *to think it believably*. Such an action is properly transitive in the same way that thinking a thought is. The other construction, however,—“believing in, or as to, something”—exhibits the true intransitive character of that radical belief of which we principally speak.

We remark, further, that, while the objects of thought, when it has any, and of knowledge, are entities and their existence or non-existence, *the proper object of belief is that thought which sets forth objects as existing or as non-existent—in other words, propositional thought*. Even the belief, or credence, exercised in knowledge (or knowing) is primarily related to thought as its object; but, since this belief is exercised *through* cognitive thought towards external realities, we neglect the former relation and speak only of the latter, which is both more prominent and more important. Common language implies that the objects of cognition are facts, and not the propositions in which the facts may be enunciated. Belief in general, however, not being always or certainly exercised towards real external entities, but only upon the more or less probable conceptions of such entities, its objects in general are not things or facts, but thoughts or statements; and are so presented in discourse. We may sometimes say, “I believe that fact,” or “in that fact;” this is an improper mode of speech. In strict correctness we say that we know—not that we believe—a fact. The common expression that one believes in a person or thing, meaning that he trusts in him or in it, is a secondary use of language. It indicates, not belief, but practical reliance resulting from belief in some conception of the person or thing. Thus faith, or practical reliance, in God, results from belief in the teaching that He is holy and merciful and good. The true belief, in all such cases, is exercised upon or about propositional thought.

Belief in the existence of a thing explained.

If any person of good sense were to say, “I believe I shall be living one year from now,” and we were to ask him whether the object of his belief were a fact about to be, or simply the proposition in which the event is foretold as probable, certainly, unless he should claim absolute foreknowledge, he would reply that he be-

lied in the statement. This would be the answer of common sense. At the same time it is to be allowed that, when we believe and assert a statement of thought, our use of thought is pre-eminently objective, that is, we think very little of the *proposition* as a mental act, but rather *think the proposition itself* in its use as representative of things. But, should any one insist that both our thought and our language often seem to state that we believe in the existence of things—not in the idea or proposition that they exist—and that thus existence itself is the object of belief, we reply that such a construction of ideas and words is not, and cannot be, literal. Belief, as such, cannot have any certain external object; if it had, it would not be belief, but knowledge. The construction in question is simply that union of assertive with enunciative thought which always occurs in formal statements of belief, and which is somewhat similar to that union of assertion with supposition already explained (§ 37). We *assert* that we believe, and then *enunciatively* add the thought in which we believe. This mode of thought carelessly employed, gives the *appearance* of our thinking and saying that we believe in the object as existing, while yet, it may be, no object exists. Allowing, therefore, that we sometimes mean to say that we believe in the existence of things—and not in the statement of their existence—some such explanation must be adopted. But the point important for us to remember in this connection is that the only *proper and literal* object of belief—and the *proximate* object of knowledge—is always a mental statement or proposition.

Belief in propositions does not depend on our thinking of them.

This leads to the remark that *it is one thing for a proposition to be an object of belief, and another thing for it to be an object of thought; and that the former is not dependent on the latter.* In other words, our belief of a proposition does not depend on that proposition *being thought of*, but only on its *being thought*, or entertained by the mind. For example, should one expect the death of a friend, the belief involved in this expectation would be conditioned on the thought of the death, but would not be dependent on any consciousness of that thought. Such consciousness would exist more or less distinctly, and might lead one to say, not simply that his friend would die, but also that he believed and thought so. This addition, however, regarding himself as thinking and believing, is no part of his expectation concerning his friend. A statement, therefore, or propositional thought, needs simply to be thought, and not to be thought of, in order to be the object of belief.

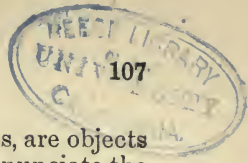
§ 43. We now come to a very essential point in the relation of credence to thought. Although belief never exists save in connection with thought, and always has thought for its object, *it primarily attaches itself either to the one or the other of two thoughts, and to other ideas only as they may have one of these thoughts contained in, or conjoined with*

them. These two cardinal notions are those of existence and of non-existence. Every statement of belief may be reduced to one of the formulas, "such a thing is," and "such a thing is not;" and all cases of doubt, or of inability to affirm or deny an understood proposition, arise from want of conviction as to the existence or the non-existence of something. We do not identify belief in the existence or non-existence of a thing with the thought of its existence or non-existence. When we conceive of a thing as existing or as non-existing, and emphasize the notion of existence or of non-existence, the form of thought thus produced is a proposition, and may always be expressed by "Hoc est," or "Hoc non est." This propositional thought, *per se*, is merely enunciative; it is not in any sense belief, but only the condition or preparation for belief. In the exercise of it we treat truth and falsehood very much alike. "The man is guilty," and "the man is not guilty," are equally complete propositions, though we may believe the one and disbelieve the other, or may have no conviction about either. But when, in the exercise of perception or judgment, we confide in, and rest upon, a propositional thought in its use as representative of things, this is the exercise of belief. Such a proposition then receives a new character; it is no longer a mere enunciation; it is an assertion; and this power of inwardly asserting a proposition—of mentally accepting, holding and presenting it, as a statement of reality—is the main characteristic of belief. It might be called the Assertivity of Belief.

It will be noticed that thought merely enunciative is expressed in precisely the same forms of language as assertive thought, just as an imaginary story is told in the same language as a real history. This, of course, gives no ground to dispute the distinction between enunciation and assertion. But it may sometimes be necessary to inquire whether one be making an assertion or merely stating a proposition.

Belief in things means belief in them as existing; i. e., in the thought of them as existing.

It is also to be noticed that, although we often speak of believing in *things*,—that is, in entities—this is only a short way of saying that we believe in their *existence*; and this again, as we have seen, is only an incomplete way of expressing our belief in the *thought* of their existence. For instance, in a dispute respecting the reputed wealth of some one, we might say that we believe in his wealth or do not believe in it, and we might express ourselves in the same way as to the asserted guilt of a prisoner, or the alleged meaning of a law, or the claimed excellence of some mode of trial, or anything else in which one might be said to believe. Such language signifies our belief in the *existence* of the wealth or guilt or meaning or excellence specified; and this belief is only belief in the proposition that such wealth or other entity exists. Thus it might be shown that no entity—that is, no conception of an entity—is ever an object of belief save only as it enters into a proposition or statement, and



that propositions, statements, histories, and doctrines, are objects of belief only because they continually set forth or enunciate the existence or the non-existence of things.

Here, however, it may be asked, "Do we not as frequently say that we believe a thing to be true or false as that we believe a thing to be or not to be, and, if so, is not belief in the truth or falsity of a thing just as radical a form of intellectual action as belief in its existence or non-existence?"

For simplicity, let us chiefly consider belief in the existence of something, as belief in the non-existence of anything is, in itself, of precisely the same nature. Let us also take belief in the truth of any statement, positive or negative, to illustrate belief in its falsity. For the latter, which is often called disbelief, is simply belief in the contradictory opposite of a statement.

In regard, then, to the foregoing questions, we remark that our belief that a thing is true differs materially from our belief that a thing exists. The "thing" of the first belief is a *propositional thought* (named perhaps by metonymy from its object), and our belief is that this is true; for only propositions can be true or false. The "thing" of the other belief is not a proposition, but *the object about which the proposition is made*; and the belief is that this thing exists.

Such being the difference between these two descriptions of belief, we say that the belief that a thing is true is a form of mental action conditioned upon, and secondary to, the belief that a thing is. For, before we can believe a proposition to be true, we must first believe that the thing, or state of things, set forth in the proposition, is a reality. In other words, we must believe that a thing exists, before we can believe that the statement, that it exists, is true. Sometimes we say that a statement is true, or correct, in order to call attention to its accuracy and excellence; more frequently, we say that a statement is true, meaning thereby only that what it sets forth is fact. In this latter mode of assertion we simply employ one fact of existence to indicate another. That is, the fact of *the truth of the statement* is used to indicate *the existence of the thing* about which the statement is made. This use of thought and language is evidently subsidiary to the more simple and direct statement of belief. It is also less radical; for it implies that we primarily believe in the existence of a thing, and is itself a complex example of that very belief in existence. For to believe in the truth of a statement is simply to believe in the *existence* of its truth. The truth of propositional thought is a relation of correspondence between it, on the one hand, and its objects, as existing, on the other: to believe in the truth of such thought, therefore, is to believe *both in the existence of the objects of the thought and in the existence of the correspondence between the thought and its objects.*

The correctness of the view now presented may be deduced from a definition of truth framed by the ablest of the Schoolmen, and which, according to Sir Wm. Hamilton, is accepted by all philosophers. "*Veritas*

Thomas Aquinas
quoted.

intellectus," says Aquinas, "*est adæquatio intellectus et rei, secundum quod intellectus dicit esse, quod est, vel non-esse, quod non est;*" which may be rendered, "The truth of thought is a correspondence of thought and fact, according to which thought says that what is, is, or that what is not, is not." Here Aquinas teaches that a thought or proposition is true, and can be so regarded, only as correctly setting forth that something exists or does not exist. From this it follows that we must believe in the existence or in the non-existence of a thing before we can believe in the truth (or trueness) of the proposition that it is, or is not. And so we conclude, again, that the proper and primary object of belief is the proposition in which existence or non-existence is directly asserted, and not the truth of this proposition. The latter—or rather the propositional thought presenting it—is a secondary and subsidiary object of belief.

CHAPTER XVI.

JUDGMENT.

§ 44. Often when men believe a proposition, or accept it as true, they say that they judge it to be true; or, believing something to be or not to be, they say that they judge it to be or not to be. This judging is not precisely identical with believing, but is the initial act of forming a belief. Moreover, judging has reference to evidence. Although no one in the possession of his faculties can believe save upon evidence, we may think of belief without reference to this. But judgment is the *formation of belief on evidence*. Further, in those cases in which perception is simple and perfect, and in which, therefore, the evidence admits of no doubt and calls for no reflection, we do not commonly speak of an exercise of judgment. We say that we perceive and know—not that we judge—that there is a sun in the heavens. But one may judge that the sun is a solid body. We call inferences judgments; for in them we believe something to exist because we believe some other thing or things to exist, or that something *would* exist in case some other thing or things existed, and often scrutinize our belief—whether actualistic or conditional—as thus founded on premises. In short, the verb *judge* and its derivatives, in its ordinary application is limited in somewhat the same way as the verb *believe* and its derivatives are.

Nevertheless, as philosophy, and even common speech, must recognize a belief in general which includes every form of intellectual confidence, so we must recognize a *judgment in general, covering the formation of every degree of conviction, and without reference to the kind or cogency of evidence*. This extension of meaning naturally and specially arises when we inquire as to the

evidence on which our sense-perceptions and other common convictions rest. The employment of it by philosophers is perfectly

Judgment includes thought; and also sometimes signifies the thought exercised in judgment.

justifiable. The term *judgment*, moreover, always, or almost always, covers an exercise of thought as well as the formation of belief; and, in this respect, differs from belief, which does not always include thought. The reason, probably, is that the scrutiny of evidence in ordinary judgment involves control and direction of the thinking faculty and makes thought a prominent factor in the work of judging, even while the distinguishing characteristic of that work is the formation of belief. For thought may take place without judgment, as in the case of the mere conception of a thing or the mere enunciation of a proposition; but the formation of a belief cannot. The propositional thought, which, as the result of an act of judgment, is accompanied by belief, is also called a judgment, just as the same thought, viewed more simply, is styled a belief. This metonymy, which occurs frequently, is easily detected and need cause no confusion. It should be noticed, however, that a propositional thought, of itself, is not a judgment, but only a mental enunciation, or the conception of a thing as existent or non-existent; it is a judgment only as accompanied with conviction. Thus the thought that "*the man is guilty*," is not a judgment till some one may decide that he is.

Judgment of the "what."

By a similar, but somewhat greater, transition judging occasionally signifies, not the formation of beliefs or judgments such as now described, and in which we emphasize the idea of existence, but *the formation of a propositional thought with the emphasis on the conception of the object set forth as existing*. We sometimes say that we judge—not that a thing is—but what or where or how or why it is. If, seeing an object at a distance, we should judge that "it was a lion," making *lion* the emphatic word, the conceiving of the lion as identical with the object in question would be the thing directly indicated by judging; the exercise of belief in the existence of the lion being included only as accessory. Or, judging where a man's money is—that "it is in the *bank*"—we form an *idea* of where it is, of the place of the money. From these examples it is evident that to judge *that* a thing is, and to judge *what* a thing is, are both exercises of thought accompanied by belief, and that they differ only because emphasis in the former is laid on that thought of existence to which belief immediately attaches itself, while, in the latter, it rests on the thought of the thing asserted to exist. It should be remarked, however, that judging never signifies the formation of the mere conception of a thing, but only sometimes *the conceiving of a thing in connection with the mental assertion of existence*.

The doctrine of judgment involves the doctrine of the proposition.

Setting aside these two secondary significations, the radical meaning remains: *judgment is the formation of belief in consequence of presented evidence*. But, if judgment be belief, and belief the mental assertion of propositions setting forth existence or non-existence, it is

clear that those propositions in which judgment expresses itself must all be such existential statements. Further, it is clear that these propositions *per se* are mere enunciations, or expressions of existential thought, but, considered as the actual objects of belief, or as the expression of judgments, they are asserted propositions, or assertions, or judgments, or beliefs. Moreover, as the understanding of any mental phenomenon necessarily involves an understanding of its natural expression, it is evident that any complete and satisfactory doctrine of judgment must teach, first, that *propositions always and essentially are forms of thought setting forth things as existing or as non-existent*; and, secondly, that *the enunciative proposition is to be distinguished from the assertive, in that the former merely sets forth the thought of the existence or the non-existence of something, or (which is the same thing) of something as existent or as non-existent; while the latter, in addition, is the embodiment or expression of belief*. Any scientific comprehension of what judgment is, of what a proposition is, and of what men do in exercising judgment and in forming and using propositions, must depend upon an understanding of these statements. Moreover, as all the workings of the mind about fact and truth—as all perception and cognition, all belief and knowledge, all inference and reasoning, are modes of judgment, we see the importance of determining what judgment is.

Aristotle's doctrine of the proposition explained.

§ 45. Definitions of this power, and of the proposition as the expression of its exercise, are to be found frequently in logical and metaphysical writings; and, as the views, which we have now presented, differ radically from those generally entertained, it may be well for us to consider those doctrines which are commonly taught regarding judgment and the proposition. Aristotle ("Prior Anal." chap. i.) defines a proposition (*πρότασις*) to be "*a sentence which affirms or denies something of something*." In regard to this famous definition, we remark, first, that it is expressed in those indefinite terms of common language which obtain special signification only through the connection in which they may be used. Accordingly, though apparently simple, it is difficult and obscure when critically considered. When one asserts "something of something," the natural meaning of this, either in English or in the Greek, is that he asserts a proposition, as a statement of fact, or in reference to some object, which exists or is supposed to exist. Thus, in asserting, "*Socrates was wise*," or "*The men of Athens were not wise*," we assert the proposition, "*Socrates was wise*," of Socrates; and the proposition, "*The men of Athens were not wise*," of the men of Athens. Aristotle, however, did not use language in the foregoing way. He did not mean to say that *a proposition is the assertion of a proposition respecting something*, but that *it is the affirmation or denial of a predicate-object in its relation to a subject-object*. The "of" in his definition indicates a relation between the first and the second "something," and not a rela-

tion between the affirmation or denial and the second "something." The first "something" does not stand for the proposition asserted, but only for its predicate; and the proposition in its parts,—predicate, copula, and subject—is indicated by the whole phrase, "something of something." The object about which the statement is made is not mentioned *as* the object to which the proposition refers, but rather *as the subject of the proposition itself*. That such is Aristotle's meaning is evident, because that signification of his words, which we have described as in some respects the more natural one, would render his definition both tautological and superfluous, and also would not express what his doctrine plainly is. He did not intend to say that a proposition is the assertion of a proposition, nor to add to his definition of a proposition that it is an assertion *about something*, as if there were some other kind of assertion *not* about something. His meaning is that an assertion or proposition is a statement *setting forth something as inhering or as non-inhering in something*. Thus, in "Socrates was wise," and "The Athenians were not wise," the object "wisdom" is set forth as inhering in the object "Socrates," and as non-inherent in the object "Athenians." In what sense we affirm and deny things of things, rather than ideas of ideas, and how we thus affirm and deny even while the existence of things is doubtful or denied, or while, as in general and hypothetical assertions, no real things—no subject-object and no predicate-object—exist, Aristotle does not explain.

Misleading and erroneous in saying "something of something."

Such being his definition, we remark, secondly, that this definition is erroneous and misleading in teaching that *the predication of something of something is essential to every proposition*. For existence and non-existence, as we have seen, though objects or objectualities, are not things or entities. Therefore simple existential propositions—that is, those which merely set forth the existence or the non-existence of something, cannot properly be said to predicate something of something. For they do not say that something exists, or does not, in relation or connection with something else, but only that something exists or does not. Thus, "John is," only affirms *existence* of John; but "John walks" affirms *the existence of the action of walking*, in its relation to John as the agent. On this account, were one forming philosophic language, it might be questionable whether simple existential propositions should be called predications. They certainly do not, in the full and proper sense, assert something of something, but only existence or non-existence of something.

The statement that every proposition affirms or denies something of something must mislead in one or other of two ways. First, if taken to signify that every proposition asserts the existence or the non-existence of some entity as in connection with some other entity, it would be totally erroneous. But, secondly, if not so interpreted, it must at least involve the error that *the*

thought of the existence of an entity and the thought of one entity as inherent in or connected with another are parallel or analogous objects of belief; whereas the latter is only a frequent and important exemplification of the former. For the object of assertion and belief in both cases, equally, is the thought of existence: in the one the existence is that of an object without thought of its connections or relations; in the other, it is the existence of an object (or entity) as related or connected with another object. Now, when we are told that every proposition asserts *either* existence or some other predicate, such as action or position or quantity or quality or place, *of* something else, we immediately infer that it is possible to assert, and to believe in, some thought aside from that of the existence or of the non-existence of things. We accept belief in existence or non-existence as only one species of belief; and, being thus driven off on a wrong course of inquiry, we vainly seek the essential object of belief in certain modes or certain relations of our thoughts as representative of objects. This cause of confusion evidently affected Aristotle himself. For, having enumerated those "categories" in which he classifies "things spoken not according to any connection"—that is, things as presented in language, but as being not yet the subjects or predicates of discourse—he says that each of these things "by itself is not spoken in affirmation or denial, but *from the connection* (*συμπλοκῆ*) of these with each other affirmation or denial arises." ("The Categories," chap. ii.).

Without defini-
tional force in say-
ing "which affirms
or denies."

It seems evident that the "something of something" in Aristotle's statement does not indicate the essential nature of the proposition. We now, as a third remark, ask, "Is this nature revealed in the remaining part of the definition, which tells us that a proposition is an affirmation or denial?" This, of itself, is not a definition, but a division, of propositions, according to their main use, which is assertion. Perhaps, however, if we can learn what affirmation and denial are, we may in this way arrive at their common and essential basis. How does Aristotle define these things? He says ("De Inter.," chap. vi.) that affirmation is the assertion of something *of, or concerning* (*κατά*), something, and denial is the assertion of something *from, or away from* (*ἀπό*), something. These statements, though little more than an etymological analysis of *κατάφασις* and *ἀπόφασις*, show that both are assertion (*ἀπόφανσις*), the one assertion of and the other assertion from,—whatever these propositions may signify. What then is *ἀπόφανσις*? It is ("De Inter.," chap. v.) "a voice signifying the inherence or the non-inherence of something." Thus Aristotle, necessarily defining the mental act from its object, brings us back to our starting-point. It is plain that he considers the proper and essential object of affirmation and denial—of assertion, positive and negative—to be the conception of *the relation or connection of something with something*, or, which is the same thing, the conception of *something as related or connected with some-*

thing. Clearly, too, from such teachings, it would be impossible to conjecture that the idea of existence has any place at all in the constitution of the proposition; if it is there in any sense, it is only as a concomitant and unnoticed implication; the relation of one entity with another is ever presented as the essential thought.

That such is a fair interpretation of Aristotle may be especially confirmed by reference to his view of the verb "to be," (*εἶναι*), as the copulative in propositions. Correctly regarding this verb, when not itself a predicate, as a kind of auxiliary, by the addition of which nouns and other parts of speech are given the force of verbs and so made predicable, he says that "to be" signifies the truth of the statement in which it occurs. But he teaches, also, that existence and non-existence signify *the composition and division of things*, and that a statement is true or false as setting forth things according or not according to their composition or division; *περὶ γὰρ σύνθεσιν καὶ διαίρεσιν ἔστι τὸ ψεῦδος τε, καὶ τὸ ἀληθές.* (Vide "De Inter." chaps. iii. and x. "Met." book iv. chap. vii. and book viii. chap. x.) In short, he differs little from modern logicians who make *esse*, as connecting subject and predicate, to be merely a copulative, that is a word indicating the relatedness of one thing with another, while *non-esse*, of course, signifies the separateness of one thing from another. Now this idea is erroneous. The intellect does not use the verb "to be" chiefly or simply for the purpose of indicating connection. This word always signifies existence; this is its primary and principal use in every predication. The idea of relation or connection is present whenever we affirm one thing of another, but the expression of this idea is only accidentally dependent on the verb "to be."

Finally, Aristotle's doctrine of the proposition is defective and fallacious because *it does not distinguish enunciation from assertion*, the expression of our thought of a thing as existing from the expression of our belief in (the thought of) a thing existing. To understand the proposition, as the act and the expression of judgment, it is necessary, not only that this distinction should be formally made, but also that the nature and grounds of it should be explicitly stated. Aristotle teaches that the declaration or statement (*ἀπόφανσις*) is that sentence in which truth or falsehood is inherent, and that this only, as distinguished from sentences expressing desire, admiration, pity, and so forth, is to be considered in logic. The proposition (*πρότασις*) differs from the declaration, not in nature, but in use only. It is a declaration viewed, not simply as a statement, but as when a thesis or premise in argument. Affirmation and denial (*κατάφασις* and *ἀπόφασις*) are species of the declaration or proposition. Other words, also, beside these, are used to signify statements. But nowhere does Aristotle distinguish what we have called enunciation and assertion. Commencing to discuss the syllogism in the prior analytics (book i. chap. i.), he defines

Involves a wrong view of the copulative verb.

Confounds enunciation with assertion, and makes belief mere complexity of thought.

the apodeictic and the dialectic propositions, the former being a simple assertion or assumption, positive or negative, and the latter the statement of a question, as "The man is either guilty or not." This, however, is not the distinction we seek for. It may be said that a formal distinction between propositional thought and an assertion was not absolutely necessary to the doctrine of deductive reasoning, and that this doctrine, which was the principal aim of the Stagirite, did not imperatively demand any distinction beyond that between real and assumed truth. This may be allowed. Nevertheless it remains that Aristotle gives no satisfactory account of the proposition, either as to its nature, as indicating existence or non-existence, or as to its use, it being expressive both of thought simply, and of belief; while, without such an account, any satisfying philosophy of rational conviction is impossible.

§ 46 We have dwelt on Aristotle's definition of the proposition partly to illustrate the obscurity and confusion which often characterize his philosophy. These do not, indeed, indicate any want of genius in him, but rather the exceeding difficulties which impeded the metaphysics of his day. The sciences of thought and of language were then in their infancy, and the true methods of philosophical progress had not been brought to light. But our chief reason for discussing the views of Aristotle is that the teachings of subsequent metaphysicians have been little else than reproductions or modifications of the Peripatetic doctrine. This will be apparent if we revert to some eminent

Quotations from
Reid, Locke,
McCosh, Hamil-
ton, and Mill.

modern authorities. Dr. Reid commences the first chapter of his sixth essay, thus: "The definition commonly given of judgment by the more ancient writers in logic was that *it is an act of the mind whereby one thing is affirmed or denied of another*. I believe this is as good a definition of it as can be given." It is worthy of remark, however, that Reid, while teaching that "judgment can be expressed by a proposition only," clearly states that not every proposition expresses a judgment. "I understand by judgment," he says, "that operation of mind by which we determine, concerning anything that may be expressed by a proposition, whether it be true or false. Every proposition is either true or false; so is every judgment. *A proposition may be simply conceived without judging of it*. But, when there is not only a conception of the proposition, but a mental affirmation or negation, an assent or dissent of the understanding, whether weak or strong, that is judgment." This is the distinction which we could not find in Aristotle, although it is not accompanied with any true analytic understanding of judgment and the proposition. Reid may represent a considerable class who adopt the Peripatetic definition without change. Locke, on the other hand, may represent a larger number who equally receive the doctrine of Aristotle, yet give to it a new expression. These say that *a proposition is a sentence which sets forth the agreement or dis-*

greement of ideas. In chap. xiv. book iv. of his "Essay," Locke writes, "The faculty which God has given to man to supply the want of clear and certain knowledge, where that cannot be had, is judgment, whereby the mind takes its ideas to agree or disagree, or (which is the same) any proposition to be true or false, without perceiving demonstrative evidence in the proofs. Thus the mind has two faculties conversant about truth and falsehood: first, knowledge, whereby it perceives and is undoubtedly satisfied of the agreement or disagreement of any ideas: secondly, judgment, which is the putting ideas together or separating them from one another in the mind, when their certain agreement or disagreement is not perceived, but presumed to be so." Here Locke distinguishes judgment from knowledge, but also recognizes them as of the same radical nature. There is therefore no real difference between him and those who make a wider use of the term *judgment*. Locke, moreover ("Essay," bk. ii. chap. xxxii. § 19), anticipates that modification of his doctrine which is presented by Pres. McCosh. The latter, in his "Logic" (part ii. § 1), says, "Judgment is defined by logicians as the comparing together in the mind two of the notions or ideas which are the objects of apprehension and pronouncing that they agree or disagree. But this definition can be accepted only when we understand by notions, not mental states as such, but objects apprehended. When we say, 'Alexander the Great was ambitious,' we are comparing 'Alexander the Great' and 'ambitious,' and not mere ideas of the mind, it being always supposed that the objects are previously apprehended by us." It is plain, however, that we exercise judgment regarding "things" that are purely imaginary or ideal, and which, strictly speaking, have no existence whatever. While conceiving and naming such "objects," therefore, we do not literally speak *of objects* but only *as if of objects*, using not actualistic but suppositive thought and language. Only in this way can it be said that we always think and judge "of things." But, this being understood, it is true that in judgment we compare *things*, and not ideas. Similar remarks apply to the mixed use of language employed by Hamilton, Bowen, and others. Sir William in his "Logic" (Lect. XIII.) says, "To judge (*κρίνειν*, *judicare*), is to recognize the relation of confliction or of congruence in which two *concepts*, two individual *things*, or a *concept* and an *individual*, compared together, stand to each other. The recognition, considered as an internal consciousness is called a judgment (*λόγος ἀποφαντικός*, *judicium*), considered as expressed in language, it is called a proposition or a predication (*ἀπόφανσις*, *πρότασις*, *διάστημα*, *propositio*, *prædicatio*, *pronunciatum*, *enunciatio*, *effatum*, *profatum*, *axioma*)." That act of the intellect by which we think of two things at the same time in order to be able to determine whether one of them as bearing some given relation to the other exists or not, is often styled *comparison*. More properly and simply it is the *collation* of things, in thought; for comparison, which is derived from

“compar,” signifies the collation of things in order to determine what similarity may, or may not, exist between them. This collation or comparison is properly no part of the act of judgment. The latter often takes place when the subject and predicate objects have not been purposely considered together. We cannot, therefore, with Hamilton and others, name judgment the faculty of comparison. In the preceding extract, however, the act of comparison or collation is correctly placed *before* the act of judgment, and thus distinguished from it. Dr. Mansel (“Prolegomena,” chap. ii.) teaches that relations are the proper objects of judgment; which also is the teaching of Dr. Porter. (“Human Intellect,” part iii. chaps. v. and vi.) In our view, relations, considered with reference to their own nature, and not with reference to their existence or non-existence, are objects of thought or conception only. Like all other forms of entity they can become objects of judgment only when conceived to exist or not to exist.

Now these varieties of view, together with some others which have been elaborated principally by German logicians, are all essentially the same with the doctrine of Locke; who, also, differs from Aristotle only in expression. For both assert that the object of knowing, judging, believing, is *some relation between things, or between ideas in their use as representative of things*—a relation of some kind of agreement or disagreement, inherence or non-inherence, inclusion or exclusion, connection or separateness, between the subject and the predicate thoughts, or objects, of every statement.

John Stuart Mill, a clear, able, and earnest thinker, but, like the rest of his school, somewhat lacking in philosophical penetration, recognizes the difficulty of defining judgment. “To determine,” he says, “what it is that happens in the case of assent and dissent besides putting two ideas together is one of the most intricate of metaphysical problems;” and then he shows his own inability to solve the problem, by adding, “It can have nothing whatever to do with the import of propositions.” This import is the key to the whole mystery.

Mill adopts Aristotle’s definition, saying, “A proposition is a portion of discourse in which a predicate is affirmed or denied of a subject.” Moreover, like all other logicians, he teaches that the verb “to be,” in the middle of propositions, is only copulative, and not significant of existence. “It is apt to be supposed,” he says, “that the copula is much more than a mere sign of predication; that it also signifies existence. In the proposition, ‘Socrates is just,’ it may seem to be implied, not only that the quality *just* can be affirmed of Socrates, but moreover that Socrates is, that is to say, exists. This, however, only shows that there is an ambiguity in the word *is*, a word which not only performs the functions of the copula in affirmations, but has also a meaning of its own in virtue of which it may itself be made the predicate of a proposition.”

Subject and predicate, with Mill, are objects, not ideas of objects; he denounces the doctrine that "propositions are assertions respecting our ideas of things." The most noticeable feature, however, in Mr. Mill's discussion is a *classification of things assertible* somewhat after the fashion of Aristotle's *Categories*; for he makes no distinction between an assertion and a mere proposition. His doctrine is as follows: "Existence, co-existence, sequence, causation, and resemblance; one or other of these is asserted or denied in every proposition without exception. This fivefold division is an exhaustive classification of matters of fact; of all things that can be believed, or tendered for belief; of all questions that can be propounded, and all answers that can be returned to them" (Mill's "Logic," book i. chaps. iv., v., and vi.). The merits of this doctrine might be considered in a discussion concerning the categories of predication; it is now noticeable only as in one respect an unconscious approach to the true doctrine; from which at the same time, in other respects, it is widely separated.

The true doctrine of judgment stated and proved. § 47. In opposition to the general teachings of philosophers we hold confidently that *the existence or the non-existence of things—or, more strictly and literally, the thought of their existence or non-existence—is the true and only object of judgment and belief*; and further, that *the verb "to be" always signifies existence, and has its "copulative" use only as having this meaning.*

In this statement the word *object* indicates the object of belief—proper or of intellectual confidence, and not the object of thought, the former being always a proposition, or an existential conception, and the latter being always some *thing*, which exists or may be supposed to exist. As an exercise of confidence, judgment has the thought of existence or of non-existence for its object: as including the exercise of that thought which belief accompanies, it has the same objects as all other thought. As belief, judgment always and literally has an object; for we cannot believe without some actual existential conception; but so far as it is thought, it does not always literally have an object; for we may believe while there is no reality to correspond to our conception.

This doctrine—that *every proposition is an existential statement setting forth something as existing or as non-existent, and that all judgment and belief is simply the exercise of confidence in connection with the thought of the existence or of the non-existence of something*—has been reached through difficulties which those can appreciate who may have attempted the solution of a vexed metaphysical problem; and yet this doctrine, as we have stated it, is so clear, so satisfactory, so evidently true, as scarcely to need formal proof. If any, however, would test its truth by the method of analysis and induction, they will speedily find that every object of belief, when fully presented, is a proposition, and that every proposition, whether affirmative or negative, falls under one or other of two heads; it is either the enunciation of the existence

or of the non-existence of *something considered without reference to its relations*; or it is the enunciation of the existence or non-existence of *something considered with reference to its relation with something else*. The first of these classes of propositions directly and expressly states that a thing is or is not. Such assertions as "God exists," or "There is no God," clearly set forth the existence or the non-existence of the subject-object of the proposition: they are plainly existential statements.

The other class of propositions (which we may call predications proper, condemning the first class as improper predications) do not set forth the existence or the non-existence of the subject about which the assertion is made, but affirm or deny *something of something*—that is a predicate of a subject. That they do not assert the existence, or the non-existence, of the subject may be shown in various ways, but most decisively from the fact that negative predications are made concerning existing subjects. For, if "John is walking," asserts the existence of John, then "John is not walking" must assert the non-existence of John. The truth is, that the copulative verb never asserts either the existence or the non-existence of the subject; and this, we suppose, is the reason of the general opinion that it does not at all assert existence or non-existence. Examination, however, will show that every predication proper is an assertion of the existence or of the non-existence of its predicate-object, and that this is what is expressed by the use, positive and negative, of the verb "to be." By a predicate-object we mean that object or entity, whatever it may be in any case, the idea of which as connected with that of the subject-object is the true and essential point presented in any predication. It may be difficult sometimes to determine precisely what this object is; but generally there is no difficulty in seeing that something is set forth, in the predicate part of the proposition, either as existing or as non-existent. To illustrate this point, let us analyze ten simple assertions, the predicates of which are taken from Aristotle's *Categories* in their order; for these were evidently intended by Aristotle chiefly as an exhaustive classification of all possible predicate objects. He says, in the "Topics" (book i. chap. ix.)—that the categories are "*ten in number, what a thing is, quantity, quality, relation, where, when, position, possession, action, passion;*" and he adds that all propositions signify either what a thing is or some other category. Accepting this for the present as a sufficient classification of things assertible, we ask, first, as to the meaning of the statement, "John is a man;" for in this we tell *what* he is. To question Aristotle on this point would lead into an endless labyrinth of confusion: (see "Cat." chap. v., and "Met." book vi. throughout). We must depend on our own analysis. Some might say that "John is a man" states the nature of John. So it does; and it is intended to do so; yet this is not the point *directly* presented. What we immediately think is—not that John exists, or that a man exists; these things are sup-

posed—but that the entity John is *identical with an entity of a given nature, that is, with a man*. Identity is the point directly asserted; as much so as when one might say, “John is the man whom I saw yesterday.” We assert that identity exists in the case described; and, should we say, “John is not a man,” we would assert the non-existence of identity in a case otherwise similar. The only difficulty which can attend the perception of this explanation is that the identity is not expressed by any word; nevertheless it is indicated by the juxtaposition of the two nouns with only the verb “to be” between them, this juxtaposition performing the same office which “apposition,” as grammarians term it, does when the idea of identity is not asserted, but only implied, in discourse. Thus, in the sentence, “John, a man of sense, was here yesterday,” the subject might be expanded into “John, who is a man of sense,” and this proposition, no less than the complex term from which it is formed, would state identity. Again, when we say that “John is six feet high,” what is the point of the assertion? Is it not that a certain quantity of length or height exists in John? Or, when we say that John is kind and strong, do we not mean that the qualities of kindness and strength exist in John? In saying “John is the son of William,” the statement in form is one of identity. It identifies John with an entity characterized by a given relation. Indeed predication in every category may assume this form of identification. But the essential fact thus stated is the existence of the relatedness of John to William, as son to father. “John is in the field” sets forth, not the existence of the field (that is assumed), but the existence of the relation of John to the field, as of an entity to its place; it asserts this existence. “John is coming at noon,” should we emphasize “at noon,” would assert, not the future existence of the coming or of the noon-time, but that of the relation of the coming to noon as of an event to its time; but were “at noon” only part of the information presented, the coming would also be asserted as about to be. “John is seated, or is displeased,” shows a certain disposition of mind, or posture of body, which exists in John. “John is wealthy,” implies the existence of wealth, but chiefly asserts the existence of the relation of possession between it and him. “John strikes, or is struck,” asserts the existence of an action in its relation to John as agent or as sufferer. “John strikes James” presents the existence of the same action in both its principal relations.

Thus all affirmative predications assert the existence of some predicate object; and, in the same way, we might show that all negative predications assert the non-existence of such an object.

CHAPTER XVII.

KNOWLEDGE.

§ 48. We have already seen that belief, the apprehension of a thing as existent, or of a statement as true, includes knowledge, although often, in a narrower sense, it signifies that conviction which is less perfect and absolute than knowledge. Part of the general doctrine of belief presents itself most naturally in connection with the consideration of knowing or knowledge; which subject also has an importance of its own.

Those varieties of meaning which attach themselves to the verb "to know," and its derivatives, such as knowing, known, knowable, knowledge, may for the most part be illustrated by the various significations of the verbs "to believe" and "to judge" and their derivatives. There is a general parallelism of use between terms expressive of belief. Some divergencies, however, in respect to knowledge, arise from the peculiarity of nature belonging to it. We have already seen that propositional or existential thought is the only proper and literal object of belief. (For there is no difference between a propositional thought and an existential conception as to the elements constituting them; though the former—the thought that "*a thing exists*"—might be distinguished as emphasizing the idea of existence, and the latter—the conception of "*a thing existing*"—as emphasizing the idea of the thing.) We have also seen that things or existences are objects of *belief* only in a secondary and somewhat improper sense, and by a use of language similar to that in which we speak of ideal objects. But, when we speak of what we know—of the objects of knowledge—we never mean the propositions, or conceptions, which set forth facts or entities, but rather the facts or entities themselves. We do this although the confidence of knowledge, no less than that of belief, is immediately exercised upon propositional or existential thought. The reason seems to be that the certainty of knowledge causes the interest and inquiry of the mind to pass over the thought of the fact or object to the fact or object itself. When, therefore, we say that we know that the man is a knave, we mean that we know, not that proposition, but that fact; and, again, in knowing the innocence of the man, we know, not a conception, but an object.

Further: to know *that a thing is* (or is so) and to know *what a thing is* are to be distinguished in the same way as the parallel cases of judgment. Whether we judge *that* a thing is or *what* a thing is, in either case, our judgment *is a propositional thought accompanied by conviction*. In the one case, we judge that

The object of knowledge is different from the object of belief.

Knowledge of the "that" and of the "what." Definitive or determinative knowledge explained.

“the man is a knave,” and answer the question, “Is the man a knave?” In the other, we judge that “the man is a *knave*,” the last word being emphasized; and this answers the inquiry, “What is the man?” These remarks apply also and equally to our knowledge of the “that” and of the “what.”

It is to be observed, however, that *knowing* and *knowledge* have a signification which can scarcely be attributed to *judging* and *believing* and their cognates, and which is derived from the idea of knowing *what* a thing is. We refer to a meaning in which they indicate an exercise of mental power at once very common and very peculiar, yet which, so far as we can learn, has never received the explicit attention of philosophers. It is *the conceiving of a thing as having a given nature or aspect, and as having, in addition to that nature, certain characteristics by which it can be sufficiently distinguished from other entities, and thought of as having a definite character of its own.* Let us take the statement “I know the shape of the earth, the form of its planetary orbit, its distance from the sun, and the law of its perpetual motion in space.” The things here asserted to be known are the shape of the earth, the form of its orbit, its distance from the sun, and the law of its motion. Now it is evident that, in knowing any one of these things, we must think also of another thing; we do not simply have *the ideas of the words used*, but also other ideas *which give to these a determination sufficient to satisfy the inquiry of the mind.* Expressing this qualifying thought in each case, one might say, “I know the shape of the earth as that of an oblate spheroid, the form of its orbit as elliptical, its distance from the sun as ninety-one millions of miles, and the law of its motion as a resultant of the gravitation and the momentum of matter.” Such knowledge is a kind of thought connected with belief—and a very marked kind of thought. It is not to be confounded with the mere entertainment of the idea of an entity believed to exist. For why is it that one can say, “I know the distance of the sun,” but not, “I know the sun?” Why “I know the weight of the earth,” and not “I know the earth?” Why do we say that we know the relation of one entity to another as in space or in time—as, for example, the place of an object or the date of an occurrence—but not that we know space or time? And why is it more natural to say that we know the shape of a square or of a triangle than that we know a square or a triangle? These illustrations show that *knowledge*, in those cases where it indicates, not belief, but conception as accompanied by belief, frequently signifies not the mere conception of a thing under some notion, but the conception of it with reference also to some predicates which may properly be asserted of it, and by means of which we can impart to the idea such a definite character as will satisfy the inquiry of the mind. That such is the nature of this knowledge is evident from the fact that our conceptions are not called knowledge when things are so simple, or so fully or ade-

quately conceived of, as either not to admit, or not to need, a definition. Hence, as above, we do not speak of knowing space, time, a square, a triangle, the earth, the sun, and so forth.

This knowledge of a thing as to its characteristics may be regarded as a partial contraction into one existential conception of the proposition which *defines* a thing or states *what it is*. For example, the statement, "I know the shape of the earth as an oblate spheroid," differs from the statement, "I know that the shape of the earth is an oblate spheroid," in that the copulative verb is retired from any prominence and the subject and predicate become more closely united. Yet they are not perfectly united in one conception. If they were perfectly united and conceived of as one object, "The oblate-spheroidal-shape of the earth;" and we were said to know this, as to what it is, this knowledge would involve some other conception to determine further the peculiar shape thus said to be known, and to satisfy the inquiry, "What is it?"

Here, however, we must remark that we "know" objects or entities in a sense *which does not involve the existence of limiting or determinative conceptions*. For instance, we may know or have knowledge of the guilt or innocence or folly or trustworthiness of a man. This would mean only that we know that the man is guilty or innocent or foolish or trustworthy; it would be a knowledge of the "that" and not of the "what," and would correspond in nature to *believing in* a man's guilt or innocence, and so forth. Should a name be desired for this latter kind of knowledge, we might call it existential knowledge, while the knowledge of things as to their nature might be styled definitional or determinative. These two modes of knowledge can always be distinguished from one another, if we only inquire, as to things asserted to be known, whether they are known with reference to their existence or with reference to their characteristics. We can say that we know a thing, as to its nature, *whether the defining attributes be distinctly conceived of at the time or not*: it is only necessary that we should know them to be within recall. When this latter is the case our knowledge includes a kind of implicit or potential thought, and is somewhat similar to that thought which Leibnitz calls symbolic. The two things are not the same, but there is in each a certain absence of thought which is yet believed to be within recall. (See Hamilton's "Logic," Lect. X.)

Secondary uses of the words *knowing, knowledge, etc.*

§ 49. There are several denominations of knowledge which are so foreign to merely intellectual life that they are without the province of our discussion. Such, for example, is that kind of knowing—the French *connaître*—according to which we have a certain friendly understanding with persons, and are, as we say, acquainted with them. Now, however, let us consider some variations from the radical meaning of the verb *know*, each of which may have a set of variations of its own similar to those already discussed. Hitherto we have analyzed different conceptions of knowledge on the supposi-

tion that both our knowing that a thing is, and that existential knowledge, which is immediately derived from it, assert *actual existence*, and that this assertion of actuality is also *implied* both in our knowing what a thing is, and in that definitional knowledge which is immediately derived from it. But no doctrine of belief could be satisfactory which should not consider those forms of credence according to which we may be said to believe—in the various modes of belief—without believing in the past, present or future existence of things, and to know—in the various modes of knowing—without there being any real objects of knowledge.

We need scarcely mention here what might be called false knowledge, but which can be so named only by a figure of speech. For in the case of a mistaken conviction we may properly be said to believe, but cannot properly be said to know. Should one assert, "The man is rich" and be mistaken in this, belief would exist and have its true object, the proposition; but if, being very confident in his mistake, he should say, "I know the man is rich," there would be no knowledge, but only the idea of knowledge. Yet this mistaken confidence might be spoken of under the name of knowledge, even by those who are aware of its true character. We occasionally meet with persons who have a wonderful faculty of *knowing* things which are the reverse of fact and truth. Of course such knowledge is simply a mistaken confidence which its possessors, by a further mistake, believe and assert to be knowledge.

There is another occasional divergence of the verb *to know* from its proper and radical meaning, of which we need only make passing mention. We refer to that use of language according to which we say that we know, and call our ideas knowledge, meaning thereby that our ideas correspond with similar ideas previously entertained by some one, and not at all that they represent any realities that have ever existed. Thus the student of Homer is said to know the stalwart strength of Ajax, the conquering craft of Ulysses, the wisdom of Nestor, the prowess of Achilles. He knows too how the capture of Helen led to the Trojan war, and how the Greeks entered and obtained possession of the city through the stratagem of the wooden horse. Or, if one be not perfectly certain of some Homeric description, he may say that he *believes* that certain things were so; as, for example, that the shield of Achilles had on it the twelve signs of the zodiac in sculptured work. Strictly speaking, this knowledge or belief in things imaged or represented is not knowledge or belief at all. The only element of fact in the case is *the correspondence of our thought with previously existing thought*—that is, with the conceptions of Homer: yet we do not speak of knowing this correspondence, but of *knowing the fictitious events and objects*. Such language is really metaphorical. We call our conceptions knowledge, because they correspond to those of Homer in a manner somewhat similar to that in which true knowledge, by reason of its very

The knowledge of
imaginary objects.

nature, corresponds with our first perception of fact. This mode of speaking is promoted by the tendency of our minds to think of "ideal objects," as if they really existed. Yet it need not deceive any one, as the peculiar character of the so-called knowledge may always be easily perceived.

In the foregoing two cases, men speak of knowing things while yet there are no real objects of knowledge. The first instance, however, is merely the language of mistake: the other is the language of analogy, in which, because our ideas correspond with previously presented ideas, we speak as if they corresponded with previous cognitions, and so with facts themselves. *The formation of hypothetical judgments and assertions presents another and a much more important case, in which we speak of knowing and believing facts and objects without this language being true, at least in its strict and primary sense.* We often assert that, if a certain antecedent exist, a certain consequent must exist also, and say that we know or believe this, even in cases where no antecedent exists, and in which therefore no consequent can be inferred to exist. Thus John Smith might say, "If I had \$100,000,000, I would be richer than Astor," and we could reply, "That is a fact, Mr. Smith; that is true; we all *know* that." At the same time we perceive that there is no real antecedent, and therefore also no necessity of consequence (or co-existence), and no consequent, at all. In truth, it belongs to the nature of every hypothetical assertion *to leave out belief as to actual existence.* Reality may characterize some part of the composition of the antecedent or of the consequent, but neither of these, as a whole, is asserted to exist. We only think and say that *if* the one exist, *then* the other *must* exist also. In the case adduced, Smith and Astor might both be living men, and other realities might be thought of, but neither the possession of the \$100,000,000, nor the superiority to Astor in wealth, nor the necessary consequence of the latter on the former, is stated as a fact. Therefore hypothetical knowledge and belief, as such, deal not with real, but only with conceived or supposed, objects.

Necessity never really exists *per se*, but always from conditions which exist as its antecedents.

Some one, indeed, may say that although in such a case there is no antecedent, no consequent, and no actual necessity of consequence, yet that there is really what might be called a potential necessity of consequence, that is a kind of latent necessity resembling dormant or unexercised power. Supposing such a necessity to exist, there is no reason for the existence of it at one time or place more than at another, and therefore it must be held to exist everywhere and always, and to be ever ready to enter into any particular case of actual consequence. It reminds one of that "necessity absolute and antecedent in the order of nature to the existence of any subject," which Dr. Samuel Clark maintains in his correspondence with Bishop Butler. (Vide Letter III. and reply.)

We see no reason to believe in any such doctrine. The phrase *potential necessity* might, perhaps, express the idea of a necessity which does not exist, but of which some, not all, of the conditions already exist; thus death at all times is potentially necessary as to human beings. This, however, is not a true but only an ideal, or unrealized, necessity; in short, simply an instance of hypothetical necessity as we understand it. The full discussion of this question would involve an investigation into the nature of necessity, which, just now, would be out of place. We may say, however, that were necessity of a nature analogous to power, we might perhaps speak of an actual (or operative), and of a potential (or latent), necessity, as both really existing; although, even so, we question whether potential necessity could exist without the existence of certain conditions. Such, however, is not the case. Necessity seems to be that characteristic of a thing according to which, being existent, it exists in such a way, or is of such a nature, that no power can make it not to be: it therefore always implies conditions. Sometimes necessity is absolute and is superior to all power, but more frequently it is only relative and is superior only to some power of a limited nature: in this latter case the limitation of the power is a condition of the necessity. Moreover, impossibility, which seems to be of the same general nature as necessity, and which, like necessity, is used in inferences, is the characteristic of that which, being non-existent, the circumstances of its non-existence are such that no power can make it to be. Therefore, impossibility—or the necessity not to be—also arises from conditions. But of this we shall speak more fully hereafter (§ 71).

We repeat, therefore, that hypothetical assertions present a form of knowledge and belief in which we believe without believing in actual existence and know without knowing actual facts. Yet, speaking strictly, the only true existence—the only true fact—is the actual. At the same time it is clear that a large and important portion of our knowledge and belief is hypothetical. The chief part of every system of science and philosophy—and the great body of the practical wisdom of mankind, together with all thoughts or statements which are ever used as *principles* in reasoning, are not properly assertions of fact, but of that *which must be or become fact, provided certain specified conditions should exist*. Moreover, many statements are of this character which at first sight appear to assert general facts, but which—at least as to their use in reasoning—are not assertions of fact at all. Thus, in laying down the principle, “books are pleasant companions,” the existence of books and their pleasant company is referred to, but we assert only that *if* books exist—or wherever they *may* exist—they afford a pleasant fellowship. So also “man is mortal,” signifies, “man, whenever or wherever he may exist, is mortal;” and this would be true even though there were not a single human being to be found. The extensive use and the prominent importance of hypotheti-

cal belief, and the fact that logic—the science of rational conviction—is, and must be, chiefly occupied with the laws which do, and the rules which should, regulate the formation of such belief, account in part for the failure of philosophers to see that the expression of confidence in existence is the essential office and ultimate end of every form of intellectual assent.

The relation of hypothetical to actualistic conviction discussed.
Hypothetical a mode of inferential belief.

That hypothetical conviction is a mode of confidence wholly *secondary, subordinate, and ministerial, to belief in actual fact*,—that is, to belief which asserts actual fact,—and that its very essence is dependent upon its having this character, without which it would not be belief at all, becomes evident *when we analyze hypothetical belief and compare it with that form of belief in actual fact to which it is most closely allied.*

That radical form of conviction which we have just mentioned as belief in actual fact, and which therefore might be termed actualistic belief, may be distinguished into two kinds or classes—the presentational and the inferential. The former of these is experienced in the presentations, or immediate perceptions, of sense and consciousness, while the latter is the inference of one fact from some other fact with which it is necessarily connected. Now hypothetical conviction is related immediately and closely to that form of actualistic belief which is inferential, and not to that which is presentational. This is so much the case that the same name, *inference*, which describes the more primary and complete mode of confidence is also applied to the secondary and subordinate mode; and these two kinds of belief have so much a common nature that they may be distinguished and compared as actualistic inference and hypothetical inference. *Realistic*, possibly, would be a better term than *actualistic*, were it not preoccupied as referring to the doctrine of realism. By far the greater part of human knowledge and belief is included under one or other of these modes of inferential conviction. Actualistic inference infers one literal fact from another, or from a combination of others. We see smoke issuing from a chimney and thence infer that there is fire within the house; or observing a library in a dwelling, we infer that the owner is fond of books. We find a field rectangular and with one side ten rods in length and another twenty in length, and thence infer that there are two hundred square rods of surface in the field. Or we learn that one man, James, is younger than John, who again is younger than William, and thence conclude that James also is younger than William. Without any searching analysis it is plain that such reasonings infer fact from fact, and that the belief or knowledge resulting from them is a conviction as to actual existence. In the foregoing examples the actual existence of fire, of a fondness for books, of a certain quantity of surface as belonging to a certain field, and of the relation of juniority on the part of James to William, are inferentially asserted. Hypothetical belief, on the other hand, asserts only that *if* one thing is so, *then* another thing is so. We say

only that, *if* there is smoke, there is fire, or if there were a field answering a given description, it would contain a specified quantity of surface. Such being the case, the question arises, "How far—or in what respects—does hypothetical inference agree in nature with actualistic inference, and how far does it differ?"

No difference as to construction of thought. First, then, it exhibits no difference *so far as the construction of thought employed in it* is concerned.

The sequence of conceptions in every inference is a peculiar one. It is the work of a special development of that power by reason of which one idea is associated with, and suggested by, another. In other words, it is the product of that faculty of suggestive conception which regards, not the accidental, but the necessary, relations of things, and which, when acting in connection with judgment and the reasoning power, may be considered as included in those powers as their thought-factor. For, on thinking of certain things, the mind can, and continually does, think of other things related to them, and of these latter as in some way *so* related to the former that their existence is *necessarily connected* with the existence of the former. And, while exercising this power of thought, the mind judges concerning the existence of the things conceived of as related in the way described. The thing known, or assumed, to exist, is called the antecedent; the thing inferred to exist is the consequent, and the necessary co-existence of the latter with the former is called the consequence. So far as these terms indicate order, it is the order of our thought in making an inference, and not an order belonging to the objects of thought as successive in time, or as related in any other way. The consequent may precede or be contemporaneous with the antecedent, and the latter is as frequently an effect as it is a cause. The only essential point is that the existence of the consequent is, in some way, necessarily connected with that of the antecedent. The special relations, which thus connect one thing with another, are of great variety, but they all possess the characteristic of involving the necessary co-existence of the consequent with the antecedent. Examples may easily be found to illustrate these statements. We should add, that sometimes there are negative antecedents and sometimes negative consequents, because a case of existence is often necessarily connected with a case of non-existence, and the reverse; and because a case of non-existence is often consequent upon another case of non-existence. These forms of thought would deserve special notice were we discussing the nature of necessity; at present it is sufficient to speak of the sequence of cases of existence, as this exhibits the nature of inferential thought in general. Such then is the construction of thought in all inferences.

No difference as to degrees of belief. Again, let us remark, hypothetical inference does not essentially or necessarily differ from actualistic *as to the degree of belief which it produces*. Actualistic inference, though always asserting fact, varies in its confi-

dence from that of perfect knowledge to that of mere surmise or conjecture. Seeing fresh pools of water, we know that it has rained; seeing the clouds gathering, we conjecture that it may rain. It is sometimes taught, that hypothetical inference, which never asserts fact, but only what would be fact if a certain other thing were fact, does not admit diverse degrees of confidence. This seems to be erroneous. It is true we mostly assume absolute certainty in the grounds of a hypothetical inference, and therefore, also, assert the conclusion with absolute confidence. Yet should we *suppose* something to be probably—not certainly—a fact, and another something probably, not certainly, to be necessarily connected with this, such supposition would yield an inference purely conditional, and also only probable. Let us suppose that a certain piece of stone is probably amber, and then that amber is probably a vegetable product; this gives the hypothetical and probable inference that the stone in question is of vegetable origin. The absoluteness of conviction ascribed to hypothetical argument belongs to it only accidentally and is assumed in order that discussions respecting the dependence of conclusions on premises may not be complicated with questions touching degrees of probability. But, when these questions arise, we easily enough fashion for ourselves probable hypothetical inferences.

There is, therefore no difference between actualistic and hypothetical inferences *as to the construction of thought employed, or as to the degree of confidence produced by them*. Degrees of probability are more frequently considered in actualistic reasoning, and the consequence, or necessity of co-existence, is commonly more emphasized in hypothetical inference; in actualistic conclusions the interest of the mind tends to leave the consequence and gather upon the consequent. But these differences are not essential or necessary.

It is, however, a most important difference that, *in actualistic inference, the antecedent is known or believed actually to exist, and that the consequence and consequent are therefore asserted actually to exist; while no such belief or assertion is found in hypothetical inference*. This latter mode of conviction occurs without any belief in the actual existence of its objects, and simply in connection with a special exercise of thought. For the antecedent of a hypothetical inference is only *supposed* to exist, or *thought of* as existing, and the consequence and consequent are conceived of as existing without any belief in their actual existence.

At the same time it is clear that a certain belief or confidence is exercised, in hypothetical inference, in connection with the conception of the consequence and consequent as existing. This belief is expressed by saying that the consequent *would exist*; and it is evident that hypothetical inference is as much distinguished by the possession of this mode of belief as it is by

A peculiar and undefinable mode of confidence. All belief in some sense concerns existence.

the absence of the other. Here is the essential or internal difference between actualistic and hypothetical inferences, considered as modes of intellectual conviction. It lies in the difference of the modes of confidence with which they accept the same thought, that is, the thought of the consequent and of its necessary co-existence. This difference is an ultimate fact in mental science. It reveals two kinds of belief or confidence similar in nature, yet also radically diverse. For hypothetical conviction cannot be explained as a special development of actualistic confidence; it is something simple, peculiar and incapable of definition save through its relations, of which those to actualistic belief are the most important. It is distinguished from this latter belief by reason of its being founded on merely supposed antecedents; and it is also *provisional for, and preparatory to*, actualistic inference. For, so soon as belief in the reality of the antecedent takes the place of mere supposition, hypothetical conviction disappears and is replaced by actualistic. Moreover, as all the interest and importance of hypothetical inference lies in its being thus ministerial to the inference of fact from fact, we see how subordinate it is to actualistic belief. Evidently, also, the whole doctrine of hypothetical conviction confirms the more primary doctrine of actualistic knowledge and belief, and proves that belief always, in some sense, concerns existence.

We may conclude by calling attention to the fact that the subordination of hypothetical to actualistic inference is manifested in the forms of language in which men express their conditional convictions. These forms mostly show that the mind entertains some actualistic belief which the hypothetical belief is used to illustrate or confirm. The assertion, "If there is smoke, there is fire," generally implies some feeble belief that there actually is smoke, and consequently fire; while the assertion, "If there were smoke, there would be fire," implies the negative conviction that there is no smoke, and consequently no fire. It is principally in the more abstract sciences, and especially in mathematics and metaphysics, that we naturally use pure hypothetical argument. Even in them, however, our reasonings have an ultimate reference to reality.

CHAPTER XVIII.

EVIDENCE.

§ 50. In the strict and primary sense that only is true knowledge or belief which is conviction concerning what is, or what is held to be, actual fact. Whatever other experiences go under these names are so called because of their intimate relation to the exercise, or their partial participation in the nature, of this

primary mode of conviction. Since such secondary mental states presuppose belief as to actuality and that knowledge of fact which all belief strives to be, realities may be considered the first condition of all knowledge and belief whatever; and, for the same reason, the explanation of actualistic belief may be expected to open the way for the understanding of every other kind. We have already seen how the definition of actualistic belief, as confidence in actual existence, enables us to understand the nature of secondary forms of belief and knowledge, and especially the nature of hypothetical confidence; this latter being immediately related to the inferential form of actualistic belief. We have now further to remark that a statement of the *causes* of actualistic belief will enable us to understand the origin of every other form of belief and knowledge. Let us consider the causes of our belief in the actual existence of things: an explanation of the origin and laws of belief naturally follows the doctrine of its general nature, and is an equally important part of philosophy.

The efficient cause of belief is wholly in the mind.

The existence of objects, though a condition of belief, exerts no efficiency in the production of it; nor, indeed, can belief be accounted for by any potency outside of the mind. The *producing* cause lies wholly within, and may be regarded as partly remote and partly immediate. The remote cause lies in the constitution of the soul as having innate and immanent powers of perception and of judgment: the immediate is the action of these powers. The special nature of a power is shown only in its action or operation; and that of the action only in the phenomena—that is the changes and states—immediately produced by it. For this reason, as we have already considered belief as a phenomenon, we have therein considered it also as a specific power and as a specific operation. We need not, therefore, discuss further the efficiency producing belief.

Evidence is the conditional cause of conviction.

But a condition devoid of efficiency is sometimes called a cause, when, not being involved in our conception of a phenomenon, it is regarded as the chief, or only, condition needful for its occurrence. Many other conditions may be as necessary to the event as that thus signaled, but they are regarded as already existing or as already secured, and so as no longer needful to be supplied. Thus the insufficiency of water might be assigned as the cause of the explosion of a boiler, though such insufficiency in itself has no power, and only leaves the way open for the excessive generation of steam. In such cases the efficient cause is supposed already to exist, and to be in readiness to act; the idea of it may be involved in the very conception of the phenomenon; and the thought of the mind is principally directed to that condition, which being supplied, the effect takes place. In this way we come to regard a mere condition as if it exercised the power producing some result, when really it is only the occasion, or,

at the most, the excitant, of the efficiency. Now such generally seems to be our use of language when we speak of the cause or causes of conviction, and when we define *evidence* as that which naturally produces conviction. Blackstone says, "Evidence signifies that which demonstrates, makes clear, or ascertains, the truth of the very fact, or point at issue, either on the one side or on the other." Strictly speaking, evidence has no efficiency and is only the special condition, which being supplied, conviction takes place. This being understood, evidence may be defined as that which is immediately productive of belief.

Proper and improper evidence. Ordinarily, indeed, this term signifies *what will make the truth apparent—in other words, what will produce correct belief*. This is the sense given by Blackstone. Yet we sometimes contrast *sufficient with insufficient evidence, and fictitious, or false, evidence with that which is true and reliable*. All testimony is evidence, but some of it, as evidence, may be utterly worthless, and other testimony may be insufficient to produce any firm belief. In thus speaking of fictitious, insufficient, or worthless evidence, we extend the term so as to include whatever produces belief, whether it be capable of producing correct belief or not. Moreover, so far as we are aware, no other word in our language signifies whatever in general is productive of belief. As insufficient or fictitious evidence is so called because, in some way, it approximates in nature true and proper evidence, and is often taken for true evidence, an understanding of the latter will naturally precede and prepare for an understanding of the former. If we can ascertain first what true and proper evidence may be, we shall be ready to discern and condemn that improper evidence which sometimes usurps the place of the true.

Probable evidence. Presupposes certain evidence. Here, however, we must distinguish *probable evidence* from that which is *improper*. The latter, if thoroughly understood and considered, cannot cause the conviction which it is employed to produce; but the former can. Probable evidence becomes improper only so far as it may be employed to produce a higher degree of confidence than it should produce; then it is insufficient, and therefore improper, with reference to that degree of confidence.

Whatever exists, exists certainly, and may be the object of absolute knowledge, and hence, also, may be perceived through that certain or perfect evidence which is the cause of such knowledge. Evidence becomes probable, not from any difference in the degree of the reality of things—since whatever is real is perfectly real,—but from something lacking in our means of knowing. Now that which is essentially partial or imperfect can be understood only by reference to the complete or perfect; therefore it is clear that we should first study and ascertain the nature of certain evidence, and, after that, the nature of probable evidence.

The right method of the philosophy of evidence.

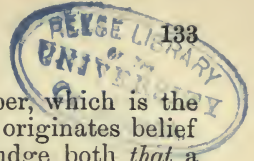
§ 51. If the foregoing observations be correct, the philosophy of the causes of belief should observe the following method. *The evidence of actualistic belief should be first considered, and, in this, we should determine first the nature of certain and then that of probable evidence.* This will prepare us to ascertain exactly the character of *that evidence on which hypothetical belief is founded: after which error, and that fictitious or improper evidence by which it is occasioned, may form a concluding subject of study.*

The word *fact* defined.

The word *fact*, in common language, is often used to signify *the actual existence, or non-existence, of anything considered as assertible of that thing.* "*Factum*" originally meant "that which has been done, or made;" but, as an accomplished result is a real thing, which it is not so long as it is merely purposed or contemplated, and since the question, "Has the thing been effected?" chiefly asks, "Does it, as a result, exist?" the term *fact* came to be applied to *that which has an actual existence*, whether it be the product of some agency or not. We say, it is a *fact* that there is a moon, and another fact that there are mountains in the moon; and in this set forth simply the existence of the moon, and of the mountains in it. The essential point in every fact—that which makes it a fact—is the existence, and not the nature, of the object, although of course no object could exist without having a definite nature. Whenever anything exists, its existence is a fact, no matter what the thing may be. In like manner, when anything does not exist, we extend the term and call the non-existence of it a fact. In short, this word signifies that which corresponds to, and is the object of, any proposition which is literally true. It may therefore be employed to designate the object of literal knowledge, that is, of certain and well-founded belief as to the actual existence of things.

The evidence of fact is of two kinds. Perception and cognition defined.

Now this knowledge—this absolute and correct actualistic belief, the knowledge of literal fact—*seems to arise from the connection of the soul, as a thinking substance, with the fact; and this connection is either immediate or mediate.* In the former case, the fact is either included in the life of the soul, or, if we may so speak, exists in contact with that life. In the latter case, the fact is perceived, not directly, but through the knowledge of another fact with which it is necessarily co-existent. These two modes of knowing may be distinguished as presentational and as inferential perception. Both are forms of judgment, when this latter term is used in the widest sense, covering every mode of forming convictions, and not in its stricter meaning which includes only probable inference. Perception, in the broad signification now employed, is precisely the equivalent of cognition: so that, in actualistic belief, there are two kinds of judgments; first, perception or cognition, by which we perceive or cognize fact, either in itself or through other fact, and thus



have knowledge; and, secondly, judgment proper, which is the probable inference of fact from fact, and which originates belief proper, or probable conviction. For, as we judge both *that* a thing is and *what* a thing is; so we perceive or cognize both that a thing is and what a thing is (Chaps. XVI. and XVII.).

§ 52. Let us now first compare and characterize the kinds of evidence employed, severally, in presentational and in inferential perception (or cognition); and after that we may give each kind a separate consideration.

In doing so, we omit from present, and reserve for future thought, the action of memory; which seems to be a power of reproducing, without evidence, presentational convictions.

The evidence, in any case of presentational perception, *is simply the fact itself*, considered of course as immediately subject to the cognizance of the thinking being. Hence we say that the fact is self-evident. If one has a thought, or a pain, or a desire, what evidence has he of its existence save that it exists within the sphere of his immediate consciousness and notice? The fact as thus related is its own evidence; nor can we conceive of any other cause of immediate knowledge than the fact itself as immediately related to our power of cognition.

On the other hand, the evidence in inferential perception is not the fact perceived, but *some other fact, or facts, with which it is necessarily co-existent*. Seeing a bird flying over a grove suddenly collapse and fall immediately upon the report of a fowling-piece, we perceive that some unseen sportsman is successfully practicing his art. Comparing these two kinds of evidence together, we may name the first presentative, because, in a sense, it presents the existing object immediately to our perception. Intuitional might be a better term, had not intuitions of late come to mean, not immediate perceptions in general, but only the immediate perception of necessitudinal, or ontological, objects and facts, to the exclusion of the "contingent" (§ 225). And the second kind of evidence may be named illative, because, in a sense, it brings the existence of an object, not immediately cognizable, within the compass of our perception. This radical distinction, which refers to the use or the non-use of means in cognition, is allied to, and co-incident with, two other distinctions. First, with reference to the exercise of thought, presentative evidence may be called originative, because our conceptions of the things perceived originate in the very perception of them; while illative evidence might be termed ratiocinative, since it only determines, according to certain rational methods, whether conceptions or propositions which have been recalled to, or constructed by, the mind, out of its acquired stores, correspond to fact or not. If one has toothache, the idea of that pain is given in the very perception of it, whether it be a first or a subsequent perception; but, when, without examina-

Presentative and illative evidence compared. Originative and ratiocinative. Primordial and logical.

tion of the tooth, we infer that *there is a decayed nerve from which the aching proceeds*, the conceptions of this inference must have been derived from a previous examination of aching teeth. Secondly, with reference to the ultimate source and ground of our belief, presentative evidence may be termed primordial, because it is the primary fountain of our convictions; while illative evidence may be called logical, because it consists either in primordial convictions so used as to derive other convictions from them, or in convictions derived from primordial and which become, in their turn, the source of new convictions. To explain the conditions and modes of this derivative conviction is the chief office of logic. Thus to evidence that *a certain cupful of black powder is explosive*, let us suppose that one is able to say from his own observation that gunpowder will explode, and that this powder in hand is gunpowder. The presentative evidence of these facts, as realized in sense-perception and its concomitant judgments, would be primordial, because it would be the self-evinced evidence of the evidence that the powder in hand is explosive. But these facts, not as self-evident, but as true and as together supporting the conclusion derived from them, would be logical evidence. Let us take another example. I see money put into a pocket-book, and then see the pocket-book put into a desk, and thus know that *the money is in the desk*. Here we have presentative and primordial evidence as to the relation of the money to the pocket-book, and as to the relation of the pocket-book to the desk; while these two facts together constitute the logical evidence of the relation of the money to the desk. In the above illustrations each of the facts which constitute the logical proof is itself supported by primordial evidence; but, as conclusions deduced from self-evident facts may in turn be used as logical evidence, we see how there may be logical evidence which is not itself immediately supported by primordial. But all evidence, to be of value, must have an ultimate basis in immediate perception. Primordial and logical evidence, therefore, are simply presentative and illative evidence considered as having this relation between them.

Both kinds rational.

Both kinds of evidence, the presentative, originative or primordial, and the illative, ratiocinative or logical, may be said to be *rational*, but for different reasons. The first is so because it is reasonable in us to put confidence in our natural and primary convictions; the second, because it gives a reason for a conviction by connecting it with previously accepted truth. Presentative evidence is rational, because it is reasonable to believe many things without a reason; because certain beliefs, though not the product of the rational faculty, are yet conformable to the conclusions of reason and supported by them. But illative evidence is rational, because the extended and deliberate use of such evidence, and especially the conscious and intentional use of it, is a distinctive work of the reason.

Diversity of views.
Causes of error.

§ 53. The operation of presentative evidence is very simple. There is no process. The object as existing in, or in immediate relation to, the experience of the soul, is immediately perceived—that is, absolutely and correctly judged to exist—either as a part of the experience or as related to it. That which is simple does not call for explanation; but the question arises, “*What facts, or classes of fact, are immediately perceived by us?*” and philosophers have not been agreed in rendering an answer. None save those extreme skeptics who have doubted whether anything is to be believed, have disputed the existence of primordial convictions; but many, apparently, have lost sight of this fact, and all, up to a comparatively recent period, have but obscurely apprehended the nature and characteristics of these convictions. Some, accordingly, have busied themselves attempting to prove statements which are in no need of proof; such, for example, as the existence of matter, of power, of mind, and the reliability of our senses; and, in this way, have misled themselves and others. Their proof being weak, or itself needing proof, doubt has arisen as to the facts which they endeavor to demonstrate, and which, if left alone, are perfectly evident. Those, on the other hand, who have more fully recognized the existence of primary convictions have differed as to the source of them. Some have taught that experience only is the origin of our beliefs; others that we are born with innate and necessary convictions: some that all knowledge originates in particular perceptions; others that self-evident general principles, first perceived as such, are the foundation of all science. There has also been a tendency to accept statements or beliefs as self-evident without sufficient inquiry as to whether they really are so or not.

Two natural mistakes concerning our primary convictions have led to confusion of thought. First, there is *the error that a truth, or fact, capable of proof, may not also be an object of immediate perception*. Sometimes there is a choice between observation and proof; and often the one of these confirms the other. The hunter who tracks the deer for food may see and taste the venison. It is true that generally there is no need of supporting presentative evidence by illative, yet sometimes faint perceptions or failing memory may be confirmed by ratiocinative proof; and certainly we often supplement inference by observation. Neither mode of evidence excludes the other.

In like manner, our perceptions of the necessitudinal relations of existence, which perceptions when generalized form axiomatic principles, though incapable of direct proof, can be supported by showing what absurdities are involved in their denial. For instance, the man who says that there are no such things as causes and effects can be seen to be self-contradictory in his thought and conduct; and this indicates his error.

In the second place, it is a *mistake* to assume that a belief, because self-evident, cannot be shown to be self-evident. Experience

and critical observation enable us to determine *under what conditions our minds form decided and reliable convictions, and what are the marks of such convictions.* The deceptions of diseased sensations or misdirected judgments can be accounted for, and can be distinguished from reliable perceptions. So, also, those intuitions of the necessitudinal elements and relations of existence, which are the radical principles of thought and conviction, have those marks of simplicity, necessity, and universality, which attest their true character (McCosh "On the Intuitions," part i. book ii). Let associationalists argue as they may, all men everywhere believe, and *must* believe, in substance and power, in mind and matter.

Specific views stated and advocated. Psychological life presentatively known. Also the soul, or ego, and its powers.

§ 54. Philosophers concur in teaching that the soul has an immediate knowledge of its own operations and experiences—that *the consciousness of psychical life is presentational*; beyond this there is no general agreement. The following views, however, respecting points of discussion, commend themselves.

In the first place, *we have presentative evidence as to the existence of the powers of the soul and also as to the existence of the ego, or thinking substance, to which these powers belong.* In other words, a man is conscious of his own existence, and of that of his powers, in the same manner that he is conscious of his spiritual activities. The truth is, that action, potency and agent are all perceived at once, and in the one exercise of consciousness. The doctrine that our first knowledge of the faculties of the soul, and of the soul itself, is a kind of inference from the operation of the faculties, this last only being immediately perceived, has originated from the fact that the *ego* and its powers are perceived only on the occasion of the exercise of the powers, and not at any other time; but this shows merely that psychical change is always the excitant, not that it is ever the medium, of the perceptions of consciousness. We might account for the cognition of the *ego* by giving the mind a wonderful ability to conceive something such as it has never perceived, and to conceive also a necessary connection of this something with another something which *is* perceived, and in addition to this, the power to infer the existence of the former something from that of the latter—that is, to infer the agent or his power from the action with which they both necessarily co-exist. This doctrine is not unintelligible; nor can it be condemned as far from the truth. But the more satisfactory view is that the mind forms its conceptions of substance and power in the very act of perceiving these things and from immediate contact with them in their operation, and not that it first imagines them as things not directly known or seen and after that judges them to exist. As will become plainer in the course of this discussion, it is more natural to hold that, originally and ordinarily, we perceive that we have souls and powers operating, than to say that we infer that we must have souls and powers because they operate. We do not deny that

such an inference may be made; for we may infer wherever there is a known and necessary connection; but, in our view, such is not our original, nor even our ordinary, mode of cognition.

For this reason, we find a singular blending of substantial truth with inexact expression in the following passage from Reid's "Inquiry" (chap. ii. sect. vii.). "It is an undeniable fact," he says, "that all mankind constantly and invariably from the first dawning of reflection, do infer a power or faculty of thinking and a permanent being or mind to which that faculty belongs, and that we invariably ascribe all the various kinds of sensation and thought we are conscious of to one individual mind or self. But by what rules of logic we make these inferences, it is impossible to show; nay, it is impossible to show how our sensations and thoughts can give us the very notion and conception either of a mind or of a faculty. . . . What shall we say then? Either those inferences which we draw from our sensations—namely, the existence of a mind and of powers or faculties belonging to it—are prejudices of philosophy or education, mere fictions of the mind, which a wise man should throw off; or they are judgments of nature, not got by comparing ideas and perceiving agreements and disagreements, but immediately inspired by our constitution." Were Reid's language literally correct there would be one form of illative evidence which would be originative of the conceptions used in the conclusions derived from it, and which would thus differ from all other illative evidence, which is simply ratiocinative. There is no sufficient ground for such a doctrine.

Again, we have presentative evidence of the existence of matter and its qualities; that is, *of the matter of our own bodies, and of such other matter as may come into immediate contact with our nervous system.* For it is now agreed that the rest of the universe is known only inferentially. Sir William Hamilton has discussed this point at length. He divides those philosophers who accept the reality of matter into two classes; the one the "Natural Realists," who hold to an immediate perception, "founding their doctrine on the natural consciousness or common sense of men;" and the other the "Hypothetical Realists," who hold to an inferential perception, in which the mind, on the occasion of its sensation, forms conceptions of matter and its qualities, and then believes in the existence of these things because of their necessary connection with sensation as its cause. As the word *natural* is not precise, and as *hypothetical* might suggest the idea of a mere hypothesis held without evidence—an imputation rejected by the class of thinkers named—it might be better to say *presentational and inferential realists*, than *natural and hypothetical*. It should be noticed that the term *realism* here is used in a sense different from that which belongs to it historically, and which concerns, not perceptions, but abstract and general notions

Reid quoted.

ii. sect. vii.).

We have presentative knowledge of our bodies, and of such matter as immediately affects the nerves.

Presentational and inferential realism compared. Points of agreement.

§ 55. Sir Wm. Hamilton may be honored as the founder of presentational realism, this doctrine having been first distinctly elucidated and advocated by him; while Reid and his immediate followers may be regarded as inferential realists. The doctrine of Reid is set forth in the following passage from his "Inquiry" (chap. vi. sect. xxi.). "We know nothing of the machinery by means of which every different impression upon the organ nerves and brain exhibits its corresponding sensation; or of the machinery by means of which each sensation exhibits its corresponding perception. We are inspired with the sensation, and we are inspired with the corresponding perception, by means unknown. And, because the mind passes immediately from the sensation to that conception and belief of the object which we have in perception, in the same manner as it passes from signs to the things signified by them, we have therefore called our sensations *signs of external objects*. . . . Two things are necessary to our knowing things by means of signs. First, *that a real connection between the sign and the thing signified be established* either by the course of nature or by the will and appointment of men. When they are connected by the course of nature, it is a natural sign; when by human appointment, it is an artificial sign. Smoke is a natural sign of fire; certain features are natural signs of anger; but our words are artificial signs of our thoughts and purposes. Another requisite to our knowing things by signs is that *the appearance of the sign to the mind be followed by the conception and belief of the thing signified*. Without this the sign is not understood or interpreted; and therefore is no sign to us, however fit in its own nature for that purpose. Now there are three ways in which the mind passes from the appearance of a natural sign to the conception and belief of the thing signified—by *original principles of our constitution*, by *custom*, and by *reasoning*. Our original perceptions are got in the first of these ways, our acquired perceptions in the second, and all that reason discovers of the course of nature in the third." Thus Reid teaches that original sense-perception is the inference of an external world from sensation as its sign, although an immediate inference and not the result of custom nor of reasoning upon previous knowledge or experience. It is to be remarked that the genius of this philosopher was powerful to seize and to present the truth, rather than to reduce it to an ultimate analysis, and that, really, he maintained, *not inferential as opposed to presentational* perception, but rather the most immediate inference conceivable in opposition to anything less immediate. He might, therefore, have been willing to accept Hamilton's statements as an improvement on his own.

Comparing these two forms of doctrine—presentational and inferential realism—with one another, we find that *they do not materially differ as to the producing cause of our conceptions of matter and its powers*. Both teach that our idea of matter as an ex-

ternal and extended something endowed with certain attributes originates wholly in the mind's own power of thought, and is not at all impressed upon us from without. Neither explains the mystery—the simple ultimate fact—of the origination of thought.

Again, *each doctrine in its own way provides for a belief in the external world.* The inferential realist says, that, on the occasion of a sensation, by a necessity of our mental constitution, we conceive of a certain external cause, acting under certain conditions, as necessarily connected with the sensation, and that the sensation being perceived to exist, we necessarily infer the existence of the cause. To him the sensation is the proof or sign of the cause, and he rejects other evidence as needless. Such a doctrine is not absurd; for illative evidence is possible whenever one thing can be conceived of as necessarily connected with another. But the presentationalist may reply that the two kinds of evidence may, and often do, co-exist, and that to suppose illative evidence to be originative of thought, as it would be in this case, is to suppose what occurs nowhere else and is contrary to analogy. And he may say that it is more philosophical to regard our first perception of the correlatives, matter and sensation, as presentative and originative, and that the inference of body and its attributes from sensations only takes place afterwards and obtains its conceptions from the analysis of presentational knowledge.

Further, *we cannot see that the doctrines in question differ as to that absolute certainty which each provides as belonging to our perception of matter and its powers.* When we are certain of the connection of some consequent with some antecedent, then we may be as sure that the consequent exists as that the antecedent does; this is the confidence of the inferential realist. On the other hand, nothing can be more absolute than the certainty of immediate cognition, which is claimed by the presentationalist.

Finally, *we can scarcely say that one of these theories is more "natural" than the other,* meaning by this that it is more agreeable to the ordinary consciousness of men. Although our perception of the parts of the bodily organism, and of such material agents as may directly affect them, seems immediate, so also does our perception of distant objects, which is confessedly inferential—for example, the sight of a tree or of a house. Indeed, not all one's perceptions respecting his own person are presentative. *Natural,* therefore, no less than *hypothetical,* is a term unduly suggestive.

Points of difference.
Favor presentational realism.

The true point of difference between presentational and inferential realism is that the former makes *the sensation, the sensation itself, the occasion on which the mind perceives, at once and together, the sensation and all the causal and conditional entities immediately connected with it,* such as matter and its powers, and their action, and the time and place of their operation—the conception of these

things being, of course, included in their perception; whereas inferential realism *makes the sensation the occasion only of the perception of the sensation, and then makes this perception the occasion of the conception and of the inference of the other entities.*

Of these two theories, the former, presentational realism, is the preferable. In the first place, *it is the simpler.* It makes but one mode of originative perception, the presentative, and so also makes all illative perception purely ratiocinative; that is, presentational perception, alone, originates the conceptions of the objects perceived, and illative perception makes use of conceptions previously acquired and possessed and in some way suggested or recalled. But inferential realism makes two modes of originative perception, the one presentative and the other illative, and so also two modes of illative perception, the originative and the ratiocinative.

In the next place, *the actual presence of the soul at and throughout the place of a bodily feeling,* which presence is now generally conceded as an immediate cognition,—that is, the object of an immediate cognition—*furnishes the only condition of the immediate perception of matter and its operation which seems necessary to be supplied.* The sensation, though within the spirit, may be regarded as occupying the place where the soul and the animal organism as affecting it meet each other—the place of contact between the *ego* and the *non-ego* in any sensation. If this be so, may not the spirit, in the place of the feeling, immediately, and in the same one act, perceive both the sensation, and itself, the subject of the sensation, and the extended organism, the cause of it? Moreover, as to the place, the time, and the various intimate relations, of the things perceived, it is as easy to regard them as immediately known, that is, at once conceived of and believed in, as to suppose them first conceived of in connection with the thought of the sensation and its causes, and thereupon inferred to exist because of the existence of these correlatives.

Finally, the doctrine of inferential-realism *is somewhat connected with erroneous views, the rejection of which leaves it without any strong support.* The idea that spirit is so related to space that it cannot pervade the body has just been noticed as an exploded theory. Again, it is no longer taught that the human intellect is capable of only one thought at once; on the contrary, the mind is allowed considerable compass of conception. We may regard the perception of matter and its powers, and of the conditions of its existence and operation, not to follow, but to accompany that of sensation. Moreover, the equally mistaken view that *phenomena, because separately conceivable, have an existence separable from that of their subjects, and can be perceived separately,* is merely a philosophical fiction. The fact is, in original perception we perceive, not the feeling merely, but the *ego* as having it, not sensible affections and changes merely, but matter as having them, never time and space alone, but things and events as existing in them and conditioned upon them. Our subsequent and independent

conceptions of these things are simply the abstractions of mental analysis. Such being the case, we may reasonably hold that things which exist together, and all of which equally are immediately related to the mind, may all be perceived immediately and in the same mental movement.

Certain relations and *relata* of the *ego* and of the *non-ego* are presentatively perceived.

§ 56. Ordinary language, in its primary use, speaks only of material things, with their qualities and changes, as the objects of sense-perception; that is, only such things are said to be seen, heard, touched, tasted, and so on. In like manner, only our souls and their powers and operations are mentioned as the objects of internal-perception, or consciousness. The reason is that language is founded on an analysis, and is not designed or fitted to express at once all of a complex of phenomena, but only that portion which may be important to notice. Very often we desire to know whether or not some object has been perceived, and we have no need, or no desire, to ask, "Where or when has it been perceived?" Indeed, the perception of the object and the perception of its time and place, though closely connected facts, are distinct in their nature and in their logical relations. For these reasons language separates the perception of the thing from that of its time and place and relations. It is not strictly literal, therefore, to say, as some do, that place and distance, size and number are perceived by the *senses*, or to say, with others, that we are *conscious* of time and succession, of sameness and difference, and so forth. On this account, and because *such cognitions as those of time and place, of quantity and number, and of collocation, succession, and other relations, accompany sense-perception and consciousness alike and pertain to the objects of both*, we have proposed a third class of presentational cognitions. And this (Chap. V.) we have named Concomitant Perception, because it accompanies the perception of the *ego* and of the *non-ego*. For these and their powers and operations are never cognized *per se*, or alone, but always as diverse from each other, as influencing each other, as having number and quantity, and as existing and operating in time and space, and as otherwise related. Granting the presentational perception of the *ego* and of the *non-ego*, and of their potencies and actings, it is difficult to deny that of the space and time in which they exist and that of their immediate relations to these things and to each other. There seems to be no difference between our cognition of the concomitant and our cognition of the principal objects save only that we regard the latter with a more direct and a more interested attention.

We have now exhaustively described the objects of presentational perception. They include *not merely psychological changes and such material changes as take place in immediate connection with them, but also spirit and matter with their powers and operations, together with time, space, quantity, and relation as the objects of concomitant perception*. Thus, we believe, there is no kind of entity which is not immediately perceived.

This whole doctrine is more comprehensive than that of presentational realism—which relates only to the perception of matter,—and therefore it may be designated by the unrestricted term, *presentationalism*, while the opposite theory, which is more comprehensive than inferential realism, may be styled *inferentialism*.

§ 57. A pernicious heresy, which is opposed to both these doctrines, since, to a great extent, it denies the reality of our perceptions, may here be noticed.

Kantianism. It has been named from its author—Kantianism. Immanuel Kant was born in 1724 in Königsberg in Eastern Prussia, and died there in 1804, eight years after Reid died in Glasgow. His father, a saddler, was of Scotch descent. During forty years Kant was an eminent teacher in the university of his native city, and, for a much longer period, his ideas controlled the speculation of Germany. Dissatisfied with the teaching of Descartes and Leibnitz, who placed the ultimate ground of human belief in a certain inward clearness of conception, Kant devised a new theory. According to him perception results from two factors, *sensibility* and *reason*. By the first of these the soul comes into contact with things; by the second its knowledge is given form, without which it would not be knowledge, but mere sensibility. This knowledge—this result of the combination of sensibility with reason, he calls experience. The forms with which reason clothes our diverse feelings not only originate within, but, so far as we can judge, represent nothing without; for they neither resemble external things nor have they any direct connection with them, but only with our sensibility. Hence, space, time, substance, quantity, power, action, and even relation, are mere ideas of the mind. In his "Transcendental Æsthetic" (2d ed. p. 59), Kant sums up his philosophy of perception as follows: "The things which we perceive are not what we take them to be, nor their relations of such intrinsic nature as they appear to us to be. If we make abstraction of ourselves as knowing subjects, or even only of the subjective constitution of our senses generally, all the qualities, all the relations, of objects in space and time, yes, and even space and time themselves, disappear. As phenomena they cannot exist really *per se*, but only in us. What may be the character of things in themselves and wholly separated from our receptive sensibility, remains wholly unknown to us." Thus Kant allows that there are "things in themselves," but declares that our knowledge of what they are is wholly illusory.

Inconsistent. In regard to this famous theory, we remark, first, that *it is inconsistent in maintaining the existence of "the thing in itself," that is, of a reality external to us and existing apart from our experience.* Since this thing is different from the modification of our sensibility, our conception of it, however indefinite, is no part of our experience, but must, like time, space, and relation, be a gift of "reason." If, then, we have no ground to believe in the existence of such entities as space, time, and relation, of which reason gives us the ideas, what ground have

we to believe in any "*thing in itself*," beyond and distinguishable from our experience? Fichté, the founder of German idealism, seeing this, threw away "the thing in itself" and maintained only the existence of the *ego* and its activity. Indeed Kantianism logically led to the abolition also of the *ego*, as a substantial entity, and to that extreme idealism of Hegel which left nothing external or internal, save the modification and development of thought.

One-sided. Again, we remark that the doctrine of Kant is *founded on a partial apprehension of truth and a partial acceptance of evidence*. It asserts truly that thought originates within, and belongs wholly to the mind, and that all real knowledge begins in connection with experience. But it is woefully mistaken in not finding that *our necessitudinal or ontological conceptions exist first of all as elements of the presentational perception of fact*, and in *disallowing the validity of our primordial knowledge*; these two mistakes being closely related. Presentative knowledge is revealed by consciousness, so that we have the same evidence for the fact of this knowledge that we have for the fact of thought. We know that we know in the same way that we know that we think. Why accept the latter fact and reject the former? Certainly, unless there be good reason to invalidate the absolute natural confidence of our cognitions, it must stand. Nay, it will stand, whatever reasons may be brought against it, and however cogent they may appear. No argument can convince a man that he has no body, and that he does not exist in space and during time. The immediate knowledge of present facts cannot be reasoned away; one might as easily reason away the facts themselves. Such being the case, idealists and nihilists have cause to question with themselves whether there be not something sophistical or misleading in their methods of thought. But in truth, and as we might expect, critical inquiry shows that there is not one sound reason for doubting our primordial perceptions, but, on the contrary, many confirmations of them. Especially it is true that they are all absolutely consistent with each other and with all derivative convictions; that they exist alike in all men and never deceive any; and that inconsistency and falsehood are to be found only in the region of mistaken inference.

The offspring of error. Once more we observe that *Kantianism finds its chief support in various errors, more or less plausible, from which philosophy has freed herself in recent times*. The Cartesians taught that *mind is unextended and can have no direct connection with matter*; according to this doctrine the presentational perception of matter and of its sense-affecting powers is inconceivable. Again, it was generally assumed that any adequate idea of a thing *must be an image or impression derived from the object in some way and similar to it*; this doctrine restricted perception to a sense or knowledge of what can affect our sensibility, excluding such things as space, time, and relation. In the

next place, philosophers, from Plato down, gave the intellect a *power of immediately forming general notions to be afterwards combined with each other and applied to individual objects*; and this doctrine underlies Kant's conception of "the pure reason." It is clear that the products of such a power, if there were one, might be more easily doubted than those of presentational perception; in which first, as it is now taught, the ideas of reason are embodied, and from which they are subsequently generalized. Further, the assumption that *sensation or feeling gives or constitutes the knowledge of itself while other objects do not furnish ideas of themselves*, is at the base of Kantianism. So far as we can see, the thought of the sensation, equally with that of the other things perceived, though originating on the occasion of the sensation, springs directly and solely from the soul's own power of cognition (Chap. IX.).

It was also an error to hold, as Kant did, that *because the "contingent," the mere matter of fact, is perceived only presentatively, or as connected with presentations, we may not also perceive the necessitudinal or ontological in the same way*. The natural inference from this is, that, since presentation, and inference from presentation, are the only modes of perception, the ontological elements of entity are not really perceived at all. This error, with its inference, is embodied in Kant's opposition of "empirical or *à posteriori* cognitions," as conditioned on experience, with "*pure or à priori* cognitions, which take place independently of all experience whatever." The fact is, as will be seen more fully hereafter, the contingent and the necessitudinal are cognized in the same way, on the same evidence, at the same time, and as existing in inseparable combination. Only afterwards, and by means of abstraction, the ontological is thought of apart from the various modes of the contingent.

Finally, it is not true, as the old doctrine of "ideas" implied, that *our primordial cognitions deal with representations, or appearances, of things, and not with the things themselves*. The positive part of this error is really inconsistent both with the doctrine of Descartes and with that of Kant; but the negative part is not. Neither the "Preordained Harmony" (Chap. VII.) of the Cartesians, nor the "Pure Reason" of Kant, makes "the thing in itself," *i. e.*, the external thing as having independent existence, the object of immediate cognition. Hence the doubt arose, "Is it the object of cognition at all?" Presentationalism, on the other hand, analyzing the idea of immediate knowledge given us by consciousness, and testing the truth of it in every possible way, affirms that so far as we truly know, we know the thing in itself—that the perceptive operation of the mind correctly apprehends the thing about which it is conversant, the thing itself, as it is, and not some delusion.

In conclusion, we may add that Kantianism is still a noticeable source of error in metaphysical and logical works. The infection of it has entered into English thought chiefly through

the writings of Sir Wm. Hamilton and his followers, and is to be felt in the perusal of their discussions. For—strange as it may appear—the great “Natural Realist” was so far misled by the systematized assumptions and subtleties of the Königsberg professor, that he denied the true validity of human cognitions, and taught that our “*relative knowledge*” is really “*absolute ignorance*.” In short, he attempted to destroy the only important addition which he had made to the doctrine of mind. In philosophy, as in religion, let us guard against “cunningly devised fables.”

CHAPTER XIX.

ILLATIVE EVIDENCE.

§ 58. Evidence is more frequently mentioned in connection with inferential than in connection with presentational knowledge. Sometimes, when recognizing a fact as self-evident, we even say it does not need any evidence, and mean by this that it has no need of illative evidence. Thus one kind of evidence has a pre-eminence over the other. The reason seems to be that the questioning of the mind seldom rests on the act of immediate perception, as this generally produces certainty, but is often necessarily concerned with inference. Both kinds of evidence, however, should be the objects of philosophic study.

Illative more prominent than presentative evidence.

In philosophy evidence must include all truths necessary in order to a conclusion.

Again, in cases of inferential conviction, we often characterize that only as evidence which is *the final and determining condition of belief, and which, therefore, alone needs to be submitted in order to produce conviction*. Thus we might say, “The only evidence of fire in that house is that smoke issues from the chimney.” In short, the word *evidence*, having a practical reference, commonly stands only for those facts or truths necessary to be employed for conviction. But if, in addition to the foregoing, we felt called upon to submit the general truth that *smoke necessarily and in all cases comes from fire*, this also would be styled evidence. In order to show a jury ignorant of the nature of strychnine, that a man was poisoned by this drug, the evidence would be needed, *first*, that strychnine is a poison, and *secondly*, that this poison was in some way partaken of by the man. In the searching and comprehensive inquiries of philosophy we ask for *all* the conditions of conviction; therefore we must now include under evidence all the facts or truths necessary to some conclusion, whether in practical life they all need to be mentioned or not.

When we speak of the *ground or grounds* of a belief—the plural word indicating either more proofs than one, or the existence of parts in one proof—we mean very nearly the same as the evidence productive of the belief.

“Grounds of belief” defined.
“Proof.”

The difference between the terms seems to be that evidence is confined to the conditions of actualistic belief; we speak of the grounds, but not of the evidence, of a purely hypothetical conviction. The suppositions which constitute the ground of a hypothetical belief, though merely thoughts without objects (Chap. XIII.) exactly correspond to the facts which are the evidence of a similar actualistic conviction. The *proof* of a truth or proposition is simply the evidence which makes it apparent, or the ground for our belief in it, considered as intentionally used to effect its proper end.

The term *evidence* is used both objectively and subjectively.

We have already, seen that, in cases of presentation, the thing itself, as in immediate relation to the perceptive power, is generally mentioned as being self-evident, in other words, as its own evidence. But it is to be noted that we also speak of the evidence of consciousness, of sense, of sight, of hearing, and so on; and this way of speaking brings to view the real productive cause of conviction. So, likewise, in inference, we sometimes mean by evidence *the facts which, as viewed by the mind, sustain some conviction*, and, at other times, *the propositional truths which set forth the facts*. Thus the term is applied both objectively and subjectively. Each sense implies the other; neither can be condemned as incorrect. In actualistic inference the facts themselves, as distinguished from the propositions setting them forth, may literally be spoken of as evidence. This, of course, is not the case in that inference which is based merely on supposition. In all cases, however, the mind in some sense thinks of things (Chap. XIV.), and infers by reference to the nature of things; nor can the laws of inference be formulated save in terms expressive of objectual relations. In short, propositional evidence is such only because of its actual or supposable correspondence with fact. Therefore, if we study the facts as evidence we shall understand the propositions also. And this, too, will reveal the nature of the grounds of hypothetical conviction, as these are simply *supposed facts*.

Inference originates constructions of thought, and their attendant conviction.

The relation of presentative to illative evidence, and that also of presentational to inferential perception, has been given in characterizing *the one as origination of thought and as the primordial source of conviction; while the other is merely ratiocinative and deductive*. In saying that there is no origination of thought in inference, we mean that *no new element is added to the material of thought, and not that no new construction of thought takes place*. Let one weigh a bagful of feathers in a scale, and, after taking them away, let him balance the scale again by supplying lead instead of feathers. We now know the double fact that the feathers are of a given weight, and that the lead, also, is of that weight. From this we conclude that the feathers and lead are equal to each other in weight. In general terms we say, "A and B are each equal to C, and therefore they are equal to one

another." Now this equality of A to B—of the feather weight to the lead weight, may have been thought of for the first time in connection with the inference, and may differ from any construction of thought ever presentationally received. Nevertheless, as we believe, the various component ideas—of feathers, lead, weight, equality, co-existence, necessity—which constitute the new construction of thought, have been previously entertained and were originally presentations. Indeed, without this power of forming new constructions, neither imagination nor reasoning would be possible; and all mental action, after our first perceptions, would be restricted to memory and its modifications. Moreover, in calling presentational perception *primordial*, we mean, *not that it furnishes the force of the conviction attending inference, but only that it is the necessary antecedent and condition of inferential conviction.* Presentational cognition is the foundation and support of all knowledge, and in this way the beginning of all certainty. Yet the conviction, consequent upon illative evidence, like the new construction of thought which it accompanies, is something new and is not derived from the force of the presentative evidence. As a bridge resting on piers has a strength of its own not derived from the piers, so an inferential conviction while resting on facts has a strength of its own not derived from the facts. This, indeed, is the sole strength belonging to *hypothetical* knowledge; which may therefore be compared to a movable bridge, not in actual service, but ready to rest on piers so soon as they may be found in the proper place. But, as the strength of the bridge when resting on its piers is the medium through which the strength of these supports is felt, and completely unites its action with theirs, so the force of logical evidence completely unites itself with that of primordial evidence whenever an inference is fairly founded on perceived facts.

§ 59. We are now prepared for a question, concerning which there has been much discussion and much diversity of view; viz., what is the radical mode or law of thought belonging to all inference? or, more specifically, *what is the generic form of that construction of thought in which the mind makes use of illative evidence?* If the nature of belief and judgment, and the distinction between presentational and inferential perception (Chaps. XV., XVI., and XVIII.) be as already described, then the form of inference always is, "*This exists; therefore that exists.*" We think of one entity or complex of entities, called the reason or antecedent, as existing; and of another entity or complex of entities, called the consequent, as existing also; and of a necessity attached to the existence of the antecedent for the existence of the consequent. This necessity is expressed by *therefore*, and other words of similar meaning. Such is the construction of thought in all inference; the confidence of belief or knowledge, which takes place in connection with this form of thought, follows upon the belief exercised in

The radical law of all inference.

connection with the conception of the antecedent, and attaches itself to the thought of the necessity of co-existence and to that of the consequent as necessarily co-existent.

The law—or fixed mode—of mental action, which the mind obeys in constructing the foregoing form of thought and accompanying it with new belief, has been styled *the principle or law of reason and consequent*. Of these expressions, the term *law* is less ambiguous than *principle*, to indicate the essential and universal mode of mental action in all inference. The term *principle* might signify a general truth known to the mind and applied by it in its reasonings; but we now speak of a form of mental action in which, or according to which,—not from which,—the mind reasons. The law of reason and consequent is the universal principle of inference somewhat in the same way that the law of gravitation may be said to be a principle—that is, a radical mode—of the action of matter. It is the fundamental law according to which the power of reasoning acts. It is true that every principle—or law—of action may yield a principle of knowledge. That which, in itself, is merely a law of action, when apprehended by the mind, becomes a general truth from which we may reason variously as to the operation of the law. From the law of gravitation as mentally apprehended, we can reason that any particular piece of matter will gravitate: so from the law of reason and consequent we can infer that any particular case of inference is from a reason to a consequent—from the existence of a determining condition to that of the entity conditioned. But the law as apprehended—or the conception of the law—*is to be distinguished from the law itself*. The former may be a ground of deduction; but not the latter. The law of reason and consequent is the mode of the mind's action in forming an inference; but *in itself* it is not the ground of any inference—not even of such inferences as follow from our knowledge of it.

This law, *as mentally apprehended*,—as a general truth setting forth the radical nature of reasoning,—so far from being an universal ground of inference, is a ground of inference *only when we may be reasoning about reasoning, and not when we may be reasoning about other things*. In such cases, our ratiocinative use of it only exemplifies the operation of one or other of those specific principles which govern reasoning from general truths. We may reason thus: “*All inference is from an antecedent to a consequent; from smoke we infer fire; therefore, here is an antecedent and a consequent.*” In this case, the law of reason and consequent, as a general truth, forms part—only part—of the reason which the two premises compose: the principle or law underlying the argument is, “*What belongs to anything in the general, must belong to it in any individual instance.*” But this law itself is only a specific example of the generic law of reason and consequent.

Consciousness of the process of inference does not involve deduction from the law of reason and consequent.

It is true that, in every inference, we not only think—but think *consciously*, of one entity, or complex of entities, as existing, and of another as necessarily co-existent with it, and so deduce the existence of the latter from that of the former. In other words, while inferring, we more or less distinctly understand what we are doing. But we can give no reason why the one entity is a reason and the other a consequent, or why we should thus form an inference. So that we do not reason from one thing to another because we perceive them to be reason and consequent, but we perceive things to be reason and consequent because we can reason from the one to the other. In short, the law of reason and consequent as a *principle of knowledge*—the statement that “every inference has an antecedent and a necessary consequent” helps to test what professes to be an inference, and to analyze what is known to be such; but it never reveals whether or not a case of consequence may exist, or what consequent, in any case, should follow a given antecedent. On the other hand, the law of reason and consequent *in itself* is the radical mode of action experienced in every operation of the reasoning power. The fact—whatever it may be—which constitutes the antecedent, *suggests* the fact related to it as consequent, and thereupon we infer, *not from the law of reason and consequent, but from a reason to a consequent, and according to the law of reason and consequent.*

In speaking of reason and consequent, it is to be understood that every reason is specially fitted by its nature to be a reason for its consequent, and, conversely, that every consequent is similarly fitted to be a consequent of its reason. It would be absurd to say that any reason may serve for any consequent. To suppose this—that we could infer anything from anything—would be to destroy our conception of reasoning. Hence the law of inference has been characterized, sometimes, as the “*law of sufficient reason.*” Possibly it might be better named the “*law of adequate reason,*” meaning a reason fitted by its nature to involve the existence of the consequent in its own existence. As already suggested, this is really part of our conception of a reason; for every true reason is an adequate one. But the expression brings the fact to view that the law contains two elements; *first*, that the existence of the consequent is necessarily connected with that of the antecedent, and *secondly*, that this necessary connection arises out of the special natures and natural relations of antecedent and consequent. Thus the reason, “James is the father of William, who is the father of John,” has the consequent, “James is the grandfather of John.” Why? Because the double antecedent-fact and the single consequent-fact are of such a nature, and are so related by reason of their nature, that the former cannot exist without the latter.

Every true reason is a sufficient or adequate reason.

The law of reason
and consequent
more fully stated.

So far, for the sake of simplicity of statement, we have spoken of the law of inference as if it always proceeded from one existing entity to another entity necessarily co-existent. But it is to be noticed that inferential, no less than presentative judgment and belief, consider the non-existent as well as the existent, and that *we infer, not only from the existent to the existent, but also from the existent to the non-existent, and from the non-existent to the existent and to the non-existent.* By the non-existent, of course, we mean non-existence in a case where something might be supposed to exist. In short, there are both positive and negative inferences; and either may follow from either positive or negative facts. "There is no fuel, and therefore no smoke."—"There is no food in the land; therefore there is disease and death," are examples of inference from non-existence. "The rock formation is granite, and does not contain coal," is an inference from existence to non-existence. The explanation of these forms of inference lies in the fact that there may be negative, as well as positive, conditions of a necessity, and negative, as well as positive, consequents of a necessity. Such being the case, a complete statement of the law of inference should refer to more cases than that in which both antecedent and consequent are positive. The whole truth might be expressed in the proposition that *inference always proceeds from a given fact, positive or negative, to another fact, positive or negative, necessarily connected with the given fact.*

A difficulty stated.
The conversion of
inferences.

§ 60. A satisfactory understanding of the doctrine of inference calls for the discussion of another point. This pertains to a difficulty connected with the logical rule, "*Affirm the reason, and you affirm the consequent; deny the consequent, and you deny the reason: but affirm the consequent, and you do not affirm the reason; or deny the reason, and you do not deny the consequent.*" This rule, as it stands, applies only to such inferences as have positive antecedents and consequents, for we cannot properly be said to affirm a negative statement. Strictly speaking, it would be more correct to say, "Assert the reason, and you assert the consequent; deny (or contradict) the consequent, and you deny (or contradict) the reason: but assert the consequent, and you do not assert the reason, and deny the reason and you do not contradict the consequent." This rule may be illustrated from the example, "There is no fuel, and therefore no smoke." Plainly, if we assert that *there is no fuel*, we may assert that *there is no smoke*, and if we deny that *there is no smoke* (saying there is smoke), we may deny that *there is no fuel* (saying there is fuel). But, if we assert that *there is no smoke*, we cannot assert that *there is no fuel*; for there may be fuel which is not smoking; and, for this same reason also, if we deny that *there is no fuel* (saying there is fuel), we cannot deny that *there is no smoke* (saying there is smoke). In either case there may be fuel which does not produce smoke. In this example, antecedent and consequent are both negative; an inference with posi-

tive parts, such as "Caius is a man; therefore he is mortal," would furnish less complex illustrations.

The perplexity, however, to which we have referred, pertains, not to the form, but to the origin and ground, of the rule which has now been stated. As regards the first half of the rule, the clause, "*assert the reason, and assert the consequent*" is simply the immediate practical application of the law of reason and consequent. We also easily approve the direction, "*deny the consequent, and deny the reason,*" for the necessitating condition of anything cannot exist if the thing necessitated do not exist. To suppose the contrary, would be to suppose a contradiction, namely, a necessity for the existence of an entity which does not exist. The difficulty, therefore, is confined to the two clauses which make up the latter half of the rule; for, since the reason is the necessitating antecedent of the consequent, it may be asked, "How can the consequent exist, if the reason do not?" and also, "How can the reason be non-existent, if the consequent be a fact?" Can the thing conditioned exist while the conditions are (or have been) without existence? Or can the conditions be non-existent, while the thing conditioned may exist? Beyond question any entity and any condition necessitating its existence are so related that they must both exist together or must both together be non-existent; so that the existence or non-existence of either determines the existence or non-existence of the other.

The difficulty explained. Separable and inseparable antecedents. Conditions.

This is the difficulty. The explanation is to be found in a *distinction between the true and exact logical conditions (or determinants) of the existence of an entity and those conditions under some envelopment.* A

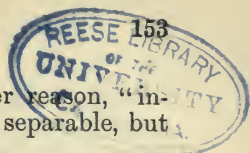
logical condition is any fact considered exactly or precisely so far forth as it necessitates (or determines) the reality of another fact, and no farther. *Such a condition and its consequent are inseparably connected with each other;* so that if either exist, the other must exist, and, if either be non-existent, the other must be non-existent. For example, among plane figures bounded by straight lines, we may reason thus as to a parallelogram, that, if any figure has four sides and the opposite sides equal to each other, it must be a parallelogram, and, conversely, if it be a parallelogram, it must have four sides and the opposite sides equal to each other. So, also, if any figure does *not* have four sides and the opposite sides equal, it cannot be a parallelogram, and if it be not a parallelogram, it cannot have four sides, and so forth. Or, to take another case, if a plane figure have four sides, and the opposite angles equal to each other, it is a parallelogram; and, if it be a parallelogram, it must have four sides and the opposite angles equal to each other. Also, if the figure do *not* have four sides and the opposite angles equal, it cannot be a parallelogram, and if it be not a parallelogram, it cannot have four sides and the opposite angles equal. From these illustrations it is evident that the same fact may be a logical condition

of several facts, and also that several facts may be logical conditions of the same one fact. For *the existence of a parallelogram* has been given as the condition first of one consequent and then of another, and *each of these consequents*, in its turn, was used as the logical condition of the existence of a parallelogram. It may also be noticed, in this connection, that there are conditions which are not logical, but causal, or constitutive, or concomitant. Straight sides are a constitutive condition of an ordinary parallelogram, and so is the equality of the opposite sides, and the number of the sides, four; but *all of these together* are needed to compose a logical condition. For a figure either might have straight sides, or it might have the opposite sides equal to each other, or even both these things might be, and yet the figure need not be a parallelogram, but might be something else, say a regular hexagon. A logical condition always is a fact which of itself necessitates or determines another fact.

Now when an antecedent consists exclusively of a logical condition, or of more logical conditions than one, the inference is thoroughly convertible—that is, either reason or consequent being asserted or contradicted, the other likewise may be asserted or contradicted. We can not only say (according to the common rule), "It is day, and therefore the sun has risen," and "The sun has not risen, and therefore it is not day," but also, "It is not day, and therefore the sun has not risen," and "The sun has risen, and therefore it is day." Because, in this case, the *risen sun* is an exact and inseparable antecedent of *day*, and *day*, also, speaking logically, is an exact and inseparable antecedent of the *risen sun*. Generally, however, a reason is not composed exclusively of a logical condition, or of logical conditions, but *consists of these in combination with other elements*. Hence there may be as many reasons or antecedents for a fact as there may be combinations of logical conditions with elements that are not such conditions. Hence, too, though one or more reasons for a consequent may not exist, other reasons may, and logical conditions in them; and, such being the case, it is plain that a consequent may exist, though some particular antecedent do not; and, conversely, that a particular antecedent may be non-existent, while yet the consequent which would accompany it is a fact.

We therefore distinguish between an exact and inseparable antecedent and a full or separable antecedent, the former being identical with a logical condition, or aggregate of conditions, but the latter including more.

Let us take the inference, "The man has inherited the farm; therefore it is legally his." The antecedent here contains more than a logical condition; for, although it is a logical condition of ownership that one should have received a title in some way, it is not necessary that this should be by inheritance. It might be by purchase or gift. But should we say, "The man has obtained a good title, and therefore he is owner of the land," we would employ that exact antecedent which, with an accidental



or non-essential envelopment, constitutes the fuller reason, "inheritance." Commonly, antecedents are full and separable, but sometimes they are not.

§ 61. The topic now discussed *itself affords a good illustration of an inseparable antecedent.* For we can both say, "Whenever there is (or there is not) an exact and inseparable reason, there is (or there is not) a thoroughly convertible inference;" and, conversely, "Wherever there is (or there is not) a thoroughly convertible inference, there is (or there is not) an exact and inseparable antecedent." Statements similarly convertible occur in every science, but most frequently in mathematics. Relations of quantity and those of space and time, are so different from those of causation, that they can easily be abstracted from them; and they are less involved with, or superinduced upon, each other in a fixed union. Hence we not only perceive mathematical antecedents with a peculiar distinctness, but we also more frequently meet among them those exact antecedents which give thoroughly convertible inferences. In arithmetic, which is the science of pure quantity, that necessary connection of two equivalent but different or opposite processes, by which calculations are often *proved*, is perceived by such an inference. For example, we not only can say that, "Since $11 \times 12 = 132$, therefore $132 \div 12 = 11$," but also, "Since $132 \div 12 = 11$, therefore $11 \times 12 = 132$." And each of these positive inferences may have a corresponding negative one; thus, "Since 11×12 does not equal 133, therefore $133 \div 12$ does not equal 11"; and the converse. Hence we prove either multiplication by division, or division by multiplication, and deal in the same way with other processes similarly related.

Many, though not all, of the propositions of geometry are thoroughly convertible, or may be made so. We can say, "If the triangle be right-angled, the sum of the squares of the sides is equal to the square of the hypotenuse," and "If the sum of the squares of the sides equal the square of the hypotenuse the triangle is right-angled." The corresponding negative inferences are also true, beginning with, "If the triangle be not right-angled," and "If the sum of the squares of the sides be not equal." So we can assert the positive propositions, "Two equal chords are equally distant from the center of the circle," and "Two chords equally distant from the center are equal," together with the negative propositions, "Two unequal chords are unequally distant from the center," and "Two chords unequally distant from the center are unequal."

Propositions which at first are not convertible may be made so by adding to the consequent such and so many elements as may be needed to make it a consequent of the antecedent as an exact logical condition. Sometimes this is easily done; at other times with difficulty. The proposition, "The line which bisects the vertical angle of a triangle divides the base into segments

proportional to the adjacent sides," which is not thoroughly convertible, becomes so if we say, "The line which bisects the vertical angle of a triangle *unites the vertex of the triangle with a point in the base, and* divides the base into segments proportional to the adjacent sides." For with this addition we can say, conversely, "The line which *unites the vertex of a triangle with a point in the base, and* divides the base into segments proportional," and so forth.

The proposition, "A cylinder has a solidity equal to the product of its base and altitude," is also inconvertible; for we cannot say that "any figure whose solidity is equal to the product of its base and altitude is a cylinder." Prisms have this property, and other figures may be so constructed as to have it. Some ingenuity is needful to make such additions to the consequent of this proposition, that its antecedent may become exact. But this might be done in some such statement as the following, "A cylinder is a solid whose surface is described by the revolution of a rectangle around one of its sides, and which has a solidity equal to the product of its base and its altitude." In this statement antecedent and consequent may change places; each is an exact logical condition of the other. Any solid so bounded and so measured as that described must be a cylinder; and if its contents were either greater or less than the product described, it would not be a cylinder.

These examples exhibit the difference between exact or inseparable, and full or separable, antecedents. The distinction is one naturally made by the mind, and is always given in answer to the question, "Is there any element in the antecedent which is not either a logical condition or a part of some such condition?" When this may be answered affirmatively, the antecedent is separable; and when negatively, it is inseparable.

CHAPTER XX.

LOGICAL NECESSITY.

§ 62. That necessary co-existence of one thing with another which is the external basis or condition of inference, has been referred to and assumed in discussing the law of reason and consequent; but it has had only a secondary place in our analysis of the mental process. More light may be thrown on the nature of ratiocination, should we now consider necessity, in general, directly and fully. For it is this necessity which, as the external basis or condition of inference, is properly called logical. Every mode or form of thought can be thoroughly understood only through an understanding of the objects with which it is

conversant: and, since every inference is the thought that something is because there is something else with which it is necessarily connected, we ask, "What is this necessity? And what are its more important relations?"

Necessity in general, like every other object of an abstract nature, should be defined from an analysis and comparison of the various modes in which it is manifested. Upon the accuracy of such a process the accuracy of our conception must depend. Merely referring in this way to the origin of the definition, we say that *whenever any fact is a fact and no power can make it not to be a fact, it is necessary; and its necessity consists in its being a fact thus related to power.* As a fact is always the existence or non-existence of something, every necessity pertains either to the existence or to the non-existence of something, and is positive or negative according to the character of the fact to which it belongs. When a thing exists, and no power can make it not to be, it is necessarily existent; and, when a thing does not exist, and no power can make it to be, it is necessarily non-existent. In each case the necessity lies in this, that the fact, being a fact, cannot be made not to be a fact.

We think, and incline to think, of things existent more than of those non-existent, and therefore think oftener of positive than of negative necessities. Hence, it is *a natural mistake to say that necessity belongs only to things existent*, and is the property of that which, being existent, cannot be made not to exist; and, along with this, to define impossibility as the character of that, which, being non-existent, cannot be made to exist. But these conceptions are incorrect; an impossibility is never a fact, either positive or negative, but always the reverse of fact. Aristotle rightly says that existence and non-existence (*εἶναι* and *μη εἶναι*) are the proper subjects respecting which necessity is affirmed or denied, and that some things are necessary to be and others necessary not to be. ("De Inter." ch. xiii.) To illustrate negative necessity, we might say that there is a necessity, arising from the nature of God, that He should not be partial in His judgments, and this statement should be distinguished from the other, indissolubly connected with it, that it is impossible for God to be partial in His judgments.

Positive and negative necessity differ only in the opposite character of the facts to which they belong, and are similar in their own nature and origin. That the sum of the three angles of a triangle should be equal to two right angles, and that it should not be greater or less, are things necessary in the same way. In each case—the triangle existing—there is a fact which no power can destroy; and, in each case, the necessity arises from, or exists in connection with, the relations of quantity between angles formed by straight lines of different directions in the same plane. Since, there-

A mistake corrected.

Positive and negative necessity.

fore, a negative necessity is of the same nature, and exists in the same way, as a positive necessity, we need only discuss the latter in order to understand both; and this singleness of discussion is desirable for the sake of simplicity, provided only we bear in mind that what is true of the necessity of existence, as necessity, is also true of the necessity of non-existence.

§ 63. The origin of necessity—by which we mean the principal condition of its existence—is a *relatedness of fact to fact*. When one thing exists and must exist, because some other thing exists, this evidently is so because the consequent fact has a peculiar relationship to the antecedent fact. More specifically, we may say that the necessity of any fact accompanies and depends upon some certain natural relation in which it exists to the necessitating fact—that is, some certain relation which connects the facts as having given natures. Hence it is that, knowing the antecedent fact, we forthwith conceive of, and believe in, the consequent fact as existing in such a connection.

The various relations which the mind refers to, and uses, in this way, when viewed with reference to our mental employment of them, may be styled *the logical relations* of fact, or of things as existing. The statement that the necessity of a fact originates *from*, or is caused or produced by, its relation to another fact, is not literal. It would be more correct to say that it originates *with*, depends upon, and accompanies, the relatedness. The equality of three angles to two right angles is so related to their being the angles of the same triangle, that the former fact necessarily exists in connection with the latter; but this relation does not, properly speaking, produce, or originate, the necessity. In like manner, the necessity that there should be fire where there is smoke, accompanies the relation of fire to smoke as the cause of smoke, but this relation does not originate the necessity (which yet depends on it) of the existence of the fire. Nevertheless, as the necessity depends on the relatedness and accompanies it, so that the necessity is perceived in connection with the relation, we sometimes express this by saying that the former arises from the latter, or is produced by it. This language need not be condemned, provided it signify no more than we have now indicated. In the statement that the consequent is so related to the antecedent that no power can make it not to be a fact, the words “so that” do, indeed, indicate dependence and sequence; but the dependence is not that of effect upon cause, but simply of a thing conditioned on its condition; and the sequence is merely that of belief and not of causation. A similar caution pertains to the significance of the logical terms *consequence* and *consequent*; objectively speaking, the consequent is not that which follows from the antecedent, but that which in some way is necessarily connected with it. This is an example of those cases which frequently occur, in which a reference to our rational use of facts affects our language respecting

them, and tends to obscure our perception of them and their relations as they exist *per se*.

Logical relations are themselves necessary relations. We have now further to say that *the logical relations of a fact not only do not produce its necessity, but are themselves included in the same necessity with the fact.*

In other words, it is not simply the fact alone, and because of its relationship, but it is *the fact as related, or with its relations*, that is necessary. In an equilateral triangle the mutual equality of the angles is not only a necessary fact, but it exists also as *necessarily related* to the equality of the sides. The geometrical relation of the consequent to the antecedent fact cannot but exist if the antecedent exist, and therefore it is a necessary or logical relation. So, also, an effect is logically related to its cause; there is a nexus which cannot be destroyed. The consequent fact that "A is part of C," is united to the antecedent fact that "A is a part of a part of C" by a necessary relation of quantity; for the part of a part must be a part of the whole. So, also, the consequent fact that a cause, being similar to another, will produce similar effects, is related necessarily to the antecedent that such or such a cause has produced such an effect, by reason of the nature of power. In each case there is an operation of power; and it belongs to the nature of power to act similarly under similar conditions. The relations thus existing between a consequent and an antecedent are very diverse, but the relation always exists necessarily if the antecedent exist. Considered by themselves these relations may be called *the necessary relations of fact*; with reference to their *fundamenta*—that is, the objects between which they exist—they may be styled *relations of connection*. But by this connection we are to understand only that necessary co-existence, or correality, of fact with fact, which accompanies the existence of the relation. While necessity originates in, or depends upon, the relatedness of fact to fact, these necessitating relations may be divided into two classes. *First*, they may be those *which belong to entity in general*, and which characterize facts simply as facts; and this class of relations, though very limited in number, furnishes the most universal laws of existence and principles of thought. These principles are those of identity, of contradiction, and of excluded middle. According to the first of these, whatever is fact is fact, and whatever is not fact is not fact; according to the second, if anything be existent, it cannot at the same time be non-existent, and, if it be non-existent, it cannot at the same time be existent; according to the third, a thing must either be existent or non-existent. Such inferences apply equally to all things and regulate all thought (§ 210). But, should we speak of some event and say, that, being an event, it must take place somewhere in space and in time, this inference would arise from the necessary relations of an event as such. We therefore say, *secondly*, that logical relations also *belong to existences as having specific natures*; and it is our apprehension of relations of this

class which furnishes those principles of reasoning upon which specific inferences rest.

But these logical relations, which belong to entities as having specific natures, may, again, be subdivided into two general classes.

Necessity originated in two ways. The necessity of self-existence.

For the consequent fact may be *the existence of the same object which is presented in the antecedent fact*; or (which is commonly the case) it may be *the existence of some other object than that given in the antecedent*. The first of these cases occurs only with regard to those entities which exist independently of all causation; namely, Space, Time, and God, or the First Cause. After we know of the existence of these objects, and reflect upon their nature, we perceive that they are not, and cannot be, the objects of either creative or annihilating power. They exist, but have not been made to be, and cannot be made not to be. Power can act in space and in time, but not upon space or time: and that substance which is the primal residence of potency and the origin of all finite things must itself be uncaused and indestructible. Thus, from the proper nature or character of each of these entities, and not from their relation to other entities, we infer their self-existence and their necessity. For space and time are self-existent, and cannot be made not to exist, simply as being space and time, and God, as being the First Cause. This necessity of existence may be said to depend upon the relation of the fact of the existence of these entities to the fact of their being what they are. But evidently it is a peculiar necessity, inasmuch as it is not dependent upon the relation of one entity to another.

The necessity of inter-related existence. Ordinary logical necessity.

§ 64. But the necessity of which we ordinarily think is not that of self-existence, and which belongs to each of its entities simply as having a given specific nature, nor is it that which belongs to entities simply as such, but it is *that of inter-related existences, and belongs to an object as being naturally related to some other object that exists*. For whenever any entity A, has such a relatedness to another entity B, that A cannot but exist so long as B may exist, A is said to exist necessarily. If the three sides of a triangle be equal to each other, the three angles also must be equal to each other; and this necessity for the equality of the angles accompanies the fact of the equality of the sides. So, also, if the double fact exist that A is a part of B, and B a part of C, the single fact is necessary that A should be a part of C. Such is *ordinary logical necessity*. As distinguished from the necessity of self-existence, it involves the existence of conditions external to the nature of the thing necessary, and consequently the existence of other entities in addition to the necessary one; whereas the necessity of self-existence involves no such conditions. At the same time, the latter necessity arises from, or is dependent upon, the nature of the

self-existent entity; and therefore all necessity may be said to be conditioned.

As necessity is a relatedness of fact to power, and as power exists in various forms, and has diverse spheres of operation more or less extensive, it follows that a fact may be necessary with reference to all power, or only with reference to some special form of power. Accordingly we distinguish between *absolute* and *relative* necessity. That is absolutely necessary which no power whatever can cause not to be. It is absolutely necessary that an isosceles triangle should have the angles at the base equal to one another, and that a parallelogram should have its opposite sides equal; also that a murderer, or a blasphemer, should be subject to the penalty of moral law. No power could make these things otherwise. Again, the execution of any Divine purpose is absolutely necessary, because it is conditioned on infinite power, wisdom and skill; and these cannot be defeated. On the other hand, a debt of one thousand dollars is a necessary burden to a man who has no means and no friends; not because such a debt is incapable of satisfaction, but because one of the conditions of the case is that the man is without the means of payment. In like manner, a poor man must of necessity sometimes go coarsely clad, because he has not the means of obtaining fine clothing; whereas this necessity does not exist as to the rich man. It is often useful, and sometimes indispensable, when the question is whether something be necessarily so or not, to ask whether the necessity be absolute or relative, and, if relative, to determine what the power may be whose sphere of exercise is limited by the necessity. A fact may be relatively, yet not absolutely, necessary; and what is necessary in relation to one power may not be necessary in relation to another. Moreover, every case of relative necessity involves not only that a given power cannot alter the fact, but also that *no power adequate to alter it is exercised*. For example, the debt would no longer be a necessary burden to the poor man if his rich neighbor paid it for him. This, therefore, though often understood rather than expressly noted, is always a condition of a relative necessity.

It is sometimes important to distinguish *hypothetical* from *real necessity*. The former is not a kind of necessity differing from the real; it is an ideal object which does not exist at all, but is conceived of as existing with the same nature as if it were real. When the antecedent of a necessity is real, the necessity is real, but, if the antecedent be merely imaginary, the necessity is so too; and, in that case, with a reference to the supposition of its condition, it is called hypothetical. This language signifies that no necessity really exists, while yet the mind has conceptions corresponding to what the necessity and its conditions would be if they did exist. Such being the case, it is clear that, to understand hypothetical necessity, we have only to understand that which is real.

Necessity, absolute
and relative.

Hypothetical and
real necessity.

The term *condition* defined.
 Accidental and necessary.
 Causal, constitutive, concomitant.
 Logical conditions.

§ 65. Any fact which, being real, another fact is necessarily related to it, and necessarily exists as thus related, is a logical antecedent of the other. We have seen (Chap. XIX.) that antecedents are either full and separable or exact and inseparable; the latter including only such elements as are necessary conditions of the consequent fact, while the former contains elements additional to these. We defined a logical condition to be a fact considered precisely so far forth as it may support the necessity of another fact, and no farther; and showed how every antecedent contains at least one such condition, while every exact antecedent excludes everything that is not a necessary condition and is always itself a logical condition. For any antecedent, which, in addition to a logical condition, should contain only such elements as are necessary conditions of its consequent, would therein be a logical condition.

As the word *condition* is of constant occurrence in philosophy, and as an important truth is expressed in the phrase "logical condition," it may be advisable for us to dwell on the meaning of these terms. The term *condition*, being derived from the Latin *condere*, to join, applies to what exists in intimate connection with something—*i. e.*, to any of its circumstances. This connection, so far as the nature of the thing conditioned is concerned, may be either accidental or necessary. For example, a man's condition in life—that is, his "circumstances"—is accidental in the sense that the man might exist under other circumstances. So, also, the condition of a farm of land, that is, its state of fertility, is accidental, because the farm might exist in a different condition. And, in a contract, the thing to be done is connected with the condition of its being done in a manner accidental so far as regards its own nature. But light is a *necessary* condition of vision, good food of health, a plane surface of a square, a square side of a cube, and so on: for these conditions are not only connected, but *necessarily connected, with the thing conditioned, so that they must exist if it exist.* Generally, in philosophy, when we speak of a condition, simply, we mean a condition of this sort—a *necessary condition*. But there are various kinds of such conditions. For example, *causal* conditions are those elements which enter into and constitute the cause of any effect; for, evidently, if the effect exist, each of these elements must exist. *Constitutive* conditions are those which enter into a thing itself, as its parts or elements; thus lines and angles are necessary parts of a triangle. *Concomitant* conditions are such as necessarily accompany the existence of something without being causal or constitutive. For instance, it is a condition of the existence of a right-angled triangle that the square of the hypotenuse should be equal to the sum of the squares of the two sides. So also the production of water is a concomitant condition of the melting of ice; for it is a necessary effect of that cause, and there is a sense in which an effect accompanies its cause.

Now a *logical condition* differs from those that are merely causal or constitutive or concomitant, in that any one of these may exist while yet the thing conditioned may not exist, some other element being needed to necessitate its reality; but a logical condition not only exists necessarily, or is given, with the fact it conditions, but also necessitates the fact. It is a condition as being given with the fact; a logical condition as having the fact also given with it. The logical is the necessitating, or determining, condition, and as such it might be named the logical necessitant, or determinant, of that which it conditions.

In discussions like the present it behooves us to note the different applications of the word *condition*, because it is often used in philosophy without any qualifying adjective; and we should especially distinguish logical conditions, on the one hand, from full and separable antecedents, and, on the other, from such conditions as are merely necessary and not also necessitant. An instance of great obscurity of

Hamilton quoted. expression, if not also of confusion of thought, arising from a neglect of the distinctions now emphasized, occurs in the XVIIIth Lecture of the "Logic" of Sir Wm. Hamilton. He says: "A reason, or antecedent, means the condition, that is, the complement, of all without which something else would not be; and the consequent means the conditioned, that is, the complement of all that is determined to be by the existence of something else. . . . The reason is conceived as that which conditions, in other words, that which contains the necessity of the existence of the consequent. A reason is only a reason if it be a sufficient reason, that is, if it comprise all the conditions, that is, all that necessitates the existence of the consequent; for, if all the conditions of anything are present, that thing must necessarily exist, since, if it do not exist, then some condition of its existence must have been wanting." In this passage the word *condition* sometimes signifies a logical condition, though as such it is wrongly identified with a reason or antecedent; and sometimes it indicates conditions that are causal or constitutive, and necessary, but not necessitating. And these again are treated as if they were the only necessary conditions, that is, as if all conditions were causal or constitutive; which adds to the confusion.

Why is an exact antecedent made up of conditions? Because only conditions necessitate.

The fact that every exact antecedent—every necessitant fact precisely considered—is a necessary condition of its consequent, *and may therefore be distinguished as a logical condition*, results from the fact that only necessary conditions necessitate.

Generally, indeed, one condition does not of itself necessitate; but every necessitating fact, so far forth as it is necessitating, is composed of such conditions. If there be any element in an antecedent which is not a necessary condition of the consequent, that element may be stricken from existence, or replaced by another, and the consequent will remain as necessary as before;

the necessity, therefore, depends on the existence of the conditions. The reason of this is that every necessary condition of a fact, even though not of itself necessitant, is what we may call necessitative; that is, it is of such a nature that it may help to support the necessity of a consequent. Every simple condition may always be found to be either a part of the cause of a consequent, or a part of its constitution or essence, or a part of a necessary effect, or of some other inseparable concomitant—in short, part of an antecedent. Light is a condition of vision, but it is also part of that total cause, which existing, vision necessarily takes place. The optic nerve is a condition without which the eye could not exist, but it is also part of that constitution, which being existent, there is an eye. And perception is a condition of healthful sight, for we cannot see without perceiving something; but it is also a part of that peculiar mental result which inseparably accompanies sight. Thus any condition may combine with others so as to form a logical condition, or necessitant; and no necessitant can be formed in any other way.

The logical condition defined.
Its relation to inference.

These observations may enable us to form a more exact conception than we have hitherto entertained of a logical condition or an exact antecedent. This was defined to be a necessitating fact so far forth as it is necessitating. The truth would be more perfectly expressed by saying that "it is a necessitating fact so far forth as this is composed of necessary conditions of the consequent." For an antecedent may include more such conditions than are needful to render it necessitating, and yet be exact. Should we say, "Every quadrilateral having equal and parallel sides and its angles right angles is a square," the antecedent would be exact and a logical condition, but it would contain a needless number of conditions, for it would be enough to say that "every quadrilateral with equal sides and equal angles is a square." Yet every element of the large antecedent is a condition and has a necessitative character, and the antecedent as a whole is an exact necessitant.

Moreover, since only logical conditions are necessitating, this explains how every antecedent contains such a condition; and since only conditions, including logical conditions, can be consequents, this explains how every thoroughly convertible inference must have a logical condition as its antecedent.

Still, we may ask, "*Why is every exact antecedent composed of necessary conditions, and itself such a condition?*" Why is it a consequent of its own consequent? Or, in yet different language, Why is every logical necessitant necessitated by that which it necessitates, so that if either exist, the other must exist, and if either be non-existent, the other must be non-existent too?" This query is allied to another of less scope, viz., "Why is the precise philosophical cause of any effect so connected with the effect that we can always infer cause from effect as well as effect from cause?" Perhaps neither question admits of any answer, save that which is

An ultimate law of being.

simply an analysis of the truth presented for explanation. In regard to the necessary and mutual co-existence of cause and effect, we may say that power acts only under conditions, and that *such is the nature of power, and of entity in general, that the same results and the same conditions of the operation of power, are mutually inseparable.* Here, of course, by "same" we mean the precisely similar, and among the conditions of the operation of power, we include the special nature of any potency itself. All the elements of the foregoing answer seem included in our very conceptions of a cause, of an effect, and of the mutual connection between them. As to the more general truth of the necessary and mutual co-existence of the logical condition (or necessitant fact) and its consequent (or the fact necessitated), we may say, in like manner, that the *limitations*, as well as the *results*, of the operation of power, depend upon conditions, and that the same limitation and the same conditions of limitation are inseparably connected. Therefore, the same limitation of power so that it cannot make a fact non-existent (in being related to which limitation the fact is necessary), and the same set of conditions limiting the power (and necessitating the fact), are mutually inseparable. Here, again, we only present certain elements involved in the truth submitted to our inquiry. The truth is explained; but it is not *accounted for by reference to any principle other than itself.* That the logically necessitating, as such, is also the logically necessitated, seems to be an ultimate law of being—a part of the very structure of existence.

Logical co-existence and necessitation.

§ 66. It has been frequently stated in the present discussion that logical necessity involves the co-existence or correality of antecedent and consequent.

We need scarcely remark that *the co-existence here spoken of is of the most general character and is not contemporaneous existence.* Antecedents with reference to their consequents are sometimes past, sometimes present, and sometimes future; and the converse is true as to consequents. So, also, when we say that the antecedent or reason necessitates the consequent, we do not mean at all to say that the antecedent *contains the cause of the consequent* and makes it to be, but *only that the antecedent contains the logical condition of the consequent*; in other words, that, if the antecedent exist, the consequent also, as existing in some necessary relation to it, cannot be made not to exist.

Causal contrasted with logical necessity.

For the most fruitful source of misconception on this subject is *the confusion of logical with causal necessity, when the latter includes more than the former,*

and should be regarded as a prominent and peculiar species of it. In every necessity there is a necessitating antecedent and a necessitated consequent; and our use of language, together with a subjective reference to the sequence of thought, favors the idea that there is always power in the antecedent to produce the consequent. But such is not the case. The exercise of power belongs to those antecedents only by which something is literally

caused to be or not to be. In all others there is no power—that is, no exercise of power as operative or as related to its effect—but only what may limit the operation of power. The fact that two quantities are each equal to a third, contains no efficiency making them equal to one another, but it is a fact of such a nature that the mutual equality exists with it, and cannot be made not to exist. The fact that Paris is in France and that France is in Europe, is not the efficient cause of Paris being in Europe, but it is a fact with which the other fact necessarily co-exists. Causal necessity, on the contrary, takes place and exists, whenever any beginning or change of existence is produced or prevented; and the exercise of power is its principal condition. For when power sufficient for some result is exercised, and there is no adequate power of opposition, the result must follow. Indeed, when speaking of an event as necessary, we naturally and commonly think of it as *causally* necessary, *i. e.*, as being *made to exist* by some sufficient efficiency, and not *simply as existing in circumstances in which no power can make it not to exist*. Thus the thing as necessary is seen to have these two relations to power; but, considered simply as logically necessary, the latter alone belongs to it. In this way, the words *necessity* and *necessary* have an ambiguity.

The difference between causal, and merely logical, necessity, may be understood from this, that the former pertains to things only as they result from the exercise of power, and includes their relatedness to the efficiency producing them, but the latter belongs to things in various other relations beside that of an effect to its cause, and excludes, from its own proper nature, the peculiarity of this relationship. A cause in its relation to an effect is as logically necessary as an effect in its relation to its cause; yet the effect has no efficiency to produce the cause. Therefore the logical necessity of the *effect* does not include the fact that power causes it to be, *but arises because of the fact that power causes it to be*. For, there being an adequate cause, the effect exists, and this cannot be otherwise.

Ratio cognoscendi
and *ratio essendi*.

This difference between causal and logical necessity is the ground of the distinction between the *ratio cognoscendi*, or order of perception, and the *ratio essendi*, or order of existence. The order of perception is the same as that of logical necessity, in which the consequent is said to follow the antecedent—this meaning that its existence is connected with, and inferable from, that of the antecedent; but the order of existence is that of causal necessity, in which an effect literally follows its cause. The one order sometimes coincides with the other, but more frequently it does not. We cannot too firmly fix it in our minds that logical necessity—not causal—is the necessity referred to in every act of reasoning, and that, when we say that a consequent exists because an antecedent exists, we do not mean to say that it is *caused by* the antecedent, but only that it *necessarily exists as related to* the

antecedent. Inference depends upon conditions, not upon causes—upon causes only so far as they are conditions.

A peculiar metonymical use of the term *necessity* is to be met with, and is likely to confuse the unwary. We sometimes hear of a thing taking place *by a natural necessity*, and some have taught the doctrine that all things originate and exist—not merely necessarily—but *by necessity*. This language might express logical necessity, but not in a strict literality, which is the case now to be considered. Bishop Butler, in the sixth chapter of the first part of his “Analogy,” shows that the word thus employed signifies, not necessity as commonly understood, but *a power or agent acting necessarily*. He says: “Necessity alone and of itself is in no sort an account of the constitution of nature, and how things came to be and to continue as they are, but only an account of *this circumstance relating to their origin and continuance, that they could not have been otherwise than they are and have been.*” Only power can produce anything, and power must reside in some agent: therefore, as Butler says, the assertion “that everything is *by necessity*,” must mean *by an agent acting necessarily*.” Clearly, necessity, as a causal agent, can only be a power acting necessarily—a power such that it cannot but exist, and cannot but act so as to produce certain results and no others. This use of language is a natural metonymy and cannot easily be avoided; but it should be noted and understood. Were a name desired for this necessity, it might be termed *causative*, as being power necessarily causative, and as contrasted with that causal necessity, already described, which depends on the exercise of power, and is the necessariness of an effect.

Certain *familiar applications* of the idea of necessity may illustrate the radical and philosophical conception. The inevitable is called the necessary, for what cannot be avoided must be met; it is about to exist, and no power of ours can make it not to be. Death is a necessity for us all. The indispensable is necessary, for it is the condition without which some important end cannot exist, and, on the supposition of the realization of the end, the condition exists, and cannot be made not to exist. It is necessary to, or for, the end. Food, clothing, shelter, are things necessary to all; medicine and care are necessary to the sick for their recovery. Compulsion involves a necessity; it makes a certain course of conduct necessary to the avoidance of some pain or loss, and this avoidance becomes the logical condition of that conduct. In general, things inevitable, indispensable, or enforced, are necessary in relation only to some particular being or set of beings, and suppose cases in which the power of other beings does not in any way conflict with the condition of the necessity, but frequently supplies it. In short, they present cases of relative necessity:

The inevitable, the indispensable, the enforced, are called “necessary.”

The relation of logical necessity to inference exactly defined.

We have now discussed logical necessity as the external basis of inference. For, in reasoning, we perceive a fact, not immediately, but because of its necessary co-existence with some known fact.

The question, however, may now be asked, *Whether we do not, in the first place, simply perceive the fact as connected with the other fact, and then, as confirmation of this cognition, perceive the necessity of the co-existence—that the fact could not be otherwise?* Such, we believe, is the case. That is, the perception of the concomitant fact does not depend on the perception of its necessity, but rather the reverse is true. For the necessity originates from the nature and relations of the fact, and, therefore, presupposes the fact. But a belief thus formed, if in any way questioned, is instantly confirmed by a perception of the necessity of the fact as related to the given fact; and *such inferential belief is formed only in cases where this necessity exists.* Evidently the mind has a wonderful power of suggestion whereby, independently of any consideration of necessity, it sees things unseen as co-existent with, and related to, things seen. But the unseen, while thus perceived, is always *necessarily* co-existent and related, and may be viewed also in this light. Logical relations are always necessary relations. We infer only such things as have some necessity of existence, either absolute or relative. If one should classify the necessary relations of fact, he would classify also the various modes of inference. The doctrine of necessity, and of things as necessarily related, cannot be separated from the doctrine of reasoning.

CHAPTER XXI.

THE UNCONDITIONED, THE MORALLY NECESSARY, AND THE IMPOSSIBLE.

§ 67. Some questions related to the doctrine of necessity, yet not directly connected with that of inference, may be the topics of a supplementary discussion.

Sir Wm. Hamilton and Dean Mansel, in their "Philosophy of the Conditioned" teach that man can know *only what exists in relation.* In this they are manifestly correct; everything known must be related at least to our cognitive faculties as their object; and this can take place only through its being related to our experience as part of it or as connected with it. Moreover, what is perceived, not immediately, but inferentially, must be necessarily related to some known antecedent as containing a logical condition, and so it must be not only related but conditioned, and the subject of logical necessity. In other words, its existence must logically necessitate the existence of other things, and must also

Can the Infinite and Absolute be known?
Hamilton, Mansel.

itself be logically necessitated by their existence. And since there is nothing that we know immediately which may not also somehow be perceived inferentially, we may admit that all possible objects of knowledge are logically conditioned. Thus far, the philosophy of the conditioned is reasonable. But Hamilton further teaches that whatever is related or conditioned is thereby limited—that “to conceive a thing *in relation to*, is, *ipso facto*, to conceive it as finite”—and hence that all knowledge of the infinite is impossible. Likewise, that whatever is conditioned cannot be absolute; for the absolute is independent of, or unconditioned by, all things else; and therefore the absolute is unknowable: it is “incognizable and inconceivable.” In short, all that we can know of God, the infinite and self-existent One, is that we know, and can know, nothing of Him whatever.

In regard to the first part of this reasoning it may be allowed that anything related to another thing cannot be that other thing, and must be finite *if nothing infinite can be distinguished from other entities infinite and finite*. But this we deny. Infinite space can be distinguished from infinite duration, and the infinite power of God from His infinite wisdom, and all these things from the finite universe. Things infinite may co-exist and be different from each other and from things finite, without any loss to their infinity. Myriads of endless lines might exist in space; countless atoms might be conceived of as having each an eternal being. Two infinities of the same kind added together may even constitute a third infinite; thus God’s past eternity added to His future eternity makes up the duration of His entire life. Moreover, in all such cases, the infinite is no less an infinite, because other things exist and are related to it; as, for example, the wisdom, power, and greatness of God are none the less because man exists as a limited and dependent creature. These remarks are simply the application of well-known algebraic principles respecting the addition and subtraction, multiplication and division, of infinities.

But it may be asked whether, if all things infinite and finite were added together, *there would not be something greater than any of its parts and specially worthy of the name infinite?* This may be. Nevertheless, should we add space, time, God, and the universe together, this total would not be the infinite of which we commonly speak and think; nor is there any necessity that we should consider God such a total,—that we should believe in pantheism,—because God is infinite. Moreover, such an infinite could not be the object of religious homage; no one could rationally adore space, time, and the universe; only that infinite part of the infinite total—that personal part, which we call God—would be worthy of worship. At the same time, so far as we can see, even such an infinite total can be conceived of and believed in, not, indeed, as related to something else, *but as related to its own parts*. In fine, the doctrine that the infinite is inconceivable and unknowable, because we can only conceive things as re-

Things infinite
may and do exist
in relation.

lated, should be rejected, *first*, because we can conceive and know of an infinite total—not as related to other things—but as related to its own parts; and, *secondly*, because a thing may be infinite without including everything else, and may be known by its relations to other things. It is in this way that we naturally know and think of God, the infinite personal substance. The argument of Sir William simply shows that an untenable conception of the Divine infinitude should be dismissed and replaced by one that will harmonize with fact and reason.

The second part of Hamilton's statement—namely, that *God is unknowable because He is unconditioned or absolute, and because we know only things conditioned—is fallacious by reason of an ambiguity*

in the word CONDITION. In one sense, God is not conditioned, while in another He is. God is free from the conditions of causal necessity. He is unproduced and self-existent; He is absolutely independent of all other beings, and even of His own creative power, for His existence and His attributes. The thought that God was ever made to be, is inconsistent with any conception that we can rationally form of Him. But God, no less than any of His creatures, *is the subject of logical necessity, and exists under its conditions, so far as they are not causal.* In particular God is a necessary Being, not only *per se*, as being what He is, but also as the Creator of the universe; and, in the latter case, the existence of the universe is the logical antecedent of the existence of God, its Maker. Moreover, logical necessity, so far as it may be absolute, limits even the power of God; which, therefore, is not infinite in the sense that it is not limited by absolute necessity, but only in the sense that He can do, and that to any extent, whatever in the nature of things is possible to be done. For no power, however great, can accomplish a mathematical or metaphysical or moral impossibility. No power could make a plane triangle the sum of whose angles should be greater or less than two right angles, or diminish the immensity of space, or stop the course of time, or destroy the difference between moral good and moral evil. To say that God is thus subject to the conditions of logical necessity, and that His power is limited by them, does not conflict with the doctrine of His infinitude and absoluteness, but only shows how reason requires these doctrines to be understood. He is infinite and absolute in that way and in those respects, of which the nature of things admits; to say more than this is to speak absurdly. An infinite which comprises all things and yet has no relation to its parts, and even is without parts; and an absolute which is independent of the necessary nature of entity—or, what is the same thing, an unconditioned which is free from logical necessity—are things which never existed, and never can exist. And belief in such objects is not an act of consistent intelligence; it is the product of a kind of philosophic jugglery in which the performers, no less than the spectators, are deceived.

Natural and moral necessity are species of causal necessity.

§ 68. A distinction, between *natural and moral necessity*, which ethical writers make, has occupied a prominent place in the discussions of modern philosophy; for which reason, and because of its own importance, it should not be neglected by those who would be well informed. No one, so far as we are aware, controverts the doctrine that the volitions and voluntary conduct of moral beings are subject to various modes of logical, as distinguished from causal, necessity. For example, they can often, as causes, be inferred as necessarily existing, or as having existed, in cases where their effects are seen. Again, past actions with reference to their past existence, and present with reference to their present existence, are necessary; for no power can make the one not to have been or the other not now to be. So also actions certainly future—really about to exist—are necessary with reference to their future existence. In other words, as certainly future, they have a logical necessity; for, as that which is existent cannot at the same time be non-existent, but must exist, that also which is about to exist, cannot be, at the same time, about not to exist, but must be about to be. But this necessity that a thing should exist because it exists—that whatever is must be—is merely logical, and is clearly different from causal necessity, according to which a thing must exist because it has been, or is about to be, *made to exist*. Aristotle distinguishes these necessities in the ninth chapter of his book “De Interpretatione.” He says, “The existent, of necessity, is when it is, and the non-existent is not when it is not. But the existent does not always necessarily exist, and the non-existent is not always necessarily non-existent. For it is not the same thing that every existence should exist from necessity, when it is, and that it should simply exist from necessity.” Thus Aristotle distinguishes two modes of necessity, the latter only being causal.

Now the distinction which we began to mention, between natural and moral necessity, is primarily related, not to the necessity which we have illustrated, and which is merely logical, but to that which is causal. It is the assertion of a difference between two modes of causal necessity, so far as this necessity may be considered to affect the actions and lives of moral beings. For, while all causal necessity is conditioned upon and arises from the exercise of power or efficiency, natural necessity arises from the action of physical, and moral necessity from that of psychical, powers. Or, to speak more exactly, since the distinction views necessity simply in its relation to voluntary life and agency, moral necessity is that *which arises from the action of psychical powers so far as this results in volitions and voluntary actions, and which attaches itself, primarily and properly, to our volitions, and through them to our conduct*; while natural necessity pertains to such events as result from *any other exercise of power, whether spiritual or material*. Instead, therefore, of natural and moral, they might appropriately be called *volitional*, and *non-volitional*, necessity.

Necessitarianism.
Edwards quoted.

The distinction between these necessities is set forth by Pres. Edwards at the beginning of his famous "Inquiry" concerning the freedom of the will (part i. sect. iv.). Having mentioned several senses in which the expression "moral necessity" is used, he proceeds: "Sometimes it means that necessity of connection and consequence which arises from such moral causes as the strength of inclination or motives, and the connection which there is, in many cases, between them and such certain volitions and actions. And it is in this sense that I use the phrase '*moral necessity*' in the following discourse. By '*natural necessity*,' as applied to men, I mean such necessity as men are under through the force of natural causes, as distinguished from what are called moral causes, such as the habits and dispositions of the heart, and moral motives and inducements. Thus men, placed in certain circumstances, are the subjects of certain sensations by necessity; they feel pain when their bodies are wounded; they see the objects presented before them in a clear light, when their eyes are opened; so they assent to the truth of certain propositions as soon as the terms are understood; so, by a natural necessity, men's bodies move downward when there is nothing to support them." (The expression "*by necessity*" in the foregoing extract, must, of course, mean "*by a necessitating power.*")

Pres. Edwards remarks that moral necessity is different from the necessity of which we ordinarily think and speak. For the necessary commonly signifies that to which our desires, volitions, and efforts may be opposed, but which such opposition cannot prevent or avoid; in other words, by necessity men mean natural necessity. But moral necessity characterizes any volition or determination as being the result of the action of our total motive nature, so far as this may act in any case; and, clearly, this action and the volition resulting from it *cannot be opposed to themselves*. At the same time Pres. Edwards says, "*Moral necessity may be as absolute as natural necessity*"; that is, volitions may be as perfectly connected with moral causes as natural effects are with natural causes; and, supposing this to be the case, it is evident that moral necessity is as truly a necessity—and as truly a causal necessity—as natural. In each case, alike, we have a causal potency as the logical condition of an effect, so that, the potency acting, the effect must take place. In each case, moreover, the necessity exists in relation to the powers of the agent, but in a different way: in natural necessity the agent cannot make the necessary thing to be otherwise than it is or is about to be, because, though his powers may be opposed to it, their opposition is insufficient or ineffectual; but in moral necessity the agent cannot make the thing to be otherwise, because his powers, being all engaged in the production and service of the volition, cannot, at the same time, be exercised in opposition to these things. Before one arrives at a resolution or volition or determination there may be a conflict between various moti-

ties; especially the tendencies of appetite or propension or affection may be opposed by those which are rational and moral. Nay, this opposition may continue and accompany the volition. But, when one side prevails, the opposition of the other is of necessity ineffectual; and the volition, as the resultant of the joint action of all our motives, cannot be opposed by this joint action, or by man's motive nature as a whole, or, which is the same thing, by man himself as a voluntary agent. The drunkard, so long as a love for the stimulus of alcohol is his ruling passion, cannot, as a voluntary agent—that is, in the actual and total exercise of his nature as a voluntary agent—oppose the volitions induced by this passion, but carries them out in practice; at the same time his rational and moral motives may make a partial and ineffectual opposition. This, though an extreme case, fairly illustrates the universal rule of spiritual life, namely, that we cannot, in any case, but follow the decision and determination of our motive nature as a whole. This impossibility is an absolute one; even God is subject to it. It is not the inability to do what one might do if he had sufficient power; it is the impossibility of a motive nature as a whole acting in opposite directions at once.

This absolute impossibility Pres. Edwards calls *moral inability*, but it should be distinguished carefully from that moral or spiritual inability which is a *want of power to change or modify—not a present volition—but one's character and future life; and which may, or may not, be absolute*. "For," says Edwards, "though it is impossible there should be any true, sincere desires and endeavors against a present volition or choice, yet there may be against volitions of that kind when viewed at a distance. A person may desire and use means to prevent future exercises of a certain inclination; and, in order to do it, may wish the habit to be removed; but his desires and efforts may be ineffectual" ("Inquiry," part iii. section iv.). Clearly a voluntary agent may experience an inability in his ineffectual resolves and efforts to reform himself and his life; but this is not that "inability" which Pres. Edwards describes as invariably accompanying moral necessity, and which is really *an absolute impossibility of making any opposition at all*.

Such is the Necessitarian doctrine as set forth by
 Libertarianism. Reid, Fitzgerald,
 the great Necessitarian divine. It is rejected by
 Hamilton.

many who believe it inconsistent with that liberty which is essential to moral agency, and who, as the defenders of this liberty, style themselves Libertarians. Both classes of thinkers agree, for the most part, on several points. Both hold that fixed powers and abiding tendencies exist in the spiritual as well as in the material world; and that a spirit may have a settled intellectual and motive character subject to variation only according to permanent laws affecting its growth and development. Both teach that causes produce effects in the spiritual as well as in the material world, and this according to

a radical law; that not only changes result from the exercise of power, but also that similar causal conditions are followed by similar effects. Both believe that causal necessity, according to both its modes—namely that no change is without causal conditions, and that the same effects and the same causes are inseparably connected—reigns, and that absolutely, in the material world, and, to a great extent, in the spiritual. But, when we reach the region of voluntary life, Libertarians admit only a qualified necessity—if they admit any necessity at all,—and say that, while thoughts and perceptions, desires and motives generally exert an influence, and sometimes a great influence, on volition, yet the soul, in addition to its motives, has a *power of self-determination, which acts independently of the influence of ends and motives, and which truly determines our volitions without being itself in any way determined.* Thus volition is made an exception to the ordinary law of cause and effect; for, though the power of self-determination may not act save under conditions, yet, so far as it acts in any given way, its action is undetermined by any condition; there is no assignable ground or reason why it acts in the one way rather than in another; and, having once acted in one way, it may, on a precisely similar occasion, and under precisely similar influences, act in the opposite way. Thus Libertarians claim an exception to the law that the same power under the same conditions acts in the same way.

The preponderance of philosophical opinion, from Aristotle to Hamilton, has been on the side of this doctrine; though many eminent thinkers have been Necessitarians. That we have truly presented the Libertarian view may be seen from one or two quotations. Reid, in the ninth chapter of his fourth essay on the "Active Powers," says, "When it is proved that through all nature the same consequences invariably result from the same circumstances, the doctrine of liberty must be given up." In this sentence the word *circumstance* is evidently used in the sense of condition. To the same effect is a note of Prof. Fitzgerald in his edition of the "Analogy" (part i. chap. vi.). "The doctrine of necessity takes this expression, that moral acts of the will are determined by their motives—meaning by *motives* all that is the result of temper, organization, education, and outward circumstances—as certainly as physical consequences are by their antecedents." Hamilton—also a pronounced Libertarian—writes thus in his "Philosophy of the Conditioned," chap. ii., "Some of those who make the doctrine of causality a positive dictate of intelligence, find themselves compelled, in order to escape the consequences of their doctrine, to deny that this dictate, though universal in its deliverance, should be allowed to be universally true; and accordingly they would exempt from it the facts of volition." Hamilton's solution is that the doctrine of causality is not a positive judgment, but only an expression of our impotence to conceive of an effect save as the re-appear

ing, in a different form, of the elements of the cause: he declares that this "inability to conceive" is no reason for believing an event without a cause, that is, *volition*, to be impossible. But this explanation fails to satisfy; it is false; and, even were it true, it would not vindicate that liberty of the will which is necessary to moral life. Hamilton allows this, perhaps somewhat unconsciously; for he adds, "How the will can possibly be free must remain to us, under the present limitation of our faculties, wholly incomprehensible. We are unable to conceive an absolute commencement; we cannot, therefore, conceive a free volition. A determination by motives cannot, to our understanding, escape from necessitation. Nay; were we to admit as true, what we cannot think as possible, still *the doctrine of a motiveless volition would be only casualism; and the free acts of an indifferent, are, morally and rationally, as worthless as the pre-ordered passions of a determined, will.* How, therefore, I repeat, moral liberty is possible in man or God, we are utterly unable speculatively to understand." Thus, having vindicated liberty by asserting that volition may be free in that it may take place without antecedent conditions, Hamilton confesses that the liberty of a moral being is not, and cannot be, this very freedom of which he maintains the possibility! In this case was not the logician Sir William too much for Sir William the philosopher?

Concluding
marks.

re- may remark as follows: *First*, it seems clear that *one of these views must be true and the other false.*

The essence of necessitarianism is to assert that the phenomena of voluntary life, no less than any others, take place according to the law of cause and effect, while Libertarianism is simply the denial of this. Between such views there can be no middle ground. In the *second* place, *the law of cause and effect is a radical and positive law of both thought and existence.* The constitution of our minds, acting in our necessary perceptions, compels us to believe that powers exist—that changes or events take place only by the operation of power—that power acts only on conditions—and that like operations and results follow like conditions. Even with God power does not act wildly, but according to law; and, in particular, the action of creative and providential power is conditioned on the exercise of infinite wisdom, knowledge, and love. In short, reason teaches that every new state of affairs, with the powers operating in it, has been causatively determined by that other state of affairs immediately preceding it, and is determinative of that which immediately follows. Such being the case, necessitarianism is merely the assertion that the law of cause and effect, as the universal law of changes or events, pervades the realm of spiritual, as well as that of material, existence. This, considered by itself, we find not only possible to believe, but impossible not to believe. In the *third* place, should we suppose necessitarianism false, and hold that volition is self caused and not the necessary consequent of antecedent psy

chical states and activities, this would not relieve us of difficulty; the liberty of indifference thus attributed to the will, and consisting in its not being determined according to motives and from motivations either natural or moral, *cannot be the liberty of moral agency*. Because a volition is moral only as it aims at good or bad ends and as it proceeds from good or bad motivations. Since, then, the liberty which supposes self-caused volitions, and which consists in their being undetermined by antecedent conditions, is not that involved in moral agency, may not this conception of liberty be a mistake? And may there not be a true moral liberty consistent with the existence and operation of the causal law? *Finally*, we remark that the necessitarian doctrine, properly understood, seems to make room for *the only conception of liberty that is possible or natural in the case*. The freedom of outward moral actions consists in their being free from the constraint of physical necessity while yet they are *voluntary*, that is, the result and expression of voluntary life; and the freedom of voluntary life itself is of the same nature, but more-absolute; for this life, of which volition is the ultimate development, as it takes place wholly within the soul and arises from the operation of psychological motivations, is, by its very nature, free from physical necessity. Hence those are not far wrong who say that moral freedom lies in the very possession and exercise of a motive and volitional nature; for it is the necessary property of such a nature. But, if this be so, if the liberty of moral agency be merely that freedom from physical necessitation which pertains to the motive nature of a rational being, it is entirely consistent with moral necessity and with the operation of those psychological causes which result in volition. Moreover, whether we regard the efficiency producing volition to belong exclusively to the will as a simple power, the motivations merely supplying conditions determinative of its action, or whether we attribute the efficiency to the motivations, and consider the will a compound faculty and a resultant of intelligence and motivity, the logical result is the same; in either case there is moral necessity and moral freedom.

Necessitarianism, as now explained, differs from **Fatalism.** fatalism, in that the former teaches that man's life and destiny proceed from himself, that is, are determined by the operation of his own motive and moral nature, while the latter subjects man wholly to outward conditions. The former acknowledges the freedom, the personal agency, and the accountability, which attend moral life; the latter denies, or at least ignores, all. Hamilton distinguishes rightly when he says, "There are two schemes of necessity—the necessitation by efficient, the necessitation by final, causes: the former is brute or blind fate; the latter rational determinism." But his language would have been more correct, had he contrasted the causes as *natural and moral*—as those which produce volition and those which do not. There is no efficiency, and consequently no causal necessitation, in final causes; these are merely the ends

pursued by that motive efficiency which belongs to the soul alone. Such is a brief sketch of the necessitarian controversy; any full discussion of it would require a volume.

§ 69. The doctrine of logical necessity cannot be fully illustrated and confirmed, if we do not consider somewhat the nature of *impossibility*. Necessity has been defined as that characteristic which a fact has when it is a fact and cannot be made not to be a fact. Now, wherever there is a fact, positive or negative, the opposite of it, or that which is not fact, is conceivable; and *impossibility is the characteristic of that which is not fact and which cannot be made to be a fact*. As both facts and things conceivable are positive and negative, so we have positive and negative necessities and positive and negative impossibilities.

As necessity and impossibility each involve a limitation of power, the one in respect to realities and the other in respect to non-realities, they may be said to partake of a common nature. Moreover, every reality involves the non-reality of its contradictory, and every non-reality the reality of its contradictory: thus, if it is a fact that there is money, it is not a fact that there is no money; and, if it is a fact that there is no money, it is not a fact that there is money. This is that "law of contradiction," of which metaphysicians and logicians speak as a most radical principle of existence and of thought. Such being the case, it is clear that every necessity is accompanied by a corresponding impossibility, and every impossibility by a corresponding necessity. More explicitly, when it is necessary that any thing should be, it is impossible that it should not be, and, when it is necessary that anything should not be, it is impossible that it should be; and conversely as to impossibility. In this way necessity and impossibility are logical conditions of each other (§ 65).

Although necessity and impossibility partake of a common nature, neither can be resolved into the other, inasmuch as the one involves a relation to fact, and the other a relation to what is not fact; but, of the two, impossibility may be regarded as the more radical. For impossibility of change, or of the prevention of change, is the essential basis of the necessity of any fact or event; and this same impossibility is also implied in any other impossibility. The necessity of God's existence, or of God's justice, involves the impossibility of a change whereby God should cease to exist, or to exist as He is; while the impossibility that God should not exist, or should be unjust, also involves the impossibility of Him ceasing to be, or to be what He is. This dependence of necessity on impossibility is indicated by the negative character of the word *necessity*. For, whether we take "*necesse*" or "*necessum*" to have originally signified "*What does not cease*," or, "*What does not yield*," in either case, there is the suggestion, of that *which continues to be and which it is impossible to change*.

But necessity, while thus involving this radical form of im-

The doctrine of
impossibility.
Necessity and im-
possibility com-
pared.
Impossibility the
more radical.

possibility, always, as we have said, includes more, namely, *the reality of its subject*. Both necessity and impossibility are limitations of the efficiency of power; each supposes that which power cannot do—an effect which, because of a limitation of efficiency, cannot exist. At the same time, the limitation of power may be thought of with reference to the non-reality of the supposed effect, and then we call it impossibility; or—since the opposite or contradictory of the supposed effect must be real—it may be thought of as related to and characterizing this reality, and then we call it necessity.

Difficulties considered. Impossibility may exist or be real.

§ 70. Some difficulties, which arise from the scantiness and inadequacy of language, attach themselves specially to the doctrine of impossibility, and may, perhaps, be best stated and discussed in connection with the two principal meanings of this word. For sometimes we speak of the impossibility of some supposed fact or thing, and sometimes we call the impossible thing or fact itself an impossibility; and, in this way, using both significations together, we might speak of the impossibility of an impossibility. Now, as to the first-named impossibility, *there is a sense in which it may be said to exist*; for, in every case of impossibility, the non-existence of an efficiency adequate to the supposed effect is a reality. At the same time, it is not a positive but a negative fact, and the question arises, What do we mean in speaking of the existence of negative facts? To which we reply, that, using language strictly—that is, according to its more ordinary meaning—no facts, whether positive or negative, can be said to be or to exist. For a fact is itself the existence or the non-existence of something (§ 51), and it is not correct to say that the existence of something exists, or that the non-existence of something exists. Only things or entities exist, or do not exist, according to the ordinary sense of this word. Nevertheless existence and non-existence, though not objects or things, have yet an *objectuality*, according to which, when a thing exists, its existence may be truly seen and believed in, and, when it does not exist, its non-existence may be as truly perceived and known. When, therefore, a fact is said to exist, we mean, and can mean, only, that it has its own proper objectuality or reality. This explains the apparent contradiction of our language when we say that a negative fact exists; for that is to say that non-existence exists. Clearly we mean only that non-existence, as well as existence, has an objectuality (§ 35).

This is our way of speaking when we say that the impossibility of anything exists, impossibility being a negative fact.

The impossible is never the real. An extension of meaning given to the words *thing* and *exist*.

We now turn to impossibility, according to the second meaning of the term, which signifies, not the impossibility of any thing, but *the thing itself as being impossible*. This might be called *concrete*, and the other *attributive* impossibility, though this would be a secondary use of language and not strictly literal. It is

plain that while the impossibility of a thing may exist as a negative fact, the thing as an impossibility has no existence whatever. The essence of impossibility is that a thing cannot exist; it would be absurd to say that a thing impossible exists. But what especially calls for attention in the statement that a *thing impossible does not exist*, is that *both the word THING and the word EXIST are used in a very wide application*. Since a thing may be impossible to be, or impossible not to be,—that is, may be impossible as to its existence or as to its non-existence—the word *thing*, in an universal statement concerning impossibility, must cover cases of non-existence as well as of existence, or supposed non-entities as well as supposed entities. In short, there is an extension of the meaning of the word *thing* by which it corresponds in extension with the word *exist*. And this leads to the remark that we have here a more notable case than that already noticed of the enlargement, or generalization, of the idea of existence so as to include under it the negative as well as the positive mode of reality. For what we mean to say is that a thing impossible is not fact either positive or negative—that it is not *objectual* at all.

The term *objectual*, as here used, characterizes, not what is opposed to the subjective (or subjectual), but *that which may be known to be fact, and so that which in any way is real*. Now, if it be not sufficiently self-evident that the impossible is never *objectual*, this may be argued from the fact noticed by Aristotle that *εἶναι* and *μὴ εἶναι*—or the existence and the non-existence of things—are the proper subjects of necessity and impossibility. For this shows that there are only two modes of impossibility, according to one of which the existence of a thing is impossible and according to the other of which the non-existence of a thing is impossible. But these statements can mean only that, in either mode of impossibility, *there cannot be fact corresponding to our thought*—that, in the one case, the existence cannot exist or be real, and that, in the other, the non-existence cannot exist or be real. Moreover, although, in connection with the first case, there is a corresponding non-existence which is real, and, in the second, a corresponding existence which is real, yet these are not the existence and the non-existence which we think of as the subjects of impossibility; they are the non-existence and the existence which are the subjects of necessity. And, even allowing what seems to be true, that we never think of an impossibility save with reference to, and for the sake of, the necessity which accompanies it, this would not prove that the two are ever identical.

Objectless thought
—A second compli-
cation of meaning.

But, if the statement, that things impossible do not exist, is true in the sense that they have no reality either positive or negative,—if, in truth, they are neither existent nor non-existent—it may properly be asked, “*What kind of things are they?*” To this we reply that *they are not things at all*, and that, in literal strictness, we do not, in cases

of impossibility, think and speak of things, but only *as if* of things. We use objectless thought, and express this in the same language as if there were actualities to correspond to it. Impossible things, together with their supposed existence and attributes, and—yet more evidently—impossible non-entities with their non-existence, are not real, but the reverse of real. Moreover, the impossibility of a thing, though this impossibility may be a fact, is not really an attribute of the impossible (*non-entis nulla sunt attributa*); it is styled an attribute only according to that same mode of thought whereby its subject, even as impossible, is a thing. In speaking of the impossible our employment of the power of conception is of the same nature with that exhibited when we speak of ideal objects; but it is of wider range. In cases of impossibility we may have the thought of impossible non-existence as well as that of impossible existence; but ideal objects are supposed existences.

Thus the word *thing*—together, we may add, with other words related to it in use—has a *double complication* of meaning when we speak of things impossible. *First*, it is so extended as to cover in thought cases of non-existence as well as those of existence, or negative, as well as positive, facts, or (which is the same thing with a different emphasis of thought) things non-existent, as well as things existent. *Secondly*, in this meaning it expresses only objectless thought, that is, conceptions of the existence or of the non-existence of things, or of things as existent or as non-existent, which conceptions have nothing in fact or reality to correspond with them.

§ 71. One may ask, how does the statement, that
 A difficulty. *a thing impossible cannot be either existent or non-existent*, consist with the law of excluded middle, which is that *a thing must either be or not be*? We answer that the doctrine of impossibility would conflict with the law of excluded middle, if the same thing at the same time could be impossible to be and not to be. But there is no conflict when one thing is impossible to be and another is impossible not to be. It is to be noticed, therefore, that when we say the impossible is neither existent nor non-existent, we do not say that the same impossible thing is neither existent nor non-existent, but only that a thing impossible is either an impossible entity or an impossible non-entity, and that an impossible entity cannot exist, and an impossible non-entity cannot be non-existent. This consists with the law of excluded middle. But it should be further observed that this law does not apply either to the impossible or to the necessary as such. The necessary is always fact, and it would be inept to say that fact must be either fact or not fact; while the impossible is always not fact, and it would be inept to say that what is not fact must be either fact or not fact; as if there were two possible suppositions and the case were not already determined. In one sense, the principle of excluded middle applies to all things, but it

applies to things considered merely *formally*, and not to things conceived of positively or negatively. (See Chap. XIII.)

A fallacy explained. Since (A) *the impossible to be is always the necessary not to be*, and (B) *the impossible not to be is always the necessary to be*, it may be asked, "Is not the impossible, after all, a mode of the necessary; or, rather, is not each a mode of the other?" Common sense rejects this argument and asserts that necessity and impossibility are never the same; but the fallacy of it may not be perceived at once.

In regard to this we remark, *first*, the statement that *a thing impossible to be is necessary not to be*, does not necessarily involve that the impossibility of the existence of a thing and the necessity of its non-existence are identical: and a similar remark applies to the other statement. It is asserted only that a thing, which is impossible to be, is also necessary not to be. The statement may be likened to this, "Every rational being is a moral being;" in which we are not taught that rationality and moral character are the same, but only that they necessarily belong to the same subject. But, *further*, one may ask, How can it be shown that this explanation is true? May not the first statement naturally imply that *the impossible to be*, in the very fact of this impossibility, is the *necessary not to be*, and the second, similarly, that *the impossible not to be*, is, in the same way, identical with the *necessary to be*? We reply that the words might bear these meanings, but not the matter. Let us consider the second statement first, concerning the impossible not to be. A thing impossible not to be is not an impossible entity, but an impossible non-entity; whereas a thing necessary to be is a necessary entity—not a necessary non-entity; and it would be absurd to say that a non-entity and an entity *as such* are the same. But the former is impossible as a non-entity and not otherwise, and the latter is necessary as an entity and not otherwise. Since, then, the impossibility under consideration attaches itself to the non-entity, as such, and the necessity to the entity, as such, it is clear that impossibility of non-existence and necessity of existence are not the same; and that *the impossible not to be* is not, in the fact of its impossibility, *the necessary to be*, but is diverse from the latter.

The question then arises, "In what sense or way are the two identical, if not as to their necessity and impossibility?" We reply, *as to their form*, (§ 35). Yet even this identity is not literal; it is that only which may subsist between a thing as existent and as non-existent, and according to which we might say that the same thing—for example, a hope—which existed yesterday does not exist to-day. For the impossible not to be—the impossibly non-existent—has no form; because the non-existent is formless; our thought of it is an objectless conception; and even the thought of its non-existence has no objectuality to correspond to it. The literal truth in the case is that the formal conception, uniting with the thought of non-existence and of

impossibility of non-existence, is always the same formal conception which combines with the thought of existence and of necessity of existence. In the latter combination it sets forth a reality; but in the former it is not so used.

In like manner as to the first statement. A thing *impossible to be* is an impossible entity, and a thing *necessary not to be* is a necessary non-entity; and these can be identical only as to form. In this case there is yet greater departure from literal language. The only objectuality or reality mentioned—apart from the attributive impossibility and necessity—is the non-existence of the thing necessary not to be. The form thought of as existent and as impossible to be, and that thought of as non-existent and necessary not to be, are, in *fact*, both alike non-existent, the “objects” of objectless thought. The literal truth in the case is that these forms *would* be the same if they both really existed; and that the formal conception, which, in a case of the impossible to be, we combine with the idea of existence, is *the same conception* which, in the concomitant case of necessity, we combine with the idea of non-existence.

These explanations may be illustrated by reference to any necessary reality; for example, a divine attribute. We say that the justice of God is a thing impossible not to be and necessary to be: and that it is the one—not *in* being the other—but only *as* being the other, or because it is the other. The subject of both these predicates is the justice of God *as formally conceived of*. This conception, uniting in the first predication, first with the thought of non-existence, and then with that of impossibility, and, in the second, first with that of existence, and then with that of necessity, presents two different propositions for our belief: first that the justice of God, *as non-existent*, is a thing impossible and without reality, and, secondly, that the justice of God, *as existent*, is a thing necessary and real. Again, we say, “Wickedness in God is a thing impossible to be, and necessary not to be.” In this the formal conception of wickedness in God, uniting, in the first predication, first with the thought of existence, and then with that of impossibility, and, in the second, first with the thought of non-existence, and then with that of necessity, presents two different propositions, in the one of which *the impossibility of an existence*, and in the other of which *the necessity of a non-existence*, is set forth. But it is clear that the impossibility and the necessity in this case, as in the other, are not the same, though they are inseparably connected, and may both be predicated of the same formal subject.

§ 72. Finally, this is to be observed, that, whether we think and speak of the necessary or of the impossible, what the mind desires to know is fact or reality; therefore *impossibility is mentally used, not for its own sake, but for the sake of its accompanying necessity*. Such being the case, the query arises, “Why employ the impossible at all?” The answer is twofold. First, the conception

The conception of the impossible subsidiary to that of the necessary.

of a non-real thing, which is impossible to be, is used to suggest or indicate the real non-existence which is necessary not to be, because of that preference (§ 35) which the mind has for positive conceptions. It is more natural for us to conceive of a thing as being and then to judge it not to be, and so deny its being, than immediately to conceive and affirm its non-existence. Hence, ordinarily, we think and speak of the impossible to be rather than simply and directly of the necessary not to be. In the second place, having thus chosen these two leading forms of thought, viz., the impossible to be and the necessary to be, in each of which the central conception is positive, we employ the other, and more negative, forms as secondary to these respectively, and often find them useful in the antithesis of illustration or argument. For the necessary to be and the impossible not to be, though differing as mental conceptions, are equivalent as expressions of fact, the former being a direct and the latter an indirect expression; and, in the same manner, the impossible to be and the necessary not to be are objectively equivalent.

CHAPTER XXII.

LOGICAL POSSIBILITY.

§ 73. In studying objectively the nature of necessity and impossibility, we have been discovering the radical nature of those modes of thought employed in inferential perception, no less than the radical nature of those modes of fact upon which such perception is based. In every inference of fact our mode of thought is simply an apprehension of the mode of the fact as necessary. In like manner, also, the doctrines of possibility and of probability will throw light on methods of thought employed in reasoning; indeed, it will be seen that these doctrines, yet more decidedly than those of necessity and impossibility, involve a reference to modes of mental action.

All inference views things as conditioned. The inference of impossibility and of possibility has reference to conditions.

The inference of a negative fact from the impossibility of its contradictory, is no exception to the principle that *all reasoning as to fact is based on the perception of necessity, or of things as necessarily related.* The impossible to be and the necessary not to be, though different, differ only as to our modes of conception, and not as to the fact in each case; objectually they are the same. The impossible is the necessary not to be thought of in a peculiar way (§§ 71-72), and is inferred from an antecedent in the same manner as the necessary to be. We therefore say, either, "If the man is moneyless, it is impossible for him to pay his debts," or "If the man is moneyless, he must necessarily leave his debts unpaid."

But we conceive of, and reason about, things, not only as

necessary and as impossible, but also as possible, inferring them to be possible, and arguing from them as possible. Hence the questions arise, "How are the inferences of possibility related to those of necessity?" "Do they proceed or not on the same fundamental laws of being and modes of conception?" and, "What is the special value and use of such inferences?" Investigation, we believe, will show that the same radical principle of conviction, namely, *the recognition of things as conditioned*, is employed in these, as in all other, inferences, though it is employed in a peculiar manner; it will also be found that reasonings regarding things as possible are specially subservient, or ministerial, to the inference of fact. Writers on mental philosophy and logic have not given these questions much attention; yet they have a place, and an important one, in any complete account of the phenomena of belief.

The first point to be determined concerning these peculiar inferences relates to the nature of possibility. This is difficult of apprehension, unless we allow that several distinguishable, yet closely related, conceptions are used when we speak of a thing as possible—in other words, that the term *possibility* has several different meanings.

Of these, three may be noticed as the most important. *First*, the possible may be defined as *that which is non-existent, yet which power can make to exist*; this might be called the primary use of the word. *Secondly*, the possible denotes *that which, whether existent or non-existent, is, or is thought of, as the effect of adequate power*; this might be called the secondary use of the word. And, *thirdly*, the possible often signifies that which, whether existent or non-existent, is compatible with other things according to the relations of necessity, in other words, *that which may co-exist with other things*; and this may be called the tertiary use of the term. The first and second of these meanings agree with reference to their principal part, namely, the relatedness of an effect to power as adequate; but they differ as to the mode of their applicability, the first being applicable only to things non-existent, while the second is applicable to things existent as well as to things non-existent. The second and third agree as to the manner of their applicability, but differ in their essential thought. The first and third differ in both respects. The first, by implication, includes, as a part of our conception of the possible, the present non-existence of the thing possible—that is, its non-existence during the time of its possibility, though there is no implication as to its future existence or non-existence. But, from the second and third, we cannot infer either past, present, or future existence or non-existence. Thus, although possibility in every mode is related to existence, no mode of possibility involves existence or fact.

The first two significations, being identical as to their principal part, may be considered together, under the head of Causal



Possibility, the first of the two being distinguished as *improper*, and the second as *proper*, causal possibility. For the notion of non-existence, though naturally attaching itself to our primary use of the conception of possibility, is really something extraneous to this conception. The third style of possibility may be named logical, as it is that to which we refer in reasoning. Or causal possibility might be simply named possibility, as having an original and proper right to this term, while logical possibility—to use an old word employed by Chillingworth and revived by Hamilton,—might be named compossibility, as it pertains more simply and directly to the co-existence of a thing with other things.

The necessity for these distinctions becomes evident when we consider various uses of language. Sometimes we contrast the possible and the actual; for example, we speak of all things actual and all things possible; and in this we are thinking of primary possibility. Again, we sometimes say that a thing is not only possible but actual, or that it is possible because it is actual. The transmission of thought through the depths of the ocean is possible, because it is a thing actually done. This is that causal possibility which does not exclude reality. Then, too, we often speak of a possibility which has no direct reference to power and causation. A man ignorant of the details of Japanese geography might say, "Yokohama and Yeddo may be twenty, or they may be one hundred miles, apart, for all that I know." Because either of these supposed things would be compatible with the fact that both cities are in Japan; and so either supposition would have a possibility. It would be compossible with facts so far as known to, or considered by, the speaker. This may illustrate tertiary, or logical, possibility.

§ 74. Our most frequent use of possibility and kindred terms sets forth what we have styled primary possibility. The idea of possibility which first finds necessity of expression, and which remains the most common, is that given in the question, "What can be done?" It refers, not simply to the proper effect of the exercise of some power, but to *what power may, or may not, be about to effect*; that is, to something which is, as yet, non-existent. And, ordinarily, the question, "What has power been able to effect?" is secondary and subsidiary to the more directly practical inquiry, "What can power do in the future?" When we say that a thing is possible, we generally mean that a thing not yet effected can be effected; and, when we apply the conception to actualities, and say that such a thing is possible, for it has been done, this view of the past or present as possible has its use in helping to determine a possibility for the future. For what any power has been adequate to do, it will, under the same circumstances, be able to do again. Thus the thought of primary possibility naturally leads to the formation and use of the more general thought of pure causal possibility.

Primary possibility.

Causal possibility proper.

In this latter we think of an object simply as producible—as a proper result of the exercise of power—without decision of the question whether or not it has been or will be produced. The fact as to its existence, whether positive or negative, may be known along with the possibility, but is no part of it. Philosophically, this pure or proper causal possibility is more important than the primary; an understanding of it immediately explains the primary, and prepares for a comprehension of that yet more general and abstract style of possibility, which is the basis of a certain mode of reasoning, and which we have named logical. Such being the case, the more particular consideration of primary possibility may be omitted, and, by causal possibility, we may understand that proper causal possibility which is applicable to things either as existent or as non-existent.

Relations of possibility to necessity.

First of all, then, we remark that *causal possibility is closely related to causal necessity*. Both arise in connection with the relatedness of an object as an effect to its causal conditions, the principal of these conditions being the existence of an adequate power. When *all* the conditions exist, the effect is necessary; when all are supposed to exist, it is hypothetically necessary. Primary possibility is immediately related to the latter necessity; the possibility of matters of fact to the former; and general, or proper, causal possibility to both. Everything actually caused is possible as being the result of the exercise of adequate power—or of some sufficient cause, but it is possible simply as being the result of such efficiency, whereas it is necessary because, as resulting from a cause, it cannot be otherwise than it is. So also hypothetical necessity involves primary possibility, because this necessity belongs to that which does not exist, but which is hypothetically inferred as the result of a supposed exercise of adequate power. Thus causal necessity always involves causal possibility.

How far possibility involves necessity. Partial and perfected possibility.

§ 75. But, while this is so, the possibility of a thing does not involve its necessity. A thing may be regarded as possible with reference to *all* its causal conditions or with reference to *some only*; we must, therefore, distinguish between what we may call a partial, and a perfected, possibility. The latter does involve a necessity real or supposed (according as the possibility may be real or hypothetical), but the former may consist with an impossibility. For example, if a person had, or might be supposed to have, ability, opportunity, and sufficient inducement to make a speech—in short *all* the conditions of this effect—the speech would be both causally possible and causally necessary. For, if all the conditions of a speech were real, it would be really necessary; and, if they were only supposable, then, on the supposition of them, the speech would be hypothetically necessary. But, if only one or two conditions existed, or were such as might exist, in the case, then the speech would be possible so far as

concerned that condition, or those conditions; yet, on the whole, it would be impossible.

A difficulty explained. All things which exist—save space, time, God, and the internal and the mutual relations of these objects

—are the subjects of proper causal possibility in its application to realities; and all things which do not, yet *may*, exist, are the subjects of improper, or primary, causal possibility: because anything non-existent, if it become existent, can do so only as the effect of adequate power, and must, therefore, be a thing possible. Therefore, all things possible are necessary; the existent-possible is really necessary, as the result of real causes; the non-existent-possible is hypothetically necessary, as the result of supposed causes. This reasoning may seem to conflict with the statement that possibility does not involve necessity. But it really does not. For when we speak, as above, of *all things which do or may exist as all things possible*, we mean all things which are *wholly* possible—which are the subjects of perfected possibility. This does involve necessity, but partial possibility does not.

The conditions of the possible. § 76. *The conditions of a thing as possible are the same as those which have been already described*

as the necessary conditions of the existence of a thing (§ 65). A thing is possible with reference to any one causal condition when that condition either exists or may exist; for, if any necessary condition of an effect does not exist, and is impossible with the nature of the case, in other words, is such as the *given* conditions—or circumstances—of the case do not admit of, the thing is impossible. It is impossible for a child by his unaided strength to lift a ton weight, because one condition of the lifting would be a certain amount of strength; this could not belong to the child—it is impossible with that childhood which is a given circumstance. But the lifting would be possible for a man with a proper lever; for then the conditions of strength and means would exist, or might be supposed to exist. So it would be impossible for a common Chinaman to speak English immediately on his arrival in San Francisco. Why? Because he would need to possess a faculty incompatible with the fact of his being an ordinary uneducated Chinaman. But an Englishman who came from Hong Kong could make himself understood at once; for the faculty would exist.

A power adequate to the production of a thing is the most prominent and important condition of its possibility. An adequate power is one *the mode and the degree* of whose operation are suitable and sufficient for some certain result. For powers differ in nature and in degree, some beings or substances being capable of more and of greater things than others. The power of the ear is different from that of the eye, and, of two ears or two eyes, one may hear or see better than another. When we find an adequate power to exist, we say the thing is possible so far as the power to produce it is concerned. Then we in-

quire concerning other conditions, and, from their existence or non-existence, determine the question as to the remaining elements of a complete possibility (§ 75). If there were a tailor we would know that a coat was possible so far as regards productive skill. We might then ask, "Is it possible as regards material? Where are the cloth, lining, thread, buttons, and so forth?" Next, "Is it possible as to instruments? Has the man a workshop, needles, scissors, and other implements?" Finally, "Is it possible as to sufficient inducement? Have you the money to pay the tailor for the coat?" Thus one might successively consider the different causal conditions of a coat, so far as there was any question concerning each, and would probably, though not necessarily, do so in the order of their importance.

Real and hypothetical possibility distinguished from pure possibility.

We now come to a radical distinction between modes of causal possibility. A thing either may be *really*, or it may be only *hypothetically*, possible. It is the former when the conditions to which the possibility relates are fact; it is the latter when they are not fact, but merely supposable, as being compatible with the given facts, or circumstances, of the case. It is hypothetically possible for any man to purchase a farm; for it *would* be possible for him if he had the money, and this is a thing supposable: but it is really possible only for one who actually has the money. A condition, with respect to which a thing is only hypothetically possible, does not exist, and is such as cannot exist; in other words, it is incompatible with the necessary modes of existence which affect the case as given. A thing may be really possible as to one of its conditions, and hypothetically possible as to another; and thus these two modes of possibility may unite. Real possibility does not involve the existence of the thing possible, but only the existence of some causal condition, and is especially asserted when the power to produce a thing exists; for power is the principal condition. The reality indicated by the term *real* is not that of the thing possible, but that of the condition. With respect to material, a coat would be really possible if the cloth existed; it would be hypothetically possible on the supposition of the skill necessary to make it, which skill, however, is not procurable; and, it would be really impossible because there is no way of having it made (§ 150).

Here, however, it should be remarked that the existence of the condition in real, and its non-existence in hypothetical, possibility, are things extrinsic to simple or pure possibility; in which respects they resemble the non-existence of the subject of primary possibility (§ 74). Simple, or pure, causal possibility involves only the compatibility of a thing and its conditions with given circumstances, and does not assert either the actual existence or the actual non-existence of the thing or its conditions. Every conception of a thing as possible does, indeed, involve a supposition, or hypothesis, of the existence of its conditions;

therefore, in a sense, all possibility is hypothetical. But no implication of the real existence or non-existence of the conditions accompanies the conception of simple or pure possibility; the thing supposed as possible and its conditions severally, may, or may not, be real: whereas there is such an implication both in real possibility and in that hypothetical possibility which is contrasted with it.

The terms *real* and *hypothetical* may be objected to as descriptive of these mixed modes of possibility; but no other terms more suitable have presented themselves.

Another distinction of some importance between modes of causal possibility is that between *absolute* and *relative possibility*. A thing is relatively possible when it can be brought about by some particular power, real or supposed; and we say it is possible *for that power*. It is absolutely possible when it is possible for power in general, so that, if not possible for one power, it yet is possible for some other. All things possible for any power would be possible for an infinite power; therefore, in respect to such a power, the absolutely and the relatively possible would be the same. Moreover, if such a power really exists, then all things absolutely possible are really possible, for that power; but, if such a power exist only in supposition, then some things absolutely possible are not really possible for any power, but merely hypothetically possible for the supposed infinite power.

Finally, we may distinguish between *natural* and *moral possibility*. Each of these is a kind of partial possibility (§ 75), and both relate to the actions of free agents. A thing is naturally possible when the agent has the intellectual and executive ability, together with the proper means and opportunity, for its accomplishment. It is morally possible when the powers of his motive nature are adequate to adopt the action as an end, or as a means. For example, it is naturally possible for a miser to give all his money to the poor; but this would be morally impossible for him under any ordinary circumstances. It is naturally possible, but morally impossible, for a perfectly virtuous being to do that which is wrong and sinful. A rational agent cannot be morally responsible for the performance of an action, or the accomplishment of an end, which is naturally impossible for him; but, if the action or end be only morally impossible, he may be responsible with respect to it. For moral impossibility, like moral necessity (§ 68), consists with moral freedom.

§ 77. Having, at some length, discussed causal, we now pass to the consideration of *logical*, possibility.

This may be defined as the existential compatibility of a thing, real or supposed, with given circumstances. These circumstances are other things which exist, and to which the thing possible is conceived of as related in some specific way. The compatibility is a peculiar and simple relatedness of the

Logical possibility defined.

thing to the circumstances. We call it compatibility, or agreement, or conformity, because it is somewhat similar to the relations thus named; but it is really *sui generis*, and incapable of analysis. We say *existential* compatibility, because the relation thus named relates to the existence, in the given circumstances, of the thing possible; this is the *fundamentum relationis*. The relation of ruler and subject refers to government; that of debtor and creditor to the use of another's property; that of husband and wife to the marriage contract; that of compatibility of temper to harmonious intercourse; and existential compatibility, or logical possibility, relates to the existence of one thing as in specific relation with others. Ordinarily the correlate of the possible—that with which it is compatible—is not prominently thought of; our attention and interest are given to the thing possible, and not to the circumstances. Yet these are always referred to, and this reference becomes explicit when we say that one thing is compossible with another, or that it is possible in such or such a case. The word *may* is that by which possibility is ordinarily predicated of any subject; as in the statements, "That may be," or, "That may be in such or such circumstances." The compatibility of a thing with given circumstances involves also the compatibility of its necessary conditions with those circumstances. *When a thing is possible in its constitutive, causal, and concomitant conditions (§ 65), it is possible in every respect; and we determine the possibility of a thing by determining the possibility of its conditions.* This radical and self-evident principle is perhaps the most important in the philosophy of the possible.

As causal possibility corresponds to causal necessity, and is connected with causal conditions, so logical possibility corresponds with logical necessity, and is connected with necessary conditions, whether they be causal or not. And as causal necessity may be regarded as a species of logical necessity, so causal possibility may be regarded as a species of logical possibility (§§ 64–66). Causal possibility is the logical possibility of a thing *considered simply as an effect; that is, as a result of causal conditions; and our inquiry, in a question of causal possibility, concerns the admissibility of causal conditions only.* In logical possibility a thing is conceived of as existing in any necessary relations whatever, and our inquiry concerns the admissibility of any condition, or conditions, to which, if the thing exist, it must stand related. If a condition exist or be admissible, the thing is logically possible as regards that condition; but if the condition do not, and may not, exist, the thing is logically impossible, that is, it is impossible, or existentially incompatible, with what is given as fact. If we knew that a thief did, or could, enter one's barn at a certain time, we might say, "Possibly the horse has been stolen;" in which reasoning we would use that species of logical possibility which we have named causal. But if, without such knowledge, we should find

Logical compared with causal possibility.

the horse gone some morning, we would say, "Possibly a thief has been here;" in this we would use logical, but not causal, possibility. For the absence of the horse, though a logical, would not be a causal, condition, of the act of robbery and of the coming of the thief. Only effects—not causes, as such—are causally possible. Again, supposing a triangle to exist, we say that it may be either equilateral, scalene, or isosceles; any one of these things is compossible with the existence of a triangle. Yet the existence of a triangle would not be a causal, but a concomitant, condition of its having some one of the three shapes. For any triangle and its special shape would come into existence together. So, if a man own ten dollars, he may own a gold eagle; but the existence of the ten dollars, as owned, would not contribute in any way to the making of the coin. It would be a necessary, yet not a causal, condition. For one could not own an eagle if he did not own ten dollars.

The use of the term *possibility*, to signify the existential congruity or compatibility of a supposed fact or entity with given circumstances, may easily be traced to the more primary employment of the term, in which is set forth the compatibility of the *causal* conditions of a thing with given circumstances. For this latter relation, which is that chiefly used in our search after things unseen or unrealized, assists our inquiry after fact, not because of its specific and causal character, but *because of its general nature* whereby an effect exists only as conditioned by, or necessarily related to, an appropriate cause; in other words, *just as any other possible consequent exists as related to an antecedent*. Hence, in cases of causal possibility, when we are not making the practical inquiry, "What can we do?" but simply ask, for information, "What may the result be?" the effect is regarded chiefly as the logical correlative—or consequent—of the cause, and causal conditions are looked upon rather as providing for a fact than as contributing to an effect. After this we find that things exist in necessary relation to other than causal conditions, and may be conceived of and reasoned about as thus related; whereupon we apply the term *possibility* to every mode of the compatibility of one thing and its conditions with other things as co-existing with them. What renders this extension of the term extremely natural is the fact that *nothing can be causally possible which does not conform to other modes of possibility*. For example, it would not be possible to make three boxes whose united capacity would be equal to that only of one of the three boxes, and this because the result proposed would involve the logical impossibility of a part being equal to a whole. A whole equal to the sum of its parts is logically, and therefore causally, the only possible whole. Other modes of possibility being thus necessarily involved with the causal mode, the same name was extended to all. Finally, the metonymy under consideration is further favored by the fact that possibility of mental conception is confined to the

A metonymy and extension of the term *possibility*.

thought of things logically possible. Forms can be conceived—that is clearly and distinctly conceived (§ 33)—only so far as they possess logical consistency; and so we call the conceivable the possible.

Logical possibility has thus been described in scholastic language: "*Possibilitas est consensio inter se seu non-repugnantia partium vel attributorum quibus res seu ens constituatur.*" The harmony of parts or attributes mentioned here, is simply the compossibility of each part and its conditions, or necessary *relata*, with the other parts and their necessary *relata*. But it should be added that not only a possible object and its parts—and the parts as mutually connected—harmonize with each other, but they also harmonize with other objects to which it and they may be related. An animal is a thing *internally* possible, because its parts are not such that they cannot co-exist, but it is a thing *externally* possible only where there is food; because food is an external condition of animal existence. A conception, however, may be so enlarged as to include any relation ordinarily regarded as external: we can think, for example, of "an animal where there is food," or of "a house built on a rock," or of "a man in a prison," as *one* possible object; with this understanding, the scholastic definition is exactly correct. For, in this case, one of the parts, or attributes, of the thing or object is its relatedness to the other object.

Distinctions of modes of possibility having reference to conditions.
Real, hypothetical, pure or simple.

§ 78. The distinctions already made in causal possibility between partial and perfected, and between real and hypothetical, possibility, *apply to logical possibility in general*; for they arise from the consideration of causal conditions, not as causal, but as necessary. The distinctions, however, between absolute and relative, and between moral and natural, possibility, do not apply to possibility in general; for they relate to power as such, and as being a condition having its own degrees and modes.

Real possibility has been defined as that which arises when some condition of a thing actually exists; hypothetical, as that which we assert when some condition does not, yet may exist. If the dinner is on the table, there is a real possibility of eating; if it is only supposable there, the possibility is hypothetical. Or if two persons are sitting at the table, there is a real possibility that one of them is a man and the other a woman; but if they are merely supposed to be there, the possibility of their being male and female is hypothetical. But, let us remark again, that logical possibility, pure and simple, is also, in a sense, hypothetical; it involves the supposed existence of conditions. The hypothesis, however, upon which our judgment or perception of the purely possible is based *does not exclude reality*; it is *simply hypothesis unaccompanied by negation*, and leaves the question undetermined whether the supposed conditions exist or not. Real possibility resembles primary possibility—the causal possibility

of the non-existent—as having an admixture of fact, and also as furnishing a form of thought frequently employed by the mind. But the reality of the condition, like the real non-existence of the thing causally possible, is something adventitious to the possibility. Pure logical possibility is that correlation of the parts of an entity or of different entities with each other, according to which they, together with their necessary relations and *relata*, may co-exist with each other. It involves the possibility of any condition if the thing conditioned is possible; but it does not require the *real* existence of any thing or any condition. When, therefore, a condition exists, this is something *additional* to the pure possibility. Yet, since what really exists in any case *may* exist in that case, we say that a thing is possible as to any condition which *either* exists or may exist, meaning which *may exist*, whether it really exist or not. Thus we employ real to support pure possibility, when the question is merely as to the possibility of a thing. But real possibility, as we shall see, has also an importance and use of its own. Similar remarks might be made as to the relations of pure and hypothetical possibility.

Inference of possibility presupposes an immediate perception of possibility.
Postulates of possibility.

We have already (§ 77) noticed that a thing may exist if its conditions may exist; in other words, a thing is possible so far as its conditions are possible. To some this statement may suggest a difficulty. If the possible involve possible conditions, will not these involve yet other possible conditions, and these still others, and so will not an infinite regression be needed to establish any possibility? We reply that it would be needed if, in our regression, we did not come to conditions the possibility of which is self-evident. *But an immediate perception of possibility takes place in several ways.* In the *first* place, as already said, whatever actually exists in any given circumstances, exists under every one of its necessary conditions, and is possible in every respect. Hence, in the case of *real* possibility, which is that most frequently considered, there is no need of inquiry as to the abstract possibility of the condition. In the *second* place, whatever has existed may, in similar circumstances, exist again; and this principle enables us to determine the possibility of a condition which, though not known to be fact, is known to resemble fact. For possibility pertains to forms conceived of as existing, but not to real things, as such; and we may at once, and once for all, perceive a form to be possible. *Finally*, in other cases there is no infinite regression, because the *radical or ontological elements and conditions of things*—such as spaces, times, powers, substances, actions and changes—in the various relations according to which these condition one another, are immediately recognized by the mind as possible. Thus many radical conceptions of things possible are formed. By means of these conceptions, in which the possibility of a thing as to its ontological character and conditions is set forth, other and less apparent pos-

sibilities are determined. We say it is possible for a bushel measure to contain a peck of potatoes, because this is simply an application of the principle that what can contain the greater can contain the less. But this radical law of the possible in spacial measures, together with the possibility of its conditions—such as space, substance, quantity and the mutual relations of these things according to the terms of the law—is immediately perceived by the mind. Such radical conceptions or judgments may be styled *the first principles or postulates of possibility*. Like our conceptions of radical necessities, they may first be formed by the mind during its perception of facts; yet the perception of fact in any case must be distinguished from the recognition of the possibility or necessity which attends the fact. The foregoing remarks show how the statement is to be taken that the possibility of a thing must be inferred from that of its conditions. This rule applies only to cases wherein the possibility is not self-evident, and must be perceived inferentially, if at all. In short, the possibility of a thing must be inferred from the possibility of its necessary conditions, just as the existence of a thing must be inferred from the existence of its necessitant conditions (§ 65). It should be noted, however, that the possibility of conditions, as being mostly mixed with fact, as in general easily ascertained, and as secondary to that of the object which they condition, receives comparatively little attention, in our ordinary thinkings.

The inference of possibility distinguished from that of the possibly necessary.

At this point of our discussion, for the sake of clearness, we must distinguish between *the inference of things possible from their necessary connection with things possible*, and *the simple inference of possibility*. In the former—which might be styled the inference of the possibly necessary—we proceed on the principle that what is necessarily connected with a possible antecedent is itself a possible consequent. This is a special application of the principle of antecedent and consequent. It is the inference of a thing as hypothetically necessary. But the simple inference of possibility—or of a thing as possible—proceeds on the principle that a thing is possible if its conditions are possible, and does not, in any sense, assert the necessity of the thing inferred.

Possibility and necessity related as modes of the conditioned. Indeterminate, determinate.

§ 79. The distinction has already been noticed between real and hypothetical necessity (§ 64). Comparing the really possible with the really necessary, and the hypothetically possible with the hypothetically necessary, we might say that the possible and the necessary are related to each other as two different modes of the conditioned. A thing is possible *really* when one or more of its necessary conditions exist in given circumstances, and *hypothetically* when one or more of its conditions are supposed to exist; and a thing is *really* necessary when one or more necessitant conditions exist in given circumstances, and *hypothetically* when one or more such conditions are supposed to

exist. The necessary—whether the necessary to be or the necessary not to be—is conceived of as existing, and is asserted to be real; but the possible—whether the possible to be or the possible not to be—is conceived of without conviction as to its reality, and is neither asserted nor denied to exist, while the mind may inquire whether, in its belief, to unite the idea of existence, or that of non-existence, with the formal conception of the thing (§ 36). For, although we regard things existing and also things non-existent as possible, and must do so when the question concerns their *fitness to exist*, their possibility does not, of itself, involve either existence or non-existence. This being the case, the necessary and the possible, as modes of the conditioned, may be contrasted as the *determinate*, and the *indeterminate, conditioned*. For, while both have conditions, we conceive the existence of the necessary, but not that of the possible, to be determined by its conditions. In partial possibility we do not consider enough conditions to settle the question of reality, while in the case of perfected possibility, although the conditions constitute a logical antecedent, *we disregard that circumstance*: for, so soon as we notice this, we speak no longer of possibility, but of necessity (§ 75). The possible is that which agrees—or would agree—with its circumstances because they contain, or, at the least, agree with, its conditions; the necessary not only agrees with, but is required by, its circumstances. Knowing that three straight lines have been made on a black-board, we say, “Possibly there is a triangle on the board;” because three straight lines are so many necessary conditions of a triangle. But, if we learn that the three inclose a space, we say that there is and must be a triangle; for three straight lines inclosing an area are not merely a condition, but a logical condition, of that geometrical figure.

§ 80. *We are now prepared to understand how the mind, in its pursuit of the knowledge of fact, forms and uses its conceptions of things as possible.* We are often unable directly to determine, from our knowledge of the circumstances of a case, what the truth may be respecting some point of inquiry. That is, we are unable to discover any real antecedent which, as involving a logical condition (§ 65), necessitates the reality of some object conceived of. Such antecedents may exist, but we know not where to seek for them, or at least, have not been able to find any. In these circumstances, abandoning the direct search for proof, we permit the inquiry, “Is the thing supposed possible?” to take the place of the question, “Is it necessary?” This inquiry as to possibility is twofold. *First*, if need be, we ask as to the pure or abstract possibility of the thing, that is, its possibility considered without reference to the question of the reality or non-reality of its conditions. The aim of this inquiry is to determine only the compossibility of the conditions, internal and external, of the object, with each other and with the given cir-

Inference of possibility is subservient to inference of fact in several ways.

cumstances of the case: we do not directly inquire respecting the reality of any condition. If any of the conditions be found impossible with the given circumstances, there *is no need of further inquiry*: no matter what existing circumstances may be, the thing is impossible and does not exist. But, if there be no inherent absurdity and impossibility, we ask, *further*, "Is the thing really possible?" In other words, "Do its conditions really exist?" For anything is really possible as to any condition when that condition really exists (§ 78). An attentive scrutiny of the thing supposed naturally brings to view its necessary parts and other conditions, and directs this inquiry as to its possibility. Suppose, now, we find that some condition, or conditions, of the thing, do not exist. This being the case, the thing is *really* impossible; for a thing cannot exist so long as any one of its conditions is non-existent. Thus, again, our inquiry concerning fact is satisfied; we can say that the thing conceived of does not exist; the possible has been our guide to the real; it has discovered the really non-existent. Suppose, again, we find that every condition concerning which we can inquire is found a reality. We now say that, so far as we can see, the thing is really possible, and *cannot be denied to exist*. We can inferentially deny only the impossible. In such a case reasoning in possibility enables one to reject any unfounded disbelief—that is, any unfounded belief in the non-existence of the object—and prepares the mind for the proper consideration of evidence. Moreover, logical being composed of necessary conditions (§ 65), inquiry after the latter puts us better in the way of meeting with the former; and thus, *searching within and over the field of necessary conditions, we are in a position to find conclusive antecedents*, if such are discoverable. *Finally*, therefore, suppose that certain conditions are found to be real which, taken together, can belong to but one object, and that the object whose reality is in question. When this happens, the inference of possibility is replaced by the inference of fact; our inquiry terminates in the positive assertion of reality. In these several ways, reasoning in possibility subserves reasoning in necessity. This latter mode of inference has mostly, if not exclusively, engaged the attention of philosophers. It is confessedly more important than the former, and is also more easily noticed; yet it is no more natural to the mind, nor better entitled to recognition in a system of psychology.

To illustrate the foregoing teachings, let the question be, whether or not a certain box contain \$100,000 in gold. If it does, many necessary conditions are involved, and these must be abstractly possible. For example, it must be supposable that box and money both exist, that the box is of size and strength suitable to receive the money and keep it safely, that the owner of the money has desired, and been able, to put it in that particular box, that he has deposited the money in the box and has not withdrawn it, and that he has the box carefully locked

and guarded. These and similar conditions must be supposable; if any of them is impossible, we need not inquire as to the facts of the case; the story of the deposit is, on its face, absurd and false. But, if the conditions are all supposable, we ask further, "How many of them really exist?" If any one condition is found not to exist really, we say that there cannot be, and is not, any such deposit. But, finding some conditions to exist, the others being undetermined, we say that the thing is possible—that is, really possible; for necessary conditions exist, yet not, so far as we can see, in such relation to each other, and to the thing supposed, as to form a necessitating or logical condition. Ascertaining, for instance, that a certain man had the money, and that the box was a suitable safe, and accessible to him, we say that the deposit is possible, but has neither been proved as necessary to be nor disproved as necessary not to be. But, finally, finding, not only that the man had the money and that the safe was suitable and accessible, but that he was seen to place the treasure within the safe, has guarded it securely, and has not withdrawn it, we say that the deposit *must* be a fact. Thus the recognition of real possibility terminates in the perception of real necessity.

§ 81. The explanations now given of reasoning in possibility apply fully only to the inference of that which we ordinarily mean by the possible. This term mostly signifies the *possible to be*, just as ordinarily the impossible signifies the impossible to be. Sometimes, however, we speak of the *possible not to be*, of that whose non-existence is, or would be, compatible with given circumstances; and our reasoning, concerning this possible, differs somewhat in mode from that already described. A thing is inferred as possible to be when its conditions, so far as considered, exist or are possible; but it is inferred as possible not to be when its conditions, so far as considered and found existent or possible, *do not constitute a logical condition*. Thus a thing is possible to be when it is *not necessary not to be*, and it is possible not to be when it is *not necessary to be*.

Such being the case, it will be seen that reasoning in possibility (whether positive or negative possibility) is closely related to reasoning in necessity (whether positive or negative). Both modes of inference may be said to be based upon the same radical principle, viz., that things exist as conditioned. Both arise from the consideration of things as conditioned. Comparing the one mode of reasoning with the other, we perceive that the necessary (or impossible not to be) is inferred from the existence of a logical condition; and the impossible (or necessary not to be) is inferred from the non-existence of a necessary condition—this non-existence being its logical condition; while the possible to be is inferred from the existence, real or possible, of necessary conditions, and the possible not to be from the non-existence, real or possible, of logical conditions. Thus, too, we see how the proof of the possible to be tends towards, and prepares for,

that of the necessary, and how the proof of the possible not to be tends towards, and prepares for, that of the impossible. The impossible is related to the possible not to be, just as the necessary is related to the possible to be; and as the necessary is always possible to be, so the impossible is always possible not to be.

The radical nature
of logical neces-
sity.

§ 82. The discussion of logical possibility throws light on the doctrine of logical impossibility and logical necessity, or, more simply, on the doctrine of necessity, since impossibility is the necessity of non-existence. The essence of possibility, as we have seen, is the existential compatibility of a thing with given circumstances; which compatibility is shown when the circumstances do not exclude any necessary condition (in the case of the possible to be), and when they do not include any necessitating condition (in the case of the possible not to be). Such^{*} being possibility, impossibility might be defined as the incompatibility of the existence of a thing, and necessity as the incompatibility of the non-existence of the thing, with given circumstances. These definitions differ from those already given (§ 62) of necessity and impossibility as the characters of that which being existent cannot be made not to exist, and of that which being non-existent cannot be made to exist: yet they are *in effect* the same. For it is because the non-existence of a thing is incompatible with the circumstances of a thing necessary, that we can always say that it exists and cannot be made not to exist (the circumstances remaining the same); and it is because the existence of a thing is incompatible with the circumstances of its impossibility, that we can always say that the thing does not exist and cannot be made to exist. But, of the two pairs of definitions, those mentioning existential incompatibility more nearly present the essential nature of necessity and impossibility, while the other statements set forth the most general and striking properties of these things. Ordinarily, we seem to think of the necessary and the impossible—or, more explicitly and literally, of the necessary to be and the necessary not to be—with reference to an inability or limitation of power to effect a change; at the same time this inability, we believe, is chiefly thought of as suggesting that *out of which it arises*, namely, the incompatibility of the non-existence of the necessary, and of the existence of the impossible, with given circumstances.

Such being the case, this last definition given, of necessity in both its modes, may be considered the more radical and scientifically exact, while, for most purposes, the less philosophical definition may be preferred as more easily apprehended and applied. But whether even the definition presented as more philosophical be itself an analytical definition or merely the description *ab extra* of a thing incapable of analysis, we shall not now discuss; it is certainly a correct and defining statement. (Thomson's "Laws of Thought," §§ 70, 71.)

CHAPTER XXIII.

CONTINGENCY AND PROBABILITY.

Contingency defined. A special phase of possibility.

§ 83. The contingent is closely related to the possible. It is that which happens or may happen, or—more generally—which exists or may exist, and which also does not exist or take place necessarily. In this statement the essential word is *may*; for, as a thing which exists is possible, not because existence is possibility, but because existence implies possibility, so a thing which happens or exists is contingent, not because happening or existing is contingency, but because these, so far as they do not take place necessarily, imply contingency.

Ordinarily, the possible means the possible to be, and so the contingent, ordinarily, is that which may exist. But, as we speak of the possible not to be, so a thing as non-existent may be regarded as contingent. In other words, the contingent in the widest sense, includes, not only what may be, but also what may not be. And, indeed, whenever a thing is positively contingent, it is also negatively contingent; and, conversely, whenever it is negatively, it is also positively, contingent.

This brings us to remark that contingency is a special mode or form of possibility distinguished from possibility in general by several characteristics, the principal of which has just been mentioned. As we have seen (§ 75) the possible to be includes the necessary, and the possible not to be includes the impossible (or the necessary not to be); but the contingent lies between the necessary and the impossible. It is what we might style the *intermediate possible*. It is that which is possible either to be or not to be. Either as to its existence or as to its non-existence, it is compatible with given circumstances.

The possibility of contingency is not that primary possibility (§ 74), the subject of which is non-existent, but that more general possibility (§ 76), the subject of which may be either existent or non-existent. Actual events or existences, as well as those merely supposed, may be styled contingent. Moreover, contingency, like possibility, is primarily conceived of as characterizing events or effects, and therefore ordinarily signifies causal possibility, but, like possibility, it comes to be employed in a wider sense. The *logically* contingent, like the logically possible, is that which is compatible with given circumstances, whether with reference to causal, or with reference to any other necessary, conditions (§ 77). Thus it is causally contingent in the making of a triangle that one of its angles should be made a right-angle, or that it should not be so made. But, should we consider the triangle, not as a thing in the process of mak-

ing, but simply as existing, it would still be logically contingent that one of its angles should, or should not, be a right-angle.

The only respect in which the contingent noticeably differs from that possible which lies between the necessary and the impossible—and which, therefore, is possible to be or not to be—is that *in possibility the emphasis of thought is on the existence of the thing, while in contingency it is on its co-existence with some other thing or things*, with which it may be related. In both cases there is the fitness of a thing to co-exist in relation with other things; but possibility contemplates this fitness principally with reference to the existence of the thing itself, while contingency contemplates it with reference to its co-existence with other things. It sets forth prominently what possibility implies. It may also be added, as a less prominent difference, that the terms *contingent* and *contingency* are used to express intermediate possibility only in cases where the possibility may be employed as the basis of a judgment of probability. This point will be more evident hereafter (§ 85). Thus it appears that the contingent is very nearly defined when it is styled *the intermediate possible*.

The relation of contingency and necessity. § 84. The relation of contingency and necessity is a subject upon which we should avoid confusion. These two things being opposed to one another, it is natural for us to form the opinion that a thing cannot be contingent and necessary at the same time. It is true that contingency and necessity cannot co-exist with respect to the same relation of a thing to some other entity; yet *a thing may, at the same time, be necessary in one relation and contingent in another*. It might be a contingent event for a horse to pass along a certain road so far as relates to the road. The animal either might, or might not, pass that way. But, should there be tracks on the road such as that horse only could have produced, we would say that he *must* have passed that way—that, in view of such tracks, his passing is logically necessary. Again, the two angles at the base of a triangle might, or might not, be equal to one another, so far as the fact of the triangularity of the figure is concerned, or in their relation to the triangle simply as such. But these same angles would be necessarily equal as related to the sides opposite them, provided these sides were equal.

A distinction between distinctions. Hypothetical and real contingency. The distinction between the contingent and the necessitudinal elements of entity, to which also that between the experiential and the intuitional elements of thought corresponds (§§ 13–231), is one of great importance in philosophy. But the necessary and the contingent of that distinction are not the necessary and the contingent of which we now speak. The former distinction calls that only necessary which is *necessary to any system of being whatever*—which must exist in any universe—and that contingent which is possible to either exist or not exist in any system of being or in any universe. In other words, the

necessary is that which must exist if things exist at all, and everything else is non-necessary or contingent. In short, ontological necessity and contingency are to be distinguished from logical necessity and contingency in general. The latter belongs to every form or modification of entity so far as it may be in any way necessarily related; so that the same form, or modification, which may in some way be logically necessitated, may also, as standing in some other and non-necessary relation, be contingent. Thus, as we have seen, the passage of a certain animal along a certain road might, at the same time, though in different relations, be both necessary and contingent. But the ontologically necessary and contingent are never interchangeable; each has a fixed character of its own. Space, time, substance, power, change, and various general relations of these and other elements of entity, are permanently necessary to any system of being; while the specific degrees and forms—or, more briefly, the specific modifications—of the radical elements and modes of entity, are ontologically contingent; for they need not exist in any universe.

The distinction already made (§§ 64–76) with respect to real and hypothetical necessity, and real and hypothetical possibility, may also be applied to contingency. A thing is really contingent when the conditions on which its contingency depends are literal fact; hypothetically contingent when they are only supposed to be. The same distinction may also be made with respect to probability and the probable. But as, in all cases, the hypothetical refers to the real and is explained by it, we need not dwell on this distinction, but may discuss contingency and probability as *real only*.

§ 85. The doctrine, already taught (§ 83), that contingency is intermediate possibility, may be expressed more simply should we say, that the contingent is the possible. For, by possibility, we ordinarily mean intermediate possibility. But contingency has also been distinguished from intermediate possibility in general, as being such possibility as may be used as the basis of a judgment of probability. By this we do not mean that a thing contingent is therefore also probable, but only that it is possible in such a mode that we may reasonably inquire whether it be not also probable, or real. Were a beautiful poem published anonymously, search would not be made among men in general for its author, but only among a certain class of men; and, although, in an extreme and abstract sense, one might say that it is contingent to a man to write poetry, yet, for the purposes of inquiry, we would limit this contingency to poets. In this way two forms of possibility may be distinguished, both of which might be termed contingency, but the latter of which is so named by way of pre-eminence.

The ground of this distinction is to be found in the diverse character of the conditions on which the possibilities depend.

The antecedent of contingency distinguished from that of possibility.

We have already seen that a thing is possible with reference to any necessary condition of its existence when that condition exists (§ 76). Therefore, such a condition, as existing, may be termed an antecedent of possibility. But of such antecedents there are two kinds, one weak and the other strong. These arise, respectively, according as the antecedent of possibility does, or does not, approximate to an antecedent of necessity, or rather to that logical condition which every antecedent of necessity contains (§ 60). We have already seen that every logical condition is composed of necessary conditions (§ 65); it is also clear that *any condition which is complex* is also composed of such conditions: for any condition, in all its parts, is necessary to that which it conditions. Now a condition, which, though falling short of a logical condition, so resembles some such condition already known to us, as immediately to suggest it to our minds, may be called a strong condition, because, in the absence of any definite information, it suggests the thought, "The whole logical condition may exist, and the consequent, therefore, may be a fact." But a condition which does not thus resemble a logical condition may be called weak, for it suggests no necessitating condition, and affords no basis or starting-point for search.

If a criminal escaped from justice, it would not excite inquiry, on the part of the proper officers, to be told that there was a man in such or such a place; although this would be a necessary condition of the location of any criminal, the possibility resting on it would not suggest any logical necessitant. But, if they should learn that a person resembling the criminal had made his appearance in a certain city just after the time of the escape, they would say, "Possibly he is the man." In this case, there would be something more than abstract theoretical possibility; there would be a strong practical possibility—a contingency—attaching itself to the man thus described, that he may be the criminal in question. The mere existence of a man somewhere is the antecedent of possibility; that of the man resembling the criminal in appearance and conduct, is the antecedent of contingency. The latter is such that the addition of only a few particulars may make it a logical necessitant, which particulars are immediately suggested to the mind. At the same time it is to be remarked that the antecedent of contingency does not, of itself, establish a probability, but only a strong or suggestive possibility—a mere indeterminate chance. The question whether the chances for the supposition be one in ten, or one in ten thousand, or whether they can be found to have any definite ratio to the chances against the supposition, is to be determined by further considerations. The judgment of contingency is one of entire uncertainty; and the proposition expressive of it is what Aristotle calls "the dialectic." "For," he says, "a demonstrative proposition differs from a dialectic in this, that the former is an assumption of one part of a contradiction, for a demonstra-

tor does not interrogate, but assume; but the dialectic is an interrogation of contradiction" ("Prior Analytics," bk. i. chap. i.).

§ 86. We are now prepared to discuss the nature and grounds of the *judgment of probability*; which (§ 83) involves, and is conditioned on, the judgment of contingency. To do this properly we must, sometimes at least, use the terms *probable* and *probability* in a very wide sense. Ordinarily, when we say that a thing is probable, we mean that the chances are considerably in favor of the supposition of its existence. But philosophy needs a term to designate that respecting which we have any expectation or belief at all, whether weak or strong, which may fall short of knowledge; and no other term seems so suitable as *the probable*. In this use of language the probable includes the improbable. The latter is not that which has no chances whatever in its favor, but that only which has more chances against than for it. Had it no chances in its favor, it would not be the improbable, but the certain, that is, the certain not to be. There is a sense in which we may call anything probable which has any chances at all in its favor.

What are "probable events"?
The probable defined.

In speaking of a *probable event*, or of any entity as probable, our mode of speech somewhat resembles that employed when we speak of *ideal objects*. The adjective does not indicate any quality in the thing spoken of, nor is there any positive assertion of the existence of the thing: indeed it is understood that the ideal object does not exist, and that the probable entity may not exist. In each case we depart from strict literality. We speak as if there were an existing object which could be externally affected or related; and then characterize it by reference to the state of the mind in viewing it. We may speak literally of a statement being probable, but not of any thing or object being so; for the latter may not exist at all, and "*non-entis nulla sunt attributa*." In speaking of probable events, therefore, we do not use the language of fact or strict literality. But, whichever form of language is employed, the *statement, or the thing, is said to be probable, when facts afford sufficient reason for some confidence as to its alleged truth or reality*: and the degree of probability is precisely the same as that degree of confidence which a mind, acting rationally and soundly, can exercise on the grounds given.

The judgment of probability may be considered to hold an intermediate place between that of pure contingency, which is wholly indeterminate as respects belief in reality, and that of absolute certitude, which is perfectly assured. That the judgments of contingency and of probability are related, is evident from the fact that we often express a probability by saying that the thing *may be*, or *is possible*, especially in cases where our expectation is but slight. In speaking thus we add something to the simple conception of possibility or contingency. We mean, not merely that the thing conceived of is possible, but also that the

chances in its favor, as compared with those against it, are an appreciable quantity. In judgments of pure contingency we express no expectation whatever.

Probability presupposes a combination of necessity and contingency. Simple and compound judgments of probability.

The judgment of probability presupposes, not only contingency, but also *the perceived combination of contingency and necessity*—necessity as to an indefinite statement, and contingency as to the definite mode of its application. It takes place when the necessity is recognized that one or other of several possible, but mutually contradictory, consequents of some antecedent of contingency must exist; and it consists in a determination of the degree of confidence with which any consequent, or the consequents severally, may be expected, or believed in. When the exercise of judgment is directed to several such consequents, we may be said to form a *compound judgment of probability*, in which the confidence of the mind is distributed, in just proportion, among the consequents. More frequently we seek to estimate the probability of one consequent only, and this may be called the *simple judgment of probability*.

A case of non-existence may be a possible consequent.

At this point, to avoid confusion, two remarks seem necessary. *First*, let us note that *cases of non-existence*, as well as those of existence, *may be included among possible consequents*. Let us suppose that a box contains three apples, and that we give some friend the liberty to take out of the box either one, or two, or all, or none of them, and this to be done somewhere beyond our observation. Having acted according to his pleasure, the friend may return and ask, "How many apples are now in the box?" Plainly, the box, as thus placed before us, presents an antecedent of contingency with four, and only four, possible consequents; for it *must* now contain either three apples, or two, or one, or none; but this last would be a case of non-existence. In like manner, every lottery blank shows that no prize exists for the person drawing it. In the *second place*, we remark that even the simple judgment of probability, already mentioned, in which we determine the likelihood of but one consequent, must be regarded not as absolutely simple, but as *double or twofold*. For, let the consequent be positive, or let it be negative, we judge not only of it, but also necessarily concerning its immediate contradictory, or simple existential opposite. That is, if we judge the existence of anything to be fact, we at the same time judge the non-existence of it not to be fact; and, conversely, if we judge the non-existence of anything to be fact, we must judge the existence of it not to be fact. For a thing cannot both be and not be at the same time and in the same sense. If it is true that a man is guilty, it is not true that he is not guilty; and, if it is true that he is not guilty, it is not true that he is guilty. Moreover, it is evident that *the more confidence of belief the mind has in anything, the more confidence also it has against the opposite of that thing*. If we are sure the man is

guilty, we have no hope at all that he is not guilty; and if we are sure that he is not guilty, we have no fear at all that he is. But if we are not wholly certain of his guilt, we have some hope of his innocence; and, conversely, if we are confident, though not certain, of his innocence, we have some fear of his guilt. So, also, if we are in utter doubt concerning his guilt, we are equally in doubt about his innocence. In short, every simple judgment of probability considers two possible consequents of an antecedent of contingency, which consequents are the immediate logical contradictories of each other. The question whether either one of these consequents be true and the other false, depends on the question whether those elements exist or not, which are needed in order to change the antecedent of contingency into an antecedent of necessity for that consequent, and of impossibility for the other.

Sometimes two propositions not so closely related as those of the existence and the non-existence of the same object, may, like these, be contradictory of one another; in that case the same law holds with them as with any statement and its simple contradiction. The probability (that is the positive probability) of the one, and the improbability (that is, the negative probability) of the other, are of the same degree. If there were two, and only two, roads, one of which a stray horse must have taken, and, from some reason, it were likely that he took the one, it would be equally unlikely that he took the other. But judgments like these are really compound, each consequent having its own immediate contradictory; they should, therefore, be distinguished from simple judgments of probability.

§ 87. We shall now direct our attention particularly to this last mentioned mode of judgment; an understanding of its nature will disclose that also of the compound judgment; which, indeed, is little else than an aggregation of those which are simple.

Judgments of probability differ from those which merely assert necessity or contingency, in that *they are characterized by various degrees of confidence*. To illustrate this essential and general attribute, and the subordinate varieties of judgment which relate to it, we may, with some advantage, employ the symbol of a straight line of given length somewhat minutely divided into equal parts. Let one end of the line—say that at the left hand—represent the point of absolute disbelief in that one of two contradictory statements to which our interest is immediately given, and which, therefore, by way of pre-eminence, may be called *the statement*. Then the other end of the line may stand for the point of absolute or certain belief in this statement. The first of these points, of course, will also be that of absolute belief in the contradictory of the statement, and the other that of absolute disbelief in this contradictory. For the sake of exact illustration, let us suppose the line to be divided into one hun-

The simple judgment of probability considered.
Two different modes of measurement, the practical and the philosophical.

dred equal parts. Should we now believe that there was just one chance in one hundred for the truth of the statement, and ninety-nine against it, the point indicating our degree of confidence would be one grade from the left hand or negative end of the line; but, if there were ninety-nine chances for the truth of the statement, and only one against it, the point would be within one grade of the right hand, or positive, end. The central point of the line would indicate that degree of belief or confidence entertained when the chances in favor of the statement are fifty out of one hundred—that is, when the chances are fifty for, and fifty against, the statement. This is the point of absolute doubt or certainty.

A difficulty here calls for explanation. If confidence commences when there is one chance in one hundred, and increases regularly till there are one hundred chances, it follows that doubt, or absolute uncertainty, being at the middle point, has half the confidence of certainty; whereas, when one is utterly in doubt, we generally say that he has no confidence or belief at all. This is an apparent contradiction: it results from that twofold use of language already described. In the wide, or philosophical sense, we say a thing is probable so far as it has *any chances at all* in its favor, and improbable so far as it has *any chances at all* against it. According to this, everything probable has some degree of improbability, and everything improbable some degree of probability. In the ordinary language of life the terms *probable* and *improbable* have a more restricted application. That only is probable which has a *majority of the chances* in its favor, and that only improbable which has a *majority of the chances* against it. According to this, the probable is never the improbable, nor the improbable the probable. In the wide, or philosophical sense, absolute doubt has just half the confidence of certainty; *our expectation is equally divided between two consequents, one or other of which must certainly exist*; but, according to the more common meaning of terms, doubt is the starting-point from which a belief, whether positive or negative, commences a progress to a certainty which is correspondingly positive or negative. Philosophically, twenty-five chances in one hundred give one fourth the confidence of certainty, fifty chances one half, and seventy-five three fourths; and these fractions symbolize these degrees of belief. But, in common language, twenty-five chances in one hundred give half the confidence of negative certainty or utter disbelief, and seventy-five chances half that of positive certainty; while the fractions one fourth and three fourths would symbolize, in the terms of chance, a disbelief and a belief, each of which had half the confidence of certainty. Philosophically, the addition of one chance in the hundred would add one one-hundredth part of the confidence of certainty to the strength of our belief; according to the ordinary mode of conception, that addition would, as the case might be, either detract one fiftieth part of the confidence of certainty

from the strength of disbelief, or add one fiftieth part of that confidence to the strength of belief. Hence, while we accept the doctrine that a chance is the unit whereby we measure the degree of our confidence or belief, it is plain that this measure is differently applied and used accordingly as the line to be measured is graded only from one end to the other, or from the middle towards both ends. In the latter case (supposing, as before, that one hundred represents certainty in the philosophical conception of it) there are two scales, of fifty units each; in the former only one, of one hundred.

Our ordinary conception of probability is more complex than that which we have termed *philosophical*, but it is necessitated by the practical question, which continually presents itself, as to whether or not some statement has the majority of chances in its favor. Our conduct is greatly determined and shaped by the answers given to this inquiry.

But the most difficult part of the philosophy of probable judgments is not that illustrating its various degrees of confidence and our modes of expressing them; it is that which explains the law according to which the mind forms judgments thus varying in confidence. This, too, is the most essential part. It is not peculiar to judgments of probability to consider cases of non-existence as well as those of existence—to estimate the truth of a contradictory at the same time with that of a direct statement—or even to unite the contemplation of necessity with that of contingency. While these things necessarily occur in connection with probable judgments and are brought by them into peculiar prominence, the essential part of every such judgment is *the rational determination of the degree of a belief*, that is, of course, in those cases where belief admits of degrees. The radical question, therefore, is, “How is this determination effected?” We reply, through the perception and estimation of chances.

Chances defined and illustrated. A chance ordinarily signifies a single or individual possibility.

§ 88. *Chance* is a term used in various senses. When, for example, an event results from causes whose operation cannot be foreseen by us, we say that it takes place by chance, thus giving this name to those causes collectively which are of un-

certain operation.

But the term assumes a different meaning in discussions and calculations respecting things probable. In this connection a chance may be defined as a consequent of an antecedent of contingency (§ 85), and is related to this antecedent somewhat in the same way that a fact is related to an antecedent of necessity. It is what would be fact if the antecedent of contingency were filled out so as to constitute a necessitating antecedent. As this may always happen in more ways than one, it follows that the antecedent of contingency may have more consequents than one; in which respect it differs from an antecedent of necessity. These chances, or possible consequents, are ideal, not real, and have to be conceived of by the mind.

Chances may be divided into *the general and the individual*, each of the former including under it a number of the latter. For the distinction between the general and the individual may be applied to ideal as well as to real objects. The individual chance is such because it is a possible consequent of a possible individual antecedent of necessity. The general chance is the consequent of a general antecedent. For example, I am going to Madison next Tuesday and hope to meet Mr. Orr at two o'clock in his counting-room. We will suppose that Mr. Orr goes to his room every business day at that hour, save three days in every ten, when he is called elsewhere. We may now speak of two chances in the case, that of finding him, and that of not finding him. But these are two *general* chances, in the former of which seven, and in the latter of which three, individual chances are included. The antecedent of contingency in this case is our going to Mr. Orr's counting-room at two o'clock. But, since next Tuesday may be any one of the seven days on which Mr. Orr is there, or of the three on which he is absent (we know not which), we say that the antecedent may be followed by any one of the ten possible individual consequents, seven of these being favorable chances and three unfavorable. And thus we judge that there is a probability of seven to three. Those chances, in any case, which are mutually similar, must be, and are, conceived of indefinitely. In the foregoing instance the seven favorable chances are distinguished from each other only as having numerical difference, and so with the three unfavorable. But they have this difference, and are individuals. It is to be noted that when we speak of the *number of chances* for or against a supposition, it is not the general, but *the individual*, chance which is referred to in our thought.

§ 89. Such being the case, we hold that every judgment of probability takes place under one or other, or both, of the two following conditions.

First, we may perceive some antecedent of contingency which admits of a *fixed number of individual consequents, of that number only*; these we call *the chances in the case*. Suppose a bag containing one hundred ivory balls of the same size, fifty being white, forty red, and ten black, and each ball with an ordinal number of its own. Let them be well shaken together. The bag now, with reference to the question, "Which of the one hundred balls will be the first drawn out?" constitutes an antecedent of contingency with one hundred, and only one hundred, possible individual consequents, or chances. As there are one hundred balls, there are one hundred possible suppositions as to which ball will come first, or, for that matter, as to which will come at the second, or third, or any other, drawing. But, if we had no knowledge of the number of balls in the bag, whether there were ten, or one hundred, or one thousand, and so could not determine the total number of chances, we might form a judgment of contingency as to any particular ball, but

Every probable judgment follows the ratio of the chances.

not a judgment of probability. Of course one's estimation of the number of chances—that is, of the total number of the conflicting individual possibilities in the case—may be either mathematically exact or merely a loose approximation. The number is, however, in some way, fixed and limited.

Or, *secondly, whether we can determine the total number of chances or not, we may perceive that a fixed proportion of the total number support some specific result or consequent.* In the illustration of the one hundred balls, there is one individual possibility or chance, out of one hundred, for the drawing of any particular ball first; but there are three general possibilities or contingencies corresponding to the three classes of balls, fifty out of the hundred chances favor one of these contingencies, as being included in it, forty another, and ten the third. Such being the case, and employing the philosophical method of computation and expression, we say that a white ball is expected with fifty hundredths, or one half of the confidence of certainty, a red one with forty hundredths, or two fifths, and a black one with ten hundredths, or one tenth. Our confidence is not distributed equally among the general possibilities, but is divided among them according to that proportion of the chances which may support each. Were the balls made up of two equal classes, fifty being white and fifty red, there would be one chance in two for either a white or a red ball; yet this would not be merely because there were only two classes, but because there was an equal number of balls in each of two classes. Were seventy white and thirty red, the chances would not be one in two for a ball of either color, but seven out of ten for a white ball, and three out of ten for a red one.

From all that has now been said, we see that, if our inquiry concerns a supposition which only one chance supports, and we know the total number of chances, we can immediately say there is one chance out of the total number for that consequent. In the case of the balls there are one hundred chances in all, and one out of the hundred for the drawing of any individual ball the first. But, if the inquiry concern a supposition which several chances support, we need not know the total number of chances *provided only we know the ratio between the total number and the number which support the supposition.* In the instance given, the total number of balls may be either large or small, if there be only fixed ratios between that total and the numbers of the white, the red, and the black. There might be one thousand, or ten thousand, instead of one hundred, balls; but if fifty out of every hundred were white, forty red, and ten black, the probabilities as to drawing a ball of a given color would be the same as before.

Comparing these two methods of probable judgment, it is easy to see that the latter is of a more radical and general nature than the former. We may say that *all probability whatever is determined according to the proportion of chances favoring*

any consequent; and it is really an accidental matter whether we know the entire number of chances or not. Where only one chance supports a supposition—as, in the illustration, only one chance supports the expectation for any one particular ball—it is, indeed, needful to know the total number of chances, yet not because it is the total number, but because it is the wanting term of a ratio. Were there one thousand balls instead of one hundred, and ten of the thousand white, the rest being of other colors, there would be one thousand chances in all, but a white ball would have one chance in a hundred—*i. e.*, the same chance which any particular ball would have in the other case. The degree of probability, therefore, is determined always according to the ratio of the chances; and this may be considered the fundamental law of all probable judgments.

That we must know the ratio of the chances in order to determine the probability of a supposition, becomes very evident if we consider cases in which such knowledge does not exist. If we were utterly unable to say how many balls were in the bag, whether one hundred, or one thousand, or one million, or any other number, we could say there was a chance to draw out first the ball numbered *one*, but we could not say what chance; and so, though we might make a blind guess, we would form no judgment save one of pure contingency (§§ 85–86). In the same way, if we knew only the number of general possibilities of which the case admits, and not the proportion of individual possibilities, or chances, falling under each, no judgment of probability would be possible. Were it known that three, and only three, descriptions of balls were in the bag, but not what proportion the possibilities of drawing a ball of any one color bore to the total number of possibilities, we might, indeed, say that, *so far as our knowledge went*, there was an equal chance for each color; but this would not be a complete and satisfactory judgment of probability so long as we did not know the number of individual possibilities, or at least the ratio existing between these. For, among all the balls, there might be one only of a given color or description, or all the balls save two might be of that color; under these conditions we could say that there was one possibility, at least, for a ball of one color, and that in no case the possibilities against it could be less than two; but we could tell nothing of the value of these chances. If, however, the total number of possibilities were known, this value would be known, and we could determine the limits of the probabilities in the case. For example, we could say that the chances for the appearance of a white ball could not be less than one, nor more than ninety-eight, out of one hundred. Yet even this would not show how many—or what proportion—of chances there were for any given consequent; which is the result ordinarily and properly expected from a judgment of probability.

The equality of the chances asserted and illustrated. "The wheel of fortune."

§ 90. From all the foregoing discussion it is evident that *it is not the general but the individual possibility—the CHANCE—which is the unit of our calculations.* This chance is a fractional unit, and obtains its value from the division of the confidence of certainty, which is regarded as a fixed integral quantity, by the number of the chances in any case, each chance receiving its share out of this division.

We are thus brought to consider another point, which hitherto has been implied rather than asserted; namely, that *every chance is equal to every other chance in the set to which it belongs.* That is, it has equal probability. This is implied when we say that the likelihood of any supposition increases or decreases, regularly, accordingly as the number of chances in its favor may increase or decrease. The reason for this equality has been already hinted at: it arises because the mind knows that one of the chances must prove a reality while it has no reason to believe in any one chance rather than in any other. A chance of itself, and apart from its being one of a total number, is a mere possibility or contingency without any expectation of reality due to it whatever. Hence, when some one of a limited number of chances must be true, we survey all as having severally the same claim on our confidence. If the total number be indefinitely conceived or known, our expectation for any chance, though equal to that for any other, is also indefinite and unsettled; if the total be definitely known, our expectation for each becomes definite also, and may be represented by some fraction having unity for numerator, and some whole number, not less than two, for its denominator. The chances in a case may be compared to a set of beggars who, so far as we know, are equally necessitous and equally deserving, and among whom, therefore, we distribute our bread in equal portions. To illustrate this point, let us suppose a "wheel of fortune," such as may be seen at county fairs, only with its rim divided into one hundred equal parts, each having its own number. The wheel being truly balanced and made to revolve freely, any one of these numbered parts may come to rest opposite an index finger; and there is, accordingly, one chance in one hundred for every number. In this case, with reference to the stoppage of any given number—just as in the case of the bag with reference to the drawing of any particular ball—the mind conceives of one hundred possible events as the total number possible, one of these being that No. 27, we will say, will stop opposite the finger, and ninety-nine of them being that it will stop elsewhere. Expectation is distributed equally among these one hundred possible events; so that the chance of No. 27 being successful is one in one hundred. But were the question whether any number from 1 to 25, inclusive, would succeed, the chances would be one in four. Or were the question whether some one of the first fifty, or whether some one of the second fifty, or whether an odd number, or whether an even number, would succeed, the chances

would be fifty to fifty, or even, for and against, the supposition. Or were the question whether some one of seventy-five numbers selected at random would succeed, there would be seventy-five chances out of the hundred. Thus it is plain, that, however we vary this illustration,—which is essentially the same with that of the bag with balls—the mind conceives rationally of one hundred possible events, and divides the expectation of reality equally among them.

A fallacy of confusion avoided.

Here we may note, in passing, that these suppositions or possible events do not require us to know or take for granted that each number is successful *once in every one hundred movements of the wheel*, and so that any particular number at each movement has one chance in its favor and ninety-nine against it. Such an antecedent would, indeed, give such chances; but it is not the antecedent under our immediate consideration; nor are the two necessarily co-existent. The events supposed are conceived of with reference to *one movement of the wheel*, in connection with which they are, not jointly, but severally, possible; and they are, that No. 27, for example, should be so many times successful (that is, once only) and so many times unsuccessful; or, in case we think of a class of numbers, that some one of the class chosen—say of the first fifty—should be so many times successful and so many times unsuccessful. In which statements, the word *times* merely indicates enumeration or counting, and not succession in time; and the one hundred chances, which are apportioned differently according to the conditions given in the different questions, are evidently conceived of as individuals, and as equal.

The equality of the chances further illustrated.

But it may be said, "*This equality of chances, though apparent in such cases as have been adduced, is not easily discerned in our more ordinary cases of probable judgment.*" This we allow, yet we believe this principle always enters into our conceptions of things as probable, and may be perceived by attention and analysis. For example, the expectation, already discussed, of our finding Mr. Orr at his counting-room at two o'clock, is based on our knowledge of his being there seven days out of the ten, at that hour, and of his being absent three days out of the ten. As we shall see hereafter, it matters not how this knowledge may have been obtained, whether it be an inference from Mr. Orr's general habits and which might be applied to every successive period of ten business days, or whether it be information pertaining only to the ten days concerned in our inquiry. In some way we have become possessed of the fact; and this antecedent justifies ten equally probable suppositions, because it compels us to conceive of and believe in, as possible, ten events with any one of which, indifferently, the event really to occur may agree, or be identical. That is, the fact of to-day may be any one of seven meetings or of three failures to meet; and these ten cases of possible identification are all equally probable. Now, if we did not know that

Mr. Orr is to be at his room seven days in the ten and absent from it three, but only that he is present about twice as often as he is absent, or (if you please) somewhat more than that, our judgment could not be so exact as it would be with definite knowledge, yet it would still consist in a determination of the ratio of the chances. We would say that the chances were more than two to one, and expect accordingly. Whereas, if we could tell nothing at all concerning the proportion of days on which Mr. Orr would be present, there would be no ground for any judgment of probability. And it is clear that in settling the ratio we rest equally on each of the ten chances, and this simply because we have no ground to trust one more than another. *Indeed the very reason on account of which the mind seeks to apprehend and to number correctly the individual possibilities in a case, is because that, as individual, they appeal equally to its confidence.* Thus, only, a measure of probability is obtained. To illustrate further from ordinary thought, let the question be whether it will freeze on next New Year's—Jan. 1st, 1879? Here again let it be assumed that we know—say, from long experience—that, in this latitude, certain causes operate in the long run to produce frost seventy-five times out of one hundred, or three times out of four, on the 1st of January. We now conceive of four antecedents of necessity as the total number of the possible individual modifications of the antecedent of contingency, and of four possible corresponding consequents or chances. According to three of these it will be frosty, according to one it will be mild. The chances for frost are three to one. In this manner every probable judgment may be analyzed.

Difficulties considered. con-
 sidered. of a number of individual possibilities is favored chiefly by the circumstance that we seldom think, directly and deliberately, of things so subtle and unreal in their nature, and so subordinate in their use, as chances, and hence tend to confound them with other objects. For the proposition, or thing, whose probability is determined according to the number of chances in its favor, is one, and is conceived of as one; the confidence or doubt with which it is held or regarded is a single state of mind; and even the quota of probabilities which support it, may be viewed collectively as a bundle of similar units. But, for all this, the chances in a case are thought of as plural and as equal; and, although mathematical exactness is not to be looked for in ordinary thought, nor even definite conceptions of things as numbered, probability is always determined according to the ratio of the chances, and cannot be determined in any other way.

It may free this doctrine of the equality of chances from some confusion to note that, in cases of causal contingency, a thing is probable or improbable in given circumstances (that is, with a given antecedent) not because they contain a strong or because they contain a weak cause for its existence, but because they contain a cause which, whether strong or weak, has been found to

be frequently, or to be infrequently, effectual. A strong tendency, if some necessary condition were wanting, would never produce an effect, while a weak tendency, under favorable conditions, might produce it often. Yet every time, however produced, the event would be as truly a fact—and the fact inquired after—as every other time. When, therefore, on the recurrence of the same causal conditions, an event is known to take place more frequently than to fail to take place, we say that it is probable; but, with a cause seldom effectual, it is improbable. Why? Because—though the chances in any case are contemporaneous, the possibility of each arising directly from the existence of the antecedent of contingency, while the several actual operations and failures to which they refer are successive—the mind conceives of chances, favorable and unfavorable, corresponding in number and character with the facts considered. Moreover, as the facts, however produced, are equally believed, so the several chances, as related to, and in a sense representing, the facts severally, are to be viewed with equal expectation. Similar remarks apply to cases where the antecedent of contingency is merely logical and not causal. No circumstance, however prominent and imposing, should affect our judgment, unless we see that it increases the chances in favor of some supposition. When the suitor of Portia, in the “Merchant of Venice,” was told that his success depended on his choosing the right one of three caskets—one of gold, one of silver, and one of lead—no reason being given to guide his choice, the case presented an antecedent of contingency with three equally possible consequents. The likeness of the lady might be either in this chest, or in that one, or in the other; and the equality of these chances was unaffected by the size or beauty or costliness of the different urns. So, were we asked to guess which of three unknown men—Smith, Brown, or Jones—was the tallest, it would help us nothing to be told that one of them, say Smith, was the best looking.

Chances are conflictive possibilities. § 91. Beside the equality of the chances, in every case of probable judgment, another point should be noted, as involved in our very conception of them; that is, *they conflict with one another. While they are all possible, only one can be realized.* Each of the one hundred balls has a chance of being drawn first, and each of the one hundred numbers on the wheel has a chance of being successful; in each case one hundred chances co-exist *as possibilities*; yet of these only one can be realized. With reference to actuality, the one hundred are mutually conflicting or incompatible. But when one chance favors a supposition and the rest are against it, or when several are favorable and several unfavorable, it may be asked, “Are the chances which thus together support one conclusion incompatible with one another? Are the ninety-nine chances against the drawing of any single ball, or the fifty in favor of a white ball, conflictive with each other?” They certainly are. Each is an individual possibility which could not be realized

if any other of its fellows were realized. If any one of the ninety-nine chances against No. 27, on the wheel, were realized, this would result from the success of some other number, say 28, and from the failure of *all the rest*; or, if another of the ninety-nine were realized, this would involve the success of some other number, say 29, and the failure of No. 28 and all the rest. These chances are individually different, and could not exist together; but they agree in excluding the success of No. 27. Then, as to the fifty out of the one hundred chances which favor an even number, these each involve the success of some one even number, and the failure of all the rest both odd and even. They agree, not in being real together—that they cannot be,—but in having a certain common character, so that, if any one of them happens, we can say that a thing of that general description has taken place.

Here, however, for the sake of clearness, a distinction should be made between the singleness, or individuality, of the chance and that of the result whose probability the chance supports: the latter may be either single or of a duplex or threefold or multiple character. If there were ninety-nine divisions of the wheel instead of one hundred, but still one hundred numbers, one division being marked with *two* numbers, say 10 and 12, and the rest with one apiece, there would be one chance in ninety-nine that both the numbers 10 and 12 should be successful, and one in ninety-nine for every other number. We might be inclined to call this a double chance; but really it would be *a single chance with a double result*. If a person, being allowed to choose two numbers, should select 10 and 12, there would be but one chance in ninety-nine for his being right as to either number or as to both, and ninety-eight against his being right. But if he chose any other pair of numbers, say 2 and 3, there would be one chance in ninety-nine as to his being right as to one of them and ninety-eight against it. In the latter case, there would be only ninety-seven chances against his being right with respect to either 2 or 3, but, in the former case, ninety-eight against his being right with respect to either 10 or 12. So, also, if a double or triple prize in a lottery were affixed to some given number, the chance for that prize would be individual, and, as it regards its own nature, equal to every other chance; though, as comprising a larger result, it might be more desirable than any other. It is clear that several results of one chance, but not several chances, may be realized at once. Such, then, are *chances*; they are conflicting individual possibilities.

Should it be desired to apply the terms *antecedent* and *consequent* to probable reasons and conclusions, and to define them in this application, we might say that an *antecedent of probability* is an antecedent of contingency (§ 85) as subject to some given number of possible individual necessitant modifications, of which one, and only one,

A chance though single may have a manifold result.

Antecedent and consequent of probability.

must be realized; and the *consequent of probability* is a consequent of contingency which one or more of the chances, that is, of the individual possible consequents of the above-mentioned modifications, may support.

Experience not the source of the ability to form probable judgments, nor even the only ground of them. The views of J. S. Mill and of La Place.

Two senses of the word *experience*. Locke quoted.

§ 92. A question of some importance in the doctrine of probable judgments concerns the extent to which we are dependent on experience for the ability to form them. Mr. John Stuart Mill, and the Associationalists generally (§ 23), teach that experience is the only ground on which any estimates of probability can be based, and indeed the sole origin of our power to make them. In his "Logic" (book iii. chap. xviii.) he controverts the doctrine taught by La Place in his "Essai Philosophique sur les Probabilités"; which doctrine is essentially coincident with that already given. He says, "In the cast of a die the probability of ace is one sixth; not, as La Place would say, because there are six possible throws, of which ace is one, and because we do not know any reason why one should turn up rather than another; but because we do know that, in a hundred, or a million of throws, ace will be thrown about one sixth of that number, or once in six times." After this he controverts the positions of La Place that "it is necessary that we should know how many possibilities there are," and "that we should have no more reason for expecting one of them than another," so that they are "equally possible." As to the latter of these doctrines, Mr. Mill is evidently confused by reason of his failure to perceive, what we have already explained, that the possibilities, referred to by La Place as *chances*, are individual possibilities, and that these in any case are all equally probable. As to the former doctrine, La Place would probably have met the objections of Mr. Mill by a more perfect explanation of his theory. We have already seen (§ 89) that the total number of the possibilities need not be inquired after, provided only we know the ratio of the chances. Yet, as this ratio must originally be determined by comparing some definite total with some definite aliquot part of it—so that the knowledge of the ratio in any case without that of the total is only derived and secondary—there is a sense in which we may hold with La Place that the whole number of chances must be known. No ratio can be determined without knowledge of a partial and of a total number, although often this ratio, when once determined, may properly be applied after these original data have been forgotten. To ascertain the proportions of oxygen and hydrogen in water, we must first find the proportional quantities in some given amount of water—say three oz.; after that we know the ratio for any amount. And so, where some law of probability prevails, this law must be first ascertained by determining definitely the number of chances in some particular case which may serve as an instance of the law. Mill further criticises La Place by

saying, "When experience is to be had, he takes that experience as the measure of the probability: his error is only in imagining that there can be a measure of probability where there is no experience." In short, Mill presents, as his own doctrine, that knowledge obtained by experience is "the only requisite" to a probable judgment. He says, "Conclusions respecting the probability of an event rest upon knowledge, obtained by experience, of the proportion between the cases in which the fact occurs, and those in which it does not occur. *Every calculation of chances is grounded on an induction; and to render the calculation legitimate, the induction must be a valid one.*"

To us these views of Mr. Mill are entirely unsatisfactory. *In the first place*, experience, of itself, can give us the knowledge only of what has been, and not that of what shall be, or what must be, or what may be. When we say that we know from *experience* that such or such a thing, belonging to the future or the distant or the unseen, must or may be so, there is an ellipsis of a factor less prominent than experience, but no less important. This factor is a power of judgment whereby we conceive of and believe in—in other words perceive—certain modes of existence as necessary or as possible under given modes of antecedence, and so assert such modes to be necessary or possible whenever the proper antecedents occur. No experience can account for these judgments in any way. In them we do not assert that we cannot, by reason of habit or association, think of certain things otherwise than as we do; we assert that the things in themselves, and by reason of their own nature and relations, are necessary, or are possible. Now the principle of *the ratio of the chances*, as a law of thought, simply combines a perception of things as necessary with that of them as possible. We perceive a total number of individual possibilities, and that one, and only one, of these must be realized. Hence we say that, in employing this law of thought, the mind does not use merely the associations of past experience, but, yet more, a power of judgment or insight, which, though constantly exercised in connection with experience—that is, with the immediate perception of fact—is easily distinguished from the latter. This power is explained away by the Associationalist school.

In the second place we remark, that experience not only does not furnish the principle of probable judgments; *it is not even the exclusive source of that peculiar knowledge of fact on which such judgments proceed.* This statement, however, must be made with an explanation. There are two senses in which *experience* may be considered a source of knowledge. In the first place, it may signify, as above, *one's immediate personal cognition of fact.* This experience cannot include any perception of the distant or the future, or of the hypothetical or the universal, but only of the actual, past and present, so far as this has been submitted to our observation. Locke uses the term in this sense when he teaches that experience furnishes all the matter of thought and

knowledge. "Whence," says he, "hath the mind 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 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 understanding with all the materials of thinking." Now when experience, as is frequently the case, has this signification of our immediate perception of fact, it must be allowed to be the original source of that knowledge on which probable judgments are based. For, as Locke says, it is the fundamental condition, or original source, of all knowledge. When, through the penetrating power of judgment and reasoning, we perceive things beyond our experience, this is only because experience furnishes "materials" out of which the mind, using intuitional principles, may correctly conceive the unexperienced.

Mr. Mill, however, does not use the term in the sense to which we have now referred. If he did, his statements might be explained and defended. He employs the word in a meaning which it often has, but according to which his teachings are incorrect. Very frequently, *experience* signifies, not simply our immediate perceptions of fact, but *that whole inductive process* (§ 5) *of which the observation of fact is the primary and most noticeable part.* The distinction between these two meanings is noted, and is somewhat obscurely expressed, by Archbishop Whately when he says that we may know *from* experience that water has frozen at a certain temperature, and *by* experience that water will freeze again at that temperature ("Logic," appendix i.). That Mill employs this secondary, metonymical, and extended sense, is evident: the knowledge of which he speaks as being obtained by experience is "of the proportion between the cases in which the fact occurs, and those in which it does not occur;" that is, as the present tense indicates, of the proportion, not as an observed fact merely, but as a general law. And then he continues, yet more explicitly, "Every calculation of chances is grounded on an induction."

Induction fur-
nishes the ground
of some probable
judgments, but
not of all.
Cases in which it
is necessary, and
cases in which it
is not necessary.

In our inquiries respecting things, the question sometimes is, whether or not in the course of nature such an event *probably* did or will take place under given circumstances—that is, with a given antecedent of contingency. For example, we may ask as to the probability of frost in Hanover on any 1st of January respecting the weather of which we have no knowledge. And clearly a kind of induction from experience is necessary for the determination of such a probability. When the observation of many years has shown that frost has occurred on that day of winter on three fourths of all the cases noted, yet in all other respects with no perceptible regularity, or approach to regularity, in its coming or in its failure to come, we perceive that there is in nature some per-



manent cause—or rather some permanently recurring causal tendency—the regular efficiency of which is thwarted by other causes which conflict with it occasionally and, on the whole, to the extent named. Hence we say that frost on New Year's is a law of nature, not an absolute or fundamental law, but one limited by a certain proportion of exceptions; we express this law by saying that the 1st of January is and will be frosty in three fourths of all the winters. By an immediate inference we perceive that the probability of the operation of this law at any or every New Year's is as three to one; and then, by deduction, we say that there is this probability for the 1st of January next. A precisely similar instance would be presented should we ask as to the probability of the death of an adult attacked by the yellow fever. We will suppose that this disease has destroyed life in one fourth of all recorded cases, and that this is our only obtainable basis of judgment. By induction we say that three out of four yellow fever patients recover or will recover; by immediate inference from this that, for one sick with yellow fever, the chances for life are as three to one; and finally, by deduction, that these are the chances in the present case.

That mode of induction, which thus is often the basis of probable judgments, is a less searching process than that which ascertains the exact and invariable laws of nature. It is, however, as frequently employed and is no less useful. It may be styled *the induction of approximation or of probability*. For the modes which it discovers only approximate universality, and they are often set forth in general statements as *laws of probable application*; as when we said above, "Frost on New Year's is a law of nature." We shall not now inquire why the mind expects nature to act universally with the same regularity, or the same approach to regularity, which may have been already observed in connection with a large number of similar antecedents; this would lead us into the philosophy of inductive reasoning. It is beyond question that we constantly use and follow this rule of judgment.

But, while asserting and allowing this, we nevertheless maintain that many questions of probability *do not refer to the repetition of the operation of natural causes under the repetition of a given antecedent, and therefore do not depend on induction for their settlement*. To illustrate, we may take an example given by Mr. Mill himself in the passage from which we have just quoted. "If," he says, "we know that half of the trees in a particular forest are oaks, the chance that a tree indiscriminately selected will be an oak is an even chance, or, in mathematical language, one *half*." The knowledge here adduced as the basis of judgment, viz., that "half the trees of the forest are oaks," could not be "grounded on an induction." Who can say that one half the trees in every forest are oaks? or that such a statement has been proved by experience? Plainly the information here supposed is derived, not from induction, but from the mere observation and enumera-

tion of the trees of that particular forest. Again, let us throw fifteen marbles into a bag, ten of them white and five blue; and let a boy be asked to guess the color of the one first to be drawn. He will say "white"; and why? Will it be because past experience has shown that in all such cases the greater number insures the greater likelihood? By no means. He does not know how such things have happened in the past. If he were told that the experiment had been tried a million of times and that the white marbles on the whole came out twice as often as the blue, this might influence his conclusion; but he judges very well without any such record. He immediately finds in the bag of marbles an antecedent of contingency with fifteen, and only fifteen possible consequents, and that ten out of the fifteen favor the white color. The truth is that probable judgments are specially based on induction only in cases where, in order to find the ratio of the chances, we have to refer to some law of nature the operation of which is not universal. No past experience is needed when the facts determining the ratio may be immediately known. Probable judgments, therefore, are not essentially dependent on experience for their data. They simply require the knowledge of such facts as may constitute an antecedent of probability; this may be obtained by experience, or in some other way.

§ 93. A clear understanding of the doctrine of probability calls for a distinction between two modes of probable judgment. Although we are always equally and utterly ignorant as to which one of all the chances may prove to be a reality, *we can sometimes secure ourselves against a repetition of this ignorance under like circumstances, and sometimes we cannot.* This difference does not in any wise affect the essential nature of the judgment of probability; it simply leaves opportunity for the repetition of similar judgments in the one case, and takes away occasion for such repetition in the other. If three men of unequal stature were called James, John, and William, and we knew not which was tallest, there would be a probability of one third that John was he; but after we had learned that William was the tallest, there would no longer be any question admitting of a probable answer. Or, if one totally unacquainted with the appearance of wild animals were shown pictures of a lion, a tiger, and a bear, and asked to guess which was the lion, he would be equally undecided as to each; but having once obtained the correct conception of a lion, there would no longer be any room for an estimation of chances.

Examples of the other mode of judgment may be found in our expectations regarding the probable recurrence of various natural events on the recurrence of certain antecedents, and also in those expectations which are excited by games of chance. These, indeed, could not be played, did they not present some means of repeatedly renewing an uncertainty. In the fifty-two cards in a pack, twelve are pictured, twenty-six are red,

A distinction between judgments of probability. Single and repetitious probability.

and twenty-six are black. There are twenty-six chances out of fifty-two that a red card will be drawn out of the pack at random, twelve out of fifty-two that a pictured card will be drawn, and one in fifty-two that the queen of hearts or of spades, or any other particular card, will be drawn. All these chances *present themselves afresh* with every shuffling of the cards. So the even chance that *head* or that *tails* will fall uppermost is repeated with every twirling toss given to a penny. With the bag of balls and with the wheel of fortune, already mentioned, the chances are recalled with every new experiment. The reason, throughout, is, that our initial ignorance is renewed in every case.

Probability implies a variety of possibilities, but not a variety of facts to correspond with the possibilities.

The foregoing distinction is useful in counteracting an error into which we naturally fall, and which is involved in the theory of Mr. Mill. This is to suppose that all matters which are proper subjects of probable judgment, do, objectually, or in fact, exhibit the same fickleness and changeableness of consequence which are to be observed in games of chance, and in certain classes of natural events. We often make probable judgments in cases in which the sequence of facts is found to be always and necessarily the same and so to admit the substitution of a necessitudinal, instead of the probable, judgment. Hence we cannot infer that, because the chances for some consequent of probability are three out of four, this consequent will certainly accompany the antecedent three times out of every four that the latter may occur. It may be certain to accompany it always, or never to accompany it at all, or to accompany it according to some other ratio than that of three to one! Because there is only one chance for John being tallest of three, and one for William—who *is* the tallest—we cannot say that in some way or other John is tallest one time in three, and William only once in three times. Because there is one chance in three that any one of three animals of different descriptions is a lion, we cannot say that an animal of one description is once a lion, then once a bear, then once a tiger, and that similar statements may be made as to each of the other animals. We can only say that, every time a similar case of doubt is presented, the chances will be one in three till the doubt is removed. Each case admits a variety of possibilities, but does not imply a variety of facts.

These remarks lead to the more important statement that, *even in cases of repetitious probability, the ratio of the chances is not so related to that of the facts in which our expectations seek to find realization, that the latter may be inferred from the former as identical with it.* To suppose that these ratios are necessarily the same is an error similar to that just noticed. A moment's reflection shows that the perception of chances and their ratios is not in any way the perception of facts. The chances in a case are merely a set of possible ideal objects, one of which must prove real; their ratio is merely an ideal relation of number between two classes of these objects. Conceiving of these things,

we are not enabled to perceive the future or the distant, but only to rely, with greater or less confidence, on the suppositions which the chances support. This is all that the consideration of chances can effect: it can never produce the certainty of sight or of demonstration. If the ratio of the facts were necessarily the same with that of the chances, then, always, after a considerable number of unsuccessful trials, the probabilities in favor of a supposition would improve, the adverse chances being partially spent along with the occurrence of the adverse facts. This is not true with reference to any case of pure repetitious probability. After fifty throws of a die, none of which has turned up ace, the chance for ace on the next throw is no better than at first. It remains one in six. Let us suppose that twenty-five successive drawings from a bag containing fifty white and fifty black balls have produced white balls only—the ball, of course, having been replaced after each drawing, and the conditions of the case exactly renewed. Are the chances for a black ball any better than at first? Not at all. They remain as fifty to fifty. But they *would* be improved if the ratio of the chances and that of the facts were necessarily the same. Because, whatever now may be the proportion of the positive to the negative events in that future wherein each chance seeks for realization, this proportion must be greater now than it was at the beginning of our experiments. Again, it is clear that a number of trials equal in number to the number of the chances may take place without some one or more of the chances being realized. It is highly improbable that in six throws every face of a die should be turned up. But what has once happened is possible again under the same circumstances, and that endlessly. Hence, in a case of pure repetitious probability, it is possible that certain chances may never occur at all. If this be true, it is evident—not simply that a chance need not be realized once in every set of trials equal in number to the number of the chances—but that it need not be realized even as often as the total number of trials, however great, may, as a multiple, contain the total number of chances. Because it may never be realized at all. Yet the assumption is frequently met with that every event which has some chances in its favor, must, absolutely, “in the long run,” take place, or—which is the same thing in its extreme form—that every one of a total number of possibilities correctly conceived of by the mind must be realized, and that too, as often, in the course of many trials, as any other. To reason in this way is to convert chance into necessity and likelihood into fact (§ 106).

§ 94. Here, however, we must allow that, *in many cases of repetitious probability, the ratio of the facts and that of the chances do agree, and that by a kind of necessity*, so that they are always, at least substantially, the same. For an illustration of such cases we might say that, in a climate wherein the peach crop is known to fail five years out

Pure and affected
repetitious proba-
bility.

of six, the chance for a crop in any summer selected at random is one in six. In regard to this agreement of ratios we remark as follows. In the *first* place, the identity of ratios cannot be inferred from the fact that we have made a correct or rational judgment of probability. As already shown (§ 93), we may form such judgments in cases where the trials subsequent to the first admit no variety of fact in their results, and in which a judgment of necessity soon takes the place of that of probability.

In the *second* place, as we have just seen, the ratio of the facts cannot, in cases of pure repetitious probability, be inferred from that of the chances, as identical with the latter. There is no ground of such inference; these ratios in such cases may always be different. And *thirdly*, although, in a large class of cases, the ratio of the chances and that of the facts are approximately the same, and that necessarily, this is to be accounted for, not because the ratio of the facts is ever dependent upon, or discoverable by, the ratio of the chances, but *because the ratio of the chances is often dependent upon, and determined by, the ratio of the facts*. To illustrate this statement, we must make a distinction between what—in the absence of better terms—we shall call *pure repetitious probability*, and *affected repetitious probability*. The former is such as we meet with in games of chance; *to determine it we conceive of every individual event possible in the case*—that is, possibly consequent upon the antecedent of contingency—and we ask how many of these chances will support, severally, the various suppositions under debate: how many may favor the drawing of a white ball, or the drawing of a ball not white. The other mode of probability is such as attaches to the expected happening of natural events. *To determine it we assume as certain that a given proportion of the events following the repetition of some antecedent of contingency will be positive, and the remaining proportion negative*; and thus, having fixed the ratio of the facts, we determine the probability of any one of the facts being positive, and also the probability of its being negative. The fact thus related to our inquiry may be any one of that series of events which follow the repetition of the antecedent of contingency. It may be the next event to occur, or the last which has occurred, or some one before the last or after the next. Now it will be seen that these modes of probability differ strikingly in this respect. In the latter, the chances respect the identity of the event under inquiry with one or other of that cycle of events, positive and negative, which are assumed as certain; which are known as having been, or as about to be; and each chance sets forth *the possible identity of the event with one or other of these facts*. But, in the former, we do not thus set out with a number of facts, nor with any ratio of facts: we simply compute for ourselves all *the possible events*, positive and negative, in the case, and then, from the ratio between these conceived-of events, we determine the probable character of the event which is about to happen, or which may have happened

beyond our observation. In the one case we judge of an event certain to occur, but of indeterminate character, with reference to a number of *other events certain to occur*; in the other we judge of an event certain to occur, but of indeterminate character, with reference to a number of *events simply conceived of as possible*. In the one case the chances are possible cases of identity; they pre-suppose facts and their ratio; in the other the chances are possible events, and they pre-suppose, or require, no fact as certain to occur, save the event of indeterminate character, which is the subject of inquiry. We call one of these modes of probability *pure*, because it is determined wholly and directly from the consideration of the possible necessitant variations of the antecedent of contingency; it is not founded on any reference to actual consequents. The other we style *affected*, because it is ever determined by, and conformed to, the ascertained ratio of the facts.

The most perfect form of affected probability arises when *the ratio of the facts is surely and exactly known*. Were it certain that a field contained one hundred trees, seventy-five being oaks and twenty-five maples, and that these would all be cut down successively, one each day, there would be exactly seventy-five chances in the hundred that the tree cut down to-day is an oak, and as many that it is not a maple. A less perfect but more frequent mode of affected probability is that of the judgment *in which we determine the likelihood of a natural event taking place on the recurrence of given conditions*. This judgment, as based on data obtained from experience, may be named *the experiential judgment of probability*. By extensive observation we become acquainted with certain laws of nature, the operation of which, under the recurrence of their conditions, is qualified by a certain proportion of exceptions or failures. This proportion is fixed, not exactly, but approximately, and is ascertained by computing from time to time, during a long series of observations, the ratio of the positive to the negative events observed. When this ratio, no matter how long our observation and computation be continued, is found to vary but little, perhaps fluctuating between near extremes so as to present a steady average, the law is considered proved and established. For this shows that there are permanent causes at work which, in any two considerable series of events, produce the same, or nearly the same, number of positive, together with the same, or nearly the same, number of negative, results. The ratio for judgment, obtained in this way, can be relied on only as a more or less close approximation to the ratio of the facts, not as an exact ratio; it generally varies somewhat after every new computation. On this account we style this experiential judgment *less perfect*, though we believe it is more useful, than the other which has been described.

With these judgments in affected probability Mr. Mill and his disciples would classify *such judgments as they think may be*

gained through many experiments in games of chance, or, more generally, by the observation of results in cases of pure repetitious probability. We question whether such judgments are ever either legitimate or possible. To support this dissent we must distinguish pure repetitious probability into that which is truly and perfectly pure and that which is only apparently and imperfectly so; which latter, as being supplantable by affected probability may also be characterized as affectible. Pure probability, in general, agrees with affected probability in this, that both refer to cases in which there are a given number of chances, positive and negative, one, and only one, of which can and must be realized. In both, also, we are ignorant as to which of the chances will be realized. At this point the resemblance ends. In pure repetitious probability, while we know that one or other of a number of possible necessitating antecedents must exist, and are totally in the dark as to which, *this unqualified ignorance renewedly accompanies every trial*. The first—or absolutely pure—form of this probability arises when the antecedents necessitating the events of the successive trials *do not occur according to any law*. Nothing happens without a cause, and, with every throw of a die or shuffling of cards, there is an individual cause, or an individual set of causes, by reason of which one particular face of the die, or card of the pack, is found uppermost. But the series of necessitating antecedents in such cases follows no method; it is purely accidental. Hence the unqualified ignorance, already mentioned, *necessarily* repeats itself before every trial. In that mode of pure repetitious probability which we have termed *imperfect* and *affectible*, the necessitating antecedents *do occur according to a law*; which, however, is as yet unknown to exist, and is assumed not to affect the probability. Hence it is not true that, in either mode of pure repetitious probability, we know that there are causes at work which favor each chance equally, or one not more than another. In cases of affectible probability we assume, though without sufficient reason, that the causes which produce now this event and now that, are ruled by no law determining the ratio of the facts; while, in absolutely pure probability, we have sufficient reason to assume that there is no law governing that ratio. Hence, too, a judgment in affectible probability, must give way to a judgment in affected probability so soon as any ratio of facts is found which can properly be applied as a law of the necessitating antecedents and their results.

To illustrate what perhaps seldom occurs, by an imaginary case, let us suppose six rats of equal size and strength to be caught and placed in a box from which there is free exit for one and only one at a time. We say that the chances are one in six that rat No. 1, or rat No. 2, or any other of the six, will come out first. Let No. 3 appear. Allowing all to come out, we return them to the box, and await another exodus with similar expectations. No. 5 presents himself; and so several suc-

cessive experiments give us no reason to expect one more than another. But let us imagine our course of trials to have been greatly prolonged—to have been continued, we will say, for one hundred days in succession. And let us suppose that it has been found approximately true for every day that No. 2 comes out first twice as often as No. 1, No. 3 twice as often as No. 2, No. 4 twice as often as No. 3, and so on with No. 5 and No. 6. We now no longer maintain our original judgment of probability. It is destroyed by our induction from observed events, and is replaced by a new judgment recognizing 63 chances in all, and distributing these among the rats in the proportions of 1, 2, 4, 8, 16, and 32.

In affected repetitious probability, the chances presuppose the known existence of the facts with their necessitating antecedents and their ratio, this last having in most cases been inductively determined. The chances consist of the various possible cases of identity between the event about to occur and the several known facts. Therefore, although, at the first trial, we may be utterly ignorant as to which chance shall be realized, yet, because the ratio of the facts is not merely knowable but known, this ignorance may be more or less modified at every subsequent trial. Here is a notable difference between pure and affected repetitious probability. If there were ten events, seven positive and three negative, the chances would be as seven to three on the first trial. But, if the first result were negative, the chances on the second trial would be seven to two: and, if the next two results were also negative, we should at last have seven chances out of seven, or certainty. This would be an extreme case; no such limitation of chances immediately appear in most cases of affected probability. Yet, in every case, a number of continuously similar results affect the ratio of the chances for the succeeding trial. This would be as true as in the case just considered, were the events ten thousand instead of ten, seven thousand being positive and three thousand negative. For the necessitating causes, in such cases, are known to conform to a law according to which, in certain cycles or series of events, one chance is realized as often, or nearly so, as any other. Hence *in this form of probability* the causes may be said to favor each chance equally.

To determine that ratio of the facts, the knowledge of which is necessary to any judgment in affected repetitious probability, demands, at least in the case of natural events, *the observation of several successive series of events*. For, if we should obtain the ratio of results in only one series, we could not tell whether this was permanent and a reliable rule of judgment, unless we found it to exist in other and similar series. But if several successive series gave the same, or nearly the same, ratio, we would allow that a law had been ascertained. The proportion of the deaths to the survivals of men forty years of age, as obtained from the statistics of one year, would not be a reliable rule of judgment

till we could show that this year was a fair example of all. Therefore we compute the ratios belonging to a succession of years; and, finding the result to vary but little, we accept it as a law. Of course we take the average ratio as that from which there is least variation. For the recurrence of a given ratio, exactly or approximately, indicates the operation of permanently recurring causes. But, should the ratios of events, in successive series, be decidedly different from one another, we would say that we could find no law determining the ratio; and, further, if the continued comparison of different extended series of events should disclose no approach to an uniformity of ratio, we should say that no such law existed. In either case, there being no steady death-rate, any definite judgment as to the chances of a man surviving his forty-first year would be impossible.

We are now prepared to estimate the opinions of those who, like Mr. John Stuart Mill, recognize no difference in modes of repetitious probability, and hold that the ratio of the chances in cases of pure probability is determined in the same way as in cases of affected probability, that is, by a continued observation of results. "In playing at cross and pile," says Mr. Mill ("Log:" chap. xviii.), "the probability of cross is one half because it is found that, if we throw often enough, cross is thrown about once in every two throws; and because this induction is made under circumstances justifying the belief that the proportion will be the same in other cases as in the cases examined. In the cast of a die, the probability of ace is one sixth; not, as La Place would say, because there are six possible throws, of which ace is one, and because we do not know any reason why one should turn up rather than another; but because we do know that, in a hundred, or in a million of throws, ace will be thrown about one sixth of that number, or once in six times." These teachings are precisely the reverse of truth. Mr. Mill confounds two modes of probability which not only are different from each other, but which cannot co-exist in the same case. As we have seen, if repetitious probability be perfectly pure, the results do not occur according to any law determining their ratio, whereas, in affected repetitious probability, they always do. Hence, too, as we have seen, if such a law can be shown to exist in any case of apparently pure probability, our first judgment may be supplanted by another in which a different ratio is used, and may always be modified by any considerable "run of luck."

The untenable character of Mr. Mill's explanation of pure repetitious probability may be further shown by an application of his own principles. If the ratio of the chances in such probability is to be determined in the same way as the likelihood of natural events, this must be done by successive series of experiments. If there be some law which, in a long course of trials, requires a tossed penny to show as many heads as tails, such a law can be established only by the observed recurrence of this ratio—of equality—in many series of experiments. But

it will be found that no such recurring ratio can be obtained. Let one toss a penny ten times in succession, noting how many times head appears; and let him repeat this course of procedure ten or twenty times. He will find the ratios differing greatly as he proceeds. Nay, even if they should somewhat approximate he would still feel a hesitancy to infer a law. Because the forces known to act in the tossing of a penny, cannot, like the more important agencies of nature, be considered to be in any degree regular in their operation. When we pass from this simplest of cases to any one more complicated, the task of observation and computation is not only as useless as in the case of the tossed penny, but speedily escapes beyond the bounds of ordinary thinking. For instance, to be satisfied, on Mill's principle, that the probability of throwing the ace of a die is one sixth, we must be sure that, in one series of experiments after another, the ace has appeared after one sixth of the throws; and indeed, not only this, but also that, in each of the series of experiments, every other side as well as ace has also appeared one sixth of the times: for the events must favor each side equally. Who ever ascertained this by experiment? Who ever determined inductively what number of trials would give every face of the die as often as every other? Who ever really regarded the judgment that, in a long course of trials, the sides will turn up each an equal number of times, as something settled by observation, and not rather as merely the best forecast of which the case admits—a forecast which either may, or may not, be realized? (§ 106.)

We must add further that the observation of ratios, even where it may set aside an erroneous judgment in pure probability, does not establish an affected probability so long and so far as the events cannot be found to be regulated by law. If one side of a die is thrown much more frequently than any other, we perceive that the die is loaded. Yet this surplus of frequency may be found of very irregular proportions in successive series of experiments. Such being the case, no steady ratio of events, as a law regulating the turning up of the different sides, can be obtained, and therefore no judgment in affected probability can take place. On the contrary, a new, though somewhat indefinite, judgment in pure probability arises from the perception of the concealed but permanent cause as acting frequently and irregularly; a judgment in which a plurality of the chances favor the loaded side. In this particular case it appears that pure probability may find a basis for judgment in the observation of results. For, in this case, a kind of induction indicates—not a law—but the *absence* of a law, determining the ratio of the facts.

The subject of repetitions probability, considered in itself, is not, perhaps, one of great importance. But the discussion which it necessitates throws light on the theory of probability in general. The philosophy of the probable judgment, though suffi-

ciently simple and intelligible, is prolific of opportunities for intellectual confusion. This arises from the character of those objects which chiefly occupy the mind while studying the nature of probability. Chances are most subtle and evanescent idealities: they continually escape from our attention and lose themselves in vacancy, or else assume the appearance of realities and claim for themselves rights which do not belong to them. We should remember that chances are the individual possibilities consequent upon some antecedent of contingency, that they are immediately inferred by the mind on its perceiving the total number of the possible necessitant variations of that antecedent; and that the probability of any statement is determined by the ratio of the chances which are in its favor to those which are against it.

CHAPTER XXIV.

THE CALCULATION OF CHANCES.

§ 95. One may have a good understanding of the general nature of probable judgments and of the mode of their formation, and yet be unable correctly to conceive the chances and their ratio in particular cases. Indeed often, when the elements of judgment are many or involved, the aid of arithmetical principles is found necessary. Hence an interesting department of mathematical science has arisen, which is known as *the calculation of chances*. We shall refer to some of the more fundamental conceptions and simpler operations of this calculus, partly to illustrate methods of thought used in determining the ratio of the chances, and partly to show what care and acumen are needed to ascertain this ratio exactly in any case that may be even moderately complicated.

Explanatory remarks as to—
 (a) The relation of probability to absolute certainty.
 (b) The nature of moral certainty.
 (c) The basis of probable judgment.
 (d) The conception of the chances in any case.

Before proceeding with this discussion, some qualifying remarks seem requisite in order to guard the general theory of probability against misconception. First, then, *the common statement* (§ 87) *that the degree of confidence accompanying a chance has that fractional part of the strength of absolute certainty which corresponds to the fraction designating the chance, appears to be somewhat erroneous.* This same view is expressed when we say that the confidence of certainty is divided equally among the chances. According to this, when the chances are even, as in the tossing of the penny, our expectation for either result has exactly one half the strength of certainty. But the truth, precisely apprehended, seems to be that the distribution of our confidence has a weakening and lessening effect on the parts distributed, so that, in their separation, they are no longer equal to the whole. Hence any high proba-

bility, produced by the addition of separate chances, as, for example, when the chances are nine thousand nine hundred and ninety-nine out of ten thousand, differs, in strength, from the certainty of sight or demonstration, remarkably, and more than is indicated by the fractional remainder, which, in the case just adduced, is one ten-thousandth. Experience testifies that the sensible difference between that certainty which excludes all possibility of the opposite and any high probability which allows some chance, however small, of the opposite, is greater than that between this degree of probability and the next lower. When we leave absolute certainty, and admit some possibility of the contrary, a new element—doubt—begins to enter the mind; and we greatly feel the difference between no doubt at all and any doubt at all. The fact is that the expectation characterizing probable judgments, and the certainty belonging to absolute knowledge, differ so strikingly in their origin, or mode of formation, that they may be regarded as modes of confidence which differ in character as well as in degree. For, in every case of probability, there is a distribution of confidence among all the chances *upon no other ground than that there is no known reason to trust in one more than in another*, this distribution being followed by a greater or less concentration of confidence on the various suppositions which the chances support. This way of distributing and concentrating confidence is a thing very peculiar, and is not used at all in cases of absolute cognition: hence the peculiar character of our confidence as distributed and as variously concentrated. When, therefore, the chances for two contradictory suppositions are seven for one and three for the other, it is scarcely proper to assert that the confidence of certainty is thus divided and distributed. It would be more exact to say that a new mode of belief is instituted and is exercised, in the proportions specified. And, because of the essentially weak character of this new style of belief, the aggregate strength of these expectations, as to the two suppositions separately, is not equal to that of absolute certainty. While it is true that the chances for and against the event exist in the proportions of seven and three, and the probabilities for and against the supposition may be symbolized by the fractions seven tenths and three tenths, the sum of our confidence in these two suppositions is, nevertheless, not equal to the strength of absolute certainty, this latter being something greater and stronger than the unit to which the fractions of fortuity or probability may be referred. The relative strength of probabilities may be determined according to the proportion of chances supporting each, but this rule fails when we compare any probability with absolute certainty. In consequence of this sensible difference between the judgments of chance and of certainty, any sound mind, we believe, would rather have a half dollar, cash down, than the even chance of getting or not getting a whole dollar, or the certainty of a guinea than the chance of one in six of receiving six guineas.

Or, to state the matter more perfectly, he would rather have a dollar in hand than two even chances of winning a dollar, and he would rather have six guineas in his pocket than six chances of one in six of winning that amount of money.

The foregoing thoughts lead to a second statement closely related to the first; viz., that *a notable difference exists between absolute certainty and that high degree of confidence which is sometimes called moral certainty.* When the chances in favor of an event are innumerable great as compared with those against it, we sometimes say that we are as certain of its occurrence as if it had already transpired, or were taking place before our eyes. This mode of speech is not exactly correct. For immediate practical purposes such events may be held perfectly certain; as, indeed, it is often wise to disregard adverse chances, even when they sensibly present themselves. But the difference between moral and absolute certainty appears when we come to consider *the possibility of the opposite.* In a case of absolute certainty—which is the certainty of sight or demonstration—we cannot entertain any question as to the truth of the thing known; we reject a denial of it as absurd and unreasonable. In a case of moral certainty, we allow that the opposite of what we may expect or believe is, at the least, possible. We say that it is certain that such or such a man will die sometime, because the chances are incalculably in favor of that event. Out of the thousands of millions of men who have inhabited the earth, only two or three have escaped the universal doom. Yet there is no absolute certainty that a man shall die; he may be translated, like Enoch or Elijah; and the mind recognizes this as a possibility. One chance out of an innumerable multitude is allowed against the supposition of death. There is a moral certainty of the sun rising on the morrow; yet there is nothing absurd or impossible in the conception that it may not rise. We cannot deny that there may have been a time when the sun began his daily journeys, and that a time may come when his journeys shall cease. Our belief in events which are only morally certain, and our disbelief in their opposites as in the highest degree improbable, are stable—very stable—yet by no means immovable, modes of confidence. The mind raises no question about such events, yet it admits question, and is even able to form new and opposite convictions, if these be supported by sufficient evidence. The disciples of our Saviour who witnessed his wonderful works, and the leper, the paralytic, the blind, the lame, who personally experienced his healing power, found it easy to believe in miracles, even though such events are out of the course of nature, and opposed to the general experience of mankind.

Our next remark is in qualification of the statement that *every judgment of probability is based on the certainty that one or other of a given number of chances will prove real.* This certainty is generally assumed in the Theory of Probable Judgment and

in the Calculation of Chances. But evidently, if the data according to which we enumerate and classify the chances in a case, admit of doubt, this same doubt will affect the reliability of our conception and comparison of the chances. If we did not know exactly the total number, and the proportionate numbers, of the balls in a bag, but only that the total is *about* one hundred and that *about* fifty of these are white and *about* fifty red, we could not say certainly that the probability of drawing a white ball is that of one in two. Yet we could, and would, make an indeterminate judgment of this kind. In like manner, were our knowledge respecting the weather on January 1st only that frost has happened about two times out of three, and that this is about the average rate of its occurrence on the annual return of that day, we would say that the chances for frost next New Year's are two in three; yet this judgment would be weak in proportion to the weakness and uncertainty of its premises. Clearly a probable judgment can be made upon uncertain data, and, when certainty is assumed in calculations, nothing more is meant than that such certainty is needful to any exact judgment, and that in every case data must be assumed as fixed before we can give a definite, even though it be but an approximate, expression, to any probability.

Another remark, closely allied to the foregoing, may check a tendency to error. *In the great majority of our judgments, the proportions of the chances for and against an event being somewhat indefinitely conceived, the ratio of the chances is determined roughly and without arithmetical computation.* Commonly we neither can nor do estimate probabilities with exactness; the mind ordinarily is not conscious of numerical calculation in its spontaneous judgments. Yet the best—perhaps the only—way to illustrate our less definite modes of mental action, is to study those explicit processes with which they essentially agree. The operation of the radical laws which govern both methods can be seen much more distinctly in connection with the explicit process.

§ 96. We now proceed to consider the more fundamental principles of the Calculation of Chances. And first, we recur to the self-evident truth that *the total number of chances in any case may always be expressed by a fraction whose numerator and denominator are equal.* In this respect it is like any other total consisting of equal parts. If there were twenty men in a crowd, the whole crowd would consist of twenty twentieths. But, since such a fraction is always equal to one, or unity, and since an event is certain when all the chances are in its favor, we may take *one* or *unity* as the expression of certainty. More strictly speaking, *unity* is the expression of that positive certainty which results from an exclusion of all chances contrary to a supposition; while *nought*, or *a cipher*, is the index of that negative certainty which results from an exclusion of all chances in favor of a supposition.

Again, since a probable event has only some, not all, of the

Certainty expressed by unity, probability by a proper fraction.

chances in its favor, and its probability varies with the number of the favorable chances, it is clear that *every probability must correspond to, and may be expressed by, a proper fraction.* Such being the case, probabilities vary among themselves as the fractions expressing them do; although the subjective unit of confidence to which they refer may be held to differ somewhat in degree and character from the confidence of absolute certainty (§ 95).

Further, since the chances for, and those against, an event constitute the total number of chances in the case, it follows that *the expression for the improbability of an event may be obtained by subtracting from unity the fraction expressing its probability.* Although the aggregate strength of our expectations for and against a probable event may not equal the strength of absolute certainty, yet the sum of the fractional expressions of these two degrees of expectation is always and necessarily equal to unity. Let the chances for an event be a in number, and those against it b ; the total number will be $a+b$. The expression of the mathematical or philosophical probability of the event will be $\frac{a}{a+b}$; that of its improbability $\frac{b}{a+b}$; and these fractions added together give $\frac{a+b}{a+b}$, or unity. More simply, should we represent the likelihood of an event by p , the likelihood of its non-occurrence, or of its contradictory opposite, is $1-p$; and these expressions, also, when added, produce one or unity.

The fraction expressing a probability may itself, for the sake of brevity, be called a *probability*. Hence we may speak of *the addition and subtraction of probabilities, and even of the multiplication, or division, of one probability by another.* Language of this kind is used in the calculation of chances. But we should remember that, in all such cases, the term *probability* signifies simply that ratio of the chances by which the degree of the probability of an event is determined. Generally by a chance we mean an individual possibility, that is, a possibility which does not admit of logical division. Every consequence of an antecedent of contingency which may be conceived of as resulting from a complete or full combination of the elements of judgment or calculation in any possible mode of combination, is such an individual. The mind accepts every chance as equally probable with every other; and the ratio of the chances is conceived and computed as existing between these individual possibilities. But we think, also, of *general* chances as including several individuals; and every probable supposition may be regarded as the conception of a general chance including, and supported by, a number of individual chances (§ 88). Moreover, *while some general chances include individual chances and receive their united probability, other chances, yet more general, may include these first-named general chances and receive their united probability.* Let one hundred balls be in a bag, forty white, thirty blue,

General and individual possibilities.
General and specific probabilities.

twenty red, and ten yellow. The probability of drawing a white ball is $\frac{40}{100}$; this is a general chance supported by forty individual chances. The probabilities of $\frac{20}{100}$, $\frac{20}{100}$, and $\frac{10}{100}$ for a blue, a red, and a yellow ball, respectively, are similarly related. But the probability of drawing a colored ball—that is a ball, not white, but either red, or blue, or yellow—is evidently more general than any of those already mentioned, and is found by adding together the three probabilities respecting the colored balls. It is $\frac{60}{100}$. In more general terms, let six conceived events be the only suppositions possible in some case; let their probabilities be $\frac{a}{m}$, $\frac{b}{m}$, $\frac{c}{m}$, $\frac{d}{m}$, $\frac{e}{m}$, $\frac{f}{m}$; let the first three agree in character, so that they may be conceived of under one notion, and so that, if any one of them takes place, we may say that the event E occurs; let the next two also agree, so that, if either of them happens, we may say the event E' takes place; the last event remaining singular. The probability of the event E is $\frac{a+b+c}{m}$, that of E' is $\frac{d+e}{m}$; and that of the remaining supposition, which we may call E'' , continues to be $\frac{f}{m}$. The total of these probabilities, $\frac{a+b+c+d+e+f}{m}$, is unity, since the sum of the numerators is the total of the chances in the case, which is represented by m .

A limiting principle and its application to the addition of probabilities. Difficulties met.

§ 97. *In every judgment of probability, we consider only such chances as are dependent on one antecedent of contingency.* As we shall see, this antecedent may be either simple or compound, the latter being formed by the conjunction of two or more simple antecedents; so also the probability depending upon it may be either simple or compound. At present we call attention to the fact that every probable judgment contemplates one antecedent only. For this reason it is no part of any such judgment to compute the aggregate amount of confidence due to several probable suppositions or events which are possible consequents of several antecedents of contingency. If such an estimate were made, it would not be a judgment of probability. This judgment always seeks to determine the ratio of the chances, and this ratio belongs only to the chances consequent upon one antecedent. Hence, in calculation, we never add together probabilities belonging to cases radically different. No judgment of probability would arise from the addition of $\frac{1}{2}$, $\frac{1}{6}$, and $\frac{1}{12}$, the probabilities attached to the suppositions, respectively, that head will be thrown on the toss of the penny, that ace will appear on the cast of the die, and that a pictured card will be uppermost after the shuffling of the pack. Neither, were a die to be cast a number of times, would it answer any purpose to multiply the probability, which accompanies each throw, for the appearance of any given side, by the number of trials. For every trial would present a new antecedent of contingency. These remarks apply to every instance of that probability which attends repeated trials. Hence, too, whenever, in the calculation of chances, we add prob-

abilities, the resulting sum can never be greater than unity. For this sum cannot exceed all the chances in the case.

In estimating the probable result of several trials in a case of repetitious probability, one might suppose that the probabilities attending the several trials should be added so as to obtain the probability of the result. But to do this would be to use a method of thought not properly applicable. Should we ask for the chances of "head once at least" in two throws of a penny, one might say the chance for head on the first toss is $\frac{1}{2}$, and, on the second toss, $\frac{1}{2}$ also; therefore, in two throws, the probability is $\frac{1}{2} + \frac{1}{2}$; that is, unity or certainty, a result manifestly wrong. The mistake lies in adding the probabilities of two independent cases, in each of which there is one toss of the penny, instead of computing the probability of one compound case in which there are two tosses. In this latter case there are four individual chances; head, first toss only; head, second toss only; head, both tosses; head, neither toss. Three of these favor the supposition, or general chance, "head once at least"; for which, therefore, the probability is three fourths.

Sometimes, in the solution of questions, the addition of probabilities takes place in a way that seems to conflict either with the principle that we add only probabilities belonging to one case—that is, to one antecedent—or with the principle that all the chances in a case are equal. In calculating the probability of "ace once or oftener in two throws of a die," we say that the chance in one throw is one sixth, and that, if it does not appear the first throw, there is the further likelihood of $\frac{5}{6} \cdot \frac{1}{6}$, or $\frac{5}{36}$, for ace on the second throw. Adding these, we find the probability of ace once or oftener in two throws to be $\frac{11}{36}$. One may object to this calculation that it adds chances arising under one case of probability to chances arising under another, or that, if this be not so, then two classes of chances of unequal value present themselves in the same case, that is, the chance of one in six connected with the first throw, and the chances of five in thirty-six connected with a second throw after an unsuccessful first. Neither of these points is well made. In the first place, though the probabilities in question might be regarded as belonging to cases with different antecedents, in the present and similar instances they are seen to belong also to probable events connected with one antecedent. For the supposition that ace will be cast, *on the first throw*, and the supposition that ace will be cast *not on the first, but on the second*, are two specific suppositions, both included under the more general idea that ace will be cast *once at least upon two throws*. Moreover, these suppositions divide between them all the favorable possibilities of the case. If ace appear the first throw, the event is determined; ace has been thrown "once at least," and we make no further trial. But, if ace does not appear, we try again. We therefore rightly add the probabilities of the suppositions. For, whenever an event may happen in one or other of several ways independent of each

other, its probability is the sum of the probabilities of its happening in these ways severally. In the second place, we remark that although we unite the probability of $\frac{1}{4}$ to that of $\frac{5}{36}$, in this we do not add *chances which have unequal values*, but *probabilities of unequal strength*. This is a secondary mode of procedure less radical than that addition of chances which it displaces, and it is dependent for its reliability upon the correctness of the specific probabilities as each of these may have been determined according to a computation of chances. For whenever, in any case, the ratio of the chances may have been ascertained, the direct consideration of their number is no longer necessary (§ 89). The nature, as well as the legitimacy, of this direct addition of probabilities may be further shown from the fact that, in every case of such addition, the probabilities may be expressed by fractions having a common denominator which indicates the total number of chances dependent on the antecedent, and having numerators indicating the proportion of chances which support the suppositions severally. In the case discussed, inspection shows that there are *eleven* individual possibilities, or possible events, in each of which ace will be thrown in two casts of a die. There is one chance that this point may appear after both the first and the second throw; there are five chances that the first throw may give ace and the second one or other of the other five sides; and there are also five chances that the second throw may give ace while the first gives some one of the other five sides. Thus there are exactly eleven chances of ace appearing *once or oftener*. But there are, also, thirty-six possible events in all—that is, thirty-six compound events consequent on two throws. The first throw may give any one of the six sides, and each of the six may be followed on the second throw by any one of the six; that is, the possible combinations in two throws are thirty-six in all. Therefore the chances for ace, or for any given side, once at least—or, which is the same thing, once or oftener—in two throws, are eleven in thirty-six. This result is the same as that already obtained by the direct addition of probabilities. Similar cases may be analytically determined in the same way.

§ 98. *Two or more antecedents of contingency may be united so as to form one antecedent, and probable events depending on them may be united so as to form one probable event; and the probability of this combination of events may be inferred from the probabilities of the several events.* Thus three casts of a die may be considered one antecedent, and three probable events respectively connected with each throw; for example, three appearances of ace, may be considered, in their possible conjunction, as one event; and the probability of this event may be inferred from the separate probabilities of the three events. In order to determine this compound probability, it is needful only that we should know the chance-ratios belonging to the several events on the supposition of the existence, that is, the

Simple and compound probability.

certain existence or occurrence, of their antecedents. There is no need that we should conceive exactly what these antecedents are, or know the total number of chances consequent on each. The attention, therefore, is mainly directed to the events and their ratios. Yet a clear understanding of the doctrine of compounded probabilities also involves some consideration of the antecedents as these are related to the compound event. The simplest case of compound probability arises from the possible conjunction of two similar events. We ask, for example, "What is the probability of ace twice in two throws of a die?" Now, if the first throw does not give ace, the event cannot be completed by ace on the second throw, whereas, if the first does give ace, the event *may* be completed by ace on the second throw. In other words, *the chance of there being any chance* of completing the event is the same as the chance of ace on the first throw, or one sixth. Hence we have just a chance of one sixth of having a chance of one sixth of ace on the second throw as a completion of the event. But, as this likelihood of ace on the second throw to complete the event is only hypothetical, and rests on the assumption that we will succeed in throwing ace the first time and will have opportunity to try to complete the event, and as this first success is not certain but has only the one sixth of certainty, it is clear that the true and real probability of ace on the second throw as a completion of the event, is only one sixth as great as its hypothetical probability of one sixth: that is, it is one thirty-sixth. The same thought may be expressed by saying that the chance of one sixth belonging to the first throw gives rise to six smaller chances in connection with a possible second throw, each of which has the value of one thirty-sixth and only one of which favors "ace on the second throw also." As *the likelihood of any event is the same with that of its completion*, the probability of two aces in two throws of a die, is, of course, one in thirty-six.

In this case, the antecedents of the simple events are the two throws; with regard to them, it is plain that the probability of the compound event is calculated on the assumption that the *first throw certainly takes place*, and that *the second throw will certainly take place, provided the first should be successful in producing its part of the supposed event*. Both are assumed in determining the probability, but the second only hypothetically and in connection with the result of the first throw. Should we now consider the compound event of "ace on the first throw, and some other side than ace on the second throw," the probability of this event would be determined in precisely the same way as that of "ace twice in two throws." For we should now have one chance in six of having the five chances in six belonging to the event of any other side than ace on the second throw. The probability, therefore, for the completion of the event on the second throw, is one sixth of five sixths, or five thirty-sixths, each of the five chances being hypothetically one sixth, but really one thirty-

sixth. Nor would the mode of calculation be different if the simple events had dissimilar antecedents. The probability of the combined event of head on the toss of a penny and ace on the throw of a die, is obtained by multiplying one half by one sixth, and is one twelfth. Here, again, notice that the second antecedent is hypothetically assumed; that is, is regarded as certain to take place in case the first antecedent should prove to be followed by its part of the compound result.

The probability of an event compounded of two simple probable events having been obtained, we can determine the probability of an event composed of three, or more, such events. For we may compound the likelihood of the joint occurrence of the two first events with that of the occurrence of a third, and then the likelihood of the joint occurrence of the three first events with that of the occurrence of a fourth, and so on to the end of the series. Thus, knowing that there is a chance of one thirty-sixth for ace twice in two throws, we see that the chance for ace again on the third throw—or for ace three times in three given throws—is one sixth of one thirty-sixth, or one two-hundred-and-sixteenth. For there is just a chance of one thirty-sixth, that there may be a chance of one sixth to complete the event on the third throw. This illustration may suffice; others will readily suggest themselves. In order, therefore, to ascertain the probability of any number of probable events succeeding each other (each event, if it take place, being certainly followed by the antecedent of contingency belonging to the next event), we have simply to multiply all the probabilities together.

The events constituting a compound probable event may be either contemporaneous or successive.

So far we have spoken of the compound event as constituted by a succession of probable events. We remark, further, that compound probability belongs also, and equally, to the combination of such probable events as may be contemporaneous; and that the same method of calculation serves in this case as in the other. Instead of one box with one die, let us use two boxes with two dice, shaking the boxes at once and overturning them together. Now, the dice remaining covered, we ask, "What are the chances that both of them have ace uppermost?" Let us, as a guide to our thought, distinguish either die, it matters not which, as No. 1; then the other will be No. 2. The question now may take the form, What are the chances that die No. 2 will give ace as well as die No. 1? Considering No. 1 by itself, the chance of its having ace uppermost is one sixth; and, since any one of the six sides of No. 2 may be uppermost together with ace of No. 1, it is clear that the chance for ace of No. 2 would be one sixth if there were a certainty for ace of No. 1; but, as there is only a chance of one sixth for ace of No. 1, the chance for ace of No. 2, as a completion of the event, is only one sixth of one sixth, or one thirty-sixth. The same thing is expressed when we say that any one of the sides of No. 1 might turn up, and might be accompanied by any one of the sides of No. 2,

so that every one of the six chances in connection with No. 1 might be united with every one of the six chances connected with No. 2, making, in all, thirty-six combinations, or possible compound events, only one of which would be the combination of ace with ace. The probability of throwing two aces at once having thus been obtained, that of throwing three at once may be determined by compounding the former with the probability belonging to ace in connection with the cast of a third die. In this manner we may ascertain the probability of the simultaneous occurrence of head on the toss of a penny, ace on the cast of a die, and a pictured card on the shuffling of a pack—each antecedent taking place, and being followed by, some one of its consequents, simultaneously with the other antecedents. In short, it is evident that the probability of a compound event is found by multiplying together the probabilities of the component events, and is the same whether these, and their antecedents, be conceived of as successive or as contemporaneous.

§ 99. Such being the case, we may now consider a point which is assumed in the compounding of probabilities, but the exact nature of which cannot be apprehended without some care. *It is easy to see that several probable events may be, and often are, so united as to form one probable event, while yet it is not so easy to say in what the bond of their union consists.* Perhaps we cannot better express the truth than by saying that every compound probable event is an ideal collective whole (§ 121), formed from simple probable events as united by the relation of mere co-existence—that is, of supposed correality, without reference to time. This whole is constructed by the mind as it may choose, but under the following limitations. In the first place, the materials used must be events considered as probable, that is, hypothetically probable, events which would be probable in case their antecedents of probability (§ 91) were realized. Secondly, these events must have a logical order, whether they have a temporal order or not, and must be, or have been made, so related to each other in this logical order, that the probability of each event follows certainly upon the occurrence of its immediate predecessor. This last thought may be otherwise expressed by saying that no compound probability can exist, or be computed, unless the antecedent of probability of each simple event after the first, may be certainly assumed on the supposition that the events preceding it in order have taken place, the probability of the first event only being real (§ 78). This rule applies universally, but is most apparently applicable when the events compounded are conceived of as successive in time.

From the foregoing we may also infer, further, that *every compound antecedent of probability is composed of a number of simple antecedents considered as co-existent, while yet this co-existence has no reference to time, and also does not necessarily involve the actuality of all the antecedents.* It requires only the actual existence of one

A compound probable event is an ideal collective whole. The conditions of its construction.

The compound antecedent of probability. The conditions of its existence.

and the hypothetical existence of the rest. Let a , b , c , and d , be four probable events, each having a specific or peculiar antecedent of its own, and, to strengthen the illustration, let them be causally independent of each other, so that they may either be contemporaneous or may follow one another in any order. The probability of their joint occurrence is found by multiplying their probabilities together. But of this we must first be sure, that the probability of the event first considered is based on an actually existing antecedent; for, if the antecedent were wanting, the chances based on it would be wanting, and there would be no reason to expect the consequent, and none, therefore, to expect the compound event of which the simple event is an essential part. But, now, if the antecedent of the event first considered really occur, or has occurred, while the event does not follow, then it makes no difference whether or not the remaining antecedents may actually occur or have occurred. The judgment of probability is correct, provided only the second antecedent would be certain to occur, or to have occurred, in case the first should contribute its share of the compound consequent, and provided that a third antecedent would certainly follow upon the success of the second, and so on throughout all. In short, the events, with their antecedents, must admit at least one order of consequence in which the first antecedent is real, and each of the rest certain provided its predecessor contribute its possible share to the compound event. In the case immediately considered, the events being causally independent, the antecedents may follow any order in which we can arbitrarily connect them; but, if the events causally condition one another, they have a necessary natural order which we cannot change.

The events constituting a compound probable event either may or may not causally condition one another.

In this connection we may consider the language of some eminent authorities *who say that the events whose probabilities combine to determine that of the event compounded from them, must be independent of one another.* Sec. Galloway, in the "Encyclopædia Britannica" (Art. "Probability"), says: "When an event is compounded of two or more simple events independent of each other, the probability of the compound event is equal to the product of the probabilities of the several simple events of which it is compounded." Such statements, if taken in their natural meaning, are misleading, because, as a matter of fact, the constitutive events either may, or may not, be independent. In other words, they may, or they may not, causally condition one another. The two events which make up the double event of ace twice in two throws of a die, are mutually independent; neither conditions the other. So are the events which compose the double event of ace on one cast of a die and head on one toss of a penny. But often one probable event causally conditions another, and we often compute the probability of a compound event composed of events thus related; in such cases the constitutive events are not independent. We might calculate the probability of a crim-

inal being caught, convicted, and sentenced to one year's imprisonment, and determine this from the three probabilities; *first*, of his being caught, *second*, of his being convicted, in case he is caught, and *third*, of his receiving that sentence in case of his capture and conviction. In this way a long series of probable events might condition one another.

What is true is, that *we cannot calculate a compound probability unless the special probability of each simple event has been determined independently of the probability of any other event, and on the assumption of the certainty of its antecedent.* To determine the probability of the probable consequent of some probable event by the chances belonging to this antecedent in connection with those belonging to the consequent as such, would be to find the compound probability of the two events as united, which might, wholly or in part, be the result aimed at, but would not be the simple probability of either event, and could not be employed in calculation as if it were. Clearly, the special chance-ratio, or probability, of each event, must be determined independently of the ratio of every other event; in this sense—this only—the probability, and each event as to its probability, is independent. These remarks apply to simple probabilities in their use as determinative of unknown compound probabilities. In this relation each probable event, whether dependent on another probable event or not, must have its probability determined without reference to the probability of its antecedent.

But, should the probability of the compound event be known, and be used in any way to determine the probability of any of its parts, then—in this relation—the probability of the simple event would not be independent of the other probability. The real probability of each part as such, would be the same as that of every other part—being the probability of the collective whole; while any event might also be given a special hypothetical probability of the same value as if it had been originally and independently known. For, the probability of the collection and that of every member save one being given, it is plain that the probability of the whole, divided by the product of the probabilities of all the parts save one, will give the separate probability of the remaining part.

Sometimes, in calculating the probability of a succession of events which causally condition one another, one event may present itself which follows its immediate predecessor, not probably, but necessarily and certainly. In this case, the ratio of the chances specially belonging to that event is unity, and has no effect in modifying the ultimate result. When we multiply by unity, the product is the same as the multiplicand. In such instances the two simple events necessarily connected might as well be regarded as one event, having the probability belonging to the event causative of the other.

The formula for calculating the probability of an event compounded of probable events.

§ 100 After the foregoing discussion concerning compound probability, the simple formula for calculating the likelihood of a collection of probable events conceived of in some given logical order needs merely to be mentioned. Let the probabilities of the events in their order, be represented by p, p', p'', p''' , etc.; then the probability of the compound event is the product $pp'p''p'''$ etc. This formula applies whether the events are simultaneous or successive, in time, and whether they causally condition one another or are mutually independent. But it assumes that there is an order of inference, or of logical dependence, which also in a sense is an order of existence, and that, in this order, each event, if it take place, is certain to be succeeded by the antecedent of the next event.

The compounding of events varying in probability.

In the use of the foregoing formula, care will be found necessary for its proper application. For instance, it is sometimes needful to inquire *whether the probability of an event remains the same after every trial, or whether it varies according to some law.* In throwing the die, the chances are exactly repeated; therefore the same multiplying fraction is used for every supposed recurrence of the event. The probability of ace three times in three throws is the product $\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = (\frac{1}{6})^3$; that of ace, first throw; failure of ace, second throw; and ace, third throw; is $\frac{1}{6} \cdot \frac{5}{6} \cdot \frac{1}{6} = \frac{5}{216}$. Let us, however, suppose a different case: a bag containing three white and three black balls, from which one ball is to be drawn at a time and is *not to be replaced.* The probability for a white ball at the first drawing is $\frac{3}{6}$; but, if the ball first drawn should be white, the probability for a white ball on the second trial is $\frac{2}{5}$; and, if another such ball appears, the probability for a white ball on the third trial is $\frac{1}{4}$; finally, if this event take place, there is no chance at all of obtaining a white ball on any subsequent trial. So the probability of getting a white ball three times in succession, is not $\frac{3}{6} \cdot \frac{3}{6} \cdot \frac{3}{6} = \frac{1}{8}$, but $\frac{3}{6} \cdot \frac{2}{5} \cdot \frac{1}{4} = \frac{1}{20}$. In like manner, the probability of the event which would comprise first a black ball, then a white ball, and then a black ball, would be $\frac{3}{6} \cdot \frac{3}{5} \cdot \frac{2}{4} = \frac{3}{20}$; that of two black balls followed by a white one, would be $\frac{3}{6} \cdot \frac{2}{5} \cdot \frac{3}{4} = \frac{3}{20}$, also. In short, the computation becomes more complicated when the same element enters into a compound event, not merely repeatedly, but also with varying probability. If Mr. Orr were at his counting-room seven days out of every ten, the likelihood of my finding him there three days in succession, would be compounded of the varied probabilities $\frac{7}{10}, \frac{6}{9}$, and $\frac{5}{8}$; and a similar modification of ratios would be necessary in every case of affected repetitious probability in which the occurrence of an antecedent, with some one of its possible events, sensibly affected the chances of subsequent events.

The foregoing point may be further illustrated by a problem presented by a young gentleman, a member of the class of 1880. Were a pack of cards dealt equally among four persons, so that

each should have thirteen, what is the probability that the first five cards taken from any one set shall all be red? Here the chances for obtaining five red cards in succession from any one set, are the same as for obtaining them from the entire collection. For, place the four sets one on another in any order so as to re-make the pack, and we shall have the same expectation, no matter which set is uppermost. Nor does it make any difference whether we take five contiguous cards or any five cards at random. Now the likelihood of drawing a red card first is $\frac{26}{52}$, after which event, if it take place, there will remain only 51 cards, 25 of which will be red. Consequently, the probability for two red cards in succession is $\frac{26}{52} \cdot \frac{25}{51}$, and that of five red cards in succession is $\frac{26 \cdot 25 \cdot 24 \cdot 23 \cdot 22}{52 \cdot 51 \cdot 50 \cdot 49 \cdot 48} = \frac{253}{9996}$ or less than $\frac{1}{40}$.

Another college problem may illustrate both the foregoing point, and also the compounding of compounded probabilities. Let two young men at a boarding-house, be irregularly absent from dinner, respectively, three and four days in every week. What is the likelihood that they will both be absent at any given dinner and both be present at the next? The chances of Mr. A. being absent any given day, are three in seven; and those of his being present on any remaining day after that absence is known, are four in six. Hence the probability of his being present one day and absent the next is $\frac{3}{7} \cdot \frac{4}{6} = \frac{2}{7}$. In like manner the probability of Mr. B. being absent any given day and present the next, is $\frac{4}{7} \cdot \frac{3}{6} = \frac{2}{7}$. Combining these resultants, we have the likelihood that the young men will both be absent on a given day and present the next. It is $\frac{2}{7} \cdot \frac{2}{7} = \frac{4}{49}$, or nearly 1 in 12.

§ 101. A second observation in regard to the formula for the compounding of probabilities is equally important with that which we have now enforced. It is that the probability immediately obtained by the use of the formula is *always that of a single or individual, and not that of a general or generic, combination of events.* To explain this doctrine, we must ask attention to the statement that, in some cases of compounded probability, *the order of the simple events may be changed, while that of the antecedents remains the same;* for, whenever this occurs, there may be several compound events, each of which will have the same antecedent and the same degree of probability, as each of the others. Let *A* be an antecedent of probability with a consequent *a* which has the probability *p*; and let *B* be another antecedent with a consequent *b* which has the probability *p*'. Let these antecedents be such that the event *a*, with its probability *p*, may follow *B* as well as *A*, while the event *b*, with its probability *p*', may follow *A* as well as *B*. Then the occurrence of the double antecedent, *A* followed by *B*, may be followed by either of two probable consequents, one of which is *a* followed by *b*, and the other of which is *b* followed by *a*; and the probability of each of these consequents is the same, viz., *p p*'. Should we now conceive of the general probable event of *a* occurring once and *b* once, this event

Individual and general events of compounded probability.

evidently would take place *whichever of the above consequents should happen*: consequently, the probability of the general combination would be the sum of the two individual combinations; that is, it would be $2pp'$.

In like manner, were there three antecedents $A, B,$ and $C,$ each of which might be followed by each of the consequents $a, b,$ and $c,$ with the probabilities respectively of $p, p',$ and p'' , the general event in which $a, b,$ and $c,$ should occur in some order, no matter what, would have the probability $6pp'p''$. For there are six possible arrangements of three things taken three at a time. In general, to determine the probability of any combination of events on the supposition that they may follow their antecedents in any one of several orders, the order of the antecedents remaining constant, we must add the probabilities of the combinations which may take place severally in connection with the several orders. These latter combinations we style *individual*, because in them every element of possibility is definitely determined, and therefore they do not admit of logical division; while the first-mentioned combination is a *general* possible event, because it contains an element thought of indeterminately, if at all, and therefore generically includes those combinations in each of which this element is conceived of as in one determinate mode. For illustration of the point now in hand, let us consider the probability of throwing both ace and deuce in two throws of a die—or, if you please, in the cast of two dice. Of course, the separate probability of ace on one throw of one die, is $\frac{1}{6}$; and that of deuce, $\frac{1}{6}$ also. Can we, then, say that the likelihood of the compound event of both ace and deuce in two throwings of one die—or in one throwing of two dice—is $\frac{1}{36}$? By no means. For this event, as a possibility, is general, and includes two individual events. These are, when one die is used, that ace should be thrown first and deuce second, and that deuce should be thrown first and ace second; and, when two dice are used, that ace should be thrown with die No. 1, and deuce with die No. 2; and that deuce should be thrown with die No. 1, and ace with die No. 2. Taking either pair of these double events, we see that the probability of each double event is $\frac{1}{36}$. Hence the chance-ratio of the general event, which includes them both, is $\frac{2}{36}$, or $\frac{1}{18}$, the answer required. Whenever, therefore, a question in probability concerns some *general* compound event, it is necessary first to determine the probability of the event as individualized. Then the probability of the general combination, being the sum of the probabilities of the individual combinations included under it, can be found by multiplying one of these probabilities by the number of the individual combinations.

§ 102. We are now prepared for an interesting theorem, the knowledge of which enables one to determine the probability of any one of a series of compound events, every member of the series being a possible consequent of one compound antecedent. This

The "Binomial Formula" applied to the calculation of probabilities.

theorem may be entitled, *The application of the Binomial Formula to the calculation of probabilities.* Its use, exactly expressed, is to determine the probabilities of the various combinations possibly consequent, either upon the occurrence of any given number of simple antecedents, each of which has the same following of possible events, or (which is really the same thing) upon the recurrence of one simple antecedent, with the same following of possibilities, any given number of times. To explain and prove this theorem, let us imagine an urn containing both white balls, and other balls not white, but black or colored. Then the likelihood of drawing a white ball, may represent the probability of any event which has a given number of chances in its favor, and the probability of drawing a ball not white, may represent the likelihood of the failure of the event. Let the number of white balls be a , and that of the residue b . The probability of drawing a white ball is $\frac{a}{a+b}$; that of drawing a black ball is $\frac{b}{a+b}$; and, provided the ball drawn be replaced in the urn after every trial, these probabilities may be renewed any number of times. But, should we wish the trials to be contemporaneous instead of successive, this would be effected by having a number of urns equal to the number of trials desired, and each supplied with balls in the same way as the single urn; for then the same probabilities as before would attach to each drawing from an urn.

Let us now designate $\frac{a}{a+b}$, that is, the probability of drawing a white ball on any trial, by p , and $\frac{b}{a+b}$, that is, the probability of the failure of this event, by q . What, now, are the probabilities of the different compound events possibly consequent upon two trials? If we indicate *the drawing of a white ball by E, and that of a black ball by F, and write these letters in the various orders in which the events may occur*, it is plain that there can be four, and only four, possible events, represented thus, EE , EF , FE , and FF . Clearly, also (§ 100),

The probability of	EE is	$pp=p^2$.
“	“	EF is $pq=pq$.
“	“	FE is $qp=pq$.
“	“	FF is $qq=q^2$.

Considering, now, the events EF , and FE , we see that their probabilities are equal, and also that they may be regarded as varieties of the same general event, viz., that *there should be one failure and one success in two trials.* The events EF and FE cannot both follow a single occurrence of their common antecedent; that is, cannot both result from two drawings; but if *either* of them take place, then that general event happens of which they are varieties. The probability, therefore, of this general event is $2pq$; and the expression $p^2+2pq+q^2$ gives the sum of all the probabilities in the case, and also, in its several parts, gives the several probabilities of all the different possible consequents, or compound events. This calculation applies equally whether

we think of two drawings, one after the other, from one urn; or of two drawings made at once from two urns. In the latter case, as in the first, there are two possible individual compound events with the probability pq , viz., that of drawing a white ball from urn No. 1, and a black ball from urn No. 2, and that of drawing a black ball from No. 1 and a white ball from No. 2.

Let us next suppose the number of trials to be three. The different individual combinations, or compound events, will now be eight in number; and may be presented, together with their respective probabilities, in the following statement.

<i>EEE</i>	will have the probability	$ppp = p^3$.
<i>EEF</i>	“	$ppq = p^2q$.
<i>EFE</i>	“	$pqp = p^2q$.
<i>FEE</i>	“	$qpp = p^2q$.
<i>EFF</i>	“	$pqq = pq^2$.
<i>FEF</i>	“	$qpq = pq^2$.
<i>FFE</i>	“	$qqp = pq^2$.
<i>FFF</i>	“	$qqq = q^3$.

Here we find two sets of compound events, viz., *EEF*, *EFE*, *FEE*, and *EFF*, *FEF*, *FFE*, each of which is marked throughout by a common character. For, whichever of the first three may happen, we succeed twice and fail once, and, whichever of the second three may happen, we fail twice and succeed once. We can, therefore, in each case, speak of one general, instead of three individual, events; and, with this understanding, we may say, that the total number of events are four instead of eight. Then, too, the formula $p^3 + 3p^2q + 3pq^2 + q^3$ will, in its several terms, give the probabilities belonging severally to the four possible events. In like manner, we might show that the probabilities of the various compound events possibly consequent on four trials are represented by the terms of the expression, $p^4 + 4p^3q + 6p^2q^2 + 4pq^3 + q^4$. In all of the foregoing formulas let us note as follows. *First*, p is the probability, and q the improbability, of an event on any single trial. *Secondly*, the sum of the terms is equal to unity. This is evident, metaphysically, because the terms present all the possible consequents, one or other of which consequents must necessarily take place; and mathematically, because the value of the expression $p + q$ is unity, of which any power whatever is also unity. *Thirdly*, the number of terms is the number of possible compound consequents as conceived of without fixing the order of the events constituting any consequent. *Fourthly*, each term whose coefficient is greater than unity, gives the probability of a general compound event; and its co-efficient indicates the number of individual combinations which the general combination includes. The literal part of the term expresses the probability of any one of the individual combinations. And *fifthly*, the exponent of p in the first term, and that of q in the last, as also the sum of the exponents of these letters in any one term, indicates the number of trials in connection with which the probabilities

originate. As the principles employed in obtaining the foregoing formulas apply equally, whatever be the number of trials, we may say, in general, that, if p be the probability, and q the improbability, of an event whose chances are repeated with the repetition of its antecedent, and if n be the number of antecedents or trials, then the development of the expression $(p+q)^n$ will give the probabilities of all the events possible in the case. But, according to that demonstration in Algebra, known as the "Binomial Theorem," the general formula for this development is $(p+q)^n = p^n + np^{n-1}q + \frac{n(n-1)}{1.2}p^{n-2}q^2 + \frac{n(n-1)(n-2)}{1.2.3}p^{n-3}q^3 + \dots + \frac{n(n-1)(n-2)\dots(n-n+2)}{1.2.3.4\dots(n-1)}pq^{n-1} + q^n$.

The law of the co-efficients and the formula expressing it explained.

§ 103. In this formula the law of the co-efficients, only, demands special attention. The co-efficient of the first term is unity; after that the co-efficients, in order, are the numbers of the possible combinations of n things taken 1 at a time, 2 at a time, 3 at a time, and so on up to the number of combinations of n things taken n at a time, or all together; this last result being always unity, so that the co-efficient of the last term is always the same as that of the first.

Or, since the combination of n elements in sets of 1 are equal in number to the combinations of n elements in sets of $n-1$; while those of n elements in sets of 2 are equal to those of n elements in sets of $n-2$; those of n elements in sets of 3, to those of n elements in sets of $n-3$; and, in general, those of n elements in sets of r , to those of n elements in sets of $n-r$ (r being any whole number less than n), the law may be expressed in another way. We may say that the co-efficient of the first term equals the number of combinations of n things taken n at a time; that of the second, the number of combinations of n things taken $n-1$ at a time; that of the third, the number of combinations of n things taken $n-2$ at a time, and so on till the co-efficient of the term next to the last is equal to the number of combinations of n things taken 1 at a time. Thus the co-efficients in order present two series of numbers precisely correspondent with one another, one of which series includes all the co-efficients save that of the first term, and the other all the co-efficients save that of the last term.

Yet, while the development of the co-efficients follows the foregoing law for combinations, it is to be noticed that, in a sense, it does so accidentally. The co-efficients, in their order, really arise, *not from the combination of n elements taken together in sets of varying size, but from the permutation of n things taken all at a time.* Here, by combination, we mean what we have already (§ 101) termed a general combination, that is, a collection of things conceived of without reference to their order; while, by a permutation, we mean an individual combination, that is, an arrangement of things in a given order. Thus the letters $a, b,$ and $c,$ taken all at a time, admit of one combination only, but of six permutations. Such being the case, we have to say that the true reason for the employment of the formula for combinations

in the Binomial Theorem, is that an algebraic formula which applies to a particular mode of permutation is identical in value with the formula for combinations, and may be easily made identical in form. This may be shown as follows. Let r and s be two variable numbers which, taken together, equal n , a fixed number; and let a set of things, r in number—say $EE \dots E$ —be specifically indistinguishable, and likewise another set, s in number—say $FFF \dots F$. Then will the distinguishable arrangements, or permutations, of the n , or $r+s$, things, taken all together, equal in number the combinations of n things taken either r at a time or s at a time. For the formula which immediately gives the number of distinguishable permutations of n things composed of two kinds of similar things, one kind being r and the other s , in number, is the following: $P_n = \frac{1.2.3 \dots (n-2)(n-1)n}{1.2 \dots r \times 1.2.3 \dots s}$; in which expression, evidently, we may cancel either the first or the second series of factors in the denominator, provided we cancel an equivalent portion of the series in the numerator. Doing either, we obtain a formula exactly the same as that for the number of combinations of n things in sets of r , or in sets of s . Thus, cancelling the second series in the denominator, and remembering that $s=n-r$, the expression becomes, $\frac{(n-r+1)(n-r+2) \dots (n-1)n}{1.2.3 \dots r}$. But this is the general formula for the number of combinations of n things taken r at a time. In the same manner, cancelling the first series in the denominator, we obtain a similar expression for the number of combinations of n elements taken s at a time—an expression numerically equivalent to the other. The full explanation of these matters belongs to Algebra; yet any one moderately versed in that science may see how the above formula for permutations immediately gives the co-efficient of any term in the development of $(p+q)^n$, whose literal part is $p^r q^s$; and how this formula and that for the combination of n things in sets of r or of s , are identical in result. Either formula, therefore, indifferently, may be used.

Having thus a rule to determine the co-efficient of any term in the development of $(p+q)^n$, there is no need that we should expand this expression in order to complete the term. We can construct the term at once, and then, finding its numerical value, we have the probability of the general compound event to which the term refers.

§ 104. The use of the foregoing formulas may be easily illustrated. Let us, for instance, determine the general form for the probability that an event E , whose chance-ratio is exactly recurrent, will happen six times, and fail to happen four times, in ten trials. Here, q standing for $1-p$, the literal part of the term is $p^6 q^4$; while $n=10$, $r=6$ and $s=4$. Substituting these numerical values for n , r and s in the permutation formula $\frac{1.2.3 \dots n}{1.2.3 \dots r \times 1.2 \dots s}$ the whole term becomes $\frac{1.2.3.4.5.6.7.8.9.10}{1.2.3.4.5.6.1.2.3.4} p^6 q^4$ or $210 p^6 q^4$, the answer required. If now we make $p=\frac{1}{2}$, and $q=\frac{1}{2}$, in this ex-

pression, it becomes $210 \left(\frac{1}{6}\right)^6 \left(\frac{5}{6}\right)^4 = \text{about } \frac{1}{481}$: this is the chance of *obtaining ace* with a die *six times in ten throws*. Should we now, under the same general question, ask for the probability that *either ace or deuce* will appear *in six out of ten trials*, some care will be needed to determine the values of p and q . But inspection will show that the simple event presented, whose probability recurs at every trial, is a general one and includes two individuals; for it will happen at any throw if *ace appear* or if *deuce appear*. Accordingly its probability is the sum of the probabilities of its kinds or modes: that is, $p = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$, and $q = \frac{2}{3}$. Substituting these values in the expression $210 p^6 q^4$, we obtain the answer. It is $\frac{1120}{19683}$, or between $\frac{1}{17}$ and $\frac{1}{18}$.

Besides such cases as these just computed, the Binomial Formula enables us to determine the probability of an event occurring *not less* than a given number of times, or *not more* than a given number of times, in a given number of trials; as also the probability of its happening *not less than one* certain number of times, and *not more than another*. The probability of an event happening not less than seven times in ten trials, its simple probability being known, is found by determining the respective probabilities of its occurring seven times, eight times, nine times, and ten times, in ten trials, and then adding all these probabilities together. For, if any one of these compound events occur, the simple event will occur not less than seven times. The probability of the event occurring not more than three times in the ten trials is, in like manner, the sum of the probabilities of its occurring three times only, twice only, and once only: while the probability of its happening not less than three times nor more than seven, in the course of ten trials, is the sum of the probabilities of the possible compound events, in which, respectively, the simple event occurs three, four, five, six, and seven times, only. To illustrate, let us determine the likelihood of obtaining *ace once at least*—that is, once or oftener—in four throws of a die. Here $p = \frac{1}{6}$, $q = \frac{5}{6}$, $n = 4$; and the sum of the probabilities of all the possible events is $p^4 + 4p^3q + 6p^2q^2 + 4pq^3 + q^4$. Of these probabilities all, except the last, support the general event of *ace once at least*. Hence $\left(\frac{1}{6}\right)^4 + 4\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right) + 6\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)^2 + 4\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)^3$, or $\frac{671}{1296}$, is the probability required. As this fraction is somewhat greater than $\frac{1}{2}$, the “odds” are in favor of the event. Precisely the same result might have been obtained by subtracting from unity q^4 or $\frac{625}{1296}$, that is, the probability of *ace not appearing* on any of the throws; since, in every other possible case than that having this probability, *ace appears once at least*.

Should we now seek the probability of *ace once and deuce once* in four throws of a die, the solution of the question will be quite different from the above. It will be necessary first to compute two independent compound probabilities, and after that to compound them. The probability of one event and three failures in four trials, is $\frac{1 \cdot 2 \cdot 3 \cdot 4}{1 \cdot 1 \cdot 2 \cdot 3} p q^3 = 4 p q^3$. Now, whether we refer to *ace* or to *deuce*, $p = \frac{1}{6}$, and $q = \frac{5}{6}$. Substituting these values,

the probability of ace once in four throws, and that likewise of deuce once in four throws, is $\frac{4}{6} \frac{(5)^3}{(6)^4}$ or $\frac{125}{324}$, or about $\frac{5}{13}$. Squaring this, we have the answer, $\frac{25}{169}$, which is rather more than $\frac{1}{4}$.

The formula for probable compound events resulting from the repetition of an antecedent with three or more contrary consequents of constant probability.

§ 105. Thus many interesting questions, involving the probability of compound events constituted by the repetition of a simple event of constant probability a given number of times together with the occurrence of a failure, or the contradictory event, a given number of times, may be solved by the help of the Binomial Theorem; though often care and introspection may be necessary in order to perceive

the specific nature of the question submitted, and the exact mode of its solution. But, *should three or more events, mutually conflictive, be the only possible consequents of one antecedent*, the probability attaching to any combination of them possibly consequent upon the repetition of the antecedent any given number of times, may be determined by *the algebraic formula for the development of a polynomial to any given power*. In this case the binomial formula is insufficient. The multinomial, which results from the involution of any polynomial to the n th power, is constructed according to the following law: viz., the sum of the exponents of any term is always equal to n , while the co-efficient may be found by the formula for the distinguishable permutations of a collection of letters n in number, in which one or more letters may occur more than once. More expressly, the permutation formula enables us to find the co-efficient of any term in the expansion of any power of a binomial or polynomial, the literal part of the term being given. In every case the co-efficient is equal to the number of permutations of n things made up of as many sets of indistinguishables as the term contains letters, the exponents of the letters severally giving the number of the elements in each of the several sets. Let $a^r b^s c^t$ be the literal part in a trilateral term in the development of the n th power of the quadrinomial $a+b+c+d$, the sum of the exponents r , s , and t being of course equal to n ; then the co-efficient of the term is $\frac{1 \cdot 2 \cdot 3 \cdot 4 \dots n}{1 \cdot 2 \dots r \times 1 \cdot 2 \dots s \times 1 \cdot 2 \dots t}$.

We easily apply these rules to the calculation of probabilities. Let A, B, C and D be conflicting events depending on the same antecedent, and let the sum of their recurrent probabilities a, b, c and d , be equal to unity. Then the completed term $\frac{1 \cdot 2 \cdot 3 \dots n}{1 \cdot 2 \dots r \times 1 \cdot 2 \dots s \times 1 \cdot 2 \dots t} a^r b^s c^t$ indicates the probability of a compound event consequent on n trials, and in which the event A occurs r times, the event B , s times, the event C , t times, and the event D , not at all. The probability of a combination in which only two of the simple events should be found would be expressed by a term of two letters, while that of a combination in which all four of the simple events should occur, would be indicated by a term of four letters. In the above $n=r+s+t$, three variables; let $n=r+s+t+u$, four variables. Then the expression $\frac{1 \cdot 2 \cdot 3 \cdot 4 \dots n}{1 \cdot 2 \cdot 3 \dots r \times 1 \cdot 2 \dots s \times 1 \cdot 2 \dots t \times 1 \cdot 2 \cdot 3 \dots u} a^r b^s c^t d^u$ presents

the probability that A will occur r times, B , s times, C , t times, and D , u times, in n trials. In short, *the successive terms of the multinomial resulting from the expansion of the n th power of the polynomial $A+B+C+D+\text{etc.}$, present the probabilities of all the combinations of the events A, B, C, D , and so forth, which are possibly consequent upon n trials.* This may be made more evident by the following considerations. First, the terms of the multinomial present all the possible combinations of the letters a, b, c, d , etc., in sets containing not more than n letters. For example, in the 5th power of the quadrinomial $a+b+c+d$, no combination of letters in sets of five is possible, but combinations, severally including four letters, three letters, two letters, and one letter are possible; and every possible combination is found. Such being the case, as the small letters a, b, c, d , etc., correspond to the large letters A, B, C, D , etc., which represent the various kinds of events possibly consequent on one trial, it is plain that the letter combinations in the different terms of the multinomial represent every combination of kinds that is a possible consequent of n trials. Unilateral terms, such as a^5 or b^5 in the expansion of the fifth power of the polynomial, fairly represent those compound events which contain only one kind of event; biliteral terms such as a^3b^2 , a^2b^3 , b^3c^2 , b^2c^3 , represent combinations in which two events occur, that is, which are composed of such events only as A and B , or of such only as B and C ; and, in like manner, trilateral terms represent combinations of three kinds, quadrilateral of four kinds, and so on. In this way *the letters of the successive terms, considered without reference to their exponents, represent, in their combinations, every combination of the kinds of events which is a possible consequent of the compound antecedent.*

Secondly, regarding the letters of each term of the multinomial with reference to their exponents, we perceive not only that the number of literal factors is always the same, but also that *the various terms which have the same letters combine their literal factors in every possible proportion.* For example, in the expansion of the 5th power of the polynomial $a+b+c+d+\text{etc.}$, those biliteral terms which have the letters a and b are a^3b^2 , a^2b^3 , a^4b , and ab^4 , and they exhibit the only possible proportions in which five things can be combined when the kinds of things are two. In like manner, those trilateral terms, which contain the letters a, b and c , are a^3bc , ab^2c , abc^3 , a^2b^2c , a^2bc^2 , ab^2c^2 ; these show the only possible proportions in which five things can be combined when the kinds of things are three. So the quadrilateral terms which contain the letters a, b, c , and d , viz., a^2bcd , ab^2cd , abc^2d , $abcd^2$, present every possible combination of five things when the kinds of things are four. Hence it appears that the successive terms of the multinomial, not only by their letters indicate how many kinds of events enter into every combination of events possibly consequent on n trials, but also, *by the exponents of their letters, indicate what num-*

ber of events of each kind enter into the combination represented by any particular term. In other words, every combination of events possibly consequent on n trials, both as to the number of kinds of events composing it and as to the number of events of each kind, is represented by the literal part of one of the terms of the multinomial.

Thirdly, the literal factors in every term being taken from the probabilities a, b, c, d , etc., of the events A, B, C, D , etc., and having numerical values accordingly, the *product of these factors in any term* is the probability that the events represented in the term will occur as according to some one arrangement, or as in an individual as distinguished from a general combination (§ 100); in other words, it is the probability of them as occurring in one particular order. In this significance the terms of the n th power of a polynomial do not differ from those of the n th power of a binomial.

Fourthly, and finally, the co-efficient of each term of the multinomial shows *how many distinguishable arrangements*, or permutations, can be made of n things composed of sets of indistinguishables equal in number respectively to the exponents of the letters of the term. This has already been considered in connection both with the involution of a binomial, and with that of a polynomial (§ 103). *The co-efficient thus shows the number of those possible arrangements, or individual combinations, of events which have the probability expressed by the literal part of the term*—each arrangement, no matter in what order, having the same probability as every other. Hence it follows that *the numerical value of the whole term expresses the probability of that general combination which is supported by the probabilities of all the possible arrangements.*

Thus, in the multinomial, every possible event has a term to correspond to it; and every term gives the probability of the event to which it corresponds. In illustration of these principles, let us consider the following case. A bag contains one white ball, two red balls, and three black ones: what are the chances that in six drawings, after each of which the ball is replaced, a white ball shall be drawn twice, a red ball three times, and a black ball once? Here the combination submitted contains three kinds of events which are conceived to occur, respectively, twice, thrice, and once. The literal part of the term correspondent to it is a^2b^3c , in which $a = \frac{1}{6}$, $b = \frac{1}{3}$, $c = \frac{1}{2}$. The co-efficient is $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6}{1 \cdot 2 \cdot 1 \cdot 2 \cdot 3 \cdot 1}$ and the whole term, therefore, is $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6}{1 \cdot 2 \cdot 1 \cdot 2 \cdot 3 \cdot 1} \left(\frac{1}{6}\right)^2 \left(\frac{1}{3}\right)^3 \left(\frac{1}{2}\right) = \frac{5}{162}$. That is, the chances are 5 in 162, or nearly 1 in 32. To determine the probability of the combination in which the white ball should be drawn three times, a black ball three times, and a red ball not even once, in the six drawings, the formula would be $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6}{1 \cdot 2 \cdot 3 \cdot 1 \cdot 2 \cdot 3} a^3 c^3$, giving the answer $\frac{6}{32}$, or nearly 1 in 86.

An endless repetition of trials produces moral certainty that the event will occur once at least.

§ 106. A critical discussion of the formulas which apply to the compounding of recurrent probabilities, and especially of the binomial formula, corroborates certain natural judgments regarding such events as depend on a repetition of trials. For example, let us take any series resulting from the development of $(p+q)^n$. The first term, p^n , is the probability that the event E will follow every trial, or occurrence, of the antecedent; and the last term, q^n , is the probability of that event failing to occur after every trial. Then also the sum of the series, less q^n , is the sum of the probabilities of those compound events in each of which E occurs once at least; while, in like manner, the sum of the series, less p^n , is the probability of that general compound event in every mode of which F —that is the failure of E —occurs once at least. Now, whatever be the values of p and q , it is plain that the values of p^n and q^n grow less, and that rapidly, as the number of trials is increased; for the progression is geometrical. Hence, in any very large number of trials, the probability of E occurring once at least—as, also, that of its failing once at least to occur—approaches so nearly to the entire sum of the series that it may be practically regarded as unity or certainty. In other words, the multiplication of trials, in a case of pure repetitious probability, can produce a likelihood differing from certainty by as small a fraction as we may desire, both that the event will occur once at least, and that it will fail to occur once at least. Such a case would yield the most perfect moral certainty. Yet we should notice that, however infinitesimal the fraction may be, thus separating moral from demonstrative certainty, it never can be made so small as to exclude the possibility of the opposite.

The most probable compound event consequent on any number of trials is that in which the ratio of events is the same as the original ratio of the chances.

Let us again consider the development of $(p+q)^n$, but *with special reference to the comparative values of all its terms*. The literal part of any or every term may be represented by the general expression $p^r q^s$, in which r and s are variable quantities whose sum is equal to n , the number at once of the trials and of the events compounded. We would naturally expect the greatest term in the series to be that in which the proportion $r : s :: p : q$, or $r : r+s :: p : p+q$ (in which of course $r+s=n$, and $p+q=1$) is realized either exactly, or more nearly than in any other term. In seven throws of a die we would expect the most probable event to be that of ace once, and other faces six times: in fourteen throws we would expect the most probable event to be that of ace twice and other faces twelve times; and so on with every multiple of seven throws. Or, were the throws only six, or were they fifteen, we would give the greatest probability to ace once and other faces five times, and to ace twice and other faces thirteen times; because, in these cases, the ratios of one to five, and of two to thirteen, more nearly approach that of one to six than any other of the possible ratios do. Mathematical reasoning shows the correctness of this judg-

ment. A general demonstration of the theorem may be found in the eighth section of Sec. Galloway's article in the "Encyclopædia Britannica." But it should be noticed that the probability of the most probable event in a series may, absolutely speaking, be very small, and that this probability is less the greater be the number of the trials in which the series originates and, consequently, the number of terms in the series. A special exemplification of these principles will take place if we assume $p=q$, and allow different values successively to n .

Let $n=2$. Then $(p+q)^2 = \frac{1}{4} + \frac{1}{2} + \frac{1}{4}$.

" $n=3$. " $(p+q)^3 = \frac{1}{8} + \frac{3}{8} + \frac{3}{8} + \frac{1}{8}$.

" $n=4$. " $(p+q)^4 = \frac{1}{16} + \frac{4}{16} + \frac{6}{16} + \frac{4}{16} + \frac{1}{16}$.

" $n=5$. " $(p+q)^5 = \frac{1}{32} + \frac{5}{32} + \frac{10}{32} + \frac{10}{32} + \frac{5}{32} + \frac{1}{32}$.

In these developments, plainly, when n is an even number, the greatest probability is given by the middle term of the series, but, when n is odd, two probabilities, greater than the rest and equal to each other, occupy the middle place. It is evident also that, when n is even, the greatest probability arises when the exponents of p and q are equal, that is, when the term refers to that compound event which is composed of the simple events E and F in equal proportions; while, in the other case, the two probabilities greater than the rest and equal to each other, arise when the exponent of p exceeds the exponent of q by unity and when the exponent of q exceeds the exponent of p by unity, the terms with such exponents being those in which the ratio of equality, as between the exponents, is most nearly approached.

Note, also, that the greatest probability in each series is less than in the series immediately preceding it. When p and q are not equal to each other, the greatest probability will not be found in the middle, but towards one end, of the series; which statement may be easily verified by trial.

Another theorem to the demonstration of which the Binomial Formula contributes, may be stated as follows. *If the probability of an event on one trial be p , and that of its contradictory q , then in an infinite number of trials the ratio of the positive to the negative events will certainly be the ratio of p to q .* More exactly, the theorem is this, that if the number of trials be indefinitely increased, a probability will result, differing from certainty by less than any assigned fraction, that the total number of the occurrences of the simple event will be to the total number of its failures to occur, as the probability of the event in connection with one trial is to the probability of its failure in connection with one trial. Thus, if a die should be thrown a very great number of times, we might be morally certain that ace would turn up one sixth, and only one sixth, of the times. This same judgment might also be made regarding deuce, and in regard to every one of the six faces of the die. The abstract proof of this reasonable and simple doctrine is difficult. It engaged the mind of James Bernoulli, an eminent

Bernoulli's Theorem.

mathematician of the seventeenth century, for twenty years. His demonstration is given in that section of the article of Sec. Galloway, to which we have already referred.

In the foregoing discussion, a few of the simpler principles and methods of the calculation of chances have been presented. Any attempt to explain the more complicated problems and the interesting and important applications of this calculus, has been quite beyond our purpose. Enough has been said to exhibit the peculiar action of the mind in conceiving and estimating chances, and to illustrate the more general theme of probable judgment.

Here, too, we close our fundamental analysis of thought and belief, as the primary powers of the human intellect. We did propose to discuss the nature of error after the radical laws of correct perception and conviction had been set forth. But that subject may, perhaps, be deferred with advantage for the present.

CHAPTER XXV.

ATTENTION AND ACQUISITION.

The division of our mental powers into the *primary* and the *secondary* is the most serviceable when we would investigate the radical nature of those powers themselves. That division which sets forth the three phases of mental life—the *perceptive*, the *re-productive*, and the *elaborative*—is the best when we would consider analytically the concrete facts of our intellectual experience. And that division which, in every phase of intellect, distinguishes the *experiential* and *contingent* from the *intuitional* and *necessitudinal* elements of thought and belief, is the most important in discussions respecting the ultimate principles and laws of truth and of being. Having considered the leading topics concerning thought and belief, the primary powers of mind, we turn to contemplate those secondary powers whose operation modifies the workings of the primary (§ 13). They may be enumerated as Attention, Acquisition, Association, Synthesis, Analysis, Abstraction, and Generalization. Such, at least, are the powers whose modifying influence calls for special study.

§ 107. We begin with *Attention*, that is, the power of attention. For, apparently without exception, our faculties receive names which yet more properly designate the exercise of these faculties. Every human spirit has a certain amount of *psychical energy*, or force, which is constantly more or less exercised in the activities of the soul's life, and especially in the activity of thought. This energy can be distinguished from the faculties or powers into which it enters. As general muscular strength can be distinguished from that

Psychical energy,
i. e., mental force
as exerted.

power of involuntary motion possessed by the heart and other organs—from capabilities such as are shown in speaking, walking, running, handling, and so forth—from that acquired ability exhibited by experts in various arts and accomplishments—and from the power of performing, without thought, actions which, through habit, have become automatic; so we distinguish psychical energy in general from the specific powers in which it is manifested. The reason of this is that the constitution of the soul gives a peculiarity of operation or function to every special power. We therefore distinguish from the faculty of thought that psychical energy necessarily belonging to it. Yet this distinction does not of itself justify the conception of a faculty different from thought. It only brings into prominence the fact that a certain force is employed in all thinking. This energy varies in different persons, and in the same person at different times. The ideas of some men are fresh and vigorous; those of others slow and obscure: while the same person sometimes apprehends with ease, at other times with difficulty. All this does not indicate any specific faculty: it is simply a result of constitutional conditions and of general laws under which intellectual life is experienced.

Attention defined.
A special and determinate exertion of the power of thought.
Involves a power of detention.

There is, however, an exertion of energy in connection with thought, which indicates what we may properly style a faculty; for it is a determinate employment of power, and it accomplishes a special function. By what seems a simple, ultimate law of spiritual activity, the soul can address itself with peculiar energy to the observation of any object, or the consideration of any subject, which it may desire more fully to comprehend. The power thus exercised is called *attention*. Hamilton defines attention as “the concentration of consciousness on a smaller number of objects than constitute its widest compass of simultaneous knowledge” (“Met.” Lect. XIII.). This description may be accepted with the addition that the effort of attention seems to increase, as well as to concentrate, the amount of mental force exercised at any one time. By “*consciousness*,” in the above extract, we are to understand the general power of thought, and, by “*knowledge*,” thought in general. For we can concentrate and stimulate the power of thought when there may be no real objects whatever.

This special exertion of the power of thought in connection with some object, or idea, or set of objects or ideas, is the essential constituent of *attention*. A sentinel, keenly vigilant for every indication of danger, might be said to exercise attention in the most general way possible; as his watchfulness would include all objects within the reach of his senses. The concentration of thought, though existing to some extent, would not be a prominent feature in such a case. But, ordinarily, the elements or objects to which our attention is directed, are of a limited number, so that the special exercise of energy in connection with them has the effect of positively abstracting the force of



thought from other objects. For every human spirit has only a limited amount of energy.

The question whether the mind can attend to more things than one at one time is much the same as the question, already discussed (§ 29), whether we can think of more things than one at once; attention being simply the exercise of a special energy in connection with thought.

The successive consideration of objects, however vigorous it may be, cannot properly be called attention; it is simply energetic thought. In attention mental action is directed continuously to the same object or objects. The earnest consideration of subjects successively includes successive acts of attention. This faculty involves, as a subsidiary and constituent part of itself, a certain power of mental detention by which the same act of observing or thinking is repeated, or prolonged.

§ 108. The most important point in the doctrine of Attention is, that the operation of this faculty is, to a considerable extent, *subject to the determinations of the will*, that power of choice which is natural to the soul. According to Dr. Reid, "Attention is a voluntary act; it requires active exertion to begin and continue it; and it may be continued as long as we will." Prof. Stewart coincides in these statements; Hamilton controverts them. He says that there are three degrees of attention, "the first a mere vital and irresistible act; the second an act determined by desire, which, though involuntary, may be resisted by our will; the third an act determined by a deliberate volition." To us a doctrine intermediate between the views of these eminent men seems reasonable. We agree with Hamilton that there is a vital and irresistible exercise of energy in connection with all thought and perception, but do not think that this should be called attention. On the other hand, choice, properly so called, is not always necessary to the act of attention; this is sometimes controlled by desires, or motive habits, which prevail against our formal volitions. How often people say that they cannot help thinking of such and such objects! How often we find ourselves earnestly considering some topic simply because we have become interested in it, without any deliberate determination! Such facts indicate that attention is exercised in accordance with that motivity which may be the prevailing one at the moment, whether it be mere unformulated desire or whether it have the more complex character of will or purpose.

In this connection we may consider a question which has been sometimes raised, viz., whether attention, a power the exercise of which confessedly originates in the motive part of man's nature, is properly an intellectual faculty at all? If, by the mental faculties, we are to understand those only which are the immediate fountains of thought and belief, then neither attention nor any other of the secondary powers, can be enumerated in

Is attention a voluntary act? Is it truly an intellectual faculty?
Reid's remarks criticised.

this class. But, if that is an intellectual faculty whose proper function is immediately to affect and modify the main work of the mind, then certainly all the secondary powers may be thus named. This, however, must be allowed, that attention has two principal functions, and, in this respect, is unlike the other subsidiary powers, which have each but one. In addition to the modification of thinking and to contributing in this way to intellectual results, attention performs a practical part in connection with the consideration of motives, and is thus *the principal instrument in the self-control and self-determination of spirit*. Whatever government the will exercises over psychical life in general is exerted through this power, just as its dominion over physical life depends upon muscular energy. Attention, therefore, has a twofold character; in one use it is an intellectual faculty; in another it is part of the practical faculty—the faculty of action, as distinguished from that of thought. Attention is a mental faculty only so far as it modifies the working, and affects the results, of the primary powers of mind. But we should notice that it retains this character, more or less, even while helping to constitute the faculty of action.

Reid makes the remark, which Stewart and Hamilton approve, that “Attention to things external is properly called *observation*, and attention to the subjects of consciousness, *reflection*.” So far as ordinary language goes, we think that we might speak of our reflection upon *any* subjects of past experience and knowledge, whether they belong to the outer or to the inner world; and of internal, as well as of external, observation. In old philosophical usage, however, reflection does signify an attentive exercise of self-consciousness; and it is true that our observation mostly regards the external.

The great importance of attention, in the system of our mental faculties, is evident from its very nature. It is a power whose use is at once most general and most indispensable. All those facts, whether of the material or the spiritual world, which constitute the original basis of thought and knowledge, are definitely seized and ascertained only through attentive observation and reflection. Moreover, those faculties of recollection, reason and imagination, which elaborate the materials possessed by the mind, demand the continual exercise of attention. Whenever this power intermits its action, mental progress ceases. Attention is the action of the frame which holds in place the warp of that cloth which the subtle machinery of mind is weaving. When this frame performs its part imperfectly, confusion immediately ensues. Attention also has an important relation to memory, though less directly than to the intentional operations of mind. The permanent acquisition of thought depends greatly, if not entirely, on the vigor with which it may be first entertained; which vigor is controlled by attention. Should we desire to impress some beautiful scene upon the mind, or to com

The importance of the faculty of attention, and of its cultivation and employment.

mit some valuable fact or truth to memory, we must regard it earnestly.

Such being the case, it is plain that this power should be assiduously cultivated by those who would hope for any worthy intellectual attainments. And in this we should be encouraged by the consideration that no faculty admits of growth and development more than attention. Every faithful scholar can testify of that wonderful increase in the ability for mental application which results from a thorough course of study. The opinion of some, that "Genius is nothing but a continued attention,"—"a prolonged patience," is an extreme one. But, beyond question, this faculty is an essential part of all true genius; and it is that element of mental greatness most within the reach of honest endeavor. It is also that of which great men have been most fully conscious. Sir Isaac Newton, when complimented on his marvelous achievements, replied that, if he had made any discoveries, it was owing more to patient attention than to any other talent. Dickens ascribed his success to a very painstaking study of the characters and details of his stories. Sometimes, with eminent men, the abstraction of mind resulting from intense application to favorite subjects, has rendered them well-nigh insensible to passing events. Archimedes was not aware of the storming of Syracuse, till he received his death-wound from soldiers whom he forbade to disturb his circles. Cardan, the illustrious mathematician, when on a journey, forgot his way and his object. The driver, asking whither he should proceed, received no answer; and, at nightfall, the carriage came to a stand, directly under a gallows. On the day of his wedding Budæus forgot everything, and was wakened to the life of the external world by an embassy from the marriage party, who found him absorbed in the composition of his "*Commentarii*" (Hamilton, "*Met.*" Lect. XIV.).

The great power of attention to modify the inclinations and purposes of the soul, and ultimately the whole motive character, is a topic worthy of consideration. The direction of thought to right rules and reasons for one's conduct in life, the contemplation of virtuous examples, the cherishing of honorable and dutiful plans and conceptions, and the rejection of ideas which solicit to evil, are the immediate causes of pure and elevated experience; the admission of sinful thoughts, the indulgence of vile fancies and degrading memories, and the study of wicked schemes, are the sure means of spiritual ruin. "I would as soon," said Dr. Thomas E. Thomas, the eloquent president of Hanover College, "I would as soon think of putting a bottle of hell-fire into the hands of my children, as a copy of the works of Lord Byron." But, rightly, the discussion of this topic belongs to moral philosophy.

§ 109. Having discussed the faculty of Attention, it seems proper that we should next consider the faculty of *Acquisition*; for, while the former of these is the condition of the present use of the materials of thought, the

The power of acquisition defined.

latter is the condition of our subsequent use of them. Thus the development of mental life is equally conditioned on the exercise of these two powers. Moreover, to a great extent, acquisition is itself dependent on attention; for the greater the energy with which any object may be contemplated, the longer will the ability to think of it again remain among the possessions of the mind.

But here a difference is to be noticed between material and mental acquisitions. The former are substances of various kinds, such as gold, silver, lands, cattle, houses, goods, and so forth, or, if not such things, at least a share or a right in them; the latter are accessions of ability, whereby we are enabled to repeat acts of thought, belief, or knowledge, which we have once experienced. When we speak of the mind committing ideas to memory—or receiving and storing up useful knowledge—or exercising the power of acquisition, our language is figurative; it means simply that the mind is qualifying itself for the future reproduction of its present intellectual activities. This power operates more or less in connection with all thought, or mental action; but, being greatly dependent on attention and thus subject to the direction of the will, it is often employed on purpose, and on this account may be styled a faculty. Speaking of the power of acquisition, we merely express the idea of a mental energy; speaking of the faculty of acquisition, we signify that the energy is, or may be, that of intentional doing (§ 9). Every studious and inquiring person continually exercises this faculty, and thereby satisfies his desire to know, and informs himself for the right conduct of his affairs.

We have included the power of detention in the faculty of attention as a subordinate yet essential part. In doing so we followed a rule, which naturally and ordinarily controls the formation of our conceptions, viz., not to conceive and speak separately of an entity invariably accompanying some other more prominent object, when there is no need for a separate conception. In such cases the mind simply enlarges its notion of the more prominent object, so as to include within it that of the accompaniment. When this rule can be observed without injury to philosophic progress, the neglect of it savors of undue refinement. Hence, also, within the faculty of acquisition we place a power without which this faculty would be useless, and whose function is to carry on the work which acquisition begins. The potency to which we refer operates in passive resistance, rather than in any positive action, and may be named the Conservative, or Retentive, Power of the Intellect. It manifests itself in preserving, against detractive influences, the tendency of an acquired and latent idea to reproduce itself on proper occasion. This function of mind is easily distinguished from that whereby an idea or belief is first received among the possessions of the soul; yet this distinction does not justify the conception of two faculties. We prefer to think of acquisition and conservation as together constituting a compound secondary power by which our

thinkings are rendered ready for future reproduction. This faculty might be named either acquisition or conservation, according to the element more prominent in one's thought; but, ordinarily, one name should suffice for both powers, the functions of both being naturally conceived of as one.

Sir Wm. Hamilton ("Met." Lect. XXX.), treating of memory, distinguishes four elementary powers, (a) Acquisition, (b) Retention, or Conservation, (c) Resuscitation, or Reproduction, and (d) Re-presentation. He names each of these powers a faculty. For reasons such as have been just considered, his language does not seem sufficiently authorized, even on the supposition of the existence of four powers. But, in addition to this, while the distinction between acquisition and conservation is well taken, and while each of these powers is different from reproduction, the distinction which Hamilton makes between reproduction and re-presentation, is not tenable. On the contrary, these names set forth, not two powers, but the same power in two different lights or relations. Each alike operates in the resuscitation of a past thought: when we speak of reproduction, the reference is to the thought previously had, and when we speak of re-presentation, the reference is to the object previously thought of. The distinction is somewhat similar to that between love and affection, as these terms are commonly used; the latter of which directs attention more to the person in whom the feeling exists, the former to the person towards whom it is exercised. We cannot agree with Sir William when he says, "These two processes suppose each other, they are relative and correlative, but not more identical than hill and valley." On the contrary, they are one and the same process; they form, not a compound, but an absolute, unity. The laws controlling reproduction as a secondary power of the intellect, will be discussed under the head of the Association or Suggestion of Ideas. While closely related to those which govern the first acquisition of thought, they have a character and operation of their own.

No general agreement has been reached by philosophers in regard to the mode in which the acquisitive and conservative power produces its results, but the fact of its action must be accepted as a radical truth. The putting away of ideas in a storehouse—the writing down of thoughts upon the tablet of memory—the reception of flying appearances, species, or images, which collect in the thinking soul—these, and such, expressions record and illustrate the fact, but do not explain it.

§ 110. The majority of writers do not attempt any account of this matter. Those who do may be divided into three classes. *First*, there are those whom two famous philosophers of the seventeenth century, Locke and Gassendi, may represent. These hold the doctrine of *latent energies*; they teach that tendencies are produced in the mind which remain inactive till proper encouragement for their action may occur. Gassendi compares the mind to

Theories explaining acquisition and reproduction. Latent energies. Gassendi and Locke.

a sheet of paper capable of receiving one series of folds after another, and of being smoothed out so that the folds become invisible, and on which, if any fold be renewed, the others connected with it also reappear. The chief thought suggested by this illustration is that every fold retains a tendency to renew itself; so that the pressure of a moving finger or point, on the line of any fold, may encourage this tendency and cause the fold to reappear; and a pressure near the place where two or more folds have crossed each other, will act in a similar way as to several folds, though more successfully in regard to some than to others. This pressure may typify the influence of attentive thinking, as operating upon the cognate, but unconscious, reproductive tendencies acquired in previous thinkings. Another figure setting forth the revivability of ideas once entertained, is that in which past thoughts are compared to sentences written with an ink which, when dry, loses its visibility, but recovers this again whenever the writing may be subjected to a certain degree of heat. Locke, in expressing his views, speaks of the memory as the storehouse of our ideas. "But," he says, "our ideas being nothing but actual perceptions in the mind, which cease to be anything when there is no perception of them, this laying up of our ideas in the repository of the memory, signifies no more but this, that the mind has a power in many cases to revive perceptions which it has once had, with this additional perception annexed to them, that it had them before. And in this sense it is, that our ideas are said to be in our memories, when, indeed, they are actually nowhere, but only there is an ability in the mind when it will to revive them again, and, as it were, to paint them anew on itself, though some with more, others with less, difficulty; some more lively and others more obscurely." The principal point in the view of Locke and Gassendi is this, that mental phenomena occur and then wholly disappear, while yet they leave in the mind a tendency, which very frequently, upon the occurrence of certain conditions, reproduces them; this doctrine is reasonable, and conformable to facts.

Accepting it, a further thought is suggested as possibly true, viz., that, after a thought has been experienced, some degree at least of the peculiar form of energy exercised in it *becomes and remains latent in the mind, and ready to be re-called into activity*. In other words, some of the mental energy exercised in connection with a given thought is converted into a tendency to reproduce that thought. This tendency remains inactive, or latent, so long as nothing occurs to occasion its exercise; we may be said to have the thought potentially, but not actually. The tendency as a condition of the existence of the thought, really exists, while the thought itself, literally or actually, does not (§ 76). On the supposition of such a latent potency, we need not consider it the only power employed in reproduction; we should rather regard it as a formative tendency which shapes and directs the action of that more general energy continually operating in the mind (§ 107).

The origin, thus conjectured for this determinant potency of reproduction, receives some analogical support from that conservation of physical force, noticed by men of science, whereby some part at least of a natural energy may pass from one state of activity into a state of latency, and out of this again into another state of activity, quite similar, it may be, to the first. Thus the power of the heat of the sun, stored up in mines of coal, reappears in the use of coal as fuel. Let the latent energy of reproduction be accounted for as it may, it evidently exists; and it begins to exist when any thought first occupies the mind's attention.

A second class of thinkers, who hold that the mind never ceases from any definite mode of action which it has once begun, explain the reproduction of thought by the theory, which Leibnitz originated, of *unconscious psychical activity*. The German metaphysician, Schmid, followed by Hamilton and others, thus applies that theory. "The problem," he says, "is not how a mental activity endures, but how it ever vanishes. . . . The solution is to be sought for in the theory of obscure or latent modifications. The disappearance of internal energies from the view of internal perception, does not warrant the conclusion that they no longer exist. . . . Only the more vivid changes sufficiently affect our consciousness to become objects of its apprehension; we consequently are conscious only of the more prominent series of changes; the others remain for the most part latent." Every new cognition draws to itself a chief part of the general energy or force of the intellect. "This force in the same proportion is withdrawn from the other earlier cognitions; and it is they, consequently, which must undergo the fate of obscurity" (Hamilton, "Met." XXX.). These latent, or, to speak more properly, insensible, cognitions, become sensible again upon a stimulus received from some kindred exercise of energy. This theory of acquisition, like that of unconscious mental activity (§ 27), on which it is founded, is unsupported by any basis of fact. Theories which have their chief strength in their consistency with other theories, similarly situated in this respect, can claim our regard only as improbable hypotheses of more or less ingenuity.

Finally, materialistic philosophers, such as Auguste Comte, and Herbert Spencer, as also those men of science who accept their leadership, regard the acquisition, retention, and reproduction of thought, as being nothing more than closely related *modes of nervous action*. According to Comte, "The positive theory of the intellectual and affective functions consists in the study, rational and experimental, of the various phenomena of internal sensibility which are proper to the cerebral ganglia. . . . It, therefore, is only a simple prolongation of animal physiology, properly so called." According to Spencer, all mental phenomena are feelings, and "the degree of the revivability of a feeling depends on the ex-

Unconscious ac-
tivity.
Schmid, Hamilton.

Materialistic hy-
potheses.
Comte, Spencer.

tent to which the nervous center concerned was capable of undergoing much molecular change and evolving much of the concomitant feeling when the original excitation was received. . . . Other things equal, a given past feeling may be brought into consciousness vividly, faintly, or not at all, according as the nervous center concerned is, or is not, well repaired and well supplied with blood, at the moment the remembrance is suggested" ("Psych." §§ 100, 101). Thus reproduction is all accounted for by the excitation, to renewed molecular action, of faint tendencies collected in the nervous system. In perusing the writings of our modern materialists, one marvels at the boldness with which the secret workings of nature are portrayed, as if these had been accurately observed and analyzed. The ascertained facts of physiology are, indeed, ingeniously used, but, along with this, there is a liberal intermixture of conjecture. And yet the insurmountable objection to materialistic theories, is not the scantiness of the facts on which they are based. The difficulty is one which no supply of facts can be expected to remove. It is the impossibility of accepting any form of materialism, even though all the physiological conjectures with which it may be accompanied, should be admitted. However in the present life certain changes and states of body may condition and affect the changes and states of spirit, we can never conceive the latter to be identical with the former. When we endeavor to think of thoughts, emotions, and other psychical experiences, as simply forms of the action of molecular forces, the mind refuses to act, or rather, it acts in the way of absolute denial. We cannot even conceive of spiritual phenomena as wholly caused by such forces; for they reveal powers whose operation, however modified by physical influences, is wholly *sui generis*. Noticing the effects of severe study, of weighty care, of strong emotion, and of various modes of mental occupation, upon one's bodily state, as also our direct use and control of muscular power, we perceive that the soul acts upon the body as truly as the body acts upon the soul. Let nervous action be explained as it may, we must hold to the distinct existence of spirit and its faculties.

The dependence of acquisition and reproduction upon the action of the brain. Extraordinary instances. Somnambulism.

§ 111. At the same time it is plain that *psychical life is experienced by us under physical conditions, and that an important, though obscure, department of science concerns the operation of these conditions*. In particular it is to be observed that none of our mental powers exhibit more dependence upon the state of the body than do those of acquisition, conservation, and reproduction. Every one knows how difficult the study of what is new, and the recollection of what is old, becomes when one is either weak or exhausted; these things are easy when, as Spencer says, the nerves are in good repair and well supplied with blood. The effect of anæsthetics, such as chloroform, of narcotics, such as morphine, and of stimulants, such as alcohol, is very immediate upon the nervous system, and through that upon psychical ac

tion, which, in this way, may be increased or decreased, or made irregular and irrational, or even suppressed entirely. Every medical practitioner is familiar with the power of bodily diseases and injuries to affect the intellect. Fevers often produce temporary delirium; paralysis weakens the memory; apoplexy, and even old age, sometimes destroy it. A blow on the head produces insensibility; a disease of the brain mental incompetency, or, it may be, absolute lunacy or mania. Such truths as these are not to be overlooked; they show how greatly—doubtless for wise ends—the present life of the human spirit has been subjected to corporeal conditions.

Various extraordinary instances of the effect of disease upon the faculties of acquisition and reproduction have been noticed in philosophical writings. Coleridge, in his "Biographia Literaria," tells of a maid-servant in Germany, who took ill of nervous fever. During her delirium she recited passages from the Latin, Greek, and Hebrew languages, acting as if she were inspired by some good, or some evil, spirit. Her sentences, being carefully taken down, were found to be extracts from classical and rabbinical writers. After much inquiry it was ascertained that she had once lived in the service of an old and learned pastor who had been in the habit of repeating aloud passages from his favorite authors, as he walked in the hall of his house. The sound of the words, without their meaning, had lodged in the girl's memory, and had been recalled through the excitement of the fever. Dr. Abercrombie tells of a boy who, when four years old, received an injury on the head. During the operation of trepanning, he was apparently unconscious, and, after the operation, he remembered nothing of the attendant circumstances. But, after the lapse of eight years, and in the delirium of a fever, he accurately recounted the particulars of the transaction, telling who were present, how they were dressed, and what parts they severally performed. In like manner, the Rev. Timothy Flint records of himself that, during a malarial fever, he repeated long passages from Homer and Virgil, which he had never formally committed to memory, and of which, before and after the fever, he could not recite any considerable portion. Such cases justify a conjecture that the nervous excitement of certain diseases exerts a repressive, or overwhelming, influence upon those tendencies to reproductive thought which are stronger because more recent, but acts as a proper stimulus upon older and weaker tendencies. This same idea is suggested by a phenomenon frequently noticed, viz., the recovery of a disused language, while one of later use is lost. Dr. Rush, in his "Medical Inquiries," says that he attended an Italian who died of yellow fever, who at first spoke English, after that, French, and, towards his end, Italian only. He records, also, the statement of a Lutheran clergyman, that old German immigrants, on their death-beds, often prayed in their native tongue, though some of them certainly had not spoken it for many years. Pres. Porter relates that a favorite pupil of his,

the son of a missionary in Syria, but who had spent much of his life in the United States, spoke Arabic, an almost forgotten language, during his last hours. His disease was yellow fever.

Another class of observations favor a *conjecture that the brain or its molecules may be made to assume a state so related to another state replaced by it, and by which in turn it may itself be replaced, that the reproductive tendencies connected with either state are wholly, or in part, disabled from operating during the continuance of the other state.* With reference to each other, these states might be styled *allotropic*. The case of the Rev. Wm. Tennent, a distinguished Presbyterian clergyman of New Jersey, is one in point. After severe sickness he was for a time supposed to be dead. He recovered; and was then found to have lost all his previous acquisitions, even to the memory of the alphabet. On a sudden he experienced a violent pain in his head, and instantly regained his former intelligence and information.

The case of a lady, mentioned by Pres. Porter, differs from the foregoing in that her lost knowledge never returned. This lady fell into a severe illness by reason of protracted mental and bodily sufferings experienced during a storm at sea and a shipwreck; after which, although she was apparently restored to perfect health, it was found that the greater part of her acquired knowledge was gone. An analogous case is mentioned in Tupper's "Inquiry into Gall's system of Phrenology." "A man was brought into St. Thomas's Hospital, who had received a considerable injury on the head; from which he ultimately recovered. When he became convalescent, he spoke a language which no one about him could comprehend. However, a Welsh milkwoman came one day into the ward and immediately understood what he said. It appeared that the poor fellow was a Welshman, and had been from his native country about thirty years. In the course of that period he had entirely forgotten his native tongue and acquired the English language. But, when he recovered from his accident, he forgot the language he had been so recently in the habit of speaking, and acquired the knowledge of that which he had originally acquired and lost."

A more remarkable instance than any already mentioned is detailed in a report of Dr. Dewar, read before the Edinburgh "Royal Society," in Feb., 1822. It was that of a girl sixteen years of age, who, during a period of more than three months, was frequently the subject of a somnambulistic affection. During the continuance of each attack of this affection, she performed and witnessed many things, of which, upon returning to her more normal state, she retained no recollection. Dr. Dewar gives the point of chief interest in her case, as follows, "*The circumstances which occurred during the paroxysm were completely forgotten when the paroxysm was over, but were perfectly remembered during subsequent paroxysms.*" The report sustains this statement by a number of facts. "One Sunday she was taken to church by her mistress while the paroxysm was on her. She

shed tears during the sermon, particularly during the account given of the execution of three young men at Edinburgh, who had described in their dying declarations the dangerous steps with which their career took its commencement. When she returned home, she recovered in a quarter of an hour, was amazed at the questions put to her about the sermon, and denied that she had been at church. But, the next night, on being taken ill, she mentioned that she had been at church, repeated the words of the text, and, in the hearing of Dr. Dyce, her physician, gave an accurate account of the tragical narrative of the three young men." This girl complained of confusion and oppression in her head at the coming on of each paroxysm.

Combe, in his "Phrenology," tells how a Dr. Abel informed him of an Irish porter who forgot, when sober, what he had done when drunk; but, being drunk again, recollected the transactions of his former state of intoxication. "On one occasion, being drunk, he lost a parcel of some value, of which in his sober moments he could give no account. But, when next intoxicated, he recollected that he had left the parcel at a certain house; and, there being no address on it, it had remained there safely, and was got on his calling for it." Phenomena similar to the above take place in connection with that somnambulism produced by what is called animal magnetism; the person magnetized thinks and acts with very little, if any, reference to the life and thoughts of his normal state.

We shall conclude our illustrations with an account presented by Dr. Mitchell to the Rev. Dr. Nott, and published in the "Medical Repository" of Jan., 1816, and which concerned a case still in progress at the date of that publication. Major Ellicott, then professor of mathematics at West Point, had a relative in Western Pennsylvania, named Miss R., who had arrived at adult age with a good bodily constitution and excellent health. She was a well-educated lady, and had a capacious and well-stored memory. "Unexpectedly, and without any forewarning, she fell into a profound sleep; which continued several hours beyond the ordinary term. On waking, she was discovered to have lost every trait of acquired knowledge. Her memory was *tabula rasa*; all vestiges, both of words and things, were obliterated. It was found necessary for her to learn everything again. She acquired, by new efforts, the arts of spelling, reading, writing, and calculating, and gradually became acquainted with the persons and objects around, like a being for the first time brought into the world. In these exercises she made considerable proficiency. But, after a few months, another fit of somnolency invaded her. On rousing from it, she found herself restored to the state she was in before the first paroxysm; but was wholly ignorant of every event and occurrence that had befallen her afterwards. The former condition of her existence she now calls the 'old state,' and the latter the 'new state;' and she is as unconscious of her

double character as two distinct persons are of their respective natures. In her old state she possesses all her original knowledge; in her new state, only what she has acquired since. If a gentleman or lady be introduced to her in the old state, and *vice versa* (and so of all other matters), to know them satisfactorily, she must learn them in both states. In the old state she possesses fine powers of penmanship, while, in the new, she writes a poor awkward hand, not having had time to become expert. During four years and upwards, she has undergone periodical transitions from one of these states to the other. The alterations are always consequent upon a long and sound sleep. Both the lady and her family are now capable of conducting the affair without embarrassment. By simply knowing whether she is in the old or in the new state, they regulate the intercourse, and govern themselves accordingly."

With respect to this whole subject of the dependence of mental upon bodily states, two points are noteworthy. *First*, there is abundant evidence that mental action, during the present life, is dependent upon, and influenced by, the condition of the brain. By various affections of this organ the action of thought is either stimulated, or retarded, or limited, or deranged, or even altogether suspended. In what way these results are produced is entirely unknown; their reality is beyond question. *Secondly*, there is no proof that those peculiar modes of action, which we style *mental*, are, in any proper sense, the product of brain forces. On the contrary, they differ so utterly from physical or molecular modes of action, that we necessarily ascribe them to an agent whose character and powers are suitable for their production, that is, to an immaterial and spiritual agent; which agent is revealed to us in consciousness. And, so far as we can see, the powers of mind, while greatly subject to corporeal conditions, have also, to a yet greater extent, *an independent operation of their own*. Acting within the limits of their bodily conditions, they immediately, and of themselves, produce an endless variety of life and experience. At least such an opinion, though not necessary to the doctrine of the distinct existence of spirit and its powers, seems more probable than that every individual thought has a cerebral state or change specifically corresponding to it, either as cause or as effect. For it is reasonable to suppose that the principal factor in mental life, is mind.

CHAPTER XXVI.

ASSOCIATION OR SUGGESTION.

§ 112. The operation of the secondary powers must be distinguished from that of the primary powers only by a somewhat subtle analysis. This necessity was to be expected; for the sec-

ondary powers have no separate function, but only the office of modifying the workings of the primary. On the other hand, one must guard against a tendency to think of any secondary power as if it had independent existence and operation; such a tendency arises whenever we make the indissoluble parts or elements of some whole the objects of analytic thought and speech. The secondary powers are simply modifications of the general faculty of intellect, by reason of which it has various peculiarities of action. Yet these peculiarities and their causes are worthy of separate consideration.

Having discussed Attention and Acquisition, we turn to *Reproduction*. This power (§ 109) does not differ essentially from the re-presentative potency, the two being really the same thing as viewed in different relations. A choice of terms being thus possible, we favor *reproduction* as generally, if not always, preferable to *re-presentation*. Not only is the latter term ambiguous, its philosophical differing from its ordinary signification, but it is also, in its philosophical meaning, suggestive of the mistaken theory that the object of a thought is always, in some sense, literally presented again when the thought is reproduced. But here we have to remark that even the term *reproduction* has not occupied so large a place in mental philosophy as the term *association*; and this for a good reason. For, when we consider the reproductive power with reference to the fundamental conditions or laws which regulate its action, we do not call it reproduction, but association, or suggestion; and most of the questions concerning this power pertain to it under this light. We have considered the fact that the mind has a reproductive potency, and have discussed certain theories connected with that fact. We shall now endeavor to determine those laws of association, or suggestion, which govern reproductive thought.

That such laws exist and operate, cannot be denied. How quickly the name of Christopher Columbus suggests the discovery of America, and that of Martin Luther the Reformation of the sixteenth century, and that of Alexander the Great the conquest of Asia by the Greeks! How many delightful memories cluster around the home of one's childhood! What solemn thoughts inhabit the church of God! How naturally patriotic reflections arise, when the Declaration of Independence is read in our hearing! And what searching questions present themselves as we give heed to the commands of the Decalogue, or to our Saviour's "Sermon on the Mount"! Nothing can be more evident than that a thought, consciously experienced, tends in some way to suggest and recall other thoughts. Moreover, this function of the suggestive potency, though a subordinate one, is equal in practical importance to that of the primary powers of intellect. If the reproductive tendency did not exist, or even were it not qualified by a tendency causing our thoughts to observe some natural connection, the discoveries of reminiscence,

Association, or suggestion, defined and illustrated. Its importance.

the constructions of imagination, and the investigations of reason, would all be things impossible. But, immediately after the first awakening of the infant mind in sense-perception, and the new cognition of things visible and invisible, the associative power begins to act, and thenceforward works incessantly. And, when the mind, of itself, thus reproduces its ideas, and that in some sort of connection, only patience and care are requisite in order to the effective use of the powers of thought. For, as Prof. Stewart observes, "When we dwell long on the same idea, we obtain all the others to which it is in any way related, and thus are furnished with materials on which our powers of judgment and reasoning may be employed."

The terms *association* and *suggestion*. A power, not a faculty.

To some authors *suggestion* seems a more befitting term than *association* to express the action of the power under consideration; and not without cause.

When we say that one thought suggests another, we mean that the idea of one object excites, and introduces to the attention, the idea of another object; this is a more essentially important result than that association, or union, which takes place when two or more thoughts are first experienced together. Suggestion is conditioned upon association; both may be considered operations of the same power, as they are elements of the same general function. But it is in suggestion that the office of the power is accomplished.

We more naturally speak of the power, than of the faculty, of association or suggestion, because this potency, considered in itself, is a factor which works without the guidance of the will. Frequently, indeed, it is controlled and employed so as to contribute to some specific and intentional intellectual undertaking; but it is then regarded as a subordinate element of some larger faculty, rather than as an independent power. Of itself, it is not a complete instrument.

The history of opinions. The Schoolmen. David Hume, Aristotle.

§ 113. When the working of this power first engaged the attention of modern philosophers, the succession of our thoughts could not be seen to observe any law. Some of the Schoolmen say that the "resuscitation of ideas," the "excitation of

the species," is "the very greatest mystery of all philosophy." The younger Scaliger—the learned son of a most learned father—said, "My father declared that of the causes of three things in particular he was wholly ignorant: of the interval of fevers, of the ebb and flow of the sea, and of reminiscence." He thus expressed the ignorance, not only of himself and of his father, but also of the age in which they lived. Nor have these mysteries even yet been wholly solved.

For a long time after the revival of letters the ancient doctrine of *ideas* and of *species* continued to exercise great influence. Our conceptions were given a kind of existence independent alike of the mind and of the objects to which they correspond. Most errors which exhibit lasting vitality, derive their strength from

some natural and permanent, but fallacious, ground of belief, rather than from any historical origin or advocacy. The false theory which we have just stated was favored in modern, no less than in ancient times, by the structure of language, in which our conceptions are given an apparent independence of existence and operation, and by our natural tendency to regard things separately conceived of as being, also, separate and substantial entities. It was not till after the time of Locke, that ideas were clearly shown and seen to be but exercises of the intellectual power, and not at all things endowed in themselves with attraction or with any other potency.

Such being the case, the causes of mental association and suggestion were first sought for in our ideas themselves as the representative appearances of objects, and were ascribed to them as having that character. Moreover, as the succession of ideas is the phenomenal expression of the operation of the suggestive power, and exhibits certain uniformities in consequence of the orderly working of the power, it was to be expected that observation, sooner or later, would detect these uniformities, and enunciate them as laws. This task was undertaken by a famous Scottish philosopher. David Hume, in the early part of the eighteenth century, by his clear and elegant writings, showed to what an extreme a logical skepticism might be carried by one who based his reasonings on the doctrines of a defective philosophy. Rejecting, as untrustworthy, the conceptions of substance and power and force, he made all phenomena to consist only in impressions and ideas. His writings incited many thoughtful minds to investigate the ultimate grounds of human belief. Hume, like his English contemporary, Hartley, accounted for every mental process by the succession of ideas under the laws of association. These laws he reduced to three; the first referring to Contiguity in Time or Space; the second to Similarity; and the third to the relation of Cause and Effect, which, however, Hume explains to be simply uniformity of succession. That such laws are constantly exemplified, no one can deny. Things which have been thought of as closely related in time or in space, or as united by the bond of cause and effect, or which are similar, often suggest one another. How naturally, when some great man, such as Cæsar, is mentioned, we recall the principal actors and events of his time; or, when some noted place is named, such as the Roman Forum, we think of the magnificent monuments with which it was adorned and of the important transactions which transpired within it! Or, contemplating Cæsar and the Forum, we are led to consider the causes which destroyed Roman liberty, and which put an end to Roman eloquence. The thought of Cæsar, again, through the principle of similarity, suggests other instances of successful usurpation; as the Forum brings to mind other spheres for the exercise of popular ability. Hume claimed to be the first who enunciated these laws of association, and probably was the first by whom they

had been discussed at length. Aristotle, however, in his treatise concerning Reminiscence, teaches that "We search for a next thought by thinking from the present or some other (time), and from the similar, or the contrary, or the proximate,"—"νοήσαντες ἀπὸ τοῦ νῦν ἢ ἀλλου τινός, καὶ ἀφ' ὁμοίου, ἢ ἐναντίου, ἢ τοῦ σύνεγγυς." Thus he gives the relations of *nearness in time*, of *similarity*, of *contrariety*, and of *vicinity*, as the fundamental conditions, at least of intentional recollection.

§ 114. Comparing Hume with Aristotle, we find that the modern philosopher mentions the relation of cause and effect, which is not named by the ancient one; while Aristotle specifies *contrariety*, which is not in Hume's enumeration. In each case, a reason can be given for the omission. On the behalf of Aristotle it may be denied that the relation of cause and effect could, of itself, form a suggestional law, if the objects connected by it had not been previously considered as existing together, or in immediate succession. No causal object could suggest any resultant object which had not previously been seen as closely related to it in time and space; and so, conversely, as to the resultant object. This denial, however, admits of the reply that, although a cause and its effect must always be first seen under the contiguities of time and space, yet the particulars of these contiguities, and even the contiguities themselves, may be entirely lost sight of or neglected, while yet the association of thought remains. When we hear a voice, we expect to find a person, and this without the slightest reference to any time or place where the connection between speech and speaker may have been perceived by us. This reply would be satisfactory to us, though we are not sure that Hume could consistently use it.

Again, on Hume's behalf, a strong reason may be given for the omission of contrariety from the list of suggestive relations. It is that no objects are contrasted with one another save those which have a common nature, or general resemblance, on which nature, as a background, their differences become prominently noticeable. An elephant is contrasted with a mouse, not with a pebble, because the two objects first mentioned are both quadrupeds. A giant is contrasted, not with a shrub, but with a dwarf or a child, because the latter also are human beings. White is contrasted with red and hot with cold, because these things have an underlying sameness; we do not oppose white to hot, or cold to red. Cæsar, passing through an Alpine village, remarked that he would rather be the first man there than the second in Rome; such a thought would not have occurred to him had not both the petty village and the world's great capital been alike the dwelling-places of men. The antithesis of objects is founded on their likeness no less than on their dissimilarity.

Such being the case, it must be allowed that, without similarity, contraries could not suggest one another, and, indeed,

that contraries suggest one another by reason of their radical likeness rather than of their opposite qualities. This is evident, because things which are so different from each other as to have no noticeable sameness, do not suggest each other at all. Yet, while likeness, not difference, is the bond of association in cases of contrast, it is also clear that contrariety strengthens this bond, and intensifies the suggestive tendency. We more readily think of an opposite than of an object which, without contrast, may partake of a generic resemblance. This seems to result from the desires of the mind: for, if we are seeking rational knowledge, contrast contributes to the clearness of our analysis, and is naturally sought on this account; while, if we have practical ends in view, we naturally aim to know what may disappoint, as well as what may gratify, our wishes. Contrariety, therefore, may be considered a ground of suggestion, yet only in a secondary way, and because of certain motivities which operate in connection with the law of resemblance, and qualify its workings. Considering, then, contrariety as a peculiar and important mode of the law of similarity, and, on this account, omitting it from a generic enumeration, there remain the laws of contiguity, of immediate consecution, of cause and effect, and of resemblance.

The laws of simultaneity and of affinity. Both explained by the law of redintegration. Hamilton, Porter.

§ 115. Contemplating these again, carefully, two thoughts arise. *First*, it is apparent that any one of the three laws first mentioned, operates only when objects have been already, at some previous time, perceived, or imagined, to co-exist in the relation to which the law refers; that is, when the thoughts of the objects must have been previously associated in the mind: but *this is not the case with respect to the law of similarity*. For how frequently, in meeting people whom we have never seen before, we are reminded of those whom we have seen, faces suggesting faces with which they have never previously been consociated in thought! But no place, no date, no event, however noted, can, while viewed simply in itself, suggest any object not heretofore connected with it in our knowledge or conception. Thus the law of resemblance, including that also of contrariety, is separated by a radical distinction from the other suggestional relations. *Secondly*, since the laws of contiguity, of consecution, and of cause and effect, operate only after the previous co-existence of conceptions in thought, we are led to conjecture that this co-existence may be, or may indicate, *the essential source of the efficacy of all these laws*. This conjecture is confirmed by the fact that cases occur which cannot easily be explained by any of the laws under consideration, yet which, nevertheless, fall under *the general law of simultaneity of conception*. The hearing, or the remembrance, of a name, instantly suggests the idea of the object to which it belongs, although the object and its name may have no other relation in thought than that of the sign and the thing signified. Cæsar and Cicero may suggest one another because they were contemporaries,

fellow-citizens of Rome, and actors in the same historical events; but the names of Cæsar and Cicero, respectively, suggest the thought of their owners without reference to the relations of time or place or efficiency. Another illustration of this point is found in the tendency of any part of any object to suggest the other parts. One precept of the art of war or of government may suggest another, simply because both are members of the same whole. Indeed, as Prof. Stewart says, "There is no possible relation among the objects of our knowledge which may not serve to connect them together in the mind." In order to such a connection or association, it is needful only that the objects, as related to each other in some way, should appear together before the mind's attention. This generic law Hamilton styles the law of simultaneity; that founded on the resemblance of objects, he calls the law of affinity. Thus all the laws of suggestion are reduced to two.

The further question now arises whether these two laws may not be reduced to one, inasmuch as their operation is the same? Is there not some principle, more fundamental than either, lying at the basis of both? Hamilton, answering this question in the affirmative, announces the law of redintegration; and Porter, yet more clearly than Hamilton, explains the principle of this law. We have seen that ideas, as such, do not attract each other, and that their association must result from some power or tendency resident in the substance of the mind. Now a tendency in the mind to redintegrate, or render again complete, any complex state formerly experienced and now renewed in part, accounts satisfactorily for all the phenomena of suggestion.

Of course, in one sense, no mental state or action can be the same as one previously experienced; a past activity is gone, and cannot literally be recalled. Yet we style things the same when they are precisely similar; and this especially applies to our successive conceptions of the same object. In this way we speak of several persons having the same idea at the same time, and of one person having the same idea at successive times; nor can the thought be readily expressed in any other way. The redintegration, therefore, or complete repetition, of a mental state, is, strictly speaking, the completion of a state exactly similar to one previously entertained. A tendency to such redintegration explains alike the law of simultaneity and that of affinity. With respect to the former, we know that the mind, while perceiving or considering objects, can entertain several conceptions at the same time (§ 29). This is true even when the objects may be presented, not at once, but in succession. In driving rapidly through the country, we remember what we have just seen, even while noticing new objects; and, in listening to an interesting speech, the leading thoughts of it are borne in mind as the orator progresses. Thus the mind, by a power of collection, adds to the natural multiplicity of present objects. Such being the case, we may hold that a number of conceptions are being con-

stantly conjoined in the same exercise of energy. If any one of these be renewed, the redintegrating tendency, under the action of favorable conditions, will recall the rest, or at least some of them.

This same tendency explains the law of affinity, though not so obviously as the law of simultaneity. When things have any community of nature, or are alike in any respect, our conceptions of them necessarily possess a certain common part or element. Hence, in thinking of any object, we partially re-form the conception of any other similar object which we have previously seen. The redintegrating power lays hold on the part of the conception thus renewed, and, by means of it, recalls the whole idea. The portrait of Sir Philip Sydney brings to one's mind that of Queen Elizabeth, for no other reason than that Sir Philip wore ruffles. His ruffles suggest those of the queen; these again, through the law of simultaneity, suggest her countenance and entire appearance. We accept redintegration as the radical regulative principle of reproductive thought.

At the same time, difficulty may often be expected in the application of this principle to the explanation of particular instances. Frequently intermediate thoughts are unnoticed, or unexpressed; in such cases, the missing links of the association can be supplied only from conjecture. Hobbes—the great philosophical supporter of absolute monarchy—gives an illustration of the natural succession of our ideas, not more remarkable than may be constantly met with in the experience of daily life, yet remarkable for this, that the inaccurate explanation of it by that distinguished man, has been quoted with approval in all the leading works of mental philosophy since his time. Some one, he says, in a conversation regarding that civil war which ended in the decapitation of Charles the First, asked abruptly, "What was the value of a Roman denarius?" Hobbes's explanation is that of a true absolutist. He supposes that the circumstances of treachery and wrong attending the death of the king suggested those attending the death of our Saviour; that these again suggested the thirty pieces of silver for which our Lord was betrayed; and that then the thought of Roman money in general suggested the denarius. Is it not more likely that the interrogation had reference to that incident in our Saviour's life, when he said, "Show me a penny," that is, a denarius; and when he enjoined obedience to lawful rulers? If this be so, the state of the man's mind may have been that of inquiry as to the righteousness of the king's condemnation, and not the deep disapproval which Hobbes supposes. But, whichever explanation be adopted, either will illustrate and confirm the law already given, the radical law of suggestion, viz., that the mind tends to redintegrate any complex state which it may have already experienced and which it may have partially renewed.

This radical law of association brings to view the intimate connection subsisting between the powers of attention, acquisition, and suggestion. These powers are so united in operation

that no modes of sequence are possible in the suggestion of ideas, which have not been preceded by corresponding modes of co-existence while the ideas have been contemplated and acquired. The principle of redintegration is simply the specific statement that the tendency resulting from the exercise of energy in acquisition and attention, is a tendency, not simply to the renewal of an activity at some future time, but to the renewal of a complex activity in its several parts.

It is, however, to be noted, that the entire redintegration of a past mental state seldom, perhaps never, takes place. Some of the more prominent conceptions belonging to such a state may be revived, and may, before they depart, be the means of recalling others; the greater portion of our thoughts pass from us into utter oblivion. Often even circumstances or particulars which have been of special interest, are not brought to mind in connection with the thought of an object or event. Conflicting suggestive tendencies are continually striving, with varying success, for the control and use of our mental energy; in addition to which the current of reproductive thought is constantly checked, interrupted, or turned into some new channel, by the stronger activity of immediate cognition. Thus the actual operation of the redintegrative tendency is simply to reproduce, from past thought, selections which find, in our present thinkings, the opportunity to renew old companionships.

The laws of associational preference, or the secondary laws of suggestion.
Three principal secondary laws.

§ 116. The character of the trains of thought, supplied under the foregoing conditions, differs greatly in different persons, and in the same person at different times; let us consider the causes of this difference. These may be indicated by saying, that redintegration, the primary law of suggestion, is constantly modified by secondary laws, which may be called the laws of *associational preference*. We shall state and discuss the more important of these.

First, then, we say that *the tendency to redintegration is greater or less according to the amount of intellectual energy with which any conjunction of ideas may have been previously entertained*. This law, like the one which it qualifies, operates from our prior thinkings, and may be directly inferred, as a corollary, from the law of redintegration. For, if the original energy of a mental state provides a tendency to its complete restoration, on the occasion of any allied thinking, it is easy to see that this tendency will be greater or less in proportion to the amount of energy originally exercised. That some such principle operates is evident from certain classes of phenomena which have been carefully noted by philosophers. For example, objects are more likely to be recalled which have occupied the mind for a considerable length of time. The traveler who beholds the wonderful cataract of Niagara, and who fears that he may never see it again, gazes long on the majestic spectacle, that he may keep a picture of it in his mind. Again, it is a trite remark that at-

tention adds to the retentiveness of memory, and, in most persons, is necessary to any considerable acquisition. In vain we read the noblest authors, and hear the ablest speakers, if we hear and read without attention. Interest in any object or event fixes it in our remembrance, because, in this way, our regards have been centered upon it. So, also, repetition of a thought commits it to the memory. Few have that marvelous faculty which receives and retains, without an effort, long discourses, and even long lists of unconnected names and dates. Most of us use the aid of repetition, as school boys do when they learn rules and verses. These and similar statements set forth cases in which a considerable amount of energy is exercised, either at once or in successive efforts, upon some given combination of thoughts. Moreover, it is evident that only the more prominent thoughts in a combination recall one another, the reason being that the energy of attention has been given to them and their mutual relations. The remaining thoughts, having been neglected, are forgotten. It is to be noticed, also, that circumstances which detract from the energy of attention, lessen our ability to recall. Nervous excitement or mental agitation weakens both our first perception of objects and our subsequent recollection of them. And things which have been seen only among other interesting sights, are not readily remembered, the energy of attention having been divided and diminished.

Another law, subordinate to the radical principle of reintegration, may be thus announced: *the suggestive power acts more or less readily according to the degree of the coincidence of the reproducible thought with one's permanent intellectual tendencies, whether natural or acquired.* No fact is more patent than that men, from their very birth, differ in their mental endowments and inclinations; this difference, too, increases during their subsequent lives. Not only some men are born poets, but others, just as truly, are born artisans, men of business, orators, philosophers, statesmen. These differences pertain, not merely to the tastes and motive dispositions of men, but to the very cast of their intellectual faculties. One essential qualification for successful business is the ability to remember every necessary item just when it ought to be remembered. How unfitted for such a task is the poet, whose mind rejects the real and practical, and continually pursues the creations of his fantasy! The philosopher, who seeks to know causes, effects, laws, principles and systems, in the general, thinks of instances only as related to principles, and allows the special facts and practical details, with which the statesman deals, to slip his mind. Occasionally some intellect combines such contrasted characteristics as are generally separated; then we see the man of varied and versatile talent. Ordinarily every mind has a peculiar bent of its own. These remarks may be abundantly illustrated from the more successful works of dramatic authors; for a certain uniformity of character may be seen to pervade the thoughts, no less than the deeds, of the several

persons in the play. When a permanent general tendency, whether constitutional or acquired, unites its power with that of a specific reproductive tendency, a special readiness is manifested for some particular line of thought. Such is the operation of this law.

A third subordinate law of suggestion is, that *lapse of time tends to weaken the association of our ideas*. We may question whether any power diminishes and is lost through the mere circumstance of its being unexercised. An ounce of gunpowder, perfectly dry, hermetically sealed, and inclosed in an impervious case, would probably display precisely the same amount of explosive and expansive force at the end of one thousand years as on the day of its being put away. But, in the great majority of instances, an unexercised power grows weak, probably *through the abstraction of its energy in the exercise of other related powers* which operate in other ways. Thus the quality of wood as fuel becomes totally lost through that gradual process of decay which reduces it to vegetable mold. Something like this may occur in the mind. There is no doubt that names, faces, facts, and particulars, casually noticed, are remembered but for a short time. After a week or a month or a year, they are lost and forgotten. For a season they recur occasionally, and are easily recalled; but one by one they disappear and become to us as if they had never been. This may be accounted for, in part at least, by a kind of absorption of energy from the reproductive tendencies, through the use of it in the action of allied potencies, and by the comparatively low place, in the rank of recollectible ideas, to which tendencies thus weakened are reduced. They may not become wholly extinguished; a faint capability of revival may remain; but they are excluded from consciousness through the activity of more powerful competitors. Whether any acquisition of the mind can be so utterly lost as not to be reproducible in another state of being, and under specially favorable and stimulating conditions, is a question upon which we shall not now enter.

We must, however, notice an exception to the law that reproductive tendencies grow weak through lapse of time. *Aged persons generally remember the events and scenes of their early days more vividly than those of their subsequent life, or those even of their latest experience.* The explanation of this phenomenon depends on the principle that one law of suggestion may be counteracted by another. We have already seen how earnestness of attention, frequency of repetition, and depth of interest, by increasing the amount of intellectual energy originally exercised, create a strong reproductive tendency. The operation of these causes in early life is beautifully delineated by President Porter. He says, "The objects and events of childhood were contemplated by the mind at first with an almost exclusive and absorbing attention. The few persons that stand out in so bold relief from the background

A notable exception to one law explained by the stronger operation of others.

of life when life is reviewed, filled its entire foreground when life was all in the future; for they were the only persons with whom the child was brought in contact. The memorable occurrences of childhood were the absorbing subjects of thought for days before they occurred. They were often reviewed with fond reflection after they were past. The learning to count ten, or one hundred, the wearing a certain dress; the beginning of school-life; the long-anticipated, the often-reviewed and recited, visit to some relative, the first considerable journey, the first party, the first composition—were most important occurrences in their time, and spread themselves over a large portion of the horizon of the infant life." Such is a true picture of the activity of the intellect in the freshness of its youth. The causes productive of this activity are wanting in later life, and particularly in old age. Even in business, men often give just so much consideration to transactions as may be necessary, and then immediately dismiss them, that other affairs may likewise receive attention. It is not to be wondered at, that earlier impressions maintain a pre-eminence amid others which, though recent, are inherently so weak. Besides, here, as in most cases of ascendancy, the more potent energies renew and prolong their reign. While past events themselves may be long separated from us, those thoughts by which we recall them, may have been entertained frequently throughout life: so that the strength of a present recollection may be in part derived from an experience not very distant. This cause of prolonged memory operates, not only in regard to the events of childhood and youth, but also in regard to any events which may deeply interest us, and which we may afterwards recall. The aged soldier, who has participated in hard-fought battles, easily recounts the incidents which he has described so often:

"He shoulders his crutch, and shows how fields were won."

The retired lawyer gives the details of some great contest in which, years ago, he conquered a proud place in his profession. The statesman sets forth accurately that political situation in which he first rose to eminence, or in which, in some signal way, he was enabled to serve his country.

We have now mentioned three general laws modifying the exercise of the associative power. They operate, respectively, from *previous energy of thought*, from *permanent intellectual habits*, and from *the gradual abstraction of energy* through the operation of tendencies allied to those thus weakened.

Other modifying laws beside these might be named. For example, it is evident that suggestion, in common with our other mental powers, exhibits various degrees of vigor or of debility, as a result of health or sickness, rest or fatigue, and other physical conditions, which affect the life of the human spirit. There may, in fact, be as many subordinate laws as there

are general causes to modify the operation of the fundamental law. But the principal laws are those which we have discussed.

The law of habit in its relation to the suggestion of thought. The opinions of Reid and Stewart.

§ 117. When we remember that the associative principle results from a prior exercise of energy and is a tendency to the repetition of a prior act, it is evident that the law of redintegration is intimately related to the law of *habit*. Some difference

has existed in regard to the precise nature of this relation. Reid remarks, "I believe that the original principles of the mind, of which we can give no account but that such is our constitution, are more in number than is commonly thought. But we ought not to multiply them without necessity. That trains of thinking, which, by frequent repetition, have become familiar, should spontaneously offer themselves to our fancy, seems to require no other original quality but the power of habit." On the other hand, Stewart, having quoted these words, says, "With this observation I cannot agree, because I think it more philosophical to resolve the power of habit into the association of ideas, than to resolve the association of ideas into habit" ("Elements," chap. v.). This opinion of Stewart is untenable. Even allowing, what appears likely, that every habit contains an intellectual element, and that this originates from the repetition of conceptions through the action of the suggestive power, it is clear that all habits save those which regulate thought only, include additional elements which cannot be accounted for by the association of ideas. Take habits of anger or of calmness, or those of decision, or of irresolution, of perseverance, or of endurance. While these involve certain recurring modes of thought, do they not consist yet more in certain activities of spirit which, through exercise, have grown into strong motives?

As to Reid's statement, we allow that the spontaneous return of "trains of thought, which, by frequent repetition, have become familiar," may be regarded as the manifestation of a habit formed by the intellect. Yet we would rather say that habit and the suggestion of ideas originate in the same general principle of psychical life, than that this suggestion is simply one mode of habit. The common principle at the basis of both is that *every spiritual exercise leaves in the soul a tendency to its repetition*. This tendency is produced, as we especially perceive in many associations of thought, even when the exercise may have been only once experienced. But we do not call such a tendency a habit, unless it both result from many similar experiences and is causative of frequent repetitions. Suggestion cannot be resolved into habit, nor habit into suggestion; but they are closely related through a common origin.

The term *habit* defined.

Let us dwell, for a moment, on the term *habit*, which, because of its various meanings, may be the ground of some confusion. This word is the exact Latin equivalent of the Greek ἔξῆς, which signifies a hold-

ing, or a holding of one's self, that is, *the condition of anything as to its internal state*, or constitution. In this sense we yet speak of nervous, phlegmatic, healthful, and diseased, habits of the body. Ordinarily, however, the term signifies a *tendency acquired by repetition, and causative of the frequent performance of some action*. We speak of habits of study, of industry, of thought, of virtue. This is the meaning in which we have used the word while inquiring whether every suggestive potency is a habit. Finally, we apply the term, not to the tendency, but to the action, or *mode of action, resulting from it*, considered as thus resultant. We say it was his habit to study earnestly, to take snuff, to speak loudly. To express this meaning the word *custom* is often employed; and, in this signification, a habit or custom differs but little from a practice; the distinction being that the latter does not suggest the existence of a corresponding tendency. The notion of facility naturally connects itself with that of habit, and is sometimes suggested by it, but is not included in it. We cannot agree with Prof. Stewart, who defines habit as an acquired facility, and who says that "the dexterity of the workman, the fluency of the orator, the rapidity of the accountant," are habits; they are rather results accompanying habits.

Differences of view exist as to the extent of the office of the suggestive power. The Associationalists make this power the source of all our ideas save those which may be regarded as impressions from without; and they account for belief and memory, judgment and reasoning, by the union of associated conceptions. The formation of such doctrines arises from a superficial analysis of the facts of intellectual life, from an undue desire for simplicity, and from a disposition to interpret the laws of spirit by a reference to those of matter. No views, however, could be more repugnant either to the common judgment of men or to severe philosophical inquiry. At the same time, we should mark the pervading influence of the suggestive power. While association does not, of itself, form new conceptions or convictions, nor even analyze and combine those already in possession, it is the agency through which past thinkings are made present, and from which our higher faculties receive the greater part of the materials which they elaborate. Without this power of suggestion, memory and recollection, fantasy and imagination, and the processes of reason, could never be experienced.

§ 118. Some writers confine the operations of the associative power to thoughts which have only an accidental connection with each other, referring to some other faculty suggestions which pertain to the necessary connection of things. Kant limits the "law of association" to "empirical ideas"; Bruckner, the earnest disciple of Leibnitz, defines association as "*non quævis naturalis et necessaria idearum conjunctio, sed quæ fortuita est, aut per consuetudinem vel affectum producitur, qua ideæ, quæ nullum*

Association not limited to ideas of accidental connection.
Kant, Bruckner.

naturalem habent inter se nexum, ita copulantur, ut, recurrente una, tota earum catena se conspiciendam intellectui præbeat." The question might be regarded as one of terms, though it may also be used in support of the theory that a certain class of our ideas suggest each other aside from any previous association. To us such a doctrine seems, not absurd, yet unnecessary. Conceptions whose connection, as setting forth a true necessity, has a necessitudinal reference, when once conjoined in the mind, may thereafter suggest each other in precisely the same way as those which have merely an accidental connection. There is no good reason to question that they may, and do, suggest each other under the law of redintegration. This is a sufficient account of those associations whereby we are enabled to reason from cause to effect and conversely, by applying that knowledge of laws which we have obtained from experience (§ 92). Seeing the outside of a book, the printing on its pages is suggested; whereupon judgment adopts this conception and asserts its truth. Even our notions of those things which are connected by absolute or ontological, as distinguished from empirical, necessity, suggest each other according to the ordinary law of association, and need no other law to explain their conjunction. This principle does not account for their first union, nor for the first production of any intuitional conceptions and convictions. This must be sought for in the immediate perception of the mind. Afterwards, however, redintegration may reproduce them together in memory, and in imagination. Thus, in noticing any action, we at once perceive it, not simply as an action, but as the action of some power residing in some substance: after which, even in dreaming, action, power, and substance, are mutually suggestive. But, should any think that one of these ideas would suggest another without such previous perception—that it would do so by reason of the very constitution of the mind—this may be allowed as probable, or, at the least, credible; to this extent, only, Kant's doctrine of the intuitions might be accepted (§§ 57-84).

CHAPTER XXVII.

ANALYSIS AND SYNTHESIS.

Defined and illustrated. Pertain immediately to conceptions, not to objects.

§ 119. Analysis and Synthesis are two modes of mental activity which are to be distinguished from thought, but which constantly take place in connection with thought, and with belief. They affect equally the working of these primary powers; because belief is experienced only as an attachment of thought. The terms *analysis* and *synthesis* are the Greek equivalents of the Latin *resolutio* and *compositio*; they literally signify a taking apart and a putting together. So far as the intrinsic meaning of the

words is concerned, analysis and synthesis might express any kind of separation and of union. In chemistry analysis is the actual separation, for scientific purposes, of any compound substance into its material elements; and, for aught we see, any actual uniting of elements so as to form a compound, might be called a synthesis. Ordinarily, however, in philosophy, these expressions refer to a kind of *sundering and joining in thought of the elements or constitutive parts of things*. In other words, analysis is the separating of the conception of an object into the conceptions of its several parts; while synthesis is the uniting of the conceptions of the several parts into that of the one object. Our conception of an ordinary triangle might be analyzed into those of a plane surface—of three straight sides—of three angles—and of certain special relations in which these things may be, and often are, conjoined. Our conception of a pin might be resolved into those of a short stiff wire—of a head—of a point—of the mutual relations of these parts—and of the fitness of the little instrument for a certain use. Our conception of an apple may be decomposed into those of fruit—of a general size and shape—of certain contents of seeds and an eatable body, inclosed within the smooth peel—of a peculiar taste and juiciness—and of the mutual relatedness of these elements. A synthesis would take place when, from any of the foregoing descriptions, the notion of a triangle, or a pin, or an apple, should be formed. Such a synthesis gives a more perfect conception of the object than we can have without the preparatory analysis; the expression of it in language is what we mean by logical definition.

Ideas often admit of analysis when the objects of them cannot be literally taken to pieces. The sides of a triangle could never be removed from the plane surface so as to leave the latter by itself; nor could the angles be removed from the sides. In defining a sphere we think of a solid body of a certain shape; this shape could not exist in separation from the body. A vow is a promise made to God; but, in analyzing a vow, though we can think separately of the promise and of its direction, we cannot literally take them apart. The separation of parts or elements, where it is possible, may assist analysis, but it is far from being the counterpart of the operation in the mind. If the constituents of a tree were so separated, that one could see the roots in one place, the trunk in another, the branches and twigs in another, and the leaves in another, the ideas thus obtained would not give the analytic conception of a tree. There would be need to see, or to construct in imagination, a tree with all its parts in their proper relations to one another. Even chemical analysis is so called by reference to an inward perception of elements, not as they may be in actual separation, but as they are in combination. It aims at that mental analysis which would ascertain and separately consider the elements *as they exist in their relations to each other in the compound*. In short, by analysis, we think separately of the parts or elements of an object, but do not

think of them as separated. On the contrary, we think of them as related and united to each other; and this last conception—that of the mutual relation of the constituents—is often the most important result of our intellectual work. Let it be borne in mind that analysis and synthesis are operations which affect our ideas; they are not operations which affect the objects of the ideas. Sometimes we speak of the analysis of this or that object, the analysis of some battle, or some crime, or some painting, or some geographical territory. But this means only a detailed description, in other words, an analytic setting forth, of our *conception* of the object.

Again, in analytic, as well as in synthetic, thought we think of all the elements of an object, including the relations of the parts to each other, *at the same time*. The difference is that, in analytic thinking, we also regard each element successively with a special exercise of attention, while in synthetic thought we do not do so. In analysis we give separate, but not exclusive, attention to each element. Modern psychology teaches that the mind can think of more than one object at once. In synthetic conception we think of but one object, composed of several parts; in analytic conception we not only think of the whole object, but also, and with a special exercise of energy, consider successively each several part as related to the rest; we may even be said to think of two objects, the first being the analyzed whole, and the second each part as it is specially considered. In analysis our attention is more or less drawn off the whole to each part in its turn; in synthesis it is more equally distributed. Yet we do not in analysis give exclusive thought to any element, forgetful of its place in the whole; when such exclusion takes place, analysis has passed into abstraction. For this reason, and in strict accordance with the Greek derivation of the word, analysis might be defined *a loosening up*, rather than an entire separation, of the elements of a compound notion. We cannot deny, however, that the conception of analysis may be so enlarged as to include not only the first separation of the constituent thoughts from one another, but also their entire abstraction into independent notions. The word is employed sometimes in this secondary sense. Having analyzed the idea of ordinary milk into those of a fluid, white, sweet, nourishing, secreted by the cow, and a common article of food, we might say that the notions fluid, whiteness, sweetness, nourishment, secretion, food, were obtained by analysis from the conception milk; and this would be true, though, in addition to analysis proper, abstraction was needed. From the nature of the case the analytic conception is not so instantaneous as the synthetic, because, in addition to the thought of the whole, it includes a successive attention to every part. When, after careful analysis, we reunite the parts of a notion, our thought is more perfect than it was at first. Our conception is freed from any obscurity or indistinctness. Nevertheless it is again properly styled synthetic.

Analysis distinguished from the division, and synthesis from the generalization, of ideas. Hamilton criticised.

§ 120. Again, let us note that ANALYSIS is not the division, that is, the logical division, of notions, and SYNTHESIS is not the generalization of notions. Logical division takes place when, by the successive addition of differences to some generic idea, we form various specific conceptions. Certain differences being added to the notion tree, we have the conceptions oak, beech, fir, elm, maple, walnut, apple, pear, cherry, and so forth. Strictly speaking, this is a division, not of the notion, but of the class of things to which the notion is applicable. So far from the idea tree being divided into parts, it is used intact, and a new part is added to form each specific conception. This is a synthetic, not an analytic, process. Many ancient logicians, however, used the word *analysis* to indicate this division of a genus into its species, and not the separation of a notion into its elements. This circumstance caused a confusion, from which the terminology of later times has been free. In like manner it is clear that synthesis and generalization are not of the same nature. The latter process is the formation of the idea applicable to a class from the conceptions of species or individuals included in the class; it is the formation of a general notion from specific or from singular notions. Such a process, had we no respect for a fixed usage, might be called a synthesis of the subordinate objects and ideas; because, in providing for the classification of different species and individuals, it figuratively unites the former under a genus, and the latter under a species. The formation of the notion tree, from the conceptions oak, beech, fir, elm, and so forth, might be named a synthesis of these subordinate objects or ideas; for it puts them in one class. Yet the formation of a general notion does not involve any literal synthesis, or composition, either of the objects or ideas. On the contrary, generalization involves the analysis of singular and specific conceptions, so that their differences or peculiarities may be rejected, and their common part abstracted and retained. To style generalization or classification synthesis, is to apply the term in a sense not only different from that in which it is ordinarily and properly employed, but essentially the reverse of it. Such a use of language should be carefully avoided; it would introduce confusion. For this reason it is surprising that Sir Wm. Hamilton should regard induction—that is, the generalization of a law from specific instances of its operation—as a synthetic act, especially as he guards against the parallel misuse of language in reference to the term *analysis*. While discussing “the method of philosophy” (“Met.” chap. vi.), he says, “Having discovered by observation and comparison that certain objects agree in certain respects, we generalize the qualities in which they coincide, that is, from a certain number of individual instances we infer a general law; we perform what is called an act of induction. This induction is erroneously viewed as analytic; it is purely a synthetic process.” Doubtless consideration would have led Sir William to

reverse this last statement. If analysis be the separation of a conception into those elements which constitute its logical content or comprehension, and if synthesis be the formation of this same content or comprehension by the uniting, or reuniting, of those elements, then the processes of generalization and induction are no more synthetic than that of logical division is analytic.

A unit defined.
A whole, a composite unit. Four classes of wholes result from four methods of conceiving of parts and of wholes.

§ 121. Greater clearness of thought on this topic may be obtained, if we consider the nature of that unity which analysis separates into a plurality of parts, and which is the foundation of the synthetic character of every complex notion. It is the oneness of what philosophers call *the metaphysical whole*.

An object is one, or a unit, when it is a definitely distinguishable quantum of entity. Any entity absolutely indivisible, and which is without a plurality of parts or elements, can be thought of only as a unit. Almost all objects, however, are composite, and can be considered both as units and as pluralities. A composite unit—using the term *composite* in the widest sense—is properly called a whole. The question now arises, “Under what conditions does a plurality of entities constitute a whole, so that we can think and speak of it as one?” The answer is that a plurality of things becomes one, or a whole, as being *commonly and mutually related*; and they are thought of as one, as a distinguishable quantum of entity, when, by reference to such relatedness, *the mind can grasp them in one conception*.

In philosophy the main points of difference between wholes do not concern the nature of the parts composing them, nor even the nature of the relations which unite the parts, though this last must be considered, but *our mode of conceiving of the parts as related*. The question whether or not, and in what sense, a whole is properly the subject of analysis and synthesis, depends on a knowledge of the different ways in which the mind conceives of parts in their relation to one another, and so may compose or decompose its conception of a whole.

The collective and the generic wholes. Not those considered in analysis and synthesis.

With respect to this conception of parts, four wholes—or classes of wholes—claim our attention, two of which are composed of parts indefinitely conceived, and two of parts conceived definitely. Of the two first mentioned, that one which is composed yet more indefinitely than the other, may be styled the collective, or aggregate, whole. This emerges when things, however dissimilar and otherwise wanting in any noticeable direct relatedness, have a common relatedness to some entity, through which, of course, they are also related to each other. Things may be together in place, or in possession, or time, or as objects of thought, or as subjects of discourse, as conjoint causes or causal conditions, or as conjoint effects, or in any other mode of assemblage. A city, an inheritance, a generation, a history, a policy, an administration, a variety, a plurality, considered as collections of

objects which have a common relation, are aggregate wholes. Such wholes admit of the utmost diversity among the parts; for these need only have a common relatedness. The other indefinitely composed whole is the generic or logical. It arises when many individuals have a similarity of nature; every individual in such a class resembles every other in the class; and thus all are commonly and mutually related. This whole, being founded on community of nature, embraces every individual that may have the common nature, and excludes all others. As a collection might consist of similar things, the logical might be considered a peculiar species of the collective whole; but it is better to distinguish them by confining the term *collective* to wholes whose composition is not conceived of as based exclusively on the relation of similarity. A collection of things, as distinguished from a class, is never based simply on similarity of nature. The generic or logical whole is seen whenever we think of any genus or species of things as comprising individuals, or subordinate classes. Mankind, the horse, civil government, thought, words, blows, and every conceivable kind of a thing, are logical wholes.

Our idea either of a generic or of a collective whole, is not obtained by a synthesis of our conceptions of its parts; and our ideas of the parts severally, are not obtained from an analysis of our conception of the whole. On the contrary, in conceiving of these wholes, the parts are referred to indefinitely, as things subject to the constitutive relations; which reference may be regarded as the result of an analysis, or abstraction. And our specific, or singular, ideas of the parts of any such whole, are not included in the conception of the whole as such. They are either given at first together with the conception of the whole, or, if subsequently formed, are obtained by a synthesis which successively distinguishes the different parts by the addition of differences, or accidents, to the common character. Such being the case, it is plain that the separation of a whole into its parts by analysis, and the uniting of parts into a whole by synthesis, do not take place in relation to collective and generic wholes, but that these processes must pertain to wholes of another nature.

The compositional or mathematical, and the elemental or metaphysical, whole. Partition and composition distinguished from analysis and synthesis.

§ 122. Let us consider those wholes which consist of definitely conceived of parts. By this we do not mean that their parts are conceived of without any indetermination (such exactitude seldom or never occurs in thought), but only that they are conceived of with a definiteness which does not belong to mere collections or classes of things. In

common language, when a whole is contrasted with a total, we distinguish the definitely from the indefinitely composed whole; but, aside from this contrast, the term *whole* is not restricted in this way; nor is the contrast found in ancient usage. *Definite wholes* are of two kinds and may be distinguished as the compositional or mathematical, and the elemental or meta-

physical, whole. They differ from those already considered in this, that the ideas of the parts enter into the conception of the whole with more or less definiteness as to the number and specific character of the parts. This is not the case with collections and kinds of things. They agree with these wholes in this, that the parts of every whole are commonly related. A tree considered as composed of roots, trunk, branches, and leaves, is a whole of definite conception; and these parts are united as participating in a common nature, as being together in space, and as forming a system of growth and reproduction. The common relatedness connecting the parts may not be so prominent and noticeable as other relations which belong to parts specially; yet it is always sensibly present and may be discovered by careful inspection. Every part of animal is related to an individual life; every part of a chair to sitting; all the parts of a stone to the size, hardness, and coherency of the body formed by them; every detail of a plan or business undertaking is subordinate to a common end or result; every part of a geometrical figure is united to every other through a contiguity within definite spatial limits, as also by a community of nature; every moment in an hour, and every year in a century, is connected, through contiguity of time, with every other part.

Moreover, the parts of definite wholes, generally, though not necessarily, exist in a fixed or systematic union, that is, in such relations that they could not change places without destroying the constitution of the whole. Hence the peculiar relations of each part often enter prominently into our conception of the integral entity. Considering a tree as a whole composed of roots, trunk, branches, and leaves, the peculiar relations of each part to the rest enter into our very conception of the tree. This is never the case with the indefinite wholes.

The compositional, or mathematical, whole *consists of parts which can exist—and therefore can be conceived to exist—apart from one another, in space or in time.* A human body, as composed of head, arms, trunk, and legs—a man, as made up of soul and body—a ton-weight, as containing twenty hundreds—a sentence, as embracing a number of words—a square, as formed by the exact juxtaposition of two equilateral right-angled triangles—are examples of this whole. We call it compositional, because it may be conceived of as formed by the composition, or putting together, of suitable parts, according to their appropriate relations; it has been called mathematical, not because its parts always admit of quantitative determination, but because it is the only kind of whole about which and the parts of which, mathematical reasonings are ever employed. Some, in defining this whole, say that “every part of it lies out of every other part” (Hamilton’s “Log.” Lect. XI.); it is more exactly to the purpose to say that the parts are such as *may* exist separately. Should we describe two equal circles with centers connected by a semi-diameter, the resulting figure would be a mathematical

whole composed of two circumferences, though these would not lie out of each other. In like manner, a *nest* of boxes, in which one smaller box after another is placed in the box next larger than itself, is a whole in which the parts do not lie out of one another. When things are separable in space or in time, they are easily considered and conceived of separately; this is a characteristic of the parts of the compositional whole. The different notes of a musical chord take place together, but they may be produced separately, and are therefore easy of separate conception. A walk, a speech, a fight, are easily decomposed as being wholes whose parts occur in succession.

The process of thinking separately of the parts of a mathematical whole is often called analysis, while that of forming a conception of such a whole may, with some propriety, be styled synthesis. But, when precision is desirable, it would be better to term these processes the *partition* and the *composition* of conceptions, reserving the terms *analysis* and *synthesis* for modes of action in which a more searching and penetrating kind of thought is employed.

This brings us to mention the metaphysical or elemental whole, as that with which—speaking strictly and precisely—analysis and synthesis are concerned. The human mind, in its natural judgments and thinkings, often distinguishes things from each other, which can have no separate existence in space or in time, and which yet are recognized as truly different in nature. Action cannot exist separately from power, nor change from action, nor quantity from entity, nor substance from quality, nor relations from their relata; yet these things can be separately thought of. *A whole considered as composed in any measure of such inseparable parts* is what we call a *metaphysical or elemental whole*. It is metaphysical, because those elements and relations specially perceived in its analysis form the data of that science which seeks the ultimate in thought and in being; it is elemental, because elements, as distinguished from parts (§ 124), are brought to view in its analysis. A satisfactory knowledge of any subject commonly demands that it should be considered as a metaphysical whole. Only in this way can we determine the ultimate elements of a thing and their relations. Elemental analysis, also, is necessary to that defined and perfected conception of a thing in which our conceptions of its parts are properly co-ordinated and combined (§ 141).

The various wholes which have now been mentioned, are not so opposed to each other that they could not exist in, or be composed out of, the same unchanged set of materials. On the contrary, the same set of objects, as, for example, the human race, might constitute a collective, a generic, a mathematical, and a metaphysical, whole. But these wholes differ as to the nature of the relations according to which they exist or are constructed, and as to our conceptions of them derived from a diverse contemplation of constitutive relations. They are ex-

clusive of each other as the conditions of different modes of mental action; and it is also to be noticed that the same set of objects are not often conceived of as composing both an indefinite and a definite whole. The descriptions, given above, particularly of the metaphysical whole, differ somewhat from those to be found elsewhere. They are, however, what the philosophy of mental action demands; in which philosophy we find the principal, if not the only, use for such descriptions.

Our chief purpose, in treating of this general subject, has been to distinguish and define the metaphysical whole. The conception of this whole is the ordinary form of our conception of anything as a unit, and is the basis of all our ordinary conceptions of things. Moreover, it is from the analysis of an object as being a whole of this sort, that a thorough understanding of the nature of the object is to be obtained. The partition of the mathematical whole being restricted to the conceptions of separable parts and the relations of these as such parts, is far less searching than the analysis of the metaphysical whole. Not merely all philosophy, but also all clear and satisfactory thinking, involves elemental or metaphysical analysis, together with the synthesis which is conditioned thereupon.

Some wholes, regarded metaphysically, that is, without limiting our analytic view of them to separable parts, are more loosely constructed than others. Their prominent internal relations assimilate them to the mathematical, or even to the collective, whole. A sentence, a speech, the philosophy of Aristotle, the history of Athens, would be examples, if by these words we would mean the whole contents of each object as dwelling in one's mind who had heard the sentence or speech, or read the history or philosophy. The analysis of such objects differs from mere partition, because it includes a further analysis of the several parts; and the synthetic conception of them differs from mere composition, in that it is based on a co-ordination of parts according to the analysis (§ 141). The formation and use of the metaphysical whole will be more fully illustrated hereafter.

Now, let us remark that sometimes, by an extension of terms, a mental process is called a *synthesis*, although it is not a perfect instantaneous grasping of all the parts of a constituted whole; and that, too, with some propriety. Often the parts of a whole, or system, are so many that they cannot be conceived of absolutely at once, while yet, by an effort of mind, they may be brought under one brief process of review. Every step of this process is accompanied by a reference, more or less general and indeterminate, to those parts of the whole not under special consideration; and so the different parts, though not viewed instantaneously at once, are seen continuously and in their proper relations to each other, and, in a sense, are considered at one time.

Analysis and synthesis illustrated from a consideration of the metaphysical whole.

An extension of the term *synthesis*.

The nature of systematization.

These observations show how synthesis is said to take place in *the formation of any scientific system*. Attention to facts is the primary source of theoretic knowledge. Through the analysis of facts the mind perceives some certain mode of sequence common to many instances. Rejecting other circumstances, and thinking of this mode only, we exercise the power of abstraction. Further, rejecting the thought of the individual and singular, we exercise the power of generalization. Recognizing the conception thus obtained as expressing a law universally valid, we form an induction—we obtain a scientific principle. All this involves analysis, not synthesis. When, however, a number of laws respecting the same class of objects have been obtained, these laws are found to be mutually related in various ways. They may be like and unlike, so as to be capable of classification; they may co-operate together; they may modify or limit or neutralize one another. The arranging and exhibiting of the laws of any science, so as to give a connected view of them and their relations, is called *systematization*; and it has a synthetic character.

The analytic and the synthetic methods in philosophy. The terms *regressive* and *progressive* explained.

§ 123. In this connection we may consider *two opposite methods employed in philosophy*, each of which has its proper use. The one has been styled the Analytic or Regressive, the other the Synthetic or Progressive. In the former we first consider individual facts or instances, and then ascend from these to general principles and conceptions. In the latter we begin with the statement and explication of general principles and notions, and then descend from these to the specific and the individual. To state the matter in another way: in the analytic method we proceed from the complex to the simple, while, in the synthetic, we proceed from the simple to the complex. For what is general is simple, while the specific and the singular are complex.

The terms *regress* and *progressive*, as applied to the analytic and the synthetic methods, may suggest that progress in philosophical knowledge is to be made by the latter method chiefly, the former being useful principally for the examination and attestation of results. Such views have been entertained; but they are erroneous in the extreme. The true point of departure for scientific progress is found, not in the simple and general, but in the complex and singular. Regress and progress, as applied above to philosophical methods, properly refer only to certain logical orders of thought whereby we often naturally proceed from the general to the specific, or from the specific to the general; they do not apply to the order of original scientific investigation and construction. According to this latter order, the analytic might properly enough be styled a progressive, and the synthetic a regressive, mode of thinking.

The analytic is the necessary method for all true progress in philosophy. It is the only means of correctly ascertaining the

laws of any department of existence. Yet we are not to suppose that the only process employed in it is analysis. This is the radical source of its efficiency and value. But, from time to time, synthesis, marking relations between the principles secured by analysis, gradually builds them into a system; which, nevertheless, is to be regarded as the product of the analytic, and not of the synthetic, method. Frequently, also, in the course of our investigation, conjectures or hypotheses, essentially synthetic acts, assist our progress.

The synthetic method is the reverse of the analytic. Setting out with general conceptions and principles, it combines them into others more complex. Such a method can have no value save so far as its general notions may be correct. Therefore, it is not a proper method in cases in which principles are doubtful, or but partially ascertained. Many systems of philosophy constructed on the synthetic method, have secured wide acceptance through their wonderful ingenuity and consistency, yet are now regarded simply as remarkable phenomena in the history of the human mind.

Two uses of the synthetic method—

1. To correct and perfect systematization, and thus to serve didactic ends.

2. To construct systems of practical philosophy.

There are, however, two applications of the synthetic method in which it may be employed to advantage. First, it may, and should, be used in the more perfect systematization of any science whose principles have been analytically determined. That synthesis, which necessarily attends any process of investigation, is insufficient for the clearest and most exact apprehension of a number of related doctrines.

This end calls for a careful review of results with reference to their mutual relations, and an orderly arrangement of them with reference to these relations. In the synthesis of investigation we successively unite together special parts of a system, without being able to show definitely their relation to larger parts, or to the whole. We proceed like the first excavators of Pompeii, who uncovered the several apartments of one house before proceeding to those of another, and who localized their labors now at a temple, now at a theater, now at a market-place. But, in the synthesis of ultimate systematization, we clear the streets and openings between the buildings, and we gradually behold residences, temples, theaters, market-places, gardens, walls and fortifications, in their proper proportions and relations. In connection with this synthesis of ascertained principles, important questions often present themselves; and many subordinate particulars also are determined. This systematizing synthesis, whereby the analytically ascertained principles of a subject are combined in outline, and less essential ideas, combinations, and discussions are introduced afterwards, contributes greatly to render one's thought and knowledge exact and complete. Generally, also, it presents a better order for the communication of knowledge. Occasionally, it may be better to present a new system in that order in which its parts have been

constructed during analytic investigation. This order is always possible, and it is advisable when the investigator would exhibit to others his conformity to philosophic methods. But the ordinary aims of instruction call for the synthetic order of thought; which, therefore, is sometimes called the didactic. It is in this use that synthesis notably assumes a progressive character. For the learner receives first the leading principles of a system and their relations to each other, and, after that, less important and more numerous details are presented under each head in succession. In this way he progresses rapidly and easily.

According to the first application of the synthetic method it is employed merely for the co-ordination and presentation of principles which have been acquired by the method of analysis; it is merely an attachment and completion of the latter method. According to the *second application*, we act independently of the analytic method, and directly construct a body of philosophy. This use can have place only when a considerable number of principles are well known, and admit of being combined and applied in various relations. This is the case with the mathematical sciences, such as algebra and geometry, and with various practical philosophies which constantly refer to the acquisitions of experience and common sense. Systems of ethics, of polite manners, of civil law, of political wisdom, of æsthetics, and of rhetoric, have been constructed in this way. Cicero's excellent treatise, "De Officiis," is an example in point. Horace's "Ars Poetica" is another, but less perfect, illustration. Such systems serve a good purpose, though necessarily wanting in profundity. It is to be noticed that analysis is often used in the construction of them, not for the ascertainment of principles, but with the object of more exact definition and apprehension: and thus analysis plays a secondary part, just as synthesis does in the analytic method.

From what has now been said, it will be seen that, as regards progress in philosophy, analytic work alone secures new principles, and is the more important. Synthesis has a subordinate office.

The analytic and synthetic methods are to be distinguished from the analytic and synthetic modes of thinking; by the predominance of one or the other of which they are respectively characterized. The chief object of the present discussion has been to explain the nature of these modes of thinking. This explanation has been found, *first*, in a power of the intellect to conceive of a plurality of objects at once and to think of them as one when they may be united by some system of relations; and, *secondly*, in the further power to think successively of each part or element of the plurality, while thinking also, though with less energy, of all the rest. From this it is plain that analysis is naturally consequent upon a special direction of the attention; while synthesis naturally takes place when all the parts of a whole, together with their mutual relations, may be regarded with the same degree of mental energy.

Analysis and synthesis exercised in the perceptive, the reproductive, and the discursive phases of mental life.

Analysis is the condition of abstraction and of generalization, and consequently of induction; whilst the opposite processes of logical division and specification are essentially synthetic.

These operations continually modify all thought.

Probably our first perceptions and ideas are synthetic, but lacking greatly in clearness and distinctness. The analysis of them, and their subsequent reconstruction under the exercise of the attention, render them available parts of human knowledge. Through a spontaneous analysis and synthesis, also, the various objects of immediate perception are perceived both as units and in their several parts. The separations and combinations of reproduction and imagination, depend entirely on the synthetic and analytic powers; while the discursive faculty is supplied with its abstract notions and principles from analysis, and employs synthesis in its systematizations and deductions. In short, every phase of mental life manifests the working of these powers.

CHAPTER XXVIII.

ABSTRACTION AND CONCEPTION.

(Substance and Attribute.)

Abstraction the ulterior result of analysis. Related to the metaphysical or elemental whole.

§ 124. Abstraction is the immediate ulterior result of analysis. We may speak of the analysis of the mathematical whole (§ 122), and so of the abstraction of any of its parts. Wherever analysis may take place, abstraction, likewise, is possible. But synthesis and analysis proper belong to the metaphysical whole as such, not to the mathematical, the synthesis and analysis of the latter being better distinguished as composition and partition. In like manner, abstraction proper belongs to the metaphysical whole only. The abstraction of the part of a mathematical whole need not be distinguished by any special name, other than mathematical abstraction; it is not of philosophical importance. The reason on account of which the analysis and abstraction of the mind are directed to the parts of the metaphysical whole as such, lies in the fact that the mental division of an object into its mathematical, or separable, parts, is not sufficient even for the ends of ordinary thought. We cannot, from such a division, adequately understand and express the nature of things. This purpose requires that we should consider and designate inseparable parts, such as powers, shapes, magnitudes, and attributes generally. The distinction, therefore, between mathematical and metaphysical wholes, as also other distinctions to be made in connection with this one, though abstruse, are

needful to a clear understanding of the workings of the intellect. For it is to be noted that the most subtle discriminations of philosophy are little else than the recognition and naming of distinctions which the mind naturally makes in its daily thinkings: and their importance arises from this fact.

The word *element* is a term which frequently occurs in philosophy. It signifies any of those parts of an object into which it is, or may be, separated by analysis; and which, therefore, may be separately considered by abstraction. The parts of the mathematical whole are improperly, while those of the metaphysical whole are properly, elements. When the term *element* is distinguished from, and contrasted with, the term *part*, the latter refers to the mathematical, and the former to the metaphysical, whole. As analysis may take place in different ways, and may be more or less searching, till a result is reached beyond which no further analysis is possible, so the elements of an object may be differently conceived of and enumerated. But, in every case, the elements are those parts which analysis has made the objects of distinct consideration. They may, or they may not, admit of further analysis.

In connection with the process of abstraction, that of conception, also, as *the act of the mind in forming a compound or complex idea*, may be considered. A notion of a thing may be formed by the composition of mathematical parts, and such a composition in its relation to the object might be spoken of as mathematical conception. Ordinarily, however, conception signifies the construction of a thought by means of the synthesis of the parts of a metaphysical whole. This may take place without preceding analysis, various constituent perceptions immediately uniting themselves so as to form one idea; but our more perfect notions follow upon a careful analysis of the ideas first entertained by us; and this is the only way in which clear and satisfactory ideas can be formed. That conception is the synthesis of a metaphysical whole, is evident in the case of objects not naturally thought of as composed of separable parts. The idea of an ivory ball is formed from the elementary thoughts, a ball, white, hard, smooth, made from the tusk of an elephant, and fitted for use in certain games. A person having obtained these thoughts, either by his own observation or from the description of others, would unite them by a more or less rapid synthesis; it is plain that they are the parts of a metaphysical whole. But, even in the case of objects easily viewed as mathematical wholes, our notions are ordinarily formed by synthesis and not by composition. A tree may be considered as composed of roots, trunk, branches, twigs, leaves, and fruit, as separable parts; but our idea of a tree is not formed by the mental composition of these parts as in certain relations to each other. After one had seen the separable parts of a tree, he would, indeed, think of them as included within the object; but his conception would also embrace various elements characterizing the tree as a whole. He

An element defined.

Conception defined and illustrated. Abstraction defined.

would regard it as a material body, as a vegetable growth of a certain size and height, and as capable of reproducing its kind by a certain process. These thoughts would enter into his conception, as metaphysical parts. Therefore the tree, as a whole, would be viewed as a metaphysical, and not as a mathematical, whole. For the former exists when any of the parts conceived of, in the analysis and synthesis, are incapable of separate existence, whether any of the remaining parts are such or not (§ 122).

From such instances it will appear that conception may be defined as *that act or process of synthesis whereby ideas or notions of greater or less permanence are formed*. In other words, conception is a mode or species of synthesis. And abstraction is *an act of analysis, differing, however, from mere analysis, in that we entirely dismiss from our attention, and often from our thought, every part or element save that which has specially engaged our regard*.

§ 125. A peculiar difference is noticeable in the mind's method of conceiving and of abstracting, according as this may be more natural and accidental, or more methodical and logical. *We therefore make a*

distinction between what we may call natural, and what may be styled logical, abstraction and conception. In logical conception and abstraction an object is viewed as being substance and attribute, in other words, as being a thing with its qualities or characteristics. These modes of thought depend on the ability of the mind to distinguish a thing as a substance from the attributes by which it is constituted and characterized. But that style of abstracting and conceiving which we have termed *natural*, and which is less refined and rationalized than the other, dispenses either wholly or in part with the distinction of substance and attribute, and deals with objects as immediately constituted by some other and less general relations. Logical abstraction may be considered as the extreme result of the exercise of the analytic power of the mind in its ordinary workings; while logical conception is that synthesis which reunites the parts separated in logical abstraction. The logical and the natural processes may be contrasted in this respect, that the distinction of substance and attribute, which enters into the former as their radical and formative part, applies equally to every entity or thing, whatever be its specific nature; whereas no such radical distinction is used as a guide in natural conception and abstraction; but the parts or elements of an object are immediately thought of as things having their own proper characteristics. In the logical processes, the parts are considered only so far as their nature lends character to the objects as a whole.

As every important question respecting abstraction and conception is directly involved in *the doctrine of substance and attribute*, which doctrine presents to us the forms of the most refined mental action in conceiving of things; and as confusion has often been experienced in the attempt to explain the nature and mu-

Logical distinction
guished from natural
abstraction
and conception.

The whole doctrine
of abstraction and concep-
tion involved in
that of substance
and attribute.

tual relations of substance and of attribute, our notions of these things may profitably be made a subject of discussion.

A scientific distinction, but not of scientific origin.

Before entering upon this, let us premise that, however difficult of analytical understanding the distinction between substance and attribute may be, it is not one for which the science of metaphysics is originally responsible. It is a natural product of the mind. When a man thinks of a guinea, and speaks of its shape, size, color, value, usefulness, and so forth, and distinguishes these things from the guinea as having them, he is distinguishing a substance and its attributes from each other. All that the metaphysician does is to name, and to explain, the distinction.

We form abstract notions of things or substances as well as of attributes or qualities. Whately, McCosh, J. S. Mill, Hamilton, quoted.

The bearing of this distinction upon the doctrine of abstraction and conception may be presented in the following statements, first, that *the logical conception of an object is formed when we unite to the idea of a substance, or thing, those of the attributes which properly belong to it*; and, secondly, that *we form an abstract idea whenever we either abstract the notion of an attribute from that of an object, or the notion of an object from that of any one or more of its attributes*. No one will dispute the first of these statements; but, in regard to the second, it may be objected that *we generally speak of the abstraction, not of substances, or things, but of attributes only*. The fact alleged in this objection must be admitted. At the same time the expression of philosophical truth calls for a use of the term *abstraction*, according to which it may be applied to the ideas of substances as well as to those of attributes; for it can be shown that an act of precisely the same nature may take place in regard to the thing as in regard to its qualities. We cannot deny that eminent writers, speaking of abstraction, confine it to attributes only. Archbishop Whately says, "When we draw off, and contemplate separately, any part of an object presented to the mind, disregarding the rest of it, we are said to abstract that part. Thus a person might, when a rose was before his eyes or mind, make the scent a distinct object of attention, laying aside all thought of the color, form, et cetera." President McCosh, in his "Intuitions," defines abstraction, as "that operation of mind in which we contemplate the quality of an object separately from the object." And, in Mill's "Logic," we read, "An abstract name is a name which stands for an attribute of a thing." The explanation of such statements, and the truth on this subject, is, that the power of abstraction is much more noticeably exercised about attributes than about the objects to which they belong, while yet it is employed about the latter also. Men often contemplate an object in some special light, or from some special point of view, rejecting from their thought other aspects and the attributes which they would bring before us. Regarding some book simply as ornamental, we say that it is a handsomely bound and finished volume; looking on it only as a collection of reading matter, we

say that it is an octavo printed clearly, correctly, and on good paper; considering its contents, we say that it is an able and interesting work. In each of these cases we abstract, not an attribute simply, but *the object, as having certain attributes*, from other attributes which also belong to it. And, so far as the nature of the act itself is concerned, the abstraction of the object from one or more attributes, differs not at all from the abstraction of one or more attributes from the object. When we consider some man as a citizen, as a son, as a husband, as a neighbor, or as a friend, we as much abstract him from characteristics foreign to the view we take of him, as we do his characteristics from him when we say that he is honest, or intelligent, or neighborly, or dutiful, or even when we say that he exhibits honesty, intelligence, neighborliness, or dutifulness. Hence, in ordinary speech, conceptions of high generalization, such as are employed in wide scientific statements, are often styled abstractions, or abstract thoughts; and this equally whether they refer to things or to attributes. Moreover, the abstraction of substances, as well as of attributes, is involved in the doctrine, which all admit and teach, that abstraction is needed to form any common or general notion. Whately says, "Generalization implies abstraction"; McCosh, "Generalization is dependent on abstraction"; Hamilton ("Met." Lect. XXXV.), "Generalization is dependent on abstraction, which it supposes; but abstraction does not involve generalization." If this be so, what is the abstraction involved in forming such general notions as those used above,—man, citizen, son, husband, neighbor, and others of similar character? Is it that of attributes only? Or is it the abstract consideration of objects as possessing certain attributes? Clearly the latter.

If the foregoing observations be correct, the term *abstract* cannot be strictly confined to attributal notions; nor the term *concrete*, which is the opposite of abstract, to substantial notions. This employment of these terms has arisen from an exclusive consideration of the more noticeable action both of abstractive and of synthetic thought, and is not based on any inherent difference in the applicability of the terms. So far as the nature of abstraction and of conception is concerned, we might, in thinking of some system of attributes, have a concrete attributal notion, while, should we think of the object simply as having some attribute or attributes, and to the exclusion of the rest, we would have an abstract substantial notion. The attributal conception to which we have now referred,—that is, the conception of attributes as such,—will receive our more particular attention (§ 131).

§ 126. But here we must remark, in explanation both of what has been said and of what we have yet to say, that the word *substance* in logical discussions, and when opposed to the word *attribute*, has a meaning quite different from what belongs to it elsewhere. Often this term signifies a material entity as occupying space. We speak

The terms *abstract* and *concrete*. *Attributal* and *substantial*.

Logical substance defined. New term proposed.

of water and clay as substances. In a wider sense it is applied to spirit and matter as the only known kinds of entity in which powers or active qualities reside. But *the substance of which we now speak, is anything whatever to which an attribute may be said to belong.* In saying, "The length of the cable is immense," "The color of the rose is pleasing," "The skill of the orator is marvelous," the terms *length*, *color*, and *skill*, stand for substances no less than the terms *cable*, *rose*, and *orator*. For each of them admits of attributes. Indeed, since everything whatever that can exist has attributes, and can be thought of as having them, everything may be regarded as a substance. There is an analogy between this and the less extended uses of the term. As an ordinary substance, and as any spiritual or material entity, is characterized by the powers belonging to it, so anything whatever is characterized by the attributes which may be predicated of it. But the wider meaning is plainly different from the more limited ones. Sometimes the phrase, *logical substance*, is used to distinguish the former. We think it would be well if some other word than *substance* could be employed in discussions like the present, and, for this reason, we may sometimes, instead of substance and attributes, use the terms "*substantum*" and "*attributa*." Even barbarous language is not to be utterly rejected, if it may contribute to clearness of thought.

We may be aided to an exact understanding of the notions expressed by these terms, if we consider some other terms and notions which, as being closely allied to those under discussion, may, with them, be regarded as the products and instruments of logical abstraction and conception.

By entity we mean *that which does or may exist.*
Entity, form, and matter, defined. The essential nature of entity is simple and un-analyzable; in saying entity is that which exists, we define it from its property, not from its essential nature, just as we define air by saying that it is that which animals breathe. Existence is a mark for entity, though it is not a mark for anything less general than entity. Whatever exists is an entity. Whatever is supposed to exist is an hypothetical entity (§ 49). Whatever may exist is a possible entity (§ 74).

Entity might also be defined, by its relation to our thought, as *that of which, or as if of which, we can conceive in any way;* or it might be illustrated and determined by enumerating its principal genera; of which more presently. The word *entity* means the same as the word *thing* in its widest use.

We may think of things, or objects, or entities, without thinking of them as existing. We may do this with respect to any particular entity, and also with respect to entity in general. We have styled entity, as thought of without reference to its existence, *form*, and our conception of it *formal thought* (§ 34). In the present discussion the word *form* will be used in a somewhat different sense from the foregoing; and our remarks will apply to entity whether conceived of as existing or without reference to

its existence. Entity, or that which exists, in general, or any entity, may be considered in two ways. First, *we may regard it without thought of the distinctions between the particular or specific entities included in it*; in which case we may name it *simple entity*, or *entity per se*, or *matter*, or *materia prima*. Secondly, *we may conceive of it as being, or as consisting of, distinguishable entities*; then, and so far as it is thus considered, we may call it *form*, or *formal entity*. An object, every element of which is distinctly conceived of, is thought of wholly as form; but generally we conceive distinctly of an object only in part; so that the object is to us *part matter*, and *part form*. Thus entity in general, or any entity, as conceived of in one way, may be all matter, and, as conceived of in another way, may be all form; but generally it is both matter and form.

Neither the conception of entity as matter, nor the conception of it as form, of itself includes the idea of existence. But, inasmuch as the question, "Is there anything?" which refers to matter, naturally precedes the question, "What is it?" which refers to form, the notion of existence tends to unite itself with that of matter, and to separate itself from that of form. Hence, sometimes, by the formal conception of a thing we may mean a thing viewed *with reference to its form only* and without reference to its existence or non-existence, or even simply *a conception of a thing as viewed without reference to its existence or non-existence* (§ 35). This, though a natural metonymy, is a secondary use of language.

The *summa genera* of entity. They may be conceived of and enumerated in two ways. The radical and the quantitative enumeration.

Formal entity has been variously divided into *summa genera*. We propose the following enumeration without entering here upon any discussion of its merits, our present employment of it being only incidental—Space, Time, Substance, Power, Action, Change, Quantity, and Relationship. In this list each category is to be construed as exclusive of every other. Space and time must be thought of to the exclusion of their quantity, though quantity resides in each of them. Substance and power must be distinctly considered, though all power dwells either in mind or in matter, the only two kinds of substances known to us. Action is to be considered to the exclusion of the change which it produces, or tends to produce. And relation, or, as we would prefer to say, relatedness or relationship, which has no independent existence, must yet be independently regarded. Each of the foregoing elements, as distinctly conceived of, is a formal entity; thought of simply as entity and without reference to its distinctive character, it might be called a material entity. When, thinking of them successively, we say, "This is space, this is time, that is power, that is action," we identify each as a formal with itself as a material entity. Thus we define these entities to ourselves, or rather exercise determinate ideas about them.

The foregoing enumeration supposes an analysis of all objects into their ultimate elemental entities, and is the product of

purely metaphysical thought. It presents seven fundamenta and the relations arising out of them and existing among them. Another logical division of entity, with another list of the elements of existence, results from an analysis of things not so searching as that out of which the enumeration just given originates. This second division is conditioned on the peculiar closeness with which quantity inheres in each of the other categories, so that it is difficult for us to think of them deliberately without thinking of them as having quantity—as being *quanta*. The enumeration, of which we now speak, omits quantity as a separate element, but considers each of the remaining members of the first enumeration as having quantity united with it. We have, therefore, as the quantitative elements of entity, space, time, substance, power, action, change, and relation. For relations admit of addition and subtraction, and of the more and the less, as well as the other forms of entity. Elements being *quanta*—or quantities—the relations of quantity exist between them, as do also other relations which arise among them by reason of their own proper natures.

§ 127. Comparing the quantitative elements of
Materia prima and
secunda. entity as to the respects wherein they agree, we find them alike in being conceivable as matter (§ 126) and as having quantity; but, aside from quantity, they differ totally as to form. Now, since entity, as characterized only by quantity, resembles entity as mere matter in being a constant factor in thought, and in being variously characterizable by the possession of form (for matter possesses form, though matter as such is not conceived of as possessing it), this community of nature, or character, may be indicated by calling entity merely as matter "*materia prima*," and entity merely as having quantity "*materia secunda*." In the same manner, we might speak of a "*forma prima*," and a "*forma secunda*," the one of these consisting of elements as determined by the absolutely ultimate analysis of being, and the other of elements as presented by the quantitative analysis. At present we call attention to the fact that the idea of quantity has a special tendency to unite with our more indefinite conceptions; hence the use of such words as *something*, *anything*, *any one*, and hence the derivation of the indefinite article from the numeral one; and we remark further, that, for the analysis of ordinary thought, "*materia secunda*," alone, may be regarded as matter.

The logical conception of substance—that is, of a substantum, or of the subject of attributes—differs but little from that of "*materia secunda*," of *matter as having quantity*. But entity, as substance, though regarded without any specific conception of form, is conceived of with a decided reference to its having *some* form; as is indicated by the construction of the word *substance*. This is not the case with the notion of entity as matter. Substance, also, is generally conceived of as affected by numerical difference; for we speak more frequently of a substance, or of

substances, than we do of substance simply. Matter, on the other hand, is more commonly spoken of in the general than as individual. Yet we may, in metaphysics as well as elsewhere, speak of a *matter* or of *matters*; and a *thing*—using this term in its widest and most indefinite sense—may be defined as a *matter* or a *material entity*.

Attribute, difference, characteristic, quality, and accident, defined.

From the nature of the case, form cannot be separated from substance except in thought; by thought also it is united—that is, regarded as one—with substance. This union, as we shall see, is mainly identification—the identification of a thing, as thought of in one way, with itself as thought of in another. Form, considered as thus united to substance, is called attribute. Regarded as the basis of the diversity of entities, it is named difference. As marking entity, so that objects are seen as having natures of their own, it is character or characteristic. Simply as revealing the nature of an entity, it is denominated quality; this is its most radical and important aspect. And sometimes it is styled accident, this term being then employed in a wide metaphysical sense to signify that which in thought falls into union with matter.

It is evident that the several quantitative elements of any entity may be regarded as substanta. Each is a distinguishable quantum, and each has form and attributes of its own. Generally, however, when we conceive of a thing as a substantum—that is, as a *something*, distinguished from the qualities belonging to it—we are thinking, not of a single element, but of a combination of elements. The question then arises, “Under what conditions is an assemblage of elements regarded as constituting a substantum, and as having the form or the attributes which we ascribe to it as such?” We answer that this takes place whenever that assemblage, as constituting a metaphysical whole, is subjected to certain modes of conception and of abstraction, which we are now prepared easily to understand.

Substance and attribute defined in their relation to the metaphysical whole and its parts. The conception of them dependent on ultimate metaphysical analysis.

A metaphysical whole (§ 122) exists whenever a number of the elements of entity, conceived either absolutely or quantitatively, are united in some system of relations. As constructed out of elements absolutely ultimate (§ 126), such a whole may be regarded both as being matter and as being form, this latter including quantity as one of its elements; or, if the object should be regarded only with that thoroughly differentiating thought in which every element is distinctly conceived—and not also with that thought which regards entity aside from differences—it would be a whole of form only. With either of these wholes, whose elements are absolutely ultimate, ordinary logical processes are not directly concerned. They have to do rather with that metaphysical whole which is constructed out of quantitative elements, and not out of the absolutely ultimate elements of being, and which,

therefore, may be conceived of as composed of a number of substanta, each element being a substantum. Such a whole may be regarded as constituted out of three general parts; for it contains, *first*, the several elemental substanta, or quanta, by whose union it is made to be a whole, *secondly*, the forms, or differences, belonging to these substanta severally, and, *thirdly*, the various relations whereby the substanta with their attributes are bound together into a system.

Directing our attention specially to these relations, we see that they themselves may be regarded as substanta, that is, as being quanta and as having form or difference (§ 126). Adding them in thought, so far as they are quanta, to the quanta between which they exist, and rejecting all thought of internal difference among parts or elements, we are enabled to think of the whole object *as one distinguishable quantum of entity—as a substantum*; while our formal conceptions of the several elemental parts, including the relations and excluding quantity, also unite themselves together and become *the formal or attributal conception of the whole*. According to the first of these modes of thought we regard the object—say, a ball—as a certain *something*; according to the latter we think of all its properties, its roundness, hardness, size, weight, color, in short, of its entire character.

Such seems to be a satisfactory account of the formation and nature of the ideas of substance and attribute. At the same time, that general act of conception, whereby the several quantitative parts are conceived of as constituting only one quantum or substantum, need not, we suppose, be preceded by specific and distinct conceptions of those parts severally. We may concede to the mind the power of perceiving a complex whole, as such, immediately. But probably that abstraction by which the non-quantitative parts or elements are separated from the substantum, and thereupon, and in their relation to it, regarded as qualities or attributes, is conditioned upon quantitative conceptions of the parts. Be this as it may, it is clear that to conceive of a substantum or thing, is to conceive of a *metaphysical whole*, *as such, but with neglect of any distinction of parts*; while to conceive of attributes is to conceive of *elemental parts in their relation to the whole, but with neglect of that element of quantity which is considered once for all in the substantum*. Thus, both conceptions—that of substance and that of attribute—involve that extreme exercise of the analytic power of the mind whereby quantity, which is so intimately united with all other forms of entity, is yet distinguished from them.

Metaphysical and
logical analysis.

The analysis of an object, whether more or less fully, either into its ultimate or into its quantitative elements, may be styled metaphysical analysis. By means of it the mind conceives more clearly of the nature of things, and advances in scientific knowledge (§ 5). The other analysis, into substance (or subject, or thing, or substan-

tum) and into form (or character, attribute, or quality), we call logical. It is employed to facilitate the comparisons and reasonings of the mind. The first analysis refers solely to the nature of things; it is objective. The second regards things in their relation to two opposite modes of thought, according to one of which an entity is form, or difference, while, according to the other, it is matter or substantum. Both analyses pertain to the metaphysical or elemental whole.

Quantity and relation as attributes. Difficulties solved. Quantity, quality, and relation when contrasted.

§ 128. When the different elements of being are considered in their use as attributes, two solicit attention because of difficulty likely to arise in respect to them. These are *quantity* and *relation*. As already explained, quantity is attributed to an object somewhat differently from the other elements. Each of these, ordinarily, is added in thought to the quantity which a substantum is already conceived of as having. But quantity itself must either be attributed to entity as *materia prima*, the most indefinite *it* of language, or, if asserted of a *substantum* or thing, as ordinarily conceived, must be predicated analytically and not synthetically. As, when we say, "Man is an animal," we add nothing to *man*, but only indicate a part of his nature; so, in saying, "A thing is a quantum," or "Everything is something," or "Everything has quantity," we do not enlarge, but explicate, our thought. But it is to be noticed that when *definite conceptions of quantity* are applied to a substantum, such attribution is not that of quantity simply, but that of *certain relations or relationships between objects, growing out of their character as quanta*. In saying, "The mountain is high," "The horse is strong," "The man is rich," the adjectives express, not so much quantity, as quantitative relations—relations of degree—determined by the comparison of objects as containing height, or strength, or the possession of means. Such a predication of relations is a true mental addition to a substantum as simply having quantity.

Relations differ strikingly from every other class of elemental entities. They excel all other elements in the variety and delicacy of their forms; and they have a peculiar dependence on the other elements for their own existence. The most radical relation of all is that of otherness, or numerical difference; for it is the condition of all others. Identity is not properly a relation, but simply the absence, or non-existence, of otherness, as characterizing an entity. We often say that relations exist *between* two or more objects, and relations have been styled *intermediate entities* (see Hamilton's "Met." p. 688). But this expression is not literally true. Strictly speaking, nothing exists between objects as related, but *every relation consists of parts*, one of which resides in each of the objects. For this reason the term *relationship* is preferable to relation as a name for the ultimate element of entity—relation being composed of inseparable relationships. A cause has a relationship to the effect, and the effect has a relationship to the cause; and these two relationships

together make up the relation of cause and effect. They arise, immediately, from the nature of action and from that of change; action and change are the fundamenta of the relation.

The peculiarity of relationship as an *attribute*, however, does not spring directly from any of the foregoing considerations, but *from its use in connection with the metaphysical whole*. Every such whole consists, in part, of relations; so far as this is the case, relations, whether they be between and among the parts, or be externally directed, are attributes just in the same way that the other elements are, and are so used by the mind. But when a whole is regarded as complete in itself, and as existing, besides, in a relation to some other whole,—for example, a dollar as in one's pocket-book,—in this case, relation is not a quality or attribute, but a *predicate-object*; and, *what we commonly mean when we speak of a relation*. Thus relationship performs a double office in respect to substanta and may be viewed in two lights, in one of which it may be a part, or attribute, or quality, of the object; and in the other of which it may be distinguished from the object as being no part of it. No other element of entity has this double office in the same subtle way that relationship has; for none is a predicate-object save as it may be united by some relation to a whole, which it thereby qualifies. To illustrate: the being a biped—or bipedality—is an attribute of man, though it involves the relation of legs to the rest of the body, and the relation of number expressed by the word *two*, which is a particular instance of the relations of quantity—that, namely, between two quanta of the same kind and one taken as a unit of measure. So *rich* indicates attribute, though it is essentially the relationship of a man to a large property of which he is owner. On the other hand, when we say, “The king is in the carriage,” the relation expressed by *in the carriage*, is no part of the king, but only something predicated of him. Thus relation, though sometimes an attribute or quality, may often be contrasted with attribute, and generally is so contrasted, save when a whole is considered analytically: then relation and attribute are often found to be identical. Objectively speaking, the predication of it as an attribute, is identificative; it identifies relation as form with part of the matter of the substantum; but the predication of it *as a relation*—that is, a relation outside of the whole—is additive. Relationship, as part of a whole, is so united in our conception with other more prominent parts, that its proper character is easily overlooked or misconstrued. It generally enters our thought only as a part of some attribute or quality. But it receives its proper name when considered by itself, which especially happens when it is expressed by a preposition. Thus the notion of *neighbor* includes a relation as an attribute, or as part of a complex attribute; while the expression, “He dwells—or is a dweller—near me,” more distinctly sets forth the relation as such.

The foregoing remarks indicate how quantity, quality, and

relation are contrasted in our minds, in their use as things predicable, and how, at the same time, there are cases in which both quantity and relation must be regarded as qualities, or attributes. They show also how the distinction, or contrast, with which we ordinarily view these predicables, refers not so much to their own nature as to the mode of our thinkings.

§ 129. In connection with substance and attribute, we may notice some similar logical conceptions and the terms applied to them. For very delicate distinctions are sometimes used by the mind while no specific expression is given to them in ordinary language. The whole system of qualities belonging to any substantum, as attributed to, but distinguished from, the substantum, has often been called the form of the object. More fully, it is the "*attributal form*," or what we commonly term *the nature*. The substantum or substance as united with an attributal form—that is, a thing definitely conceived of as possessing a given nature—is the "*substantial*," or, as we would prefer to say, the *substantial*, form. These senses of the word *form* differ somewhat from that already mentioned (§ 126); for in the notion of the attributal form there is a reference to the substantum, and in that of the substantial form the substantum is included as an essential part. Forms of whatever description may be individual or universal, singular or general. The general or universal form is that found in every member of a class; the singular is that peculiar to an individual. The individual, as distinguished from the singular, form, differs from the universal form only by having individuality. Thus, any particular man, considered simply as *a man*, would be an individual substantial form. Frequently, when form is spoken of, the context shows that it is the general, not the singular, form, that is meant.

A *substantial form*—such as a man, or a month, or money—considered as partly constituting some particular individual (for example, Pres. Hayes; this month of September, 1879; *that crooked sixpence*) and so as supporting singular characteristics, has been styled a "*subsistence*"; which therefore may be regarded as closely allied to the substantum. A subsistence is simply a substantial form viewed in a special relation. A subsistence as combined with a singular nature has been called a *suppositum*, or *hypostasis*. The relation between suppositum and subsistence is analogous to that between substantial form and substance. The same thing, according to the light in which we view it, may be substance, substantial form, subsistence, or suppositum. These terms were of more importance in connection with certain exploded metaphysical theories than they are now. They are so allied in meaning that the one term *substance* has been often used for each of the others, and as a general term. Except in certain abstruse reasonings, in which the distinctions they present are necessary to avoid difficulty, there is little need for them. Ordinarily such words as *thing* or *object* serve, according

The attributal and the substantial form, the subsistence, and the *suppositum*.

to the connection, to express the specific ideas of the four terms last considered. For example, when we said above (§ 125), "The logical conception of an object is formed when we unite to the idea of a thing those of the attributes belonging to it," the word *object* might be replaced by either substantial form, or subsistence, as a more exact expression,—and the word *thing* by substantum. Again, in saying, "We may either abstract the notion of an attribute from that of an object, or the notion of an object from that of an attribute," the word *object* would be expressively replaced by either substantum or subsistence, or substance in the wide meaning given above.

Erroneous views considered. Difficulties explained. ex-

If the foregoing doctrines be correct, they may be contrasted with some perversions of truth which occasionally present themselves. Some have been led to believe *substance a thing inconceivable and un-*

knowable. "We can perceive qualities and changes," they say, "but the thing to which they belong is hidden and unseen." This doctrine has been taught both in regard to the logical substance and in regard to that other and less general substance which is distinguished as real. Closely connected, also, with this teaching is the doctrine, of Kantian origin, that the substance or thing has no true and objectual existence, but is *simply a mental form whereby a number of qualities are conveniently bound together*. Such explanations of our conceptions are very unsatisfactory. In the preceding paragraphs the ordinary idea of a substance (or substantum) has been analyzed into those of entity, quantity, individuality, and relatedness to non-quantitative elemental parts. Although this idea is very general and indeterminate, it can be distinctly conceived, and can, and does, express what actually exists. It is neither an inconceivability nor a mental figment. Sometimes, again, the distinction of substance and attribute has been condemned as a delusion of the mind. It has been said that the whole being of a thing consists of its attributes, and that, if these be taken away one after another till all are gone, nothing will be left. Qualities have been compared to the enveloping layers of an onion; the question has been asked, "What remains of the onion after the last layer has been removed?" We allow that a thing is wholly made up of its attributes (that is, of course, including quantity), but we deny that the intellect—the general common intellect—of men, makes any mistake in its fundamental distinctions. The truth is that an object may be viewed as both substance and attribute in much the same way that it may be viewed both as form and as matter (§ 126); in each case we contrast a thing as viewed in one way with itself as viewed in another.

No one can deny that we can distinguish between the same man as a father and as a son, or between Socrates the Athenian and Socrates the philosopher, the same Socrates being both. It may be said, however, that a thing viewed as matter and as form is precisely the same thing *in all respects*; whereas Socrates as

Athenian and Socrates as philosopher are not precisely the same object, but two wholes whose principal part is common, but which also have each a peculiar element. This point, in a certain sense, is well taken. Were we to regard things only in their objectual relations, we must allow that the names *matter* and *form* would present a distinction without a difference. But let us remember that the definition of these terms involves a subjective reference, that they stand for an object as in its relations to two diverse modes of thought, and that therefore *they properly distinguish the object as in one relation from itself as in another*. These remarks respecting matter and form immediately apply to the distinction of substance and attribute in case we take a logical substance to signify, as it sometimes does, simply matter (*materia prima*) as individualized and as related to that form with which it is wholly identical. But if we employ the ordinary conception of substance, which adds quantity, as well as individuality, to matter, we have an *objective*, as well as a subjective, reason for the distinction under consideration. For now quantity, as belonging to the substantum, is distinguishable from *the non-quantitative attributes which constitute the attributal form*; so that, to some extent, the attribution of the form to the substantum mentally unites things of different natures. If, proceeding a step farther, we employ substance to signify *a substantial form, or a subsistence, in its relation to additional attributes which may be assigned to it*, we find a yet stronger reason, objectively, for distinguishing the substance from any such added attributes. In forming the idea, "An elegant speech," by attaching the attribute *elegant* to the substance *a speech*, we add this attribute to other attributes already conceived of as in the object, and, as clearly, distinguish the attribute *elegant* from the substance *speech*. Thus the distinction between substance and attribute is, in several ways, fully justified.

The structure of language analyzed. The parts of speech and their use accounted for. Two stages in the development of language. Aristotle quoted.

§ 130. Light will be thrown on the substantum and its attributa, as well as on kindred forms of thought, if we study *the structural parts of human speech*, and their probable or necessary origin. The analysis of thought and of objects, which language indicates, is not metaphysically ultimate. It differs both from the non-quantitative and from the quantitative analysis of which we have spoken (§ 126). It is related to that mode of thinking which we have just considered, and which recognizes three categories or general classes of objects, viz., substances, attributes, and relations. It agrees with this last in having reference to the character of our mental action as well as to the nature of objects, and differs from it in being not so searching as to the separate conception of relations. Often, in ordinary thinking, a relation is so combined with that which it introduces as related, that the two form but one conceptum—or object of conception. The radical categories of thought, and of existence, on which the structure of language is based, are four

in number, namely, the substance, the attribute, the relation, and the adjunct.

For facility of explanation, the formation of speech may be regarded as having had two stages, the one primary and immature, the other mature or secondary. In the former of these the mind may be supposed to have framed for itself five classes of conceptions. *First* of all, *real* substances, as they have been called, that is, persons and tangible material objects, were perceived and thought of. For the world of fact and of observation presents these things, and, indeed, all things, not as one, but as many wholes. In the *next* place, these substances, being compared with one another, the differences, attributes, or qualities, of real things were distinctly noted. *Thirdly*, the actions and changes of these substances were thought of—not, like the substances themselves, as things to be considered independently or in a changing variety of relations, nor yet, like attributes, as parts of wholes,—but as adjuncts related to the substances, and also as things of a transitory character. We may suppose that the first formal predications of language referred to this class of objects and presented them as taking place in their relation to the substances to which they were seen to belong—the latter being the subjects of the predication, and their existence being assumed as fixed and known. *Fourthly*, relations—that is, relations *other than those* between substances, on the one hand, and their qualities or their actions and changes, on the other,—were perceived as existing variously between substances, attributes, actions, and changes. And, *fifthly*, the attributes, the actions and changes, and the relations, of things, were seen to admit of qualities and adjuncts in somewhat the same way as the substances to which they belong. Thus originated the *noun*, or substantive as it is sometimes called; the *adjective*, which primarily is the attributive word; the *verb*, in its use as predicating action, or change; the *preposition*, by which relations are expressly denoted; and the *adverb*, by which modifying words and expressions are themselves modified. When we say, “The white horses prance gayly on the road,” the adverb *gayly* qualifies *prance* just as the adjective *white* qualifies *horses*, while the preposition *on* shows the relation between the *prancing* and the *road*. Thus the adverb, as will be understood more fully hereafter, is a kind of adjective of peculiar use and application. The whole phrase, *on the road*, may be regarded as an adverbial expression, and is similar in meaning to such words as *here*, *there*, *now*, and *then*. But in construction with a noun it would be an adjective expression. For the thought of some relation is included in that of every attribute or adjunct. In addition to the foregoing parts of speech, *conjunctions* were devised to express the relations of connection, sequence, and opposition, between successive thoughts and statements. This is evident from the fact that every simple conjunction—for some conjunctions have an adverbial force also—may be replaced, though somewhat awkwardly, by a preposition and a pronoun.

And means, "in addition to this"; *but*, "notwithstanding this"; *therefore*, "because of this"; and so on. When we say, "James and John spoke," we mean "James spoke; in addition to this, John spoke." If we remember that a pronoun is really a noun, expressing, by reference, the meaning of the noun for which it stands, and that interjections simply utter feelings with the indefinite thoughts or beliefs which give rise to them, we shall have defined the noun, the pronoun, the adjective, the adverb, the verb, the preposition, the conjunction, and the interjection—in short, all the structural parts of language, in its primary or immature stage.

The secondary, or maturer, stage differs from the primary *in extending the applicability of most of these parts of speech*; in this way it greatly enlarges the capabilities of language as the vehicle and instrument of thought. The noun is no longer confined to substances in the narrow sense, but is applied to every entity whatever which the mind may make the object of its more direct consideration. For anything whatever may be regarded as a substantum. Hence the use of infinitives and abstract words as nouns. The sphere of the adjective is enlarged, not only because attributes are multiplied along with the multiplication of substanta, but also because adjectives are employed to denote *whatever is capable of being the attribute of a substantum*—that is, of being included in or with a metaphysical whole as part of it—*whether it be considered as an attribute or merely as an adjunct*. Hence some adjectives generally indicate what are conceived of as adjuncts or as relations—things which may be contrasted with attributes. Take, for example, such words as *cheap, dear, present, future, possible, true, third, fourth*, together with the articles and the demonstrative pronouns; for these also are adjectives. Other adjectives more naturally denote attributes; most adjectives may be used by the mind either way. The varying application of adjectives may be especially seen in some participles. "A running horse" may signify either a racer, or a horse that is running. In the latter case we have an adjunct; in the former an attribute. And any adjective is only adjunctive when intended to express a temporary condition. For illustration, take the sentence of Cicero, "*Nemo saltat sobrius.*"

In the maturer stage of language, the verb, also, and its forms, *are no longer restricted to actions and changes*, but are applied to whatever in thought may follow substanta and may be predicated of them, as actions and changes follow substances and are predicated of them. Hence the principal office of the verb is, *now*, to denote whatever may be a temporary adjunct of a substantum, and to assert the existence of it in this relation, defining also the time of its existence. This widened applicability of the verb may be seen in such words as *occupy, last, exceed, amount to, resemble, relate to*, and many others which express relatedness. By a further extension of the use of this part of speech, all predications whatever come to be expressed

by it or by the aid of it. That large and more primary class of predications which refer to time, have determined the form of all. Universal statements—for example, “Grapes grow on vines,” “Our canary sings sweetly,”—are commonly made in the present tense, but without reference to time. Aristotle appears to be partly wrong when he says, “A verb is that which, besides something else, signifies time;” for the indication of time is something accidental to the verb, is not its essential and important office, and is sometimes wholly laid aside; but he is right in adding, “It is always indicative of those things which are asserted of something else” (“De Inter.” chap. iii.). The spheres of the adverb, the preposition, and the conjunction, are greatly enlarged with the development of language; but they can scarcely be said to have found new spheres of employment in the same way that the noun, the adjective, and the verb, have done. We may add, however, that the main primary use of the adverb seems to have been to express adjuncts, as that of the adjective was to express attributes. In the preceding sketch two stages have been assumed to indicate *the probable order logically followed by the mind in its development of the use of the different parts of speech*. We would not be understood to assert that such stages were ever really experienced. Certainly the first stage, if it ever occurred, must have been of short duration.

The radical conceptions exhibited in the formation and use of language. Substance, attribute, adjunct.

We shall study the forms of language further in connection with predication. Our present analysis suggests the following lessons.

First, a substance or substantum, of which the noun is the expression, is conceived of as being the quantitative metaphysical whole, without additions. Nothing is a part of the substantum which is conceived of as in external relation to the whole. The substantum may be considered independently of its relations, as when we say, “The road,” or “The fire”; or we may think of it in some relation, as when we say, “On the road,” “The fire smokes.” In the latter case there is something prefixed or affixed to our conception of the substantum.

In the *next* place, adjectives do not always express attributive parts; they may denote relationships external to the whole. Therefore, they are sometimes identificative or attributive;—and this either analytically or synthetically, according as our attribution develops or enlarges our conception of the object;—but, at other times, they are adjunctive or relational. The notion of the substantum—that is, of the *substantial form*—can be so modified as to include that of the adjective adjunct; but, as a matter of fact, this unification does not always or necessarily take place.

As the adjective primarily expresses permanent attributes, so *the verb*, that is, the proper or finite verb, *primarily expresses temporary adjuncts*. Its inflexions subserve the design of indicating the present, past, or future existence of such an adjunct. When the verb is used to express what belongs to a thing permanently

or essentially, its full proper expressiveness is abated. The predicational force of the verb arises from the fact that the ideas of existence and of non-existence, which predication asserts (§ 47), naturally connect themselves with the transitory, and with distinctions of time. For, in one sense, the present is the existent; while the past and the future are the non-existent; and, in another, what has existed in the past, or shall exist in the future, does not exist now. In other words, the existence of temporary things has a close logical connection with the *time* of their existence.

The employment of the verb *to be* as copula, and its force as such, are a special and peculiar result of the general employment of the verb in predication; and will be considered in its proper place (§ 204).

The adverb *differs little in force from the adjective*, as is seen in those languages which, like the German, do not ordinarily distinguish these parts of speech. It is related to other modifiers as secondary branches are to the larger ones on which they grow.

Prepositions and conjunctions differ from other parts of speech in that the ideas they express are always doubly related, as themselves indicating relation. They agree with adjectives, verbs, and adverbs, in never denoting the object of independent or of direct conception. Moreover, they properly indicate, not parts, but adjuncts.

Finally, to repeat what we said at first, the principal lesson taught by a survey of the structure and use of language, is the following, viz., that *the categories of ordinary conception embrace not only the substance, the attribute, and the relation, but also the adjunct, or, if we regard relation as a kind of inchoate or incomplete adjunct (which it always is), we shall have three categories of conception, the substance, the attribute, and the adjunct.* The first of these is expressed by the noun only; but the *oblique cases* of the noun present the substantum, not as such, but as introduced by a relation, and therefore as the object of indirect conception, and as constituting, with the help of the relation, an adjunct, or, it may be, sometimes, an attribute. The adjective chiefly expresses attributes; the adverb, adjuncts; but each may express either. The verb generally, the preposition and the conjunction always, indicate adjuncts. The adjunct may be distinguished from the attribute, in that *the former is conceived of as external to the whole which it affects*; both may be distinguished from the substantum, because they are always conceived of as in relation to what they modify, and *their proper character is lost if they be conceived of independently.*

“*Res per se considerata.*” “*Ens per se subsistens.*”
Attributes as substances. “Abstract” conceptions.
Spinoza.

§ 131. Inasmuch as the substantum, being a whole without additions, can be conceived of independently—that is, without thought of any relation external to itself—while attributes and adjuncts cannot, some have explained a substance to mean a thing considered in itself—“*res per se considerata.*”

This is not true if we should mean by it that a thing as a sub

stantum cannot be, and never is, conceived of as in relations external to itself. The contrary constantly takes place. Hence the cases of nouns, and those adjunct expressions in which nouns are governed by prepositions; even the nominative case as the subject of a sentence sets forth the substantum as in relation. But the statement may mean that a thing is a substantum *as being itself, and without respect to any additions*, that is, only so far as it is a metaphysical whole; and this would be true. The consideration of the thing by itself, or without thought of its external relations, enables us to form the conception of the substance, but is not itself any part of that conception. Others again, following some statements of Aristotle, have defined a substance as "*ens per se subsistens*." In this the word *subsist* has a meaning only remotely connected with that subsistence of which we have already spoken (§ 129). It signifies to exist by reason of some cause, which, figuratively speaking, supports the existence. The expression "*per se subsistens*," is equivalent to self-existent. According to this, a substance is that which exists independently, or of itself. This famous definition was the main pillar of Spinoza's pantheism; it made God, as alone self-existent, to be the one only substance. We shall not dwell upon its falsity. Plainly the only independence necessarily connected with the substantum is a kind of independence of conception.

Before concluding the present discussion we must consider a class of conceptions in which the ideas of substance and attribute form a peculiar combination. Sometimes the notion of substance is applied—not to the whole to which some attribute belongs—but to the attribute itself; hence arise what are called *abstract nouns*, such as whiteness, gayety, length, breadth, goodness, gladness, greatness, etc. This class of ideas are secondary formations; they may be distinguished from the conceptions from which they are derived as being attributal, not attributive. That is, they do not, by their own force, attribute anything as a quality to a substance, but they set it forth as having been attributed, or as attributable. Moreover, it is plain that the mind forms these notions by considering things which are attributes *independently*; that is, without thought of any relations save those which are involved in our very conception of the attribute. In other words, they arise from our considering the thing, or whole, *per se*, and no farther. Moreover, the object thus thought of may be, and often is, characterized by attributes and affected by adjuncts. In short, what was at first an attribute is now thought of as a substantum, even while a general reference to its natural function as an attribute is a part of our conception of it. But, it may be asked, "Is this substantum, which can be independently conceived and which admits of attributes and adjuncts, characterized by quantity also?" We think it is: we believe that the quantitative mode of thought is naturally assumed, when the quality is thought of directly and independently and not in immediate contrast with the substantum to which it belongs. Even

if this could not be shown to take place very sensibly, we would still regard the quality, when abstractly considered, as a kind of secondary substantum. It would partake of the principal characteristics of the substantum, even while this might not reach its full or normal development. Similar remarks are applicable to the significations of those nouns which represent actions, changes, states, relations, and other *adjuncts*. Such words as *war, peace, motion, rest, transaction, result, walking, speaking, nearness, distance, contrariety, agreement*, and others like them, are properly styled substantives. We have now described certain modes of thought to which the action of the mind is more or less constantly conformed; of course, modifications of these modes may be looked for whenever such modification may be demanded by the nature of the case. This subject of conception illustrates that wonderful unconscious skill with which the soul adapts its forms of thought and of expression to the numberless modes of being which the universe presents. The reflections of a perfect mirror are not to be compared with the thinkings of the human mind for amazing and subtle adaptability.

CHAPTER XXIX.

GENERALIZATION AND INDIVIDUATION.

§ 132. Generalization is a process allied to abstraction, and might be considered a species of it. Generalization includes what we ordinarily mean by abstraction, together with a further process radically of the same nature. Each of these constituent processes involves the retention of part of a thought and the rejection of the rest. But the part specially rejected when we generalize is quite different in its signification, or objective force, from that rejected when we merely abstract, and the rejection of it is attended with peculiar results. For these reasons it is well to consider abstraction and generalization as distinct processes.

Of all the secondary powers of mind, generalization has the most immediate bearing upon the philosophy of the ascertainment of truth and the construction of science. An understanding of the doctrine of the general notion is the key which unlocks the principal mysteries of logic; and it is the explanation of the leading laws and forms of scientific thought.

General ideas are those which can be applied to any one of a class of similar objects simply on account of their similarity. The notions *horse, man, strong, wise, walk, think, certainly, quickly, homeliness, beauty, fear, force*, and the immense majority of conceptions expressed by single words, are general. We have

Generalization related to abstraction.
General notions defined.

general notions, not only of logical substances—or *substanta*—but also of attributes, and of adjuncts, and of abstract *substanta*. Combinations of thought and statements of truth may also be general; as when we say, “The strength of the horse,” “The value of money”; or, “The wise man speaks wisely,” “The rose is the most beautiful of flowers.” Every mode of conception and every construction of ideas setting forth the nature of things, may assume the form of generality. But, as the character of attributes, adjuncts, and predications, is determined by that of the *substanta* to which they are attached, our discussion must mainly concern the generalization of *substantial* notions.

Ideas which correspond to one object only, and cannot be applied to different similar objects, are styled *singular*, as having that in their signification which is wholly singular or peculiar. When some singular object is thought of *simply as a singular object of a certain kind*, we call it an individual; and our conception of it may be styled an individualized conception. If, instead of speaking of man in general, we should mention some one person as “*the man*” with whom we had some transaction, or as “*a man*” of whom we heard once, the expressions “the man” and “a man” would stand for individualized notions. Such notions result ordinarily from applying a general notion to an individual object; in other words, from thinking of the object by means of a general notion which corresponds to it. All singular objects are called individuals, because they cannot be divided into members in the same way that classes of similars can. When, however, the singular is contrasted with the individual, the latter signifies a singular object considered with reference to some general character, while the former sets forth the singular object with reference to its own peculiar characteristics. Cæsar, simply as a man, is an individual object; Cæsar, *as Cæsar*, is a singular object. In this way individual, or, more properly, individualized, notions are contrasted with singular. But, without this contrast, expressed or understood, the singular comprehends both the singular and the individual. General notions are expressed by the common noun used without addition, as “horse”; individualized notions, by this noun accompanied or affected by an individualizing adjunct; for example, “a horse,” “horses,” “this horse,” “these horses”; singular notions, either by proper names or by the common noun with some singularizing adjunct, as “The king” (that is, the definitely known king), or Alexander, or Alexander’s horse, or Bucephalus.

The terms *universal* and *general* are opposed to the terms *individual* and *singular*. Either of the former may be opposed to either of the latter. But the term *universal* is more frequently used when the contrast is with singular or individual objects, and the term *general* when the contrast is with singular or individual conceptions. “Man” stands for an “universal” *object*, and expresses a general *notion*. The word *general*, being derived from

The singular notion defined.
Singulars distinguished from individuals.

the Latin *genus* (*γένος*, a kind), signifies what belongs to every one of a given kind of objects. This, its original and philosophic meaning, is to be distinguished from that signification in common use, according to which whatever is true for the most part of some class of things, is called general; as when we say, "Savages generally—that is, for the most part—are treacherous."

Modes of expressing general notions. Proper and improper.

§ 133. A general notion may either be conceived *simply*, or it may be conceived *as contrasted with other general notions, and as definitely distinguishing some given kind of thing*. The proper expression of it when conceived in the former way, is the

common noun without the definite article or other addition. *Man, gold, virtue, heat, malleability*, are words each of which of itself expresses a general idea in its purest or simplest form. The expression for a general notion, conceived as having a distinguishing power, is the common noun with the definite article prefixed. Such designations as "The horse," "The dance," "The church," "The state," "The pulpit," "The press," "The theater," and many like them, may serve as illustrations. The significance of the article, to which we now refer, is quite different from its force in pointing out an individual either as definitely known or as definitely related. While it attaches itself to general ideas, it does not form any part of them. It is especially employed when the mind opposes some one kind of thing to others of the same generic nature. When we speak, in the general, of "the pulpit," we mean that agency of public impression as contrasted with the press, the theater, and other agencies. "The *dance*" is thought of as an amusement and in contrast with other amusements. As every general notion may be conceived either *per se* or as distinct from other notions, a choice becomes possible between the defined and the undefined modes of thought and of expression. Some languages, as the French and the Greek, prefer the defined; others, as the Latin and the English, the undefined. German occupies a middle ground. These differences arise from peculiarities in the mental habits of each people.

Beside the two proper modes of expressing general notions, several secondary, or improper, modes, are of frequent use. The tendency of the mind is to avoid the general and abstract, because removed from a view of things as actually existent, and to employ modes of thought in which the general conception is presented rather by implication than expressly. For example, *individualized* notions are employed instead of general ideas; and this sometimes in the singular number, and sometimes in the plural. We say indifferently, "Man must die," "A man must die," and "Men must die"; or, "The horse is a noble animal," "A horse is a noble animal," and "Horses are noble animals." In each case we utter, and intend to utter, a general truth. But, when using the indefinite terms *a man*, and *men*, we do not present the truth in its naked generality; we give an immediate

inference from the general truth, from which inference, also, that truth itself may be immediately inferred. Hence such statements themselves are often styled *general*. When the indefinite article occurs in them, it differs from the singular number of the adjective *any*, only in being a less emphatic expression of individual indefiniteness; the plural of nouns signifies that what is said applies to any number, or to all, of the things of the kind named. What is necessarily true of any kind of thing, is true of any individual or of any number of individuals of the kind; and what is necessarily true of any individual, or any number of individuals, of a given kind, simply as being of that kind, must be true of that kind of thing in general.

Another secondary and inferential mode of expression is found in universal statements respecting the members of the *logical class*. All the objects to which the same general notion is applicable, may be considered as constituting one class. Whatever is true of that general thing, or that kind of thing, which the notion represents, must be true of every member of the class, and of all the members individually; and whatever is true of every member of a logical class, or of all the members individually, simply as being things of a certain kind, must be true of that kind of thing in general.

Hence we have such statements as, "Every law-breaker should be punished," "All judges should be just;" in which class-conceptions take the place of the general notion.

Sometimes a statement in one of the forms of universality which we have now considered, evidently is not literally true. Should we say, "The horse is a useful animal," it might be objected that some horses are utterly vicious, wild, and unusable. The fact is that such statements are made with an understanding which limits their application; they express, therefore, what is universally true within a given sphere. Horses are useful always under the circumstances in which the speaker conceives of them—that is, as ordinarily to be met with and observed. These statements of limited universality may always take this form, "Things to be supposed being supposed, such and such is universally the case." We say, "The grape is a luscious fruit," that is, of course, always when it is in ripe and good condition. Because such expressions when interpreted without an interpreter, when considered as unqualified, though they need qualification, are not strictly universal, the term *general* came to signify that which happens for the most part. Here, also, we must allow, what shall be seen more clearly hereafter, that the general notion, that is, *the notion expressed by the common noun*, does not always or necessarily involve the universality of the predication of which it may be the subject. This really results from the necessitudinal character which ordinarily belongs to such predications.

The distinction between general and individual, or singular, ideas, even when the latter are used, in indefinite or universal

Limited generality
—statements of.

expressions, as equivalent to the former, is essential to an understanding of the nature of the general notion. This distinction is recognized in the forms of language; but the nature of it will become more apparent if we consider that process, called *generalization*, by which the mind forms its general thoughts or notions.

The process of generalization described and defined.

§ 134. This process, as it ordinarily takes place, is often, and correctly, described as follows. *First*, a number of objects are perceived to be similar to each other in one or more respects. Ten, fifteen, twenty, or any number of cherries, are seen to be alike in their form, size, color, taste, contents, origin, and use. That act of the mind whereby its thought is intentionally exercised regarding objects, in order to discern their points of likeness and of unlikeness, is called *comparison*. *Secondly*, the perception of similarity, obtained by comparison, is immediately and naturally followed by an act of abstraction, whereby the objects compared are thought of only as to those characteristics or parts in which they are alike, all other characteristics being rejected from consideration. We have now still as many ideas as there are objects, but every idea is precisely similar to every other. Our conceptions, at this stage, of fifteen or twenty cherries, are very similar to what our perceptions of the same number of cherries would be, were the cherries arranged in a row at such a distance from us that no difference in size, or appearance, or any other particular, could be noticed between any two of them. *Thirdly*, some one individual object, selected at random, is thought of in the special or abstract view taken of it; or all the individuals are thus thought of at once, under one plural conception. That is, we think of one particular cherry as this or that cherry simply, or of all the cherries collectively, as those cherries. For a plural conception, in which we think at once of many things as many, is not composed of many unital conceptions, though it may be derived from them; but is the same as a unital (that is, a grammatically singular) conception, save only that the element of plurality has displaced that of unity. *Fourthly*, the mind, taking either of these last-described conceptions, rejects from it the element of individuality. Thereupon, we think, not of any individual cherry, nor of any number of individual cherries, but simply of cherry or of *the* cherry.

The essential point in generalization; the specific difference of this process.

The first two of the foregoing steps, and likewise the last two, may, if we please, be naturally regarded as one. Generalization, therefore, may be described as containing two successive parts or stages; in the first of which *we consider a number of similar objects abstractly* and only so far as they are similar; and in the second of which *we discard the element of individuality* from the conception either of one object, or of several. This second step is the essential part—the specific difference—of the process of generalization; it may be illustrated by a mental ex-

periment. Let us suppose ourselves to inspect successively a number of ships at a sea-port town, so as to have a correct and distinct idea of each. Let us imagine, also, the whole fleet to have set out to sea and to have attained a distance at which each ship can be seen plainly, yet not with sufficient distinctness to be recognized by means of its own peculiarities. Our perception of the vessels is now quite undefined as compared with the views obtained in the harbor, yet it is still a perception of individuals; we see this ship, that ship, and the other, sailing before us. Now, shutting our eyes, let us take the thought of any one ship, or of several, and let us eliminate from this conception all reference to individual difference—all thought of the fact that individual peculiarities must and do exist. There remains the general notion, ship, or *the ship*.

In order to an understanding of the process of generalization certain points are worthy of special consideration. In the first place, let us notice that the thought of the similarity found to exist between the objects compared, does not enter into the general conception as a component part of it. The general notion includes the respects wherein the objects are alike, but not their likeness. Similarity furnishes a rule to be observed by the mind in the process of abstraction, but is not itself one of the elements abstracted. After the completion of the generalization, all thought of the comparison may be dismissed, just as a scaffolding no longer needed may be taken away.

The thought of similarity not included in the general notion.

This introduces the remark, that generalization *may* take place without any comparison at all, and from the consideration of only one object.

It is only necessary that we should conceive, more or less fully, of the object, and then reject from our conception the thought of individual difference or peculiarity. For, in this way, we can obtain a notion applicable to any other object which may be similar to the one considered so far as it is considered—that is, a general notion. A geologist, finding a specimen of rock such as he has never seen before, may truly say that he has discovered a new kind of stone. Commonly, however, the comparison of individuals is requisite for the exact establishment and definition of any existing kind of thing.

Some writers, referring to the exclusion of all thought of individual difference, have said that, in generalization, we think *the similar as the same* and *the many as the one*. Such language is not strictly true; and is calculated to perplex. There is a sense in which it may be accepted; but, taken literally, it suggests either that a number of different things can be condensed together, so as to form one of their own number, or that, against reason and fact, we can think of them as if they could. The truth is that the mind, in generalization, does not judge and accept the many and different to be one and the same, but rather rejects

We do not think the similar as the same, or the many as the one.

all thought of their number and difference, and no longer thinks of them, or of any one individual object, but thinks *that one thought which remains*; and which, in a certain peculiar and secondary sense, may be said to have an object—one object—of its own.

Numerical difference defined.
The rejection of it the final step in generalization.

In the next place, to say that all thought of *individual* difference is rejected in generalization, though true, is not the full and perfect expression of the truth. It would be better to say that the final and essential step in generalization is to reject all thought of *numerical difference*, that is, all thought of that difference which is necessarily involved in the formation and use of the conceptions of number. For it is evident that we generalize, not only from individuals, but also from species, and that the last step in this latter case, no less than in the former, is to eliminate, from our conception of the subject, or subjects, of our generalization, the thought of number, whether it be of one or of more than one. We may think of the horse, the dog, the cat, the fox, the lion, the tiger, and other animals as so many similar kinds of things; and, from consideration of them, we may form a generic notion—the quadruped. In such a generalization individual difference is not rejected; all such difference has been dismissed already in the primary generalizations. But we may be said to discard numerical difference. For the various species of animals mentioned can be conceived of, without conceiving of their specific characteristics, simply as *so many similar kinds*; we can speak of this or that kind, of the first, second, third, or fourth kind, or of one, two, three, or four kinds, and so on. But the generic idea, "Quadruped," or "The Quadruped," contains no such numerical distinctions.

The nature of numerical difference explained.

§ 135. That difference between species, which is thus rejected, and which is extremely analogous to the individual difference already mentioned, escaped the notice of the older metaphysicians and logicians. The only numerical difference they give is that which is individual. We ascribe this omission, not to any lack of acuteness in mediæval thinkers, but partly to the comparative unimportance in logic of the numerical difference of species, and yet more to that false objectualization of the Aristotelian metaphysics, which made the distinction of form and matter much greater than it really is. This resulted in a tendency to confine matter to the individual and to make the *universal*, whether species or genus, all form and form only.

When, in the case either of individuals or of kinds, we analyze numerical difference, we find it to be the same with ordinary specific or singular difference, *conceived of, however, as matter and not as form*. That is, it is simple difference, without distinction of the parts or elements of the difference. We may say, then, that there are two modes of numerical difference, one

of which belongs to individual objects as having *individual differential matter*, and the other of which belongs to general objects as having *specific differential matter*. Or, should genera be numbered under a higher genus, we might speak of *generic differential matter*, as constituting their numerical difference. The rejection of either of these modes of difference is the final step in generalization.

Singular and individual difference distinguished.

The singular has already been distinguished from the individual as being identical with the latter, save only that its peculiarities are more fully conceived. In the same way we may contrast singular and individual difference; with reference to this contrast individual difference would mean the same as the numerical difference of individuals or of singulars.

Specification and individuation defined and distinguished.

In connection with the foregoing point, we may consider specification and individuation (or individualization) as mental acts. By the former of these a specific conception is formed from a generic one by the addition of specific difference; thus "horse" may be formed from "quadruped." By the latter an individual conception is formed upon a general one; thus "Bucephalus" is formed either upon "horse" or "quadruped." These processes are closely allied; there is, however, a twofold distinction between them. *First* of all, in specification, the difference may be added either as definitely conceived, that is, as *form*, or as indefinitely conceived, that is, as *matter*. We can therefore distinguish between material and formal specification, the former merely enumerating kinds, or distinguishing them externally, the latter giving also the nature of each kind. But in individuation only Omniscience can add in thought every attribute of the object; therefore, of necessity, we add first what we may know and then, by a further addition, make allowance for what we do not know. In short, our individuation always adds matter; or—taking advantage of the contrast of terms—our singularization always partakes more or less of the character of individualization.

Secondly, the mental addition of matter, in numerical specification, is never so complete as to render the object thought of incapable of receiving further differential matter. If we think of quadruped as a kind of animal, we can again think of dog or horse as a kind of quadruped, and still further of the dog Nero or the horse Bucephalus as an individual, each new conception involving a new addition of difference. But when, finally, we add singular or individual difference, there is no possibility of adding more. We then conceive of an object as having every characteristic or distinction—in other words, all the difference—that it can have. Individual difference, therefore, differs from specific in that it has a certain fulness, or completeness, which the latter lacks.

Thomas Aquinas
and Duns Scotus.
Quoted on individ-
uation.
Their doctrine
substantially cor-
rect.
Hæcceitas and
quidditas.

These remarks enable us to appreciate the teachings of two famous doctors of the thirteenth century. Thomas Aquinas "made the principle of individuation to lie in the matter by virtue of which when united to the form—that is, the universal—each individual came to be what it is"; Duns Scotus taught that the individual thing is constituted by the union of its *hæcceitas*, or thisness, with its *quidditas* or whatness ("The Human Intellect," § 399). These views are essentially the same; the *quidditas* is the specific form as it is related to the generic, and the *hæcceitas* is individual differential matter considered as a ground of distinction. But Scotus asserted that his *hæcceity* had something in it additional to the matter of which Aquinas spoke; which assertion agrees with the view already given, that individual difference has the peculiarity of a certain fulness or completeness, which specific difference lacks. *Hæcceity* is an excellent term; it is nearly the equivalent of numerical difference, each expression presenting the same thing in a special light. Like numerical difference, also, it naturally applies to specific as well as to individual differential matter; yet it may usefully be confined to the latter, according to the intention of its inventor. The doctrine to be gathered from the teachings of the Scholastics, is that an individualized conception results from a combination of matter with form; and this may be accepted provided it be understood that *form as well as matter may be singular*. That is, we may, and constantly do, perceive characteristics in individuals such as no other individuals have or can have. What other body could be the center of the solar system in the same sense in which our sun is? And it is evident that individuation—or, more exactly speaking, singularization—often involves the addition of this singular form, as well as that of individual differential matter, to the general form, or universal.

Specification and individuation are processes closely allied to one another; on which account, in common speech, the same term—*specification*—expresses either.

§ 136. Having considered general notions, and the mode of their formation, we proceed to inquire concerning *general objects, or universals* as they have been styled by philosophers. The true doctrine concerning universals is not only interesting in itself, but also contributes greatly to an understanding of the nature and functions of the general notion. First of all, it is to be premised that, in some sense or other, *we may speak of general objects*. We constantly mention such things. We say, "Man is mortal," "War is a dreadful evil," "Virtue is the highest good," "The pulpit and the press are potent in a free country," "The human soul is Godlike and immortal." It would be folly to say that those who make such statements are not, in any sense, thinking about any-

The general ob-
ject, or universal.
Is constantly men-
tioned, yet has no
real existence.
Analogous to the
ideal object.
"Omne quod est, eo
quod est, singulare
est." Boethius.

thing, that their conceptions do not, in any sense, have objects. Several theories have been held in regard to the significance of that thought which is expressed by general language; but one of two views must be correct. Either it sets forth objects which exist as truly and literally as the mind itself does which thinks of them, and as those individuals do which the mind perceives and knows to exist; or it may be held that our thoughts and statements, as about universals, are *secondary modes of mental action* based upon, and referring to, our thinkings concerning real objects, yet *not of themselves setting forth any reality*. In other words, general may be supposed to be analogous with ideal objects (§ 38), of which we speak as if they really existed and acted and were related variously, when, in truth, they do not exist at all. Of these contradictory views, the second, alone, in whatever light the matter may be regarded, is worthy of acceptance.

For, first of all, to suppose the reality of universals would lead to great absurdities. Take any general object, as "animal." We ask, "Where, when, and how long, has it existed? Who ever saw it? What is its position as a part of the universe of actual being?" Clearly no place or period can be assigned to it, unless we say that it exists everywhere and always. For whatever exists at any particular place or for any given time, is, and must be, an individual object. But what absurdity to think of an eternal and omnipresent animal! Nor does it help the matter to say that the general animal exists in every individual animal. For, in the first place, we can conceive of animals that have no existence, such as unicorns, winged horses, great sea-serpents; yet such animals would include the universal. And, in the second place, although every animal has that in it which corresponds to the general object, and may be conceived of by the application of a general notion, still, properly speaking, it does not include the universal, but only that which corresponds to it. Every part of the nature of any individual animal is individual, not universal; and the general notion, when applied to any individual, or to any number of individuals, receives an addition whereby it ceases to be a general, and becomes an individualized notion. Moreover, the general object "animal," if it exist, is but one object; but, if it exist in many different animals, it must do so *as the many and the different*. And so a case arises in which many and different objects are, without any change of meaning, one and the same object. This is an impossibility. Hence those authors who say that, in generalization, we think of the many as the one—of the similars as the same—swerve somewhat from literality ("The Human Intellect," § 384). Their language resembles that employed when we speak of certain things, which have similar natures, as having *one common nature*; just as if a nature were like a piece of land, or other property, which several persons may own in common.

The only literal truth in the case, is that the objects, by reason of their similarity, are related to *one and the same notion*, so

that it may be applied to each of them, and is, therefore, a *common or general notion*.

The true character of universals shown from the genesis, nature, and use of the general notion.

In the next place, the genesis and essential nature of the general notion, and the manner of its employment by the mind, show how it comes to be formed and used without having any object of its own. General notions are a secondary mode of thought, and are derived by a process of abstraction from individual or singular conceptions. This derivation—as that also of generic from specific conceptions—can often be actually traced; and always satisfactorily accounts for the origin of the notion. Many, both in ancient and in modern times, have taught that some of our abstract ideas, and particularly those of a moral nature, are innate, and born with the soul; and they have given the mind a power of perceiving certain kinds of general truth by “the immediate intuition of the reason.” It is sufficient to say that such doctrines have almost entirely disappeared, as the progress of philosophic investigation has shown them to be unnecessary and unfounded (see McCosh on “The Intuitions”). The power, first of perceiving individual facts and objects, and then of forming, from these perceptions, general truths and notions, is, we believe, inborn; but the development and exercise of this power does not involve the perception or the inference of the actuality of any general object.

The subordinate character of the general notion and its essential nature.

Moreover, general notions are not only formed wholly from perceptions and conceptions of individual objects; they also are used exclusively with reference to individuals; their whole value and force lies in *their applicability*. It is by means of these notions that we learn from others the nature of individual things. The general conception being applied to one or more objects, we understand what it or they may be; we can say, “It is an animal,” or “They are animals.” Then the general notion enables us to form judgments regarding individuals; because whatever is true of the universal, by reason of some necessity which attaches to it, must be true of every corresponding individual. The truth, that “animal life is supported by food,” is valuable, because we may infer from it immediately that this or that animal, these or those, some, or any, or all, animals, live by means of food. The general—or generalized—judgment is simply an instrumental and intermediate state of mind which frequently intervenes between the perception of necessity in some individual case, or cases, and the assertion of necessity in some other similar individual case, or cases. Finally, the general notion is used in *indeterminate thought*, and in this, especially, its character, as wholly subordinate to the individual conception, is strikingly manifest. For the universal is often made the subject of statements which cannot be regarded even as propositions of limited or conditioned generality (§ 133). We can say, “The trotting horse has now attained the speed of a

mile in less than two minutes and a quarter," or, to use a nobler illustration, "Man measures the weight of the sun, and the distance of star from star." In such statements as these, it is equally evident that the subject is an universal, and that it is not conceived of as having a separate existence of its own. The facts presented concern only certain individuals of a class; it would be absurd to assert them of any separate and universal entity. Predications like the foregoing, which are not uncommon, throw much light on the true nature and significance of the general notion. They show that it is an abstract and indeterminate mode of thought which the mind always refers or applies to individuals, more or less immediately; and which always has universal applicability, *yet is not always used as having it*. For not every trotter attains the speed mentioned, nor is every man an astronomer. From all of which we gather that the character and name of universal, or general, are derived rather from the chief property and principal employment of the notion, than from its essential nature. When we say, "Man calculates eclipses," the term *man* expresses what we commonly mean by a general idea; yet, in this statement, the idea is not general or universal, but only abstract and indeterminate. Of itself it does not include reference to the many or to the few; it simply presents its own contents. We are told that human beings calculate eclipses; whether many or few of them do so, or even only one, is no necessary implication of the general notion. In view, therefore, of the origin, use, and radical nature of general conceptions, we conclude that there are no general objects to correspond with them,—that universals, as such, are unreal entities,—and that, in thinking as if of them, we do not think of realities at all, but only in a way similar to, and correspondent with, our conception of real objects (see §§ 36 and 70). In accordance with this we find that men, in ordinary speech, never make independent mention of general objects, or universals, as if they were a distinct class of entities, but only use terms setting forth indeterminate notions which may be applied to individual objects.

The history of opinions concerning universals. Pythagoras, Socrates, Plato, Aristotle, Zenon, Porphyry.

§ 137. The discussion of the general notion would not be complete without some reference to *the history of opinions* concerning universals. This exhibits a gradual advancement in the apprehension of truth, together with some movements of a mistaken, or retrograde, character. The school which Pythagoras founded, five hundred years before Christ, was probably the first to give formal expression to the error of attributing reality to universals; but the earliest extant teaching of this doctrine, is to be seen in those writings which Plato composed about one hundred years after the death of Pythagoras. Socrates, the master of Plato, had insisted upon the necessity of our attaining correct conceptions of the permanent and the important by eliminating, from individual perceptions, what may be essential to

any given kind of thing; this teaching was developed and enforced by Plato in his doctrine of ideas. But the term *idea*, as employed by Plato, meant something wholly different from what we now understand by it. He contrasted the idea (*ἡ ἰδέα, τὸ εἶδος*) with the *νόημα*, or conception; and meant by it the *object* of the conception. The genius and aims of this delightful writer are moral rather than metaphysical; yet his statements imply that ideas have an existence of their own, separate from the mind and from individuals; that ideas alone are true, incorruptible, and imperishable, entities; and that the passing objects and phenomena of the world derive the laws of their existence from these ethereal ideas.

Aristotle, rejecting Plato's doctrine, denied that ideas, or universals, exist separately from the individual; yet he was far from refusing them a reality. He did not see that the distinction between matter and form, which we naturally make and use in our ordinary thinkings (§ 126), represents no external, or objectual, difference of things, or parts, or elements, but only sets forth the very same things in their relations to two different modes of thought. He accounts for the generation—or the becoming—of things, by the union of matter and form, as two elements externally distinguishable. But he asserts that form never exists save in union and co-operation with matter, and that matter never exists save in similar union with form. Moreover, what is general or universal is formal and never exists separately, but always is uniting variously with matter so as to produce the individual.

The inextricable confusion of the Aristotelian metaphysics is to be traced chiefly to the misapprehension of the true nature of such distinctions as that between matter and form; and if, to this cause, we add the influence of ambiguous terms, it will be entirely accounted for. As an instance of the latter, the word *οὐσία*, which may mean either a substance in the narrow sense, or a logical substance, or the essence of a thing, or an entity, or a real existence, or any one of these in the general, constantly operates, in the writings of Aristotle, as a philosophic stumbling-block. The obscurity of ancient metaphysical teachings, with their imperfect distinctions and yet more imperfect terminology, can be appreciated by those only who may endeavor to comprehend them.

It is said, without much evidence, that Zeno and the Stoics denied the reality of universals. Be this as it may, the question descended from the more ancient philosophers as a legacy to their successors. In the third century of our era, Porphyry, a Neo-Platonist, who taught philosophy at Rome, mentions certain inquiries concerning universals as too profound for his discussion. These were, "Whether genera and species subsist in the nature of things or in mere conceptions only; and whether, if existent, they are corporeal or incorporeal; and whether they exist separately from sensible objects or not" (see Porphyry's

εἰσαγωγή, or Introduction, to the "Categories" of Aristotle). In Neo-Platonism, at Rome, Athens, and Alexandria, the philosophy of the ancients exerted its last independent activity.

The Scholastics—that is, the great Christian teachers of the Middle Ages—earnestly discussed the nature of universals; with them this subject was closely connected with the doctrine of divine creation and government. According as they asserted or denied the reality of the universal, they were classed as Realists and as Nominalists. In the eleventh century, Roscellinus maintained nominalism, but his eloquent disciple, Peter Abelard, advocated a kind of moderate realism; and, from that time till towards the close of Scholasticism, the doctrine of Abelard generally prevailed. It is, however, simple justice to say that the teaching of the mediæval thinkers was different from that either of Plato or Aristotlê, and vastly to be preferred. Albertus Magnus held that universals exist *ante rem* in the divine intellect, *in re* in the individual object, and *post rem* in the human intellect by reason of the power of mental abstraction. His great contemporary, Thomas Aquinas, taught that "forms which exist in matter have come from immaterial and separately existing forms, which, however, subsist, not in themselves, as Plato says, but in the divine mind, and derive their causing power from Heaven." Finally, in the fourteenth century, William of Occam revived the nominalist doctrine, and asserted that singulars alone exist, and that such things as universals, even as mental conceptions, are wholly without reality. His views were favored at the universities, but caused great commotion in church and state. The Emperor Lewis, of Bavaria, protected the followers of Occam, while Louis the Eleventh of France sided with the Pope, and persecuted them.

Modern nominalists—Hobbes, Berkeley, Hume, Stewart, Campbell, Hamilton.

In later times nominalism found a powerful advocate in Thomas Hobbes, the contemporary and friend of Lord Bacon. "If," says Hobbes, "one should desire the painter to make him the picture of a man (which is as much as to say of a man in general); he meaneth no more but that the painter should chuse what man he pleaseth to draw, which must needs be some of them that are, or have been, or may be; none of which are universal. But when he would have him to draw the picture of the king, or any particular person, he limiteth the painter to that one person he chuseth. It is plain, therefore, that there is nothing universal but names; which are therefore called indefinite, because we limit them not to ourselves, but leave them to be applied by the hearer" ("Tripos," chap. v.). To us this illustration seems an unfortunate one for its purpose. A painter might make an outline image, which, without being the likeness of any particular man, would serve to call to mind some one of our race; and, if this be so, may not the human mind have the power of forming an indeterminate notion, which is

not the conception of any individual man, but yet is applicable to any?

About one hundred years after Hobbes, nominalism was elegantly set forth in the writings of Berkeley and Hume. In the present century it has been defended by Stewart, Campbell, and Hamilton. But these last named authors, as well as others of an older date, really modify their teaching so as to concede to the mind a power of general thinking. The inevitable difficulty of strict nominalism is that it sets aside, instead of explaining, a well-known mental phenomenon. Those who institute inquiry by a scrutiny of consciousness, must see, more or less clearly, that we have general notions. Hence every argument for nominalism may be turned against itself. Berkeley says, "The idea of a man that I frame to myself, must be either of a white, or a black, or a tawny, a straight or a crooked, a tall, or a low, or a middle-sized man"; which language can only mean that our idea of a man must be *the idea* either of a white, or a black, or a tawny man, and so forth. But the simple fact is that we constantly do think even of an individual man,—much more, therefore, of man in general—without thinking of the determinations of singularity. Things cannot exist without determinations, but they can be conceived of without them. At the present day nominalistic views are held only by certain associationalists, sensationalists, and materialists, whose systems produce an incapacity for understanding the more delicate phenomena of psychical life.

Modern realism.
Spinoza, Schelling,
Hegel.
The last expiring
effort of the an-
cient metaphysics.

Since the inauguration of modern philosophy, in the seventeenth century, by Descartes, the influence of realism has been notably manifest in the pantheism of Spinoza, and yet more in that of Schelling and of Hegel.

Spinoza's radical conception, the unity of substance, was immediately based on the Scholastic definition, "*Ens per se subsistens*," but was wonderfully supported by a philosophic error that can be traced to a very early day. For Aristotle himself identified existence with unity, and taught that the science of entity is the same as the science of unity, and that in some sense the existent, as such, is also the one. This obscure doctrine, which sounds absurd in modern ears, originated from the ambiguity of an idiom in Greek. Often in that language general attributal notions are expressed by the neuter singular of adjectives accompanied by the definite article. *Τὸ ἀγαθόν* and *τὸ καλόν* signify excellence and beauty. In the same way, *τὸ ὄν* and *τὸ ἔν* are employed throughout the metaphysics of Aristotle to signify existence and unity ("Met." bks. iii. and ix.). These meanings were perfectly allowable; and it is evident that they do not present realities, but simply abstracta or universals. But the expressions *τὸ ὄν* and *τὸ ἔν* may also be taken in an actualistic sense, and as having the individualizing, instead of the merely distinguishing, force, of the article; in that case, *τὸ ὄν*

would mean the only existing being, and τὸ ἕν the only one being—the only one unit. But these must be identical. Therefore, simply allowing that these expressions set forth realities, we must admit their teaching that there is one being only. Aristotle was too sensible a thinker to carry out this doctrine fully; but Spinoza found no difficulty. Giving objectual reality to the general abstract ideas of *the unit* and *the existent*, as if each were one individual object, and the only one of its kind, he thereupon identifies these things. For, if the unit is the only one, there can be no existent beside it; and, if the existent is the only being, there can be no unit beside it. Hence the identity of τὸ ὄν, τὸ ἕν, and τὸ πᾶν; hence the impersonal pantheistic substance.

The continued attribution of reality to universals, even after they were no longer granted an existence apart from intellectual activity, left the way open and ready for the heresy of Schelling and Hegel. They declared, and maintained ably, that object and subject, the real and the ideal, thoughts and things, nature and spirit, are identical. Hegel treated *being*—that is, general attributal existence—as a real object, and found in it the power of evolving out of itself, and as parts of itself, all other things and combinations of things. Thus modern genius unconsciously produced a gigantic system of delusion out of the ancient metaphysics. The philosophic pantheism which prevailed in Germany at the beginning of the present century, is a notable instance of the fact that the doctrine of realism, whenever logically followed out, leads into a labyrinth of error.

Some, however, have called themselves realists, and some yet do so, who scarcely deserve the name. To hold that classes of similars, corresponding to general notions, actually exist, and are not mere creations of the intellect; to teach that many things in their individual natures have a power of producing their like, and of perpetuating their kind; to believe that general conceptions dwell in the divine spirit prior to the existence of organized beings; and to hope that, by the study of the universe, we ourselves may seize and think the thoughts of God—these are things entirely consistent with the doctrine of the non-reality of universals.

John Locke—who was eighteen years old when
 Conceptualism.
 Locke, Reid, etc.,
 etc. Descartes died, who was born in 1632, the same
 year with Spinoza, and who died in 1704, twenty
 years before the birth of Kant, and seventy before that of Schelling—was probably the first of modern philosophers to state clearly the true doctrine concerning general ideas. Before his time Conceptualism, as it has been called, had found advocates, but had not attained any established position, in the world of letters. "General and universal," says Locke, "belong not to the real existence of things; but are the inventions and creatures of the understanding, made by it for its own use, and concern only signs, whether words or ideas. Words are general when

used for signs of general ideas and so are applicable indifferently to many particular things; and ideas are general when they are set up as the representatives of many particular things but universality belongs not to things themselves, which are all of them particular in their existence; even those words and ideas which in their signification are general" ("Essay," bk. iii. chap. iii.). Had Locke, in addition to the foregoing, clearly seen and taught that ideas, whether general or singular, are simply the states or actions of the soul in thinking, and that an idea is never, in any true or literal sense, the object of itself, the philosophy of the eighteenth century might have been saved from much useless and extravagant speculation. As it was, Locke's doctrine has prevailed. Adopted and improved by Reid, it was defended by him against Berkeley and Hume; and, at the present time, Conceptualism is upheld by the general assent of philosophers; though, even yet, some scarcely comprehend how we can think as if of objects, when no objects corresponding to our thought exist.

A realistic argument stated and refuted.
Reid quoted.

§ 138. At the risk of exposing ourselves to the charge of laboring to slay the slain, we shall discuss one other argument for the reality of universals. For the fact that *general notions occur both as the subjects and as the predicates of assertive propositions*, is one calling for explanation. We say, "The tea-plant grows in China," "The gorilla lives in the woods of Africa," "Man has built many structures of stone," "The ocean cable has proved a success," "Spirit and matter exist," "Cæsar was brave and magnanimous," "Mary Queen of Scots, was beautiful and unfortunate," "The rain falls softly," "There is justice for the oppressed." In all such statements, general notions furnish either subject, or predicate, or both. But it is the specific difference—that is, the essential characteristic—of predication proper, when affirmative, to assert the existence of the predicate-object, that of the subject being taken for granted; and it is the essential characteristic of improper predication to assert the existence of the subject, no predicate-object being mentioned (§ 47). Such statements, therefore, seem to assert, either directly or indirectly, the existence of general objects. Yet that this use of thought and language does not really assert the existence of universals, will become evident, if we consider successively the various modes according to which general notions may occur in predication. *First*, there are the predications, already noticed (§ 136), in which the general notion, as subject, cannot have an universal force or a general applicability. In these, of course, it cannot present any universal or general object as existing. *Secondly*, there are those in which the general notion is attributive or adjunct; as when, above, "lives in Africa," "brave," "beautiful," and "falls softly," are predicated. Statements of this class evidently do not assert the independent existence of these predicate-objects, but, on the contrary, their dependent and inherent existence as

connected with the subject of the predication. Moreover, when the subject is singular, it is clear that the whole force of such statements lies in the fact that they become individualized, or, at least, may easily do so. *Thirdly*, this last statement holds good as well when the predicate is a noun as when it is an adjective or verb. In "*Cæsar erat homo*," *homo* becomes individualized in the very act of predication; we mean, not that Cæsar was man, in general, but that he was *a* man. The modern language expresses this individualization by using the indefinite article, while the ancient does not. But in plural propositions the Latin, also, gives number and individuality to the predicate-object, saying, "*Romani erant homines*." Therefore, *fourthly*, seeing that the force of the predicate is determined by the character of the subject, let us turn to that aspect of predication according to which the existence of the subject is asserted or implied; and, in this connection, let us remember that all predication, according to the intention of the mind in using it, is either actualistic or hypothetical. Actualistic general assertions are those which set forth matters of fact; as when we said above, "The gorilla ranges the woods of Africa," "Spirit and matter exist," "There is justice for the oppressed." When we examine the state of our minds in making such predications it becomes evident that we have no intention to assert that any general object, as "the tea-plant," "the gorilla," "matter," "spirit," or even "justice," has an existence by itself, in China, or in Africa, or anywhere else. We simply mean that tea-plants, gorillas, material and spiritual objects, and just retributions and rectifications, each in its own individuality, do, or shall, exist. The general notion in such statements, though not individualized, is employed with a reference to its capability of individualization, in other words, as having applicability. The truthfulness of these actualistic general statements consists solely in this, that they are the secondary, partial, indeterminate expression of literal, determinate, individual facts. This is what Dr. Reid really meant in saying, "The existence of universals is nothing but predicability" ("Essay," v. chap. vi.). For these words can signify only that general objects are spoken of as if they had an existence, simply because general ideas may be applied to existing individuals. *Finally*, let us notice hypothetical, or suppositional, predications with general subjects. These vary in form accordingly as the hypothesis is expressed or implied. We may say, either, "If theft take place, it is a crime," or simply, and as usually, "Theft is a crime"; and, "If there is a triangle, its area is as the product of its base by its altitude," or "The area of the triangle is as the product of its base by its altitude"; also, "If there be a beginning, or change, of existence it must be caused," or, "Every beginning, or change, of existence is caused"; and, once more, "If there be angel and demon, they are moral beings," or "The angel and the demon are moral beings." Now hypothetical statements (§ 49), so far as the construc-

tion and use of thought is concerned, follow the same rules which govern the actualistic. As, therefore, literally and strictly, general actualistic predications do not assert or assume the actual existence of universals, so hypothetical general predications do not assert or assume even their supposed existence. Indeed it is doubly and emphatically true that the whole force of these predications lies in their applicability. For those very individualized, but indefinite, statements which they immediately imply, into which they easily transform themselves, and by means of which also they are very commonly expressed (§ 133), are themselves merely hypothetical, and concern only supposed or ideal objects; so that the truth of these indefinite statements also, lies in their applicability. For, while the general notion may be applied to any actual object because of the membership of the latter in a class of similars, the individualized indefinite notion is applicable to an actual object, not simply because it is a member of a class (§ 132), but also because of that individuality which every actual object possesses, no matter to what class or classes it may or may not belong. We conclude, therefore, that the employment of general notions in predication is no proof of the reality of universals.

The laws of existence defined.
They are general and unreal objects.

Most general statements are intended as necessitudinal and hypothetical predications. This is often the case even when they include also an actualistic reference or implication. So far as general statements are hypothetical they are said to express laws, that is, either the laws of entity in general, or of some kind or department of existence. It follows, therefore, that, in strict truth, the laws of being, in all its departments, are not real but general things,—or universals. They are not even ideal individualities. A law of existence is a general case of antecedent and consequent; and the truth of the statement expressing it lies in this, that a real and individual fact corresponding to the general consequent necessarily exists whenever there is a real and individual fact corresponding to the antecedent. Hence we say that general scientific statements express laws and not facts. Similar remarks apply to moral and governmental law as a general mode of conduct prescribed for us by some authority or necessity. It has no more reality than those general forms or modes of existence, which are necessitated by general antecedents. Hence the legal profession distinguish between fact and law. But sometimes by a law we mean the mental or verbal statement of some mode of conduct prescribed by authority or duty; and in that sense a law may be individual and real.

Only individuals exist.
Locke.

§ 139. From the truth that universals do not exist, we turn to the correlative doctrine which Locke asserts, viz., that "all things that exist are particulars," that is, individuals ("Essay," bk. iii. chap. iii.). This doctrine might be inferred from the former. For the universal is simply that which has not individual difference, and the in-

dividual is that which has; if the former of these cannot exist, then only the latter can; and so every actuality is an individuality. But the same conclusion may be formed more directly from certain intuitions which accompany our perceptions of fact. We never perceive anything save as existing definitely in space and time, and as having parts and relations which belong to it alone. Even God, and the universe as a whole, are inferentially perceived as thus existing. And every perception of simple fact is accompanied with the necessitudinal judgment that each individual object perceived, considered simply as an actual entity, *must* exist in its own place, in its own time (or rather with its own relations to space and time), and with its own parts, and its own relations to other objects. But this is the same as to say that every actual entity is an individual. From this, again, we immediately infer that whatever has no parts and no relations *of its own*, in other words, whatever is not an individual, cannot exist, and is a non-entity. Truths so simple and radical as these do not admit, and ordinarily do not need, direct proof; yet the absurdity of denying them may be shown. Let us suppose that two entities—two trees, or two men—occupy precisely the same space, exist during precisely the same time, and have, in strict literality, the same parts and the same relations. Is it not evident that such a supposition destroys itself, and that the two things cannot be two, and must be one only?

The "*Principium individualionis*" discussed. Three different senses.

But while Locke's doctrine, that all actual objects are individual, is undoubtedly correct, we cannot accept another doctrine which he teaches elsewhere, viz., that the individuality of objects depends simply on their actuality. We believe that individuality depends on something that belongs to existing objects, and not simply on their existence. The passage, in which Locke teaches that the individuality of things is essentially derived from their existence, occurs in his discussion of identity and diversity ("Essay," bk. ii. chap. xxvii.). He writes, "From what has been said, it is easy to discover, what is so much inquired after, the *principium individualionis*; and that, it is plain, is existence itself, which determines a being of any sort to a particular time and place incommunicable to two beings of the same kind." The term *principium*—or principle,—as it occurs in this passage, is only remotely connected with that sense according to which a principle is a proposition, which, being accepted as true, becomes a ground or source of inferential conviction. By *principium individualionis* we are to understand simply the source or origin of individuation. This latter word signifies the making or causing of something to be individual; and, according to a very wide use of such terms as making, or causing, or originating, the whole phrase, *principle of individuation*, may have any one of three meanings. First, it may signify that which produces individuality—the efficient cause of it. This clearly is not existence; existence produces nothing. The

producing cause of individuality and of every other attribute of a thing must be that cause, whatever it may be, which produces the thing. The strength and skill of a carpenter produce a table, or, more correctly, the form or structure of a table; the materials exist previously. And they produce the individuality of the form, for this is a part of it. True, the carpenter may make one form and not another, while he has no choice regarding individuality; by reason of which circumstance, the production of the individuality is never mentioned, but is something assumed or understood. Yet it seems clear that whatever produces a thing must produce its individuality with it. Secondly, the principle, or cause, or source, of individuation, may refer, not to a power producing individuality, but to a *controlling or determining condition*, under which the power must act, if it act at all (§ 50). The cause of fishes living in the water, and of birds living in the air, is that neither could live in any other element than their own. In the same manner, we may say that the cause of anything being an individual is that whatever exists, or is made to be, must be an individual. In other words, individuality is a necessary attribute—not of existence—but of that which exists, of entity. It belongs to “the nature of things,” to the universal and necessary nature of things. Here is the cause of the uncaused individuality of God. According to this view a law of ontological necessity is the *principium individuationis*; and this opinion seems really to have been that of Mr. Locke, though he imperfectly expressed it.

Finally, the *principium individuationis* may mean that which constitutes the individuality of a thing; for constitutive, as well as productive or determinative, conditions, are styled causes; and are said to make a thing to be—or to be what it is. This is the most important signification of the phrase, because it leads to the question, “What is an individual?” A constituting cause is either the whole nature of a thing, or it is that which, being added to some given nature, completes the nature of the thing in question. Now, although existence logically necessitates the individuality—just as it does the time and place (or the temporality and locality) of a thing,—it is clear that it does not constitute individuality. What then does? Is it not the possession of a nature affected throughout and in every part by such difference as distinguishes every existing object from all other existences, that is, by individual or singular difference? Is it not that body of characteristics which belong exclusively to every actual thing, and which give it that full *hæcceitas* of which Scotus speaks? This is the doctrine of the Nominalists, which Leibnitz supported—“*Omne individuum sua tota entitate individuatur*”—and it seems to be correct.

The phrase *principium individuationis*, though admitting several lawful meanings, is a relic of the false objectualism of the Aristotelian metaphysics. It smacks of the time when universals were allowed a real existence, and when active substantial

essences individualized themselves in combinations with passive matter. Locke rightly employs the phrase as referring to things rather than to thoughts, and endeavors to neutralize its suggestion of error by giving it a proper explanation.

The individuation of thought.

We must add a few words as to the *individuation of thought*. This is a genuine causative process such as we commonly speak of; and it consists,

not in giving individuality to our thoughts themselves, for they are already always individuals; but in changing the force of general conceptions so as to apply them to individual things. We individualize a conception when we add to it the thought of that difference of which we have already spoken.

Imaginary objects have only imaginary existence and individuality.

In connection with the doctrine that existence is no part of individuality one or two points are noticeable. First, it is generally, and we believe correctly, taught that *imaginary objects are individual*. We do not,

however, argue from this that, literally speaking, not all individual objects are actual. For neither imaginary objects, nor their individuality, really exist at all (§ 38). Nor, on the other hand, in allowing that imaginary objects are individual, do we assent to the theory of the reality of such objects. We simply use objectless thought and language, the meaning of which is that, in imaginative conceptions, we think as if of individual objects; in other words, that our imaginations are all singular or individualized conceptions. This last is the teaching of Pres. Porter when he says, "A concept is general; an image is individual" ("Human Intellect," § 424 and § 64).

Existence may be used as a specific difference.

Again, although, ordinarily, the idea of existence is not an essential element in a general notion, we can, and sometimes do, generalize the thought of a *kind*

of things as existing. Thus we speak of "the existing elephant," in contrast to extinct species; or of "the existing fashion," as opposed to what has been or might be; or of "the existing mammals and birds," in each case making the notion of reality an essential part of the general conception. This does not individualize the notion, though it renders it more specific; nor does it imply the existence of a general object, but simply indicates that one's thought is applicable only to an existing class of individuals.

Formal and negative individualizations.

Finally, that independence of conception which we have found between existence and individuality makes possible conceptions of individuals either as

non-existent, or without reference to their existence; in other words, negative and formal individual conceptions. The question, "Is there a loaf in the cupboard?" and the answer, "There is none," may furnish examples of such thought (§ 36).

The terms *conception* and *notion*.
Reid, Stewart,
McCosh.

§ 140. In the present and previous discussions we have used the term *conception* as a general word applicable to either the power, the process, or the product, of the mind in the formation of its ideas, whether singular or general. On the other hand, the term *notion*

nas been for the most part restricted to general ideas, though it naturally applies, also, to those indefinite individualized conceptions which are so closely allied to the general (§ 133). In this use of language we have been governed partly by necessity and partly by propriety. Of late years, especially since the days of Hamilton, many have applied the term *conception* only to general thinkings. This is a departure from earlier usage and from that still employed in common speech, and, without any sufficient reason, deprives philosophy of a most useful word. *Conception*, being derived from *concipere*, to grasp, properly denotes any thought, but especially any synthetic thought, in which the grasping, or comprehending, power of the mind is exerted. Both Reid and Stewart employ the term correctly, though neither defines it well, and neither apprehends fully its comprehensiveness of meaning. Reid first identifies "conceiving, imagining, apprehending, understanding, having a notion of, and having an idea of," a thing; but afterwards allows a distinction between conception and imagination, saying that "we can conceive universals, but cannot imagine them." Stewart, in distinguishing these powers, says that the province of conception is to present us with an exact transcript of what we have formerly felt and perceived." This definition probably resulted from his nominalistic views; elsewhere in speaking of the opinions of others, he mentions "general conceptions" (Reid's "Essays," iv. 1, vi. 6, and Stewart's "Elements," chaps. vii. and iv.). The true comprehensiveness of the term is well given by Dr. McCosh when he says that a conception may be either "a phantasm or a notion," meaning by the former a mental image, and by the latter a general idea ("Intuitions," p. 344). We believe that this gives the historical use of the word.

The terms *genus* and *species* ambiguous in their philosophical use. In one sense *genera* and *species* may really exist.

In connection with the doctrine of generalization, we should notice an ambiguity in the terms *species* and *genus*. *These sometimes signify that general object, or universal, to which every member of a class corresponds, and sometimes they denote the whole class of things which correspond to the universal.* The former meaning is the more frequent in ancient writings; the latter is the more frequent in modern (Whately's "Logic," book ii. chap. v; Hamilton, Lect. XI.). A similar ambiguity attaches to the ordinary expression, "A kind of a thing." The reason is that, for practical purposes, the meanings are equivalent, and may change places with each other (§ 133). Yet the difference should be noted, because a class of similars may really exist, while an universal never can. The reality or the non-reality of such a class depends upon the reality or the non-reality of the individuals composing it; for whatever is composed of realities is real. The universal is not composed of realities, but only may be said to correspond to them. The members of a logical class, simply as such, are not conceived of any more determinately than general objects or universals, so far as their differences are

concerned; nor is their number definitely conceived. Yet they are granted individual difference and number. Were it not that the mind in this way allows for the existence of differences whose nature is not considered, we could no more admit the reality of a class than that of an universal.

The ambiguity of the word *genus* shows itself in that also of the word *generalization*, and yet more in another derivative, *generification*. Each of these terms, but especially the latter, may signify either the formation of a general notion properly so called, or that of a class notion. Generification, being a species of generalization, is either the formation of a generic from specific notions, or of a wide class conception from other class conceptions naturally subordinate to it. Thus the generic notion "quadruped," may be derived from the specific notions, "horse, deer, cat, dog, lion, tiger," etc., and the generic class notion "quadrupeds" from the specific class notions "horses, deer, cats, dogs," and so forth. But we generalize either from species or from individuals. The term *classification*, at first sight, might seem to signify the forming of class notions; but it includes more than this, and signifies principally that act of judgment by which objects belonging to any genus are ranked in the subordinate classes to which they properly belong. The twofold meaning attaching to terms derived from the word *genus* excites the expectation of a similar ambiguity in the derivatives of the term *species*. This, however, is seldom, if ever, found. The terms *special* and *specialize*, together with their synonyms *specific* and *specify*, commonly relate to our ideas of objects and not to class notions as such; nor do they lose this character in certain secondary significations which attach to them. The reason may be that the thinking of practical life, in descending from generalizations, for the most part seeks separate individuals, and therefore prefers those forms of conception which most easily apply to them: in all ordinary inference the consideration of classes is something secondary and occasional. But, in ascending thought, the general and the class notion equally subserve the purposes of the understanding.

Both philosophers and others employ the term *division* to indicate the formation, from a general or a class notion, of a number of specific general or class notions no two of which can be applied to any one individual. In this process, the mind, by adding differences to the generic notion, divides the genus into parts. To analyze the principles which guide the mind in forming satisfactory divisions, would involve a wider range of thought than belongs to the present discussion. This task will be undertaken when the rational or discursive phase of mental action comes under formal review (§ 197). In treating of the primary and secondary powers of mind, we have been aiming, though somewhat carelessly, to confine our studies to the essential nature of these powers, and to whatever may be necessary to illustrate that nature. In this

Generification defined.
Classification defined.

Logical division defined.

way we have been preparing ourselves to understand those more complex developments of thought in which all these powers, in special ways, mingle with, and modify, each other (§ 13).

The co-ordination of parts, in conception. § 141. Before leaving the subject of generalization, however, we may call attention to one exercise of this power by which it does important service as the auxiliary of another secondary power. We refer to what may be styled *the co-ordination of parts in conception*. By means of this our conception of an object is rendered simpler and clearer than it otherwise would be, and also becomes capable of analysis into what are commonly called *views*. The different parts of a house may each be regarded as connected with and acting upon the rest; the foundation performs its part, the walls theirs, the floors and the roof theirs; in this way we conceive of the whole house as a structure. Very similarly, considering the origin of the parts severally, we may think of the whole as a building. Noticing the uses of the rooms, one is a cellar, one a kitchen, one a dining-room, others halls, parlors, bedrooms, drawing-rooms,—all are variously intended for human habitation. Thus the house is regarded as a dwelling. Or, in the same way, the building may be perceived to be a store, or workshop, or church, or school. Again, seeing that one part of the house faces the road, another the garden, that one side of it is a certain distance from a fence and another from a lane, we call the whole *a place*. In the same manner, the different elements in a book being co-ordinated according to their community of nature, we variously describe the book as an elegantly bound volume, or as an octavo printed clearly and on good paper, or as an interesting and valuable work. Moreover, all the different aspects of the book, or of the house, may combine again so as to form a more exact total conception than the original one; in which combination a further process—an act of identification—takes place, which unites the partial conceptions into the full conception of the substance, or substantial form, in question. It is evident, also, that we do not form partial views of every object, but only of those which are complex and whose nature may be said to comprise several natures. This is particularly the case with individual beings, or substances, whether material or spiritual. That abstract consideration of the object by which each new view is obtained is often described figuratively as the regarding of a thing in a given light. Because, when some light, as that of a lantern, shines successively in different directions upon an object, different conceptions may be formed according to the direction in which the light may come.

CHAPTER XXX.

PERCEPTION OR COGNITION.

Three grand phases of mental life distinguished and accounted for.

§ 142. In order to the attainment of that degree of intellectual development and efficiency which characterizes the human mind, there is need of a threefold work, and, consequently, of an ability, on the part of the soul, to act mentally in three diverse ways. *First* of all, we must be able to perceive such objects as come within the range of our immediate observation; for without such a power we could have no ideas at all. *Secondly*, we must be able to recall and control the ideas and the knowledge gained by this perception of things; otherwise, our thought, dying the instant it was born, would serve only as a momentary illumination of our darkness. *Finally*, we need a penetrative and comprehensive power of mind—a power whereby the *nature* of things may be clearly understood and correctly reasoned from; without which we would be incapable of intellectual progress and of the management of affairs. Corresponding to these necessities, and, in a sense, originating from them, are the three grand phases of mental life—the Perceptive or Cognitive, the Reproductive or Representative, and the Discursive or Rational. These phases have so many attributes in common, and each of them comprehends such a variety of modes, that they are distinguished more easily by a reference to the necessities in which they originate and the ends which they serve, than by any internal characteristics. In this way, we believe, our ordinary conceptions of them are formed (§ 13). At the same time we should seek accurate ideas of the diversities of these phases considered in their own character as aggregates of mental operations. No one of them is distinguishable from the others by any radical or generic diversity in the powers productive of it. Not only thought and conviction, the primary powers, but also attention, suggestion, synthesis, analysis, abstraction, conception, generalization—in short, all the secondary powers—are involved, to a greater or less extent, in each of these general modes of mental action. Yet, in each phase, our powers, being exercised under special conditions, act also in peculiar or specific ways. A critical consideration of these peculiarities of action, may lead to an exact conception of internal or essential differences. Using this discriminating care, we will first avoid some mistakes of confusion, and will then be prepared for the definitions we desire to make.

Misconceptions to be avoided. No phase is the exclusive field for the operation of any fundamental power.

First of all, we must bear in mind that one phase of intellect *may be distinguished by the special or prominent exercise of some power, without being the only or exclusive field for the exercise of it.* The use of general conceptions and the formation of inferences from them, are prominent features of the discursive phase of thought; but they also occur in certain modes of sense-perception, and in that style of reproductive thought which is called *imagination*. In like manner, the power of association or suggestion, which is a prominent factor in reproductive activity, is a necessary element of rational thought. In view of these and similar facts, the most that can be claimed for any one of the generic modes of intellect now under consideration, is that it exhibits the special or peculiar action of one or more powers.

No phase comprises the whole of our mental experience at one time.

Secondly, it is not to be supposed or understood that each phase of activity *necessarily constitutes the whole of our mental experience during the time of its continuance.* By the term *phase*, here, we mean simply the total collection of those activities, which, arising from common conditions, accomplish, or tend to accomplish, a common end or work, and are, therefore, naturally regarded by us in one general view. We do not mean the total of our mental experience at any one time. Activities belonging to different phases may co-exist, and a constant influence may be exerted from one phase upon another. Thus an object seen may give a new turn to some train of thought, or may furnish a link in some chain of reasoning; the observations of sense may be directed by the recollections of memory or the principles of science; and the playful work of fancy often interrupts, and sometimes is interrupted by, the earnest inquiries of philosophy. Yet the activities of the different phases may be distinguished even while mingling with, and affecting, each other. For the operations of the reproductive intellect are always subsequent in nature to those of perception, and presuppose them; while the operations of the discursive faculty are subsequent in nature to both the rest.

A mental operation may belong to two phases at once.

Thirdly, one may be doubtful, sometimes, as to which one of the three grand phases of intellect some complex activity, or series of activities, should be assigned; *it is even conceivable that an operation may be of such a double character as to belong to two phases at once.* An argumentative history or a philosophical poem might be claimed either for the reproductive or for the rational phase. For the one would combine memory, the other imagination, with reasoning. Ordinarily, the character of any intellectual state or work may be determined by considering simply the principal end immediately subserved by it. Imagination involves skill and judgment in the analysis and synthesis of ideas, and might, therefore, be assigned to the discursive intellect. Yet this faculty,

in its ordinary development and use, is properly classed as one mode of reproduction. For it aims *simply at the contemplation of its own creations*, and not at all at the attainment of truth and understanding. But there is an exercise of intellect very nearly akin to imagination, which, taking reason for its guide, and acting in the service of the knowledge of fact, forms conjectures, hypotheses, ideals, and illustrations; and this mode of thought, which has been called the Philosophical Imagination ("The Human Intellect," § 362), is a subordinate part of the discursive faculty, its proper aim and effect being to discover and comprehend the truth.

Each phase should be regarded as including whatever belongs to it at any time.

Perception involves inference, and reason intuition.

Finally, we must be careful not to limit our conception of any one of the grand phases of thought so as to exclude from it any element of activity which is ever properly included within it. The perceptive phase may be styled the presentative, because in it alone we find immediate or presentational cognitions, and because no perception takes place without at least having such a cognition as its most essential part. Yet it would be a mistake to suppose that perception—that is, the perceptive phase of thought—is confined to cognitions which, in the strict or absolute sense, are immediate. Every secondary, or *acquired*, sense-perception involves an inference; and it is evident that the immense majority of our external perceptions are of this kind. The very word *perception*, though now applicable to cognitions which are immediate, probably signified originally a learning through the use of means. In like manner, the reproductive phase of thought includes more than the mere reproduction of thought. In all the higher employments of the fantasy the reproductive power simply furnishes materials; which then are elaborated by poetical skill and judgment. Sir Wm. Hamilton, in his "Metaphysics" (Lects. XXI.—XXIX.), treats of *perception* as including only presentative thought; but afterwards speaks of the reproductive faculty as being practically identical with the imagination. He should either have enlarged the sphere of perception, or limited that of reproduction. President Porter gives a wider scope for the exercise of both faculties; and avoids that cause of confusion by which the discussion of Sir William is affected. The discursive phase, also, may be the subject of inadequate conception. The "Discourse of Reason," as it is called, is only the more prominent method, or manifestation, of that faculty whereby man seeks to perfect and extend his knowledge of things. There is also what has been called "The Intuition of Reason," from which the discourse of reason originates, and which may be conceived to take place without the latter. This intuition is simply that clear analytical perception of elements and relations of which brutes are incapable, unless in a very low degree; and the development of which gives to the human understanding its peculiar and penetrating power. It is with reference to these two modes of rational activity that the

division of reason into intuitive and discursive may be best maintained. The penetrating analytical apprehension of the nature or composition of objects, is a condition of the discursive processes of reason, and is the chief and the ultimate source of the distinctive character of the rational faculty; but this apprehension is mostly to be found and seen only in connection with those discursive processes—such as formal generalization, analysis, synthesis, and inference—which are discussed in the philosophy of logic. Moreover, language expresses the operations of reason only as they are discursive. With reference, therefore, to its notable manifestation we may rightly style reason the discursive faculty; remembering at the same time that the “*discursus mentis*” is not the whole work of reason, but only its full and principal development. The same extension of meaning takes place when, in English, “the understanding” is used as equivalent to “the reason,” and when, in Greek, “*ἡ διάνοια*” is used as equivalent to “*ὁ νῦν*.” For “*ἡ διάνοια*,” the discursive faculty, and the understanding, are all interchangeable terms.

The grand phases of thought defined.

With the foregoing explanations such definitions as the following of the three grand phases of mental activity may prove sufficient. The perceptive phase is composed of *perceptions which are either immediate (§ 52), or which closely and invariably follow upon those which are immediate.* It exists whenever there is immediacy of perception; and there is a sense according to which it includes immediate perceptions only. It excludes all formal inference, or such as deserves the name of reasoning. The reproductive phase comprises *every form of the reproduction and elaboration of acquired knowledge and thought, which the purposes of contemplation, as distinguished from those of understanding and conviction, may call for.* The discursive phase includes *all those operations in which, for the ends of understanding and conviction, we use that power of intellectual penetration and comprehension, which is called reason,* and which especially manifests itself in the discursive or logical processes of mind. The prominent feature of the first phase is the immediate cognition of things; of the second, the reproduction of ideas; of the third, that elaboration of knowledge in the practice of which we form clear and distinct conceptions of things and reason consecutively concerning them.

The perceptive phase originative of all thought and primordial as to all conviction.

§ 143. Let us now concentrate our attention upon the perceptive intellect. The most important doctrine to be taught concerning this faculty, is that *it furnishes man the materials out of which all his thoughts are composed, and lays the foundations on which all his knowledge and convictions rest.* More particularly, we say, *first*, that perception originates the conceptions of things perceived; while all other conceptions and constructions of thought are obtained by the analysis of presentational conceptions and the synthesis of their elements; and, *secondly*, we say that perception originates its own convictions, while other convictions

are either actualistic inferences, which rest their truth entirely upon perceptions as their actualistic basis, or hypothetical inferences, whose whole value lies in the possibility of their attaining actualistic force by becoming connected with perceived fact (§ 49). For here we exclude, or rather include, inferences of possibility and of probability, as these accompany or rest upon necessitudinal inferences, and are related in the same general way, though less directly, to presentational knowledge (§ 80-86).

The originative and primordial character of perception, is, therefore, twofold, and is related, *first*, to the ideas, and, *secondly*, to the beliefs or convictions, of the mind. With regard to ideas it is not denied that we have many thoughts other than perceptions, and many, too, differing greatly in their style and structure from the conceptions obtained by cognition: it is only held that no element of conception can be found which has not first appeared as an element in perception; and that *the presentative faculty furnishes all the materials of thought*, the work of other faculties, so far as thought is concerned, being confined to reproduction and elaboration.

The first philosopher who fully perceived the truth and importance of this doctrine was John Locke; for this reason Locke may justly divide with Descartes the honor of inaugurating modern metaphysical progress, and may even claim the greater share. For, while Descartes was first to break loose from the false scholastic methods of interpreting thought and belief, Locke was the first to indicate and adopt the true method. The first book of the "Essay Concerning Human Understanding," directly combats the doctrine of innate ideas; the second opens by giving the "original" whence all our ideas are derived. "Let us," says Locke, "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 the understanding with the materials of thinking. . . . These two, I say, viz., external material things, as the objects of sensation, and the operations of our own minds, as the objects of reflection, are to me the only originals whence all our ideas take their beginning. . . . The understanding seems to me not to have the least glimmering of any ideas which it doth not receive from one of these two." Thus Locke taught that sensation and reflection, or what we now call sense-perception and consciousness, as the modes of immediate perception, furnish all the materials of thought. In the subsequent books of the "Essay" the development of this

Locke quoted and commended.

doctrine is attended with considerable obscurity; this arises, we think, partly from an imperfect recognition and analysis of the operation of the secondary powers of mind, but chiefly from that unnatural enlargement of the conceptions of sense-perception and consciousness whereby they are made to include all of our presentative cognitions. This enlargement, in violating certain common combinations of thought and speech, renders the perplexity of the reader almost a matter of necessity. For men allow another class of perceptions, additional to the two which Locke mentions, though inseparably concomitant of them. Ordinary language permits us to say that material bodies, with their qualities and operations, are perceived in the cognitions of sense, and that the soul, its powers, and its activities, are the objects of consciousness. But we cannot properly speak of feeling, seeing, or hearing such things as spaces, times, or relations, nor are we properly conscious of our mental states as being causes or effects, or as having number, or difference, or similarity, or succession. Such language, if used, is secondary and improper. Therefore, while accepting Locke's doctrine, we think that clearness of thought and statement calls for a threefold division of the perceptive phase of intellect. The fact that concomitant perception (§ 56) acts only in connection with the other two modes of presentational thought, does, indeed, excuse Locke's division and its general adoption by subsequent writers; yet, in metaphysical philosophy, it is often advantageous, and even necessary, to distinguish, and to consider separately, things which are inseparably united.

§ 144. *The convictions of perception*, in their relation to all our other convictions, are *primordial* (§ 52). In other words, they are the first beginnings of all knowledge and belief. This relation has not at all been so thoroughly considered as that of the *thoughts*, or *ideas*, of presentation, to our other thoughts, or ideas. We trace this neglect to the fact that the difference between thought and belief (§ 40) has been greatly overlooked, and unconsciously belittled, by philosophers; so much so that many, if not most, have treated belief as if it were merely either a clearer exercise of thought or a specific combination of ideas. Were either of these opinions correct, we would naturally suppose the convictions of perception to be related to our other convictions simply in the same way that the conceptions of perception are related to our other conceptions. In other words, we would hold that all other than presentational convictions are formed from these latter merely by analysis and composition; a doctrine which would not be true.

The want of any tangible distinction between thought and belief, in Locke's writings, is another cause which affected them with ambiguity and left them open to serious misunderstanding. Such ambiguity is especially apparent when he says, that experience is "*the original (or origin) of all knowledge.*" For knowl-

Perception is not the origin of our convictions in the same sense in which it is the origin of our conceptions.

edge is *thought* considered, not simply in itself, but *as accompanied by certain and well-founded conviction* (§ 41); and, while it is true that experience furnishes all the ideal, or conceptual, elements of knowledge, it is not true that it furnishes all the convictional elements of it. The very nature of inferential knowledge is to project itself beyond the range of presentational cognition. Yet Locke certainly intended to teach that experience—that is, presentative cognition—is the origin of all belief as well as of all thought; and he taught this doctrine without apprehending its duplex nature, and without perceiving that a true account of the origin of our convictions must differ materially from a true account of the origin of our conceptions. His teaching, however, as to the origin of our convictions is obscure rather than incorrect. In a very important sense, presentation is the origin of all knowledge and belief. Locke does not say that subsequent convictions are merely the reproduction and elaboration of those which are presentational; but only that “perception is the first step and degree towards knowledge, and the inlet of all the materials of it.”

The difference between Locke and Leibnitz. The phrase “*nisi ipse intellectus*” discussed.

We cannot, therefore, agree with the great German contemporary and opponent of Locke—Gottfried Wilhelm Leibnitz,—when he says, “In Locke there are some particulars not ill expounded, but upon the whole he has wandered far from the gate, and has not understood the nature of the intellect.” On the contrary, the same cause of obscurity which affected Locke’s doctrine, equally affects the refutation of it attempted by Leibnitz, in his “*Nouveaux Essais*.” In these he teaches that many “*ideas and truths are innate*” to the mind. By this, he says, we are to understand, not that they have been in conscious possession from birth, nor yet that they have no need of experience as *an occasion* for their apprehension, but that perception is not at all the origin or source of them, and that they are produced by another and higher power. This teaching of Leibnitz has been accepted by later philosophers, especially by many who claim for man a power of “intuition” or “common sense.” But it is no necessary part of modern “Intuitionism”; and, so far as it sets forth a source of ideas other than presentative perception, we believe it to be positively wrong. Locke’s “*Essay*” is only negatively wrong in not distinctly recognizing, in certain phases of conviction, an element which is not derived from presentation. A good view of this whole subject may be obtained from a consideration of that pithy statement in which Leibnitz expresses his dissent from Locke. In modification of the Aristotelian aphorism, “*Nihil in intellectu quod non prius in sensu*,” Leibnitz adds, “*nisi ipse intellectus*” (Ueberweg’s “*History Phil.*” § 117). Here, in justice to both parties, the term *sense* must signify, not sensation, nor even sense-perception, but presentative cognition in general. This use of terms is similar to that according to which consciousness, as a perception connected

with feeling, has been called man's internal or spiritual sense. Indeed Locke speaks expressly of "external and internal sensation" (bk. ii. chap. xi.). The term *intellect*, also, must here signify the mind in its higher, or rational, phase of activity. And, as this intellect can contain only two kinds of things, conceptions and convictions, the statement that there is nothing in intellect which has not been previously in perception, means that every constituent element of conception and of conviction is furnished by the presentative faculty. In opposition to which doctrine, and in the phrase, "Except intellect itself," we are taught that mind has a power of generating thought and conviction altogether different from the power of immediate cognition. Such, at any rate, is a fair statement of the view of Leibnitz as opposed to that of Locke.

So far as the origin of our thoughts or ideas are concerned, we prefer Locke to Leibnitz. At the same time the opinions of these illustrious men might be harmonized, and that, too, without any violent change in either opinion, if the following statements should be accepted as true. *First*, it seems clear that powers of thinking and believing are born with, and innate to, the human soul. *Secondly*, the faculties of reproduction, analysis, and composition, exist in addition to the perceptive faculty. *Thirdly*, presentation furnishes the elements of all thought or conception, considered merely as thought and aside from any accompaniment of belief. The sameness of the reproduced elements, however, is not literal, but only such as we ascribe to a *repeated* activity. *Fourthly*, the convictions, as well as the conceptions, of the presentational intellect, may be recalled, analyzed, and combined. *Fifthly*, we can, and do, immediately perceive that necessitudinal connection whereby individual facts may be related to each other as antecedent and consequent, which perception is not inference (both facts being presentatively perceived), yet forms that same construction of thought which inference afterwards employs. *Sixthly*, this inference, or reasoning, as a power and mode of belief, is something wholly additional to presentational conviction, and is not a derivative or secondary form of the same thing. But, at the same time, and *seventhly*, presentation not only furnishes the necessitudinal modes of thought which inference employs, but also is the only *ultimate ground* of *real* conviction. For an antecedent must, in some way, have presentational evidence for its existence, before any consequent of it can be really known to be. No one of the principles now enumerated can be neglected, or denied, or confounded with another, without leading to a confused or one-sided statement of the truth. The importance and the correctness of them cannot be farther shown at present, but will become apparent in connection with future discussions.

The objects of perception are—
 (a) Real.
 (b) Individual.
 (c) Complex.
 Descartes quoted and discussed.
 "Cogito, ergo sum."

§ 145. Leaving the subjective for the objective relations of the perceptive faculty, a threefold doctrine presents itself for consideration. In the first place, the object of perception is *real*; in the second, it is *individual*; and, in the third, it is *complex*. The statement that the objects of our presentational cognitions are real, is the equivalent of another statement more frequently discussed, viz., that our immediate perceptions are reliable, or trustworthy. It is plain that presentational thought, in its very nature, asserts the existence of its objects, and that this existence can be gainsaid only by denying the truth or soundness of this assertion. Very few speculators have attempted that extreme of skepticism which questions the testimony of consciousness; and those who, like David Hume, have done so, have not been able to produce any real doubt, even in themselves, as to the fact of one's own life and being; yet they have succeeded to some extent in confusing, first themselves and then others, as to the method by which this fact may be philosophically proved. But many have theoretically questioned, and even denied, the testimony of the senses. This form of skepticism found support in the doctrine of Plato that truth is to be gained only by contemplating the abstract and the universal, and in that scholastic mode of philosophizing which employed deduction from general principles as the all-sufficient method of advancement in knowledge. Besides, the well-known facts, that mistakes occasionally occur in connection with *sensé-cognition*, and that dreams and hallucinations are attended with false belief, were naturally cited against the reliability of external perception. When René Descartes felt himself forced to discard old doctrines and methods, his difficulties with regard to the cognitions of sense led him to seek the foundations of certain knowledge in the perception of spiritual things. Confessing that he greatly doubted almost all things, he yet was sure that he doubted, and that he himself, the doubter, existed. In the first of his "Meditationes de Prima Philosophia," he shows, to his own satisfaction, that all things may be doubted save that we doubt, or rather that we think and have spiritual experience in general. In his second meditation, he claims to have found the *πῶν στῶ* of Archimedes—the fixed point on which to rest the lever of philosophic reasoning for the displacement of all false doctrines, and for the elevation of true conceptions into their rightful places. This was the certainty of the fact that he himself really doubted and thought. His words are, "Nonne ego ipse sum, qui jam dubito fere de omnibus, qui nonnihil tamen intelligo, qui hoc unum verum esse affirmo, nego cætera, cupio plura nosse, nolo decipi, multa vel invitus imaginor, multa etiam tamquam a sensibus venientia animadverto?" and he expresses this irresistible conviction of his own existence as a thinking being, in the famous sentence, "Cogito, ergo sum." By this formula we are to understand—not

that one's existence is either a part or a consequence of one's thought—but only that the certain knowledge of one's thinking involves the knowledge of the existence both of the thought and of the thinker. Descartes expressly says, "Neque etiam qui dicit 'ego cogito, ergo sum sive existo,' existentiam ex cogitatione per syllogismum deducit, sed tanquam rem per se notam simplici mentis intuitu agnoscit." In other words, Descartes assumed, or posited, certain knowledge of our own inward life and being. From this circumstance some have supposed that he held consciousness to be the primordial source of conviction. Such, however, is not a fair presentation of his doctrine. For he found the source of the reliability of our internal perceptions, not in the power of the simple and direct cognition of that to which the active life of the soul may be immediately related, but in that clearness and distinctness which he found particularly to characterize certain modes of thought. He does not say, "*Conscius sum cogitandi, ergo sum*"; but only, "*Cogito, ergo sum*." Thus Descartes came very near hitting the truth, yet missed it altogether, and went off, like a comet, into the abyss of hypothetical speculation. "In this first knowledge which I have acquired," says he, "nothing but the clear and distinct perception of that which I assert, assured me of its truth; and this could not have so assured me, if it were possible that anything which I should conceive with the same clearness and distinctness should be false. Hence it seems to me that I may adopt the general rule that all things that I conceive very clearly and distinctly are true." For the word *percipio*, in the sentence, "*Videor pro regula generali posse statuere, illud omne esse verum, quod valde clare et distincte percipio*," means any kind of clear apprehension. Descartes, like Locke and Leibnitz after him, did not see the essential difference between thought and belief, and so was led to mistake clear and distinct conception for that irresistible and irrefragable conviction which is the special characteristic of knowledge. We may have clear and distinct conception of that which is false. This error of Descartes showed itself in the next step of his philosophy. In this he asserted the existence of God simply on the ground that the idea of God is natural to the soul. "*Tota vis argumenti*," he says, "*in eo est, quod agnoscam fieri non posse ut existam talis nature qualis sum, nempe, ideam Dei in me habens, nisi re vera Deus etiam existeret*" (Ueberweg's "Hist." § 114). This reasoning, and much more of the same kind by the same author, is not satisfactory. At the present day Cartesianism has little value, save as an illustration of the truth by way of contrast.

Descartes' reason for trusting his senses. The true reason given. Reid quoted.

We must not leave Descartes without mentioning his argument justifying reliance upon the perceptions of sense. It is this: from the innate knowledge of the Creator, which the soul possesses and develops, we know that God loves truth and abhors deceit; therefore he cannot have given us a nature whose opera-

tion would be a continual deception. This reasoning seems good, provided the existence of God and His moral attributes can be shown without any dependence on knowledge gained by the senses. This may be disputed; and, for another reason, also, the argument is unsatisfactory. Even granting it to be well-founded, it is a proving of that which needs no proof, and which is plainest when presented alone, and in the light of its own self-evidence. The weakness of the human intellect is such, that, in the course of abstract speculations, it may be enticed to forsake that solid ground of conviction presented in perception, and to seek for evidence in all sorts of argumentation; and then, for a time, even visible and tangible facts—or, at least, our remembrance of them—may be surrounded by the clouds of doubt and of confusion. A more satisfactory way of defending the primary convictions of the mind is to exhibit them in their own self-evidence: and this is to be done by clearness of statement and of illustration. It may be shown, also, that any denial of the self-evident involves absurdity; which mode of proof, however, is often only a variation of that just mentioned, the absurdity being inherent in the very contradiction of the truth, and not arising from the conflict of this with some other truth, of a different nature (§ 159). And, finally, the unsoundness of objections, or difficulties, may be shown, according to the best of one's ability (Reid's "Essays," vi. chap. iv.).

Self-evident truths are mostly presented in forms of thought which are general and secondary, and in which the full force of original conviction is somewhat abated. Strictly speaking, only those intuitions are self-evident in which truth and fact are first perceived by the mind; and general forms of thought are styled intuitive and self-evident, only because they may immediately represent or symbolize our primary convictions. On this account the truth of such generalized intuitions must be evinced by the employment of instances. In the case of presentational perceptions this is easily done. Let any one for a few minutes attend to his own experience; he will see that his belief in the reality of his inward life and of his immediate surroundings is something over which he has no control—something absolutely irresistible. Should he attempt for a time to reject the evidence of his consciousness and his senses, and to believe something contrary to it—for example, that he is a motionless and insensible block of stone or ice—he will immediately be convinced of the impossibility and absurdity of such a task.

The objections to the truthfulness of our presentational knowledge can be shown to be simply ingenious fallacies, and, for the most part, founded on exploded theories. But were they ever so subtle and unanswerable, they are such as never, for one moment, affect our real belief in the existence of an external and of an internal world. As Reid says, "The statesman continues to plod, the soldier to fight, and the merchant to export and import, without being in the least moved by the demonstrations

that have been offered of the non-existence of those things about which they are so seriously employed. And a man may as soon, by reasoning, pull the moon out of her orbit, as destroy the belief of the objects of sense."

The individuality of the objects of perception proved.

The doctrine of the *individuality of things perceived* does not call for extended consideration; it follows directly from the more general truth that all real things are individuals (§ 139). But we should notice that it is a double doctrine, and involves both a statement of simple fact and a statement of necessity. It is true both that all things perceived, that is, all that have been perceived, are individuals, and that all things perceived, including *those yet to be perceived*, must be individuals. Whichever phase of the doctrine we take, we can trace the origin of it to presentational thought. The first phase is simply a generalization from our immediate perceptions; while the second arises because, when we perceive objects to be individuals, we perceive also that this *is necessary in the case of those objects*, and that, too, simply by reason of their nature as real entities. Thereupon, because whatever is true of the particular by reason of its generic character is true also of the general, or universal, we infer and affirm that *all real entities whatever* must likewise be individuals.

The question of the complexity of things perceived, stated by Hamilton, and discussed. The question of the "*Primum Cognitum*" fourfold.

§ 146. We shall now consider whether the objects of presentative thought are complex or not. Sir Wm. Hamilton states this question clearly, though with special regard to external cognition, in the following language: "Whether, in perception, do we first obtain a general knowledge of the complex wholes presented to us by sense, and then, by analysis and limited attention, obtain a special knowledge of the several parts; or do we not first obtain a particular knowledge of the smallest parts to which sense is competent, and then, by synthesis, collect them into greater and greater wholes?" The subject thus presented may be treated as one branch of a wide inquiry formerly prosecuted under the head of "*The Primum Cognitum*," or, as we might say, of "*First Cognitions*." Cognitions may be first either in that capacity which is the most important distinction of all perceptions and with which we are now more immediately concerned, that is, *as the origin of all true knowledge*; or they may be first *as belonging to the commencement of human life*; or *as connected with the first formation of language*; or *as entertained by the mind at its entrance upon some methodical investigation*. We hold that knowledge which is first in any one of these modes is always more or less complex, and that the distinct cognition, either of elements or of minute parts, is gained afterwards by attention and analysis.

Adult perceptions complex.

No one now contends that the inseparable metaphysical constituents of things, are separately perceived in cognition. To this extent an initial complexity or synthesis is allowed to presentational thought,

at least by all who recognize the existence of metaphysical parts (§ 122). One's perception of a shining drop of dew might include the cognition of its body, size, shape, place, color, transparency, fluidity, and brilliancy. Though one or another of these attributes would probably affect the mind more sensibly than the rest, they yet might all be perceived at once; and a distinct notion of each of them would only be obtained afterwards. Prof. Dugald Stewart held a different doctrine from this. Influenced by the teaching of previous writers, that the soul, being unextended and indivisible, cannot have different simultaneous modifications, he maintained that the perception of the mind at any one time is confined to what he termed the "*minimum visibile*," or what might be more adequately called the "*minimum percipibile*"; and he ascribed the apparent instantaneousness of the perception of wholes to the rapidity of mental action. This view, together with the parent assumption that the soul is incapable of more than one modification at a time, has been rejected as unfounded and improbable (§ 29). Consciousness testifies that wholes of considerable complication can be perceived by the mind without any process and in one simple exertion of energy. The different parts of the object—of a lamp, or inkstand, or chair, or table,—together with the connecting relations of the parts, are apparently perceived as quickly and as simultaneously as the whole figure of a man is reflected from a mirror. Were this statement in need of formal proof, no more ingenious argument could be desired than one which is employed by Sir Wm. Hamilton. He calls attention to the fact that the face of a friend is much more easily recalled in its general outline than in its particular features. It is often found difficult to remember exactly the color of the hair or eyes, or the lines of the mouth or nose, of some perfectly well known friend. But such a result could scarcely be expected were the parts of the face always first perceived in succession, and after that combined, as Stewart says, with the assistance of "the faculty of memory." At the same time we must remark that, in adult or developed perception, the idea of the object is generally filled out from previous knowledge. When we speak of seeing a stone, or anything else which is hard, the idea of hardness is supplied by the mind from knowledge acquired through touch. Such perception is double; yet, probably, no more time intervenes between the commencement and the completion of it, than that which must elapse between the reflections from a looking-glass of the nearer and of the more distant parts of an object.

The first perceptions of the infant in one sense more complex, in another less, than those of after life.

The character of the perceptions of a new born infant must be chiefly a matter of analogical conjecture. In comparison with that developed character which they soon attain, they are doubtless wanting greatly—not in vividness—but in that distinction and separation of things which results from an ex-

ercise of the analytic power. Though it would be hazardous to say respecting any doctrine whatever, that it has not been upheld by some philosopher, we have never yet heard of any one who maintained that children an hour, or a day, or even a week old, are given to attentive and discriminating thought. The thinking power of

“The baby, new to earth and sky,”

may be supposed to be occupied simply with two comprehensive and ever varying conceptions. All things other than the conscious spirit and its life probably appear to it as one complicated and fluctuating *non-ego*, surrounding the soul and affecting it on every hand; while, at the same time, the soul perceives itself as the diversely sentient and thinking *ego*. Plainly, this mode of thought would be more confused and complex than that of our ordinary perceptions. But we may conjecture it to be followed by a phase of mind in which attention is specially given to the cognitions of one sense at a time; in which, for example, the infant considers simply the visible appearance of some toy, or of a hand or foot, to the exclusion of those qualities which are apprehended in connection with muscular and tactile sensations. The conceptions thus formed would, in one respect at least, be less complex than those of our daily life. But, finally, the child learns that the world around him, with its scenes and agencies, is not a mass of confused and intermingling parts—that many material forms may easily be distinguished—and that objects definitely perceived by one sense can be identified with the objects of other senses. So, at last, hands and feet, fingers and toes, persons and things, become individually marked and known. At the same time the young spirit begins to discern different general modes in its own life; sensation, thought, fear, desire, occasionally succeed in attracting some slight attention. Then perception may be supposed to have assumed its normal character, and to be ready for whatever increase in quickness and power is to be obtained through future practice.

The cognition—or rather the knowledge—which conditions the first formation and use of language, is more advanced than that of presentative thought; as is that, also, the possession of which is prerequisite to formal scientific or philosophical investigation. These, however, are illustrative of the general complexity of our earlier modes of thinking, and may be noticed in the present connection. Hamilton, unadvisedly, we think, regards the question of the *primum cognitum* as applicable only to the origin of language, and gives the following statement of it. “Does language originate in general appellatives, or by proper names?” (“Met.” Lect. XXXVI.) Without following the course of his discussion, we shall present what seems a reasonable answer. First, it appears evident that a considerable degree of mental development is necessary to the first use of language. Long before children begin

The state of thought at the first formation of language.

to speak they possess general notions, and are able to think by means of them. It is true that many of their ideas are particular; their conceptions of the different members of the family to which they belong, of the different departments of the house in which they live, and of the permanent objects within and about their home, are individual, or singular. But they have perceptions, also, of things which are continually changed, and replaced by others of a similar character; and it is impossible that they should not form general ideas in connection with such perceptions. Not to speak of the modes of their own life which repeat themselves in rapid succession, classes of things, such as cups, saucers, plates, knives, forks, spoons, tables, chairs, and other articles of daily use, together with general notions such as bread, butter, milk, water, wood, coal, which represent things of daily consumption, must find a place among their thoughts. It is unlikely, therefore, that human language at any stage of its development ever consisted wholly of proper names, or even that all words are first employed and understood by children as applicable only to singular objects. On the contrary, when children ask for a spoon or cup, a piece of bread, or a glass of water, as they do so soon as they can talk at all, they are using common nouns in their appropriate significance.

At the same time, it is true that the very first words used by children are either proper names or terms which they take for such, and which are not as yet understood by them to have a common applicability. Locke, and Aristotle before him, are only two out of a long line of philosophers who have remarked that the little ones at first use appellatives, such as papa, mamma, nurse, aunt, in just the same way as they do proper names, such as Edward or Eliza, not knowing that the former have a general meaning while the latter are individual properties. So, also, often, in very early life, the cow, the horse, and the dog, are names which represent individual animals only. The same philosophers remark that the action of the mind in forming general notions, is instanced by the readiness with which terms are transferred from a singular to a common signification. A child who has learned to say papa and mamma will call every man he sees a papa and every woman a mamma. Very soon, however, such mistakes are corrected, and words are employed properly. But the law of thought, that the complex and particular precedes the abstract and general, affects the language of adults no less than that of children. Numberless instances might be adduced in which the individual fact has lent its own proper name for a general service; and many are of special interest. The verb *meander* was originally a noun designating a winding stream in Asia Minor. Buncombe, which is the name of a county in North Carolina, came to signify the making of speeches for the sake of distant popular effect, by reason of the remark of a rough old mountaineer, Felix Walker, who once represented that county in the State Legislature. His fellow-members were tired of the old

man's rustic oratory; some shouted, "Question, question"; others begged him to desist. But he could not be stopped; "for," said he, "I am bound to make a speech for Buncombe." Jack Ketch, which is a common English expression for hangman, was at first the proper name of a man who busily discharged the duties of that office during the "bloody assizes" of Lord Jeffreys, in the reign of James the Second. The term *Czar* or *Kaiser*, is an enduring monument of that supreme authority which Julius Cæsar once obtained for himself over the ancient world; while *Emperor*, which is from the Latin *Imperator* and is the English equivalent of *Czar*, also dates its origin from the times of Cæsar. For, being unwilling to offend Roman ears by the designation "king," he contented himself with this military title. The doctrine of the priority of the complex in the history of mental development is also supported by the fact that our more abstract nouns are, for the most part, of late appearance, as compared with those more concrete. Such words as *animal*, *quadruped*, *mammal*, which present certain aspects of that natural genus to which *horses*, *cows*, *dogs*, *cats*, and other like species, belong, are of later use than these specific names. Grammarians, also, note that modern languages are analytic, while the ancient are synthetic, in modes of expression; which circumstance indicates a kind of unconscious public progress in discriminating and abstractive conception.

Science starts from a consideration of the complex. Aristotle and the Elder Scaliger quoted and criticised.

After all that has been said, we need not dwell on the doctrine that the knowledge with which any science begins, is more complex than that afterwards attained. This is simply to say that the analytic is the only reliable method in scientific investigation (§ 123). For, if this be granted, it is plain that the knowledge of attentive observation is that with which philosophizing commences, and that this knowledge is more complex than the general conceptions and principles which may be evolved from it by means of right thinking. Few now hold the contrary doctrine, though too many yet conform their practice to antiquated methods. Very few deny that our knowledge of the general is originally derived from our perception of the individual. And no fact is better attested by the past history of philosophy than that those who will construct science, whether physical or mental, from abstract principles unsupported by induction, or generalization from particulars, are devoting their lives to the accomplishment of failures. Man, indeed, is capable of understanding the abstract when presented to him by others, and can combine elementary ideas into those which are more specific. But such is not the order of our first attainment of the principles of knowledge. These things, which appear plain now, were once hidden in obscurity. The confusion of the greatest intellects in regard to them, may be illustrated by quoting the words of two eminent men. Aristotle, and that, too, in the commencement of his "Physics," says: "We ought to proceed from universals to singulars; for the whole is better

known to sense than its parts; and the universal is a kind of whole, as the universal comprehends many things as its parts." And the elder Scaliger, a man famous for philosophical acuteness, writes, "Whatever presents itself to us as a whole is known before its parts, . . . and, in this way, the prædicable genus is known before its species." These statements have a color of justification in the fact that we often form tolerably correct conceptions of genera—for example, of trees, or grasses, or horses, or elephants—before we can tell their species, and because, also, these wide conceptions are of use in giving a general direction to our inquiries. But the grand mistake of investigators has been to accept unverified spontaneous generalizations, which cannot be relied upon except in things easy and evident, as "they were the principal support of philosophy. These generalizations do not belong to the ultimate basis of truth at all. When Aristotle directs us to proceed from them as from "the better known to the less known," his words have a most mischievous tendency. To say, without qualification, as Scaliger does, that "whatever presents itself as a whole is known before its parts," to make the metaphysical and the logical wholes (§ 122), alike and in the same sense, the starting-points of inquiry,—is a direction which certainly may lead to truth, but which also, much more certainly, will lead to error (Hamilton's "Met." Lect. XXXVI.).

CHAPTER XXXI.

CONSCIOUSNESS.

The doctrine of consciousness simpler than that of sense-perception, and logically antecedent.

§ 147. Of the three subordinate modes of the presentative intellect, that immediately conditioned on sensation, and therefore called sense-perception, is more noticeable than the rest, involves a greater number of important questions, and has received more attention from philosophers. For that appearance of simplicity which characterizes our external perceptions, notwithstanding the real complexity and subtlety of most of them, has beguiled many into a task which they have found easier to begin than to finish. The problem of sense-perception has been the "*quæstio vexata*" of twenty centuries, and has reached a satisfactory solution only during the last one hundred years.

Before attempting the discussion of it, let us consider the power of consciousness. For the action of this power is simpler than that of external perception, and also conditions it. Because, although we do not regard our first cognition of body and its changes to be merely an inference from sensations which are immediately perceived, there is yet a sense in which conscious-

ness conditions sense-perception. It is self-evident that material changes are never seen apart from the psychical phenomena which result from them; and, on the assumption that both are seen together and with equal immediateness, it is plain that we cannot perceive the material correlate, without perceiving the psychical, also. This latter cognition is an act of consciousness. For this reason the process of sense-perception might be conceived of as including a certain exercise of consciousness, that, namely, in which the sensation is perceived as the correlate of its material cause. This mode of conception, however, is not necessary. As we have often remarked, things inseparable may be distinguished; the consciousness of the sensation may be regarded only as a concomitant condition, and not as an internal part, of the sense-perception.

The history of the term *consciousness*. The term *reflection* as employed by Locke.

The term *consciousness* signifies, literally, an accompanying knowledge. In this radical meaning it is synonymous with conscience, or *conscientia*, which term, in mediæval philosophy, was the ordinary expression for what we now call consciousness.

The scholastic definition of *conscientia* was "*perceptio qua mens de presenti suo statu admonetur.*" But our activities may be perceived either simply and as to their own essential nature; or as being right or wrong, virtuous or vicious or indifferent, by reason of their relation to the moral law; therefore two kinds of knowledge may be said immediately to accompany the life of a rational spirit. Thus the term *conscientia*, as expressing equally either of these kinds of knowledge, was affected with an ambiguity. This was avoided, in the English language, by forming the word *consciousness* and by surrendering the word *conscience* to a use purely ethical. The ambiguity had been previously avoided by Latin writers who employed the term *reflexio* for the notice taken by the mind of itself and its life; and so, when Locke wrote, a choice of terms was presented to him. Although Locke speaks of consciousness, and even gives the definition, "Consciousness is the perception of what passes in a man's own mind" (bk. ii. chap. i.), he prefers reflection as the formal name of the power. Two reasons may have influenced this choice, perhaps unconsciously. In the first place, reflection, which signifies the bending back of the mind, naturally suggests an attentive or observant consciousness, by which, only, we can form clear and satisfactory ideas of what passes within; it is to such a consciousness that Locke constantly appeals, though he does not distinguish it from consciousness in general. And, secondly, the term *reflection* admits an easy, though unscientific expansion of its meaning, so as to include and account for the cognition of certain things—such as duration and succession and number—which are not, properly speaking, perceived by consciousness, yet are perceived in immediate connection with the proper objects of consciousness. Locke, for example, distinctly says, that duration has "its idea from reflection on the train of our ideas" (bk.

ii. chap. xiv.). The use of the term *reflection* by this great man illustrates his chief defect, which is a want of precision and exactitude both of thought and of expression. But, for all that, the "Essay on the Human Understanding" is a book blazing from beginning to end with independent and powerful thinking. "The other foundation," says Locke, "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 understanding 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*."

Consciousness defined.
Includes perception of the *ego* and its powers.
Hume quoted.

Both before and since the publication of the "Essay," philosophers have defined consciousness as the power of the soul to perceive its own states and operations. These, undoubtedly, are the objects concerning which consciousness is principally exercised.

But it seems proper to say that we are conscious of the *ego*, or self, or spiritual substance, and of its powers, as well as of the operation of the powers of the *ego*. *In all acts of consciousness, and in these acts only, we perceive, as one complex object, the ego, its power, and its activity*; which cognition, moreover, is all truly concomitant of our thought and experience as related to other objects. President Porter says rightly, "We are directly conscious of the *ego* itself;" to which we take the liberty of adding, "and of its powers, also." This doctrine, that the soul is immediately cognizant of itself and its powers, would, we have no doubt, have received the approval of Locke; yet it was never directly taught or asserted by him. This omission left opportunity for subsequent writers, who accepted "sensation and reflection" as the "original of all knowledge," to question whether any such things as the soul and its powers are ever perceived to be. Hume, in his usual pleasant way, says, "For my part, when I enter most intimately into what I call myself, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch myself at any time without a perception, and never can observe anything but the perception. . . . If any one, upon serious and unprejudiced reflection, thinks he has a different notion of himself, I must confess I can no longer reason with him. . . . He may, perhaps, perceive something simple and continued, which he calls himself, though I am certain there is no such principle in me" ("Human Nature," part iv. § 2). To the same effect is

the assertion of Stuart Mill, "My mind is but a series of feelings." It will be noticed that these statements are deductions from an exclusive construction of the doctrine of consciousness—from the view that consciousness perceives only the *operations* of the *ego*. The best mode of dealing with such heresies is to confront them with the common sense of men, by which they are flatly contradicted, the ground of the contradiction being every man's own immediate cognition of himself. True, we never "catch ourselves at any time without some perception or other." But this does not show that no *ego* exists and is known, but only

that it is never seen save as in activity. We allow that the conception of *self*, as distinguished from the conception of the *ego*—in other words, the conception of the *ego*, not simply as existing at the present moment and with this present activity, but as an enduring entity with permanent characteristics,—requires something more than the exercise of mere consciousness. It includes the identification and the comparison of the *ego* and its present state with itself and its previous states; which acts involve memory. Indeed the identification of the *ego* as now existing with itself as existing formerly, is one of the elements which distinguish remembrance from every other exercise of the intellect. At the same time, it is clear that, if the *ego* of consciousness be admitted, the *self* of memory and of anticipation cannot long be rejected. Let us note, also, that the *ego* and the *self* may be conceived of abstractly and aside from the thought of any particular modifications. The notions of them expressed in language are not only formed in this way, but have also a general character. *Ego* and *self* and the other personal pronouns, though not ordinarily used to express general notions, are yet terms which have a common applicability, and whose singularity depends wholly on their individuality of application. But the *ego*, of which one is conscious, is always perceived, not merely as an individual, but also as affected with the modifications and relations of the present moment.

§ 148. The conception of consciousness which we have been considering hitherto, may be regarded as the primary and proper meaning of the term.

From this two secondary senses are to be distinguished. Sometimes the word, according to its original force, signifies a cognition accompanying some other cognition which more directly occupies the mind. A student, while engaged with his books, might be said to be conscious of the presence of some one in his room; an orator, while speaking, might be said to be conscious of his power over some assembly. A criminal may be conscious of his guilt, a martyr of his innocence, a millionaire of his wealth, a beautiful woman of her attractions. Such language, however, belongs chiefly to common life. On the other hand, there is a peculiar metonymical sense of the term *consciousness*, which is employed chiefly by philosophers, according to which it signifies, not the act or power of self-cognition, but all those

The conception of the *self* distinguished from that of the *ego*.

Two secondary significations of consciousness.

internal affections and operations, taken collectively, of which the soul is conscious. In this sense one's consciousness includes all his thoughts without exception; it is the entire life of the soul considered as the object of one's experience or immediate cognition. Hence Hamilton's definition is inadequate, in saying, "Consciousness is a comprehensive term for the complement of our cognitive energies." This statement could be accepted only in case no other psychical phenomena than those of cognition could be internally perceived; or provided, at least, that usage had restricted the term *consciousness* to less than its natural application. Neither supposition is true. On the other hand, according to the *usus loquendi*, "the contents of one's consciousness" comprise only whatever is part of the active life of the soul. The soul itself and its powers are not included, though, as we have seen, we may be said to be conscious of them also. The cause seems to be twofold; in the first place, the ordinary attention of consciousness is directed to the changing phenomena, and not to the permanent factors from which they originate; and, secondly, a name is needed for these phenomena as a collective whole, whereas there is little or no need for a collective name to cover the soul, its powers, and its operations.

The point of principal difficulty in the doctrine of consciousness is connected, somewhat, with the ambiguity with which the name of this faculty is affected, by reason of its diverse meanings. It may be presented thus: *Consciousness is a power of mind which has a distinct and special function of its own.* This proposition has been strenuously controverted by Sir Wm. Hamilton, and by other eminent writers both in Europe and America. In the eleventh lecture of his "Metaphysics," Hamilton says, "The knowledge which I have of the modifications of my being, and through which knowledge alone these modifications are possible, is what we call consciousness. The expressions, 'I know that I know'—'I know that I feel'—'I know that I desire'—are thus translated by, 'I am conscious that I know'—'I am conscious that I feel'—'I am conscious that I desire.' Consciousness is thus, on the one hand, the recognition by the mind, or *ego*, of its acts and affections; in other words, the self-affirmation, that certain modifications are known by me, and that these modifications are mine. But, on the other hand, consciousness is not to be viewed as anything different from these modifications themselves, but is, in fact, the general condition of their existence, or of their existence within the sphere of intelligence." These words of Hamilton conflict with his definition that consciousness is "the complement of our cognitive energies"; they make consciousness to include all the modifications of our being, and not the cognitive only. That definition may be accounted for, though it cannot be justified, by the fact that the term *bewusstseyn*, which Hamilton encountered frequently in German authors, signifies, not only that distinct knowledge of one's own life which is ob-

Consciousness a special mental faculty. Sir Wm. Hamilton quoted.

tained from consciousness, but also any kind of knowledge so clear, or so confirmed, that one can say respecting it, "I know that I know that," or "I am perfectly aware of that." No English noun expresses this second meaning of *bewusstseyn*.

The doctrine, that "consciousness is not a special faculty," which Hamilton teaches, not merely in the passage above quoted, but also in many others, is really abandoned when he comes to treat of "self-consciousness" as a specific, or "subaltern," faculty. His description of this faculty cannot be distinguished from that conception of consciousness which he elsewhere asserts to be self-contradictory and absurd. The different conflicting statements which make up the doctrine of consciousness as expounded by Sir William, illustrate and confirm a scholastic adage which he quotes: "*Reflexiva cogitatio facile fit deflexiva.*" This saying is true respecting every exercise of internally directed thought; it is especially true when consciousness, assisted by attention and discrimination, is engaged upon the problem presented by itself.

A difficulty connected with the consciousness of thought.
Jas. Mill, Hamilton.

The confusion affecting Hamilton's doctrine may be partly accounted for by the ambiguity of the words *consciousness* and *bewusstseyn*; the first of which, as expressing the object of the exercise of the power of consciousness, includes every phase of psychical life; and the second of which is applicable to every mode of clear and conscious knowledge. But it originated chiefly from the difficulty naturally encountered in distinguishing the consciousness of thought in any particular case from the mental state or operation which is the object of it. This difficulty is greater than that, already noticed, of separating the consciousness of a sensation from the perception of the cause of the sensation. Yet the cases are similar, because in each we must distinguish elements which, at the same time, are indissolubly united in one complex exertion of energy. With Mr. James Mill the phenomenon of consciousness was something that did not admit of analysis; therefore he identified the consciousness of a feeling with the feeling itself. "To say," he writes, "that I am conscious of a feeling is merely to say that I feel it. To have a feeling is to be conscious, and to be conscious is to have a feeling." For our own part, so far as other than intellectual states and operations are concerned, the distinction between a psychical activity and our perception of it, is not a matter of unusual difficulty. Is it not easy to distinguish between pain or anger and the cognition and conception of these things? The relation, however, between a *thinking* and our consciousness of it, is affected by a subtlety, which becomes apparent, not when we speak, indefinitely, of the consciousness of thought, but *when we attempt to explain the consciousness of some particular conception*. It is evident that, in the very act of cognition, we form an idea or conception of whatever is the object of cognition, and therefore, if any idea or conception be an

object of cognition, we must form a conception of it. But it is impossible to form any conception of an idea without including in that conception, and as a prominent part of it, that very idea of which we conceive. Our idea of the moon is the most prominent part of our idea of the idea of the moon. It is the individual difference which distinguishes our conception of this idea from our conception of any other idea—for example, that of the sun, or of the earth. This fact was the chief obstacle with Hamilton in the way of crediting consciousness with any specific intellectual function. In support of the doctrine that “consciousness is not a special faculty,” he argues: “If it can be shown that the knowledge of an operation necessarily involves the knowledge of its object, it follows that it is impossible to make consciousness conversant with intellectual operations to the exclusion of their objects.” Again he says, “*We know, and we know that we know, these propositions, logically distinct, are really identical.*”

The conception of an idea includes the idea conceived.

We admit that our conception of anything is part of our consciousness, that is, of our immediate cognition, of that conception; at the same time, we affirm that the consciousness even of our thoughts may be distinguished from them. In our conception of the idea of a thing, the thing itself is not the direct and proper object of thought, but is only referentially conceived of. And the idea of the object, the moon, is not by any means the whole of our conception of that idea; nor is it that element of the conception which it is the peculiar office of consciousness to furnish; which element is the thought of mental action or condition. When we say we are conscious of an idea of the moon, we not only have this idea and do this thinking, but we perceive that in so doing we are exercising a certain kind of intellectual power. In other words, we perceive that the idea of the moon exists as an idea and belongs to ourselves as intellectual. Although this includes having an idea of the moon, it is something very different from having it.

The consciousness of a knowing does not include the knowing.
Bewusstsein.

Moreover, having admitted that an idea conceived of is part of the conception of itself, we have nothing more to admit as to the identity of consciousness with its objects. *Our consciousness of a knowledge, or knowing, may be said to include the conception contained in the knowledge, but cannot be said to include the knowledge.* A knowledge of anything may be defined as the conception of the thing known to be, together with a certain and well-grounded conviction as to the existence of the thing (§ 40). The consciousness of a knowledge is, in part, the consciousness of the conception of the thing known, and, therefore, also includes that conception. For the consciousness of a conception includes the conception. But the consciousness of a knowledge must comprise not simply the consciousness of the conception of the thing known, but also a consciousness of our absolute confidence as to

the existence of the thing; and it is not true that the consciousness of a conviction (or belief, or any mode of intellectual confidence) includes that conviction. The consciousness of a conviction, being the immediate knowledge of it, must include two things; first, *our conception of the conviction or belief* (and this, as to its generic nature, which is that of confidence in the existence of a thing; as to its particular object, whatever that may be; and as to its character, whether strong or weak, certain or probable); and secondly, *a perfect conviction as to the existence of the conviction or belief experienced*. But *neither of these things can be identified with the conviction experienced*. The conception of the conviction cannot be identified with it; this would be to confound thought with belief; and the conviction as to the existence of the conviction experienced, cannot be identified with that conviction; because it has a different object from the latter, and may have a different character. When I know that I expect a friend to tea, my knowledge and my expectation are quite different convictions; and the difference between the two knowings would be no less real in a case where I might say, "I know that I know that my friend is faithful." Consciousness, therefore, so far as it may be the cognition of a knowledge, does not include the knowledge known.

Here precision of thought calls for the remark that *the consciousness of a knowledge does not include the perception that the conviction contained in it is well-founded, but only the perception that the conviction is absolute and assured*. The expression, "I know that I know," may be regarded as naturally including more than the mere consciousness of a knowledge. That expression *may* signify simply, "I am conscious of a mental operation attended by an absolute conviction," or it may signify, "This conviction, of which I am conscious, must be well-founded and perfectly reliable; for I have repeated and tested the operation productive of it, and find that there has been no mistake." This latter meaning is the more natural; and, plainly, the secondary and confirmatory knowledge which it sets forth, though dependent on the use of consciousness, results from a process of careful repetition and inquiry. It shows the instinctive exercise of a kind of logic. These two applications of the expression, "I know that I know," illustrate the two meanings of *bewusstseyn*. But, in English philosophy, the term *consciousness* is restricted to the *immediate* cognition of what passes within.

§ 149. We need not dwell on the difficulty, also presented by Hamilton (Lect. XI.), that the conception of consciousness as a special faculty would involve a knowledge of what consciousness is; which could be obtained only through a perception of the operation of this power, that is, through a consciousness of consciousness; which is impossible. We grant that consciousness cannot be conceived of and defined without being perceived, and that this perception is a consciousness of consciousness. This second consciousness

We may be conscious of being conscious.

is not an impossibility. It is of the same nature as those modes of the first consciousness, already considered. It is the present perception of a present perception; this involves no absurdity, if we allow that the intellect is capable of a complexity of action. This secondary act of consciousness does not imply any infinite regression; it is simply the perception by the mind that its immediate cognition of itself as thinking, knowing, feeling, and doing, is an element of its activity additional to those more directly perceived.

When such difficulties as we have now mentioned, are dismissed, because of their sophistical character, how plain the fact remains that consciousness, though not a separately operative, is yet a distinct and peculiar, mental power! If modes of immediate cognition be contrasted according to the differences of things perceived, in their relation to the percipient *ego*, then this faculty, which gives the knowledge of psychical things, must be distinguished from every other. If we must recognize a faculty of external cognition which, nevertheless, is conditioned by the perception of things internal, we must recognize also a faculty of internal cognition which, nevertheless, is conditioned by the perception of things external. How manifestly, too, conceptions originate from consciousness which are distinct from all others, and which could not come from any other source! How could such ideas arise as seeing, thinking, believing, doubting, reasoning, knowing, or such as enjoying, suffering, desiring, fearing, resolving, doing, if we had not a power of perceiving these things? All these notions are generalizations from the particular cognitions of consciousness. The special action of this power, even in the case of our thoughts, is witnessed by such terms as notion, imagination, idea, thought, conception, which apply to *classes of mental states and operations*. The use of such terms must have been preceded by the individual perception of such states and operations; and the conceptions which they express must have been obtained by eliminating, from individual conceptions of ideas, the ideas themselves. This abstraction shows that the cognition of internal things is very naturally regarded as a distinct function, even while it combines with other functions in the same exercise of mental energy. In this case, as in many others, common thought is able to separate the inseparable, and can reject as absurd the language of Hamilton when he declares himself conscious of his table and his inkstand.

The trustworthiness of consciousness. Mill quoted. His doctrine of the *ego* discussed.

§ 150. The trustworthiness of the cognitions of consciousness is a doctrine on which all philosophers have always been agreed. We think it is the only one which has never been disputed. This

unanimity should be a matter of congratulation among the thoughtful brotherhood; though we suppose they would hardly claim that they have each other to thank for it. Beyond question, if there were any possibility of rejecting the

authority of consciousness, some illustrious school of wise men would have done this long ago. What Varro says is true, "Nihil tam absurde dici potest, quod non dicatur ab aliquo philosophorum." No one, even of that considerable class whose originality lies in paradoxical opposition to the common sense of men, has dared to broach a doctrine so untenable as the denial of the testimony of his own consciousness would be. When a man is suffering, how vain it is to tell him that there is no pain—that there is no such thing as pain! The stoic may maintain that pain, at least for the virtuous, is not an evil, but the means of great and lasting good; but who that has had the toothache, can deny the reality of pain? When we survey a landscape, when we study a lesson, when we remember an absent friend, when we are pleased with goodness or indignant at wrong doing, when we have earnest desires, or make high resolves, or put forth strong exertions, when we feel exhausted with labor or are triumphant with success, how certain we are of the reality of these things as parts of the soul's experience! Even that skeptical school, who destroy our conceptions of knowledge and belief by identifying these things with the reproduction of sensations and the association of ideas, admit that the revelations of consciousness are of immediate and absolute authority. Mr. John Stuart Mill, the Associationalist Aristotle, in his "Examination" of Sir Wm. Hamilton's philosophy, condemns, as needless and unwise, any attempt to prove the reliability of consciousness. "All the world," he says, "admits that it is impossible to doubt a fact of internal consciousness. To feel and not to know that we feel, is an impossibility. But Sir Wm. Hamilton is not satisfied to let this truth rest on its own evidence. He wants a demonstration of it. As if it were not sufficiently proved by consciousness itself, he attempts to prove it by a *reductio ad absurdum*."

In view of statements, such as these,—which are made by Associationalists—we naturally inquire how these writers can reject that teaching of consciousness which asserts the existence of the *ego* and its powers. Any ordinary unsophisticated man will say that he is just as certain of the existence of himself and of his faculties of thought, feeling, and action, as he is regarding the operation of these faculties; nor will he allow that his perception of himself, as a living being, is any less immediate and reliable than his perception of his spiritual life. He will even affirm that he desires no greater certainty respecting any fact, than that, which he experiences every moment, respecting the fact of his own existence. Those who admit the "self-evidence" of consciousness can defend their denial of the *ego* only in one way: they must claim that no such thing as an *ego* is ever perceived. To do this directly would be a declaration of open war upon the common sense and the common language of mankind. Therefore they permit us to speak of ourselves and our powers, and allow that such language sets forth reality. But they assert that

the reality is different from what most of us take it to be. The problem, however, of explaining away the *ego* has not been found easy. Mr. Mill's explanation consists of two parts, the one of which supplements the other. Proceeding on the hypothesis that we know only that of which we are conscious, and that we are conscious only of feelings, and having defined the mind as "a thread of consciousness" or "a series of feelings," he first encounters the fact that "the thread of consciousness," consists "in part of memories and expectations." "These," he says, "include the belief that I myself formerly had, or that I myself, and no other, shall hereafter have, the sensations remembered or expected. The fact believed is that the sensations did actually form, or will hereafter form, part of the self-same series of states, or threads of consciousness, of which the remembrance or the expectation of those sensations is the part now present. If, therefore, we speak of the mind as a series of feelings, we are obliged to complete the statement by calling it *a series of feelings which is aware of itself as past and future*; and we are reduced to the alternative of believing that the mind, or *ego*, is something different from any series of feelings or possibilities of them, or of accepting the paradox, that something which, *ex hypothesi*, is but a series of feelings can be aware of itself as a series." This reasoning is clear and good. It is true that the "fact" of the continued existence of "the self-same series of states," in which the experience of the past is united with that of the present and that of the future, can be known only through a *recollection* of the past, combined with a *consciousness* of the present, and an exercise of *judgment* which anticipates things to come. Here, therefore, three fundamental grounds of belief, Consciousness, Memory, and Judgment, are assumed. What one of these can be explained as merely the reproduction of sensations or the association of ideas? We think that Associationalists have no right to appeal to the testimony of such powers. Nevertheless, accepting the assumption as a statement of truth, the syllogism is perfect. The mind, which is but a series of feelings, remembers its past feelings and expects others in the future. Therefore the mind is simply a series of feelings which is aware of itself as past and future. This nonsense is termed by Mr. Mill, "that final inexplicability at which we inevitably arrive when we reach ultimate facts." An ultimate fact may be inexplicable; it is not absurd. We do not wonder that Mr. Mill styles his doctrine a paradox. Who ever thought himself to be a series of any kind? What mind was ever aware of itself as being a passing procession, or as being anything else than an enduring unit? It is strange that the noble intellect, which so clearly apprehended the absurdity, could not reject the hypothesis from which it springs, and accept the alternative that "the *ego* is something different from any series of feelings or possibilities of them"—that the soul is something different from its states, though it is not to be seen save in connection with them. We see how wonderfully

able thinkers, like Hume and Mill, can be deluded, when once they have been led to adopt defective principles. Theoretical disbelief in the *ego* is a direct result of the fundamental error that we have immediate cognition of phenomenal changes only. These gentlemen deny themselves to be conscious of their own existence, because that would be a surrender of their philosophy.

The *ego* neither a series of feelings nor a permanent possibility of feeling.

The other part of Mr. Mill's doctrine regarding the *ego*, is an explanation of the belief that the soul exists during the intermissions of actual consciousness; and is supplementary to the definition that mind "is but a series of feelings." In recognizing the necessity for a second statement, Mr. Mill assumes that one's unavoidable belief in his own existence is sufficient evidence of some fact to be accounted for; thus he admits the exercise of a power of judgment by which we believe in the existence of something which continues to exist as well when we are not conscious as when we are. Associationalism cannot even plausibly account for any such belief as this; indeed, nothing more exhibits the weakness of this system than the necessity, constantly encountered by its advocates, of assuming or admitting principles which have no proper place within their creed. This, however, does not invalidate the reasoning of Mr. Mill. "The belief I entertain," he says, "that my mind exists, when it is not feeling, nor thinking, nor conscious of its own existence, resolves itself into a belief of a permanent possibility of these states. If I think of myself as in a dreamless sleep, or in the sleep of death, and believe that I, or, in other words, my mind, is or will be existing through these states, though not in conscious feeling, the most scrupulous examination of my belief will not detect in it any fact actually believed, except that my capability of feeling is not, in that interval, permanently destroyed, and is suspended only because it does not meet with the combination of outward circumstances which would call it into action; the moment it did meet with that combination, it would revive, and it remains, therefore, a permanent possibility." In this statement we are taught that mind exists, during intervals of unconsciousness, as a suspended capability of feeling, and that it is, at all times, a possibility of feeling, a permanent possibility. The word *capability*, which Mr. Mill uses, properly signifies a kind of power (§ 10), and might be regarded as exhibiting another indirect admission of truth; passing that over, let us consider Mr. Mill's intentional teaching. Our first objection to it is that it *denies the fact which it professes to explain*. We are ignorant of any conception of possibility that associationalism can form; but we know what possibility is, and what it implies (§ 73). In particular, we know that when we speak of the possibility of an entity which does not, yet may, exist, we are speaking of the consistency of the supposed existence of that entity with given fact, whether negative or positive,

and that the entity, its existence, and its possibility, are merely ideal objects which do not exist at all (§ 37). To make our continued existence the mere possibility of that which does not exist is to deny that continued existence altogether. Such a possibility in itself is nothing at all.

Our second objection to Mr. Mill's statement is that it really involves the fact which it is intended to disprove. It is impossible to assert a real possibility without admitting the condition, or conditions, on which it depends. Let us remember that the possibility of a non-existent entity may be either hypothetical or real (§ 76). The former of these is an imaginary possibility, and is asserted simply on the supposition of conditions, which are known not to exist. A fire would be hypothetically possible, but really impossible, on the supposition of the possession of fuel which yet cannot be procured. This possibility is entirely removed from reality; to make our continued existence the hypothetical possibility of something would simply emphasize the denial of that existence. But, on the other hand, if our continued existence be a real possibility (which is the best conjecture we can make as to the meaning of Mr. Mill), then it is plain that something must really exist as a foundation for this possibility. The reality of a possibility is metonymical and sets forth only the reality of that on which it depends. And now, what else can be the condition of a permanent possibility of feeling than the continued existence of one's self and one's powers? Mill's conception of the *ego*, therefore, is doubly self-contradictory. First, it is self-contradictory in identifying reality with possibility—the confessed reality of the *ego* with the mere possibility of a non-existent experience. Secondly, it is self-contradictory in asserting a self-sustained possibility. For—we repeat it—a possibility has no reality of its own, and exists only in the existence of its own proper conditions. Beyond question there is within us a permanent possibility of psychical experience; but this possibility exists, and can exist, only in the existence of the powers of the soul.

Error traced to a strict construction of Locke's doctrines, and to his definition of substance.

The radical errors of Associationalism, including the denial of the *ego*, originated, historically, from the influence of Locke's doctrines upon a certain class of his disciples. The fundamental conceptions and principles of Locke are marred by great want of definiteness, and should be regarded, not as statements whose perfection precludes correction or addition, but as the first rude beginnings of a great philosophy. That class of disciples to which we have referred have construed Locke's doctrine as to the primary sources of our knowledge very strictly; and then, with much logical skill, but with little philosophical penetration, they have maintained that sensations, and ideas (reproduced sensations), are the only objects whose existence can be perceived. This extremity of delusion is not to be met with in Locke himself, whose belief in respect to the objects of our cog-

nition coincided with that of men in general; yet the incidental imperfections of his philosophy wonderfully facilitated the progress of error. His constant mention of ideas, as if they alone were the immediate objects of knowledge, threw great obscurity over the doctrine of perception: his account of personal identity is unsatisfactory; above all, his definition of substance, in which the metaphysical and the logical substance (§ 126) are confounded, includes a falsity, which many, if not most, subsequent philosophers have received without question. Even Reid and Hamilton accepted Locke's incognizable substratum; we think that Pres. McCosh is the first author by whom it has been expressly rejected. Locke defines substance, "The supposed but unknown support of those qualities which we find existing." In truth, substance is not a thing supposed or unknown, though it is a thing abstractly conceived of, and difficult of definition. For, certainly, we know two kinds of substances, spirit and matter; and, therefore, the knowledge of substances exists in one's mind whether he be able, or whether he be unable, to analyze and define it. Locke's definition gave an admirable opportunity for his keen-witted disciples to reject, at once, the definition and the thing. Why should any one, without some good reason, believe in a supposition? And how can we know that any given thing *is*, without, in that very knowledge, knowing *what* it is? (§ 48). The chief difficulty connected with the definition of substance—that is, of metaphysical or "real" substance—lies in the extreme simplicity of its nature. Substance is a thing absolutely simple; therefore, like space, time, power, or change, it is incapable of analytical definition. Such things, however, can, and should be, defined by mentioning one or more of their relational properties. For the present, it may suffice to describe substance as that kind of entity by which alone power, whether active or passive, can be possessed and exercised. And the *ego*, or soul, may be described as a substance endowed with those peculiar powers which we call psychical (§ 162).

§ 151. If the consciousness of one's self be allowed, the consciousness of one's powers may be claimed without further argument. In general, the same reasons, which support the one, support the other. Moreover, our consciousness of the self, its powers, and their operations, should be considered not merely as a fact of frequent occurrence, but as the necessary and constant concomitant of our psychical life. For, although the parts of our experience at any one time may be regarded with diverse degrees of attention, and some, it may be, with the least possible attention, we cannot be said to be entirely unconscious of any part of it. The power of inward cognition appears to be all-embracing in its notice; should any one assert his utter unconsciousness of any thought, or desire, or motive, attributed to him, we would accept this as equivalent to the statement that no such thought, desire, or motive, exists within his bosom. So far as we can ascertain, every period of

Consciousness the concomitant of all mental life.

unconsciousness exactly corresponds to a period of mental inaction; and every activity of the *ego* involves, also, a consciousness of that activity. To this dreams and somnambulistic performances present no exception. If they did, they could never be remembered in any way. Our power of inward perception views the whole phase of our psychical life at any one time somewhat as the eye views a picture which falls wholly within its range of vision.

While we thus recognize consciousness as invariably and necessarily a factor of our mental life, the question may arise, whether this be a result simply of man's actual constitution or whether it result from that constitution which necessarily belongs to every intellectual being? In other words, is it, or is it not, possible that a mind, with its powers and operations, should exist without any consciousness of itself and its life? This inquiry is allied to another, which might even be said to be embraced within it, viz., Could an intellectual being be constituted so as to be cognizant of his own operations without perceiving the powers producing them, or so as to be conscious of his operations and powers without any perception of himself? The dependence of the negative of this question, at least, upon the negative of the preceding one, is very obvious. If we cannot perceive things not ourselves, without also perceiving our perceptions of them, then we may easily agree that the power of self-consciousness itself does not admit of divided action. At present we shall direct our principal consideration to the former question; and this with reference to the place which it occupies in the history of opinions. Philosophers have differed in their belief as to whether a mind could be so constituted as to have the power of perceiving real things, or of imagining unreal things, *without being at the same time conscious of itself as perceiving or imagining*. The authority of two distinguished men may be cited in favor of the negative opinion; Locke says, "Can a man think and not be conscious of it? It is altogether as intelligible to say that a body is extended without parts as that *anything thinks without being conscious of it*, or perceiving that it does so. They who talk thus, may, with as much reason, say that a man is always hungry, but that he does not always feel it; whereas hunger consists in that very sensation, as thinking consists in being conscious that one thinks" ("Essay," bk. ii. chap. i.) And Sir Wm. Hamilton writes, "*I know, I feel, I desire*, etc. What is it that is necessarily involved in all these? It requires only to be stated to be admitted that, when I know, I *must know that I know*,—when I feel, I *must know that I feel*—when I desire, I *must know that I desire*. The knowledge, the feeling, the desire, are possible only under the condition of being known, and being known by me. Now this knowledge which I, the subject, have of these modifications of my being, and through which knowledge alone these modifications are possible, is what we call con-

Is consciousness a necessary element in the constitution of mind?
Locke, Hamilton, Spencer, Schelling, Pantheism. Monism.

sciousness." With reference to the first of these quotations, we would express a doubt whether Locke really meant to identify hunger and thinking with our consciousness of these things; and, in regard to the second, we confess inability to reconcile the words of Hamilton with his doctrine concerning the "latent modifications" of mind; but it is plain that both authors use language expressive of absolute necessity, and speak, not simply of what is impossible to man as at present constituted, but of what is impossible to any thinking being whatever. We contrast with the foregoing teachings a doctrine of consciousness which enters equally into that pantheistic idealism, with which Germany was deluded during the first half of the present century, and into that pantheistic materialism, which fascinates many brilliant minds in our own day. The doctrine of Herbert Spencer is wonderfully allied to that of Frederick Schelling. The latter makes external nature the unconscious development of mental life; the former makes mental life the refined and conscious development of nature. Spencer writes, "We can think of matter only in terms of mind. We can think of mind only in terms of matter. . . . The antithesis of subject and object, never to be transcended while consciousness lasts, renders impossible all knowledge of that ultimate reality in which subject and object are united. . . . *It is one and the same ultimate reality which is manifested to us subjectively and objectively*" ("Psych." § 273). Schelling in his "Transcendental Idealism," says, "The dead and unconscious products of nature are but abortive efforts of nature to reflect herself; but so-called dead nature, in general, is an immature intelligence, whence the character of intelligence shines, though unconsciously, through all her phenomena. Her highest end, which is to become wholly objective to herself, is only reached by nature in her highest and last reflection, which is nothing else than man, or, more generally, that which we call reason, through which nature first returns completely into herself; whereby it is made evident that *nature is originally identical with that which is known in us as intelligence, or the conscious.*" Thus Schelling and Spencer, and Schelling more explicitly than Spencer, assert, not merely as possible, but as actual, an unconscious activity radically of the same nature as the conscious activity of mind.

The question not as to the distinction between mind and matter.

What we have to say in regard to these conflicting views may be expressed in several remarks. First, it is not in the line of our present discussion to argue *the distinct existence of mind and matter.* This duty has been performed in another place (§ 20). We assume, as needing no further proof, the common conviction of mankind, that *the nature of the material world is generically different from that of the spiritual, and is wholly incapable of psychical action.* The observed activities of matter, and the observed activities of mind, are so diverse in character that the identification of the one with the other, or even the transformation of the one into the other, is an

absurdity such as only philosophers can maintain. And, should we, for a moment, admit the unwarranted hypothesis that God is a mere "*animus mundi*," we must of necessity distinguish that soul from its body, for the same reason that the human soul is distinguished from the human body. So far, therefore, as Spencer and Schelling assert fact, we now content ourselves with a simple denial.

Nor as to the existence of the *ego* and its powers.

In the second place, the question as to the possibility of unconscious mental activity *is to be distinguished from the question whether mental action can take place save as the activity of the powers of the soul*. The soul immediately perceives that every one of its operations results and must result—that is, can result, only—from a power of the soul itself; from which judgment, or direct cognition of necessary fact, the general principle is derived that action can never take place in separation from agent and faculty. In the same manner, we obtain the principle that operations in the material world are conditioned on abiding powers and agents. The doctrine that there can be thought without a thinker, or an action of any kind without an agent, is another of those absurdities which show themselves when abstruse speculations are developed upon false hypotheses (§ 150).

Nor a question as to probability.

In the next place, were we to admit the possibility of unconscious mental activity, this would be *a very different thing from allowing that such activity ever took place or even that there is any probability of it*. No instance of such unconscious life has ever been alleged which cannot be naturally explained, either as the mere action of material forces under the determining and controlling power of conscious intelligence, or as the action of conscious mind itself. Moreover, the supposition of such life, especially in regard to any being of superior rationality and intelligence, is a thing in the highest degree improbable. Certainly, if irrational animals at all possess the power of attention or reflection in connection with consciousness, they do so only in a very low degree. We allow that the consciousness of any being is weak in proportion to the general feebleness of its mental nature; so that those creatures which can scarcely be said to have a mind, can scarcely be said to have a consciousness. But it is difficult to believe that beings of high intelligence are ignorant of their own existence. In particular, it would be unreasonable to hold that the creative Spirit, of whose marvelous and all-embracing knowledge the universe is the proof, and whose goodness, love, and wisdom are shown in his dealings with his creatures, can be anything less than a self-conscious Person. Those, who allow that man is capable of perceiving his own life and existence, and who deny such a perception to the mighty and penetrating mind of God, have been misled into a strange delusion.

Merely a curious
abstraction.

If the foregoing observations be just, the question whether unconscious mental life be possible, is shorn of its chief significance. No longer pertaining to the explanation of any important fact, it is merely a curious abstraction. Moreover, the difficulty of inquiries so far removed, as this seems to be, from any connection with actuality, is very considerable and altogether out of proportion to their importance. For this reason those philosophers should be excused who do not give them much attention. Such points, nevertheless, are of some interest, and therefore we shall conclude by saying, that the view of Locke and Hamilton seems to us a reasonable one, although we question whether it would have been presented by these philosophers so confidently and as being so perfectly self-evident, had they considered the question to be one merely of abstract possibility. Their doctrine is only a probable inference from the radical nature of our faculty of cognition. For it is unlikely that any power of perception could exist without including the ability to perceive what is so immediately and so sensibly present as its own activity. The lamp which throws light upon other things necessarily exhibits its own flame also. Moreover, external things, though perceived by us correctly and as they truly exist, are perceived only as in their relation to some activity of the spirit; and thus the two correlates are seen together. Not the body alone, but the body as animated by the soul, is for man the measure of the universe. Even space and time are first known in connection with the location of our sensations and the succession of our experiences. All thought is affected with an ultimate subjective reference. It is difficult to see how external perception can escape from this condition. At the same time we confess that the strangest and most unheard-of modes of existence are to be found within the immeasurable realm of possibility, and that moderation in opinion becomes those who have never had anything to do with the creation of different kinds of souls.

Consciousness
may be called a
faculty.
The extent of its
field of perception.
Every category of
entity embraced
within its view.

§ 152. The power of consciousness is sometimes styled a faculty; it may be granted this name, not because of its ordinary action, which is purely involuntary, but because this power of perception may be, and is, intentionally employed whenever the mind gives special attention to its own affairs (§ 9). We have seen that, through consciousness, man perceives himself as an agent possessed of powers and putting forth exertions. We may now, in concluding our consideration of this mode of cognition, ask whether it may not have *yet other objects than those thus indicated*. This question is one of terms. Beyond doubt, we perceive, as immediately and inseparably connected with the activity of the soul, other elements of entity in addition to substance, power, and operation. Our inquiry, therefore, merely concerns the proper application of a word. Yet the student of philosophy need not be reminded that questions con-

cerning the use of language cannot be neglected with impunity, and that, for the most part, safety is to be found only in strict adherence to ordinary usage. In the present case, we believe, this usage justifies that broad use of the term *consciousness* which might be expressed by saying that consciousness is the faculty of internal perception—or of the perception of internal things. The conception of consciousness which men ordinarily form, is quite analogous to that they form of sense-perception, and makes the perceptive force, or capability, of the one power to be very similar to that of the other. In regard to both modes of cognition, we may remark that the operations perceived by them, whether psychical or physical, are perceived, not simply as the exertions of power or energy, but also *as embracing the changes thus produced*; while all the elements of entity perceived by either faculty are perceived as affected by *the universal attribute of quantity*. Therefore, not only substance, power, and action, but also change and quantity may be numbered among the immediate cognitions of both faculties. Similar remarks hold with respect even to the *relations* of objects perceived and of their elements, so far as these relations may not be made the objects of our principal attention. We may be said to be conscious of some conception as co-existing with another conception, or as being similar to the other, or as the product of a power, or as a thought of the soul. One also can say that he is conscious of some pain—a headache, for instance—as existing at the present time, and in a definite place. Let us notice, too, that the perceptions of sense-perception and consciousness include the *necessary or logical, as well as the merely contingent, relations* of things. It is by reason of necessary relations that the fact of an operation involves the fact of an operating power, and this, again, the fact of a substance or agent in which the power resides. But, so far as we can ascertain, the operation, the power, the agent, and the necessary or logical relations existing between them, are all perceived at once and in the same exercise of mental energy. It is no wonder, therefore, that common language, in a certain way, permits us to speak of them as all perceived by the same general faculty of cognition. Thus it is allowable to say that one is conscious of himself or of his powers as related to his life, and even as necessarily related. Moreover, the *now* of consciousness and sense-perception is not strictly construed in ordinary thought. On the contrary, the action of these faculties is conceived of as including both that initial exercise of memory which unites the immediate past to the present in one unbroken view, and that instinctive exercise of judgment which enlarges the view so as to embrace the immediate future. Hence we say that we see the fall of a bird, or the galloping of a horse, or any other instance of motion, and that we are conscious of the succession of thoughts and feelings. It is also to be remarked that the cognition of relations implying space and time—which is common to both external and internal percep-

tion—involves the cognition of space and time themselves, although, it may be, only a referential and subordinate cognition. If this be so, then space, time, substance, power, action, change, quantity, and relation—in short, all the ultimate categories of entity, are perceived both in consciousness and in sense-perception. This greatly justifies the view of Locke, that all our ideas are obtained from “sensation and reflection.”

The sphere or field
of concomitant
perception.

At the same time, the common language of mankind never speaks of a consciousness, or of a sense-perception, either of space, or time, or quantity, or of the relations of space, time, or quantity; nor are any relations, whether logical or contingent, thus mentioned, save as our perception of them may be adjunct and subordinate to that of other things. To say that we are conscious of, or that we perceive by the senses, such things as space, time, or quantity, or their relations, or such things as number, similarity, difference, succession, causation, and relations generally, is a use of language which is improper, because it is unnatural. The better way is to regard our more direct notice and cognition of this class of objects as constituting a special subject, which may be advantageously treated under the head of Concomitant Perception. For, although this perception never takes place separately, and may be considered as included in the other two, it cannot be assigned exclusively to either, and it has a distinct character of its own. In relation to sense-perception and consciousness, concomitant perception may be compared to a segment formed by the intersection of two colored circles. Should each of the circles be of some given shade, say a light blue, the segment formed by their intersection would be common to both of them; but, having boundaries of its own and a peculiar shade of blue, it would be a subject for special consideration.

CHAPTER XXXII.

SENSE-PERCEPTION.

§ 153. Every science sets out with the recognition of alleged fact. This is the case with the philosophy of sense-perception. Men generally hold that they perceive, and that, too, as things different from themselves, material objects, together with the operations, qualities, and relations, of these objects. Let us discuss the nature of this perception; let us inquire how far it may be a reliable source of knowledge; and let us seek for satisfactory conceptions of the objects which it reveals. These aims are so connected with each other that no one of them should be

pursued in forgetfulness of the rest; yet each of them in its turn may become the principal object of our effort.

Our first inquiry must concern the process itself of sense-perception. Without an understanding of this, it is difficult to say why, and how far, we should trust the testimony of the senses, or to state with accuracy what that testimony may be. No investigation can either add to, or detract from, the natural certainty of our external cognitions. The most extreme skeptic, when he suspends his speculations and attends to the things about him, has an absolute conviction of the reality of what he sees, and hears, and feels. Neither can philosophical analysis alter our perceptions, or make the nature of objects different from what it is. Yet the inquiry upon which we enter is interesting and important. It both leads, in different ways, to a clearer comprehension of the workings of the human mind; and it shows how the speculative denial of an external world is an exceedingly poor foundation for disbelief in things unseen.

In every case in which the views of philosophers have differed from those of men in general, in regard to the reliability of sense-perception, and the reality of the material universe, this difference may be traced to the various explanations of this mode of cognition which different thinkers have adopted. Such being the case, a review of theories concerning the process of external perception will be serviceable. This will bring to light the causes of mistaken judgment both as to the topic immediately considered and as to those others connected with it; and will qualify us to condemn unfounded or unnatural hypotheses, and to accept those that are satisfactory. No department of philosophy shows a more gradual advancement than the doctrine of sense-perception; none exhibits more strikingly how truth has often been attained, at last, only by the slow and difficult elimination of error.

Diogenes, Heraclitus, Empedocles, Democritus, Lucrætius, Plato, Aristotle.

The earliest theorizers, as was natural, formed conceptions of the soul more or less materialistic; they fashioned their notions of perception according to the analogy of some operation of matter.

Diogenes of Apollonia defined spirit as a highly refined air or vapor, and perception as a vibration produced in this by the impact of outer things on the organs of the body, which the air pervades. Heraclitus said that the soul was fire, or caloric, and that its cognitions were movements corresponding to the motions of a similar external element which is the living principle of the universe. Possibly, neither of these sages would have claimed that his language was strictly literal; but only that it was the best he could find to express his thoughts. Empedocles held that "like can be known only by its like," and that images of things, "*simulacra rerum*," must reach the mind from the object through the avenues of sense. These likenesses he called *ἀπορροαι*, or effluxes. Democritus, who taught that

the soul differs from the body by being composed of finer particles, and that it is, as it were, a finer body inclosed in the visible one, agreed with Empedocles in the doctrine of the *simulacra*. These also are the appearances mentioned by Lucretius,

“Quæ, quasi membranæ summo de cortice rerum
Dereptæ, volitant ultro citroque per auras.”

The view of Democritus, that “all the senses are modes of touch,” figuratively expresses a fundamental principle in philosophy, viz., that the soul immediately perceives external things only so far as they may come into immediate contact with the body, the perception of the distant being inferential. The effluxes of Empedocles are evidently devices to bring the soul into contact with something which, being immediately known, may reveal the prototype from which it comes. Plato, rejecting external effluxes and *simulacra*, inculcated that sense-perception—or *αἴσθησις*—results from the interaction of the material object and the sentient soul. Hence, he held that it varies with this joint-activity; the perceptions of the same object by different beings are not necessarily alike; nor need the perceptions of the same object by the same being be always alike. Therefore, sense-perception, as compared with rational knowledge, *ἡ ἐπιστήμη*—is inferior and untrustworthy. Moreover, in the Platonist doctrine, the object immediately perceived is an immaterial *εἶδωλον*, or image, formed by the action of the soul under the excitement of impressions from without. This *εἶδωλον*, with reference to its part in perception, was called the gnostic reason, *λόγος γνωστικός*—i. e., the reason, or ground, of knowing. Aristotle, with a more penetrating genius than that of Plato, considered the individual, which is the object of the cognitions of sense, to be that which alone has substantial existence, and in which alone the general conceptions of the intellect are realized. He did not condemn our first perceptions as Plato did. At the same time he did not, like Locke, recognize their supreme authority as the sole origin of knowledge (§ 143). Nor did he see that perception, being an act wholly intellectual, and by no means a variable compound of thought and sensation, differs in different cases only because of its own invariable nature—only because the object immediately perceived is no longer the same. Aristotle makes too great a distinction between the *ψυχή*, or sentient and percipient soul, and the *Νοῦς*, or thinking mind, and therefore, by implication, between the *αἰσθητόν*, or object of sense-perception, and the *εἶδος*, or form, which is the object of true knowledge. The latter is contained in the former and is invariable; but the former, so far as it does not contain the latter, is a joint product of the sensation of the soul and of the sense-affecting motions of the external object. In short, the Stagirite did not recognize that the intellectual character of sense-perception is radically the same with that of the rational

faculty—nay, that its revelations are not less, but more, reliable, than those of the elaborative intellect. The truth is that neither sense-affecting objects, nor the sensations which they produce, have any part in the production of perception, but only in the excitation of it. Perception is wholly a cognition from within. Sense-perception (*αἰσθησις*) is defined by Aristotle as “the power which receives the sensible forms of things without the matter, as the wax receives the likeness of the signet-ring without its iron or gold” (*τὸ δεκτικὸν τῶν αἰσθητῶν εἰδῶν ἄνευ τῆς ὕλης*); in which statement sensible forms seem to signify *impressions corresponding to the whole individual natures of things*, but which yet are of a radically different character from the things themselves (“De Anima,” ii. 3).

“*Species sensiles vel intentionales.*”

Wm. of Occam,
Gassendi, Descar-
tes, Père Male-
branche, Antony
Arnauld, Berke-
ley, Hume, Reid.

§ 154. The Schoolmen gave the name *species* to the images of Plato and the sensible forms of Aristotle; and, because they considered these mental representations to result from the effort or intention of the soul in the direction of the objects of sense, they called them “*species intentionales.*” With them these species were of three kinds, *species sensibiles*, of which each sense furnished its own in respect to any observed object, *species sensatae*, which were treasured up and employed by memory and fantasy, and *species intelligibiles*, which are the general notions of the intellect applicable to things perceived. The species of the fantasy were derived from those of sense; but different opinions prevailed as to the origin of intelligible species. Some derived them from the species of the fantasy; others held them to be innate to the mind, which brought them into use as occasion required. Moreover, while most made sensible species the internal products of a mental power, some gave them an existence external to the mind, and even a capability of flying, in a continuous and rapid succession, through space. Most mediæval thinkers, also, assumed some sort of resemblance between the species and the object perceived—a doctrine which very naturally finds a place in every theory of representative perception. But William of Occam, the great Nominalist, who rejected the universals of rational thought, rejected also species of every kind. He held that no such media are necessary for the perception of things. In this he was followed by two great men of a succeeding age, Gassendi and Descartes, both of whom denied the possibility of any resemblance between thought and things known, but who, nevertheless, left the nature of sense-perception very ill-defined. Descartes did an essential service to philosophy in asserting the intellectual character of sense-perception more strongly than had ever been done before; and his employment of the word *idea*, to signify the immediate object of the mind in any mode of perceiving or thinking, has resulted in the modern use of the term to denote a thought of any kind whatever. Previously to his day, *ideas* meant what Plato understood by them, that is, eternal patterns of things in the Divine Mind. After

Descartes the doctrine of perception by means of species underwent various fortunes, being incased and protected by the terminology of philosophy, yet weakened by every new advance in psychological analysis. The learned Père Malèbranche, whose doctrine of "occasional causes" (§ 18) made perception immediately dependent on Divine interposition, was a noted defender of sensible species; while Antony Arnauld, the distinguished Jansenist, discarded species, and identified the idea of the object with our perception of it. Even Arnauld, however, held that the idea of the object was representative of it, and the immediate object of perception: and this seems to have been the view of Locke also. Locke expressly says that "Idea is the object of thinking," teaching, however, at the same time, that "the ideas of sensation are in the mind no more the likeness of something existing without us than the names that stand for them are the likeness of our ideas" ("Essay," bk. ii. chap. viii.). Berkeley and Hume so developed this doctrine of Locke as to leave no objects of thought save ideas only. At last Thomas Reid, the stalwart apostle of common sense, arose, and thoroughly destroyed the theory of representative perception in all its forms. No one can study the writings of Reid without being mightily convinced that, in perception, we deal with the object itself, and not with any species, or idea, or representation of it, in the mind. We perceive the object itself, and not a vicarious substitute. The position of Reid may be illustrated by citing part of his "first reflection on the common theory of ideas." This theory, he says, "Is directly contrary to the universal sense of men who have not been instructed in philosophy. When we see the sun and the moon we have no doubt that the very objects which we immediately see are very far distant from us and from one another. We have not the least doubt that this is the sun and the moon which God created some thousands of years ago, and which have continued to perform their revolutions in the heavens ever since. But how are we astonished when the philosopher informs us that we are mistaken in all this; that the sun and moon which we see, are not, as we imagine, many miles distant from us and from each other, but that they are in our own mind; that they had no existence before we saw them, and will have none when we cease to perceive and think of them; because the objects we perceive are only ideas in our own minds, which can have no existence a moment longer than we think of them! If a plain man, uninstructed in philosophy, has faith to receive these mysteries, how great must be his astonishment! He is brought into a new world, where everything he sees, tastes, or touches is an idea—a fleeting kind of being, which he can conjure into existence, or can annihilate, in the twinkling of an eye. After his mind is somewhat composed, it will be natural for him to ask his philosophical instructor, 'Pray, sir, are there, then, no substantial and permanent beings, called the sun and moon, which continue to exist, whether we think of them or

not?' Here the philosophers differ. Mr. Locke, and those that were before him, will answer that it is very true there are substantial and permanent beings called the sun and moon; but they never appear to us in their own person, but by their representatives, the ideas in our own minds; and we know nothing of them but what we can gather from those ideas. Bishop Berkeley and Mr. Hume would give a different answer to the question proposed. They would assure the querist that it is a vulgar error that there are any permanent and substantial beings called the sun and moon; that the heavenly bodies, our own bodies, and all bodies whatever, are nothing but ideas in our minds; and that there can be nothing like the ideas of one mind but the ideas of another mind. There is nothing in nature but minds and ideas, says the Bishop;—nay, says Mr. Hume, there is nothing in nature but ideas only; for what we call a mind is nothing but a train of ideas connected by certain relations between themselves" ("Essay," ii. chap. xiv.). The treatise from which the foregoing is quoted is an irresistible demonstration of the falsity of the representational view of sense-perception, and a strong vindication of the truthfulness of the dictates of common sense. In particular, ideas or species, as intermediate objects, are shown to be things merely hypothetical, assumed, without any evidence of their existence, in order to explain facts which they really tend to explain away.

Reid's doctrine
criticised.
Clarke, Porterfield.

At the same time it is to be confessed that Reid succeeded better in refuting erroneous views than in developing and defending a theory of his own. His doctrine is defective both in regard to our *acquired perceptions*, to which class all our more noticeable sense-cognitions belong, and in regard to those *original perceptions* on which the acquired are founded. He certainly made a mistake in denying the fact relied upon by the advocates of representational perception, that, in some sense at least, the immediate cognition of the distant is a thing impossible. This denial is discernible in the language cited above; it is more distinctly expressed in his formal discussion of the question. He first quotes Dr. Clarke, and Dr. Porterfield, and acknowledges their views to be the same as those of Père Malebranche, and Sir Isaac Newton. The words of Clarke are, "The soul, without being present to the images of the things perceived, could not possibly perceive them. A living substance can only there perceive, where it is present, either to the things themselves (as the omnipresent God is to the whole universe), or to the images of things, as the soul is in its proper sensorium." Porterfield, treating of vision, says, "How body acts upon mind, or mind upon body, I know not; but this I am very certain of, that nothing can act, or be acted upon, where it is not; and, therefore, our mind can never perceive anything but its own proper modifications, and the various states of the sensorium, to which it is present: so that it is not the external sun and moon which are in the hea-

vens, which our mind perceives, but only their image or representation impressed upon the sensorium."

It does seem self-evident that nothing can be immediately perceived which is not immediately present to the soul in space and time. What Porterfield says of the heavenly bodies is the simple truth. We do not immediately perceive them, but only the image of them, not in the mind, but on the retina; and then, in a way to be explained hereafter, we infer their existence and character from the existence and character of the image. Reid should have allowed the truth of Clarke's assertion, and should then have shown that distant objects—that is, objects from which the soul is separated in space and time—may be perceived mediately and inferentially, yet without the vicarious perception of any species or idea. Instead of this, he denies that immediate presence is necessary to immediate perception. He acknowledges that "nothing can act immediately where it is not," yet claims an exemption from the condition of an immediate presence, because, in sense-cognitions, neither the object acts on the mind nor the mind on the object. "I perceive," he says, "the walls of the room where I sit, but they are perfectly inactive," and "to say that I act upon the wall by looking at it is an abuse of language and has no meaning." "Therefore," he adds, "Dr. Clarke's argument against our perceiving external objects immediately, falls to the ground." This reply is not satisfactory. We admit that perception is not a transitive, but an immanent, act, which cannot in any way affect its object; we allow that the object does not act upon the mind so as to have any proper share in the cognition of itself; and yet we hold that immediate perception involves immediate presence. We regard this as a necessary and intuitive conviction. Moreover, it seems conformable to experience. Although the essential force of perception is wholly from within, it is not true that distant material objects can be perceived if they do not, in some way, affect the mind. The sense-cognition of them takes place only when they radiate or reflect light, emit sounds or odors, move or resist the motion of things instrumentally connected with the body—in short, only when, by some means, they produce some sensible impression upon us. Certainly, with our present constitution, an object must act on the mind to be perceived; such being the case, it is rational to suppose that only those objects are immediately perceived which act immediately, and that other objects, which act through them, are perceived inferentially, although, it may be, by a simple, easy, and instantaneous inference. But, even were we to suppose disembodied spirits to have a power of external cognition in no way conditioned on impressions from without, it is impossible to believe that they could exercise that power if entirely separated from the object and from all means of communication with it. We reject Reid's doctrine of the immediate perception of the distant as being contrary both to fact and reason.

Original and acquired perception as distinguished by Reid. An important distinction.

The teaching of this philosopher respecting original sense-perception is not so objectionable as that which we have just considered, and which pertains to acquired perception only. His account of original perception is defective rather in the mode of its conception and expression, than in the principal matter presented. Believing every act of cognition to be of a purely internal origin, and not, like sensation, the effect of external causes, he was led to say that perception is a kind of suggestion, or inference, made by the mind on the occasion of its sensations. Nevertheless, he held this to be an act of immediate cognition, because it is entirely independent of any past knowledge or perception of things, and itself originates both our conception of objects and our belief in their existence. Therefore, also, it is radically different from that suggestional, or inferential, cognition, which it is the province of the reasoning faculty to supply.

This view of sense-perception is analogous to Reid's teaching concerning consciousness. Just as he speaks of "the existence of a mind and its powers and faculties" as an "inference," such as logic can give no account of, from our conscious activity, so he declares, that "our belief that what we perceive or feel does now exist" is "a natural and original suggestion," produced by sensation ("Inquiry," chap. ii. 7). But his doctrine of the immediateness of both original and acquired perception may be best gathered from a passage in his second essay. "In perception," he says, "whether original or acquired, there is something which may be called the sign, and something which is signified to us, or brought to our knowledge, by that sign. In original perception the signs are the various sensations which are produced by the impressions made upon our organs. The things signified are the objects perceived in consequence of those sensations, by the original constitution of our nature. Thus, when I grasp an ivory ball in my hand, I have a certain sensation of touch. Although this sensation be in the mind and have no similitude to anything material, yet by the laws of my constitution, it is immediately followed by the conception and belief that there is in my hand a hard smooth body of a spherical figure, and about an inch and a half in diameter. This belief is grounded neither upon reasoning, nor upon experience; it is the immediate effect of my constitution; and this I call original perception.

"In acquired perception the sign may be either a sensation, or something originally perceived. The thing signified is something which, by experience, has been found connected with that sign. Thus, when the ivory ball is placed before my eye, I perceive by sight what I before perceived by touch, that the ball is smooth, spherical, and of such a diameter and at such a distance from the eye; and to this is added the perception of its color. All these things I perceive by sight, distinctly and with certainty. Yet it is certain, from principles of philosophy, that, if I had not been accustomed to compare the informations of

sight with those of touch, I should not have perceived these things by sight. I should have perceived a circular object, having its color gradually more faint towards the shaded side. But I should not have perceived it to have three dimensions, to be spherical, to be of such linear magnitude, and at such a distance from the eye. That these last mentioned are not original perceptions of sight, but acquired by experience, is sufficiently evident from the principles of optics, and from the art of painters, in painting objects of three dimensions upon a plane which has only two. And it has been put beyond all doubt by observations recorded of several persons, who having, by cataracts in their eyes, been deprived of sight from their infancy, have been couched and made to see after they came to years of understanding.

“Those who have had their eyesight from infancy acquire such perceptions so early that they cannot recollect the time when they had them not, and therefore make no distinction between them and their original perceptions; nor can they be easily persuaded that there is any just foundation for such a distinction. In all languages men speak with equal assurance of their seeing objects to be spherical or cubical, as of their feeling them to be so; nor do they ever dream that these perceptions of sight were not as early and original as the perceptions they have of the same objects by touch. This power, which we acquire, of perceiving things by our senses which originally we should not have perceived, is not the effect of any reasoning on our part; it is the result of our constitution and of the situations in which we happen to be placed” (“Essay,” ii. chap. xxi.). In the foregoing the word *sign*, as applied to a sensation, is used in a peculiar sense; it indicates that the sensation, when experienced, is the occasion of a knowledge which yet results immediately from the constitution of the soul, and which, therefore, is not at all an inference from past knowledge. It is also to be noticed that an original perception, or the sensation appropriate to it, becomes the sign for an acquired perception in precisely the same manner that a sensation is the sign for the original perception itself. Although the power of acquired perception is obtained in the course of one's experience, this perception is not of the nature of reasoning; it is not an inference, properly so called, but the direct result of our constitution as modified during the past experience. In the passage immediately subsequent to that just quoted, Reid goes on to argue this point at length.

The inferential nature of acquired perception.
Pres. Porter quoted.

§ 155. The doctrine of acquired perception, thus presented, has not been accepted as a final and satisfactory statement. Before the time of Reid, Bishop Berkeley, in his “New Theory of Vision,” had skillfully analyzed our sight-perceptions of the distance and size of objects, and had shown them to be judgments in which ascertained standards of measurement are easily and unconsciously employed. Possibly, the reasonings of Berkeley suggested to Reid the necessity of distinguishing

our original from our acquired perceptions; they certainly indicated and determined the direction in which later philosophy has advanced. During the present century the action of the reasoning power has been shown to be much more pervading than was formerly supposed; and, at the time of our writing, there is a general agreement that acquired perception is an inference—nay, that it is an inference founded on induction. In illustration of this we shall cite only the following characteristically judicious remarks of President Porter: "It may surprise many," he says, "to learn that the processes employed in the acquired perceptions are processes of induction. Induction is usually conceived and described as a process which is appropriated to philosophical discovery, which requires wide generalization and profound reflection, and issues only in comprehensive principles and laws. A little reflection will satisfy any one, however, that the act of mind is the same with that performed in every one of the acquired perceptions. The difference between the two kinds of induction, is not in the process, but in the materials upon and with which the mind performs them. But the acts, the fundamental assumptions, and the liability to error in both, are essentially the same" ("Human Intellect," § 148). Were we to add anything to these words, it would be simply to emphasize the statement that the circumstances of the origin and development of our inferential perceptions cause them to differ greatly from the formal operations of the reasoning power. In particular, the processes involved in them are really so simple, and become so habitual, and take place so easily and quickly, that they escape from all ordinary analysis. To understand them requires special methods of observation and comparison. This distinction, between our ordinary and articulate reasoning and the instantaneous conclusions of perception, should be fully recognized.

The doctrine of original perception perfected by Sir Wm. Hamilton. Hamilton quoted.

We now turn to Reid's doctrine of original perception, which we accept as substantially expressing the truth. Rejecting both representative ideas, and reasoning of any kind, it is truly a theory of immediate cognition. This immediateness is somewhat marred when perception is made the interpretation of a sign, or the belief suggested by an experienced sensation. Even while the interpretation or suggestion introduces a cognition which is original and independent of past knowledge, this cognition is represented as subsequent in time to the sensation upon which it depends, and seems to be separated by the sensation from the object perceived. There is reason for saying that the object is perceived *through*, or by means of, the perception of the sensation, and not simply *along with*, this latter perception. Such a mode of statement is an invitation easily accepted by a thinker of Kantian proclivities to question the authority of the "suggestions" of the mind, in regard to objects external to the soul; it also gives one who supposes the "interpretation" mentioned to

be an ordinary logical inference, the opportunity of showing that there is no ground for any such inference—nay, that an original inferential perception is an absurdity. The latter objection is unjust, being grounded on misapprehension; and the former may be met by saying that what is ultimate and irresistibly self-evident should be received as its own proof; yet both naturally present themselves. The discussion of difficulties like these led to the inquiry whether the doctrine of the Glasgow professor was not capable of improvement. In particular, it was asked, "Have we not ground to believe in a perception yet more immediate than that which Reid describes?" and, "May not the phenomena of such perception be set forth in terms more exactly expressive of its nature than any which have yet been used?" The answer to these questions was wrought out by Sir Wm. Hamilton; and is the principal addition which his learned and laborious criticism has made to the philosophy of Scotland. His improvement of the doctrine of perception pertains to two points. In the *first* place, he rejected the statement of Reid and his immediate successors, who said that "perception follows sensation," or that "sensation is the antecedent of perception." This view was the logical concomitant of another commonly held at the close of the last century, viz., that a collection of things can be perceived only by the successive cognition of its parts or members. For, this being granted, sensation, which determines the perceptive power to action, must itself be the object first perceived. Moreover, as the inference of a cause follows the observation of an effect, it was natural to say that the perception of body and its changes follows the consciousness of the feelings which they produce. In opposition to these views Hamilton forcibly maintained that the activity of immediate cognition is complex, and that both the sensation and the sense-affecting object, together with the proper characteristics and relations of the latter, are perceived directly and at once, and in the same intellectual movement. In the *second* place, Hamilton rejected all such terms as *interpretation* and *suggestion*, and spoke of the "intuitions and presentations" of perception. "*External perception, or perception, simply,*" says he, "is the faculty *presentative, or intuitive,* of the phenomena of the *non-ego*, or matter—if there be any *intuitive* apprehension of the *non-ego* at all. *Internal perception, or self-consciousness,* is the faculty *presentative or intuitive* of the phenomena of the *ego*, or mind" (Note B, § 1).

By these simple changes, in which Reid himself would have heartily acquiesced, Hamilton freed the doctrine of perception from a liability to be misapprehended, and rendered it in every way conformable to the common judgment and experience of mankind.

Such is a brief history of the philosophy of sense-perception. We have omitted from it, as not calling for present mention, those doctrines of modern materialism which identify perception with sensation, and sen-

sation with nervous action—crudities, which do not deserve the name of doctrines. The foregoing sketch indicates how slowly, and with what difficulty, a satisfactory theory of perception has been reached by speculators. The earliest philosophers regarded the soul as a material essence, and its perceptions and thinkings as molecular motions resulting from the impact or attraction of external things. The membranous simulacra of Empedocles, constantly flying off from objects and entering through the avenues of sense, betoken a more thoughtful theorizer. Next we notice the obscure and half-developed views of Plato and Aristotle; the former of whom scarcely recognized any connection between thought and sense, and the latter of whom made perception the result of the combined action of the semi-corporeal sensitive soul and the immaterial rational mind. The sensible species of the Schoolmen, produced by the percipient spirit, yet distinct from it, and the direct objects of cognition, may be taken as showing progress in the recognition of the intellectual character of perception. This progress is more apparent in the "ideas" of Occam, Descartes, Leibnitz, Arnauld, and Locke; which were identical with perceptions, yet the immediate objects of perception. These introduced the logical but self-destructive philosophies of Berkeley and Hume. Reid followed, denying that we perceive by representations, and teaching, though imperfectly, the doctrine of immediate perception. Finally, Sir Wm. Hamilton expressed the truth by saying that our cognition of things immediately present is absolutely free from any process, and that, therefore, it should be called presentative or intuitive perception.

§ 156. The question as to the *reliability*, or truthfulness, of the senses, pertains chiefly to our *original* or *immediate cognitions*. Mistakes occur in acquired or inferential perception; but our original perceptions are never incorrect. The so-called deceptions of sense are merely wrong conclusions from facts immediately perceived. This is the position of Reid, in his chapter on "The Fallacy of the Senses." In speaking of "the errors to which we are liable in our acquired perceptions," he even denies that such perceptions are those of sense at all. "Acquired perception," he says, "is not properly the testimony of those senses which God hath given us, but a conclusion drawn from what the senses testify." And, in this chapter, although he does not retract the teaching that acquired perception "is not the effect of reasoning and does not arise from intuitive evidence in the thing believed, but is the immediate effect of our constitution," he no longer asserts this doctrine positively, but declares it to be unconnected with the point in hand. "Whether," he says, "this acquired perception is to be resolved into some process of reasoning of which we have lost the remembrance, as some philosophers think, or whether it results from some part of our constitution distinct from reason, as I rather believe, does

The reliability of sense-cognition. The question pertains to original perception chiefly. Anselm, Augustine, and Aristotle quoted.

not concern the present subject. But, whether the one or the other be true, it must be observed that the errors of acquired perception are not properly fallacies of our senses." Thus Reid supposed a kind of natural judgment distinct from both sense-perception and the reasoning faculty, which judgment he regarded as capable of error, and subject to the correction of reason. Long previously to Reid, philosophers had recognized the reliability of immediate perception, and had ascribed fallibility only to the accompanying judgment. Anselm of Canterbury wrote, "Falsitas, non in sensibus, sed in opinione." St. Augustine, referring to the oar half dipped in water, says, "Si quis remum frangi in aqua opinatur, et, quum inde aufertur, integrari, non malum habet internuntium, sed malus est iudex." And Aristotle taught that sense perceives its own things correctly, or with the least possible error, but may be mistaken in things accidental to it. We cannot be wrong in saying that we see something white, but we may be mistaken in saying that the white thing is this, or that; if, for example, we should say that it is, or that it is not, the man, Cleon ("De Anima," iii. 6). But, although a certain recognition of the difference between original and acquired perception may be traced in ancient philosophy, this difference has been satisfactorily explained only in modern times.

In considering the reliability of sense, we should bear in mind the fact remarked by Reid, that *by far the greater part of our perceptions are acquired*. This will enable us to see that, in one part of every ordinary perception, there is no possibility of error, and that there is another part in which one may find himself deceived. We may be mistaken in asserting some object to be yellow; for the apparent color may not truly reside in the surface of the object, but may result from the reflection of a yellow flame, or from our looking through stained glass, or from a jaundiced condition of the eye. But we may be certain that the soul sees something different from itself, and which may be distinguished from other things as the cause of a peculiar sensation of color. In other words, there can be no doubt that we see something yellow. After this manner all our ordinary perceptions may be analyzed.

Only a branch of a wider inquiry, which concerns human knowledge in general. Method of inquiry proposed. Aristotle quoted. Some things must be self-evident.

The question of the veracity of the senses is the principal branch of a more fundamental inquiry, with which it may be regarded as practically identical; we mean that inquiry which concerns the reliability of presentational thought in general. Since presentation is the ultimate source of all knowledge (§§ 52, 138), the bearing of our present investigation is very broad. We are really to discuss the question, whether or not human knowledge in general has any good foundation.

Let us start out with the principle that something must be self-evident, if any things at all are true and can be known to

be. This truth, which may be deduced immediately from the nature of inference, is one of the oldest doctrines of philosophy. Aristotle taught that nothing can be more unreasonable than to ask a reason for everything, and that some things must be evident of themselves ("Met." iii. 6). The most perfect logical inference is valueless if it do not rest ultimately on truths which are not logically inferred. Nothing can be supported unless there be that which needs no support; nothing dependent and derived without that which is independent and underived. We cannot go so far as some philosophers who say that things self-evident and originally true, do not admit of logical proof. Sometimes our confidence in one original conviction may be confirmed by our confidence in another. A knowledge of places and things, gained in past perception and treasured in the memory, may be corroborated by the present evidence of our senses; and the conclusion, based on self-evident principles, that a cubic foot contains one thousand seven hundred and twenty-eight cubic inches, may be proved correct by the actual adjustment of blocks accurately made. We recognize that wonderful network of conditions by which facts, presentationally perceived, are logically bound together. This does not conflict with the doctrine that all belief and conviction presuppose the self-evident, and that if there be not things self-evident, nothing can be known to be. It is the office of philosophy—perhaps its most important office—to consider self-evident truths simply so far as they are self-evident, and to determine what may be the marks of their self-evidence. In other words, while making no attempt to prove the self-evident, we should seek to prove that it is self-evident and does not stand in need of extraneous support. There is only one way in which this can be done; *we must consider attentively undoubted individual cases of intuitive conviction, so as to see in what respects they differ from other beliefs which are not intuitive.* Some, while admitting the possibility of this process, may say that it is useless—that one might as well be called to prove the visibility of the sun as the self-evidence of a thing self-evident—that, in short, there can be no question as to the truth of things presentationally known. This is true in regard to one aspect or relation of our immediate perceptions; but it is not true in regard to their philosophical relations. In practical matters, and in the primary and proper exercise of intuition, one never doubts the self-evident, or hesitates to act on his perception of it. But in speculation, when we deal not directly with sensible realities, but with mental reproductions and elaborations, it has been found possible both to deny that some things, which are self-evident, are so, and to assert that other things are self-evident which are not. The intuitional character ascribed to abstractions and generalizations, is secondary and derivative, and is that only of the individual perceptions which they represent. And as, in commerce, gold is never rejected, while this may happen to notes "as good as gold," so general and abstract "intuitions,"

together with conclusions derived from them, are questioned, while actual individual perceptions never are. The most astounding errors have arisen from this theoretical rejection of our immediate cognitions.

The negative tests of intuition. To counteract such speculative evils, certain tests or marks—certain rules of judgment, both positive and negative, may be employed, by means of which we may estimate the value of alleged intuitions. If such criteria can be found, not only the "*ipse dixit*" of philosophers, but also our own uninformed opinions, may properly be subjected to their authority.

The negative rules of judgment are based on those negative characteristics which belong to every true presentation. For example, no belief is intuitive *which requires logical proof* before we can accept it. That the Kohinoor diamond exists, and that it is a crystal of carbon, may be assured convictions with persons who never saw the gem; but they are not intuitions. In like manner, *no remembrance* is an intuition; even the most perfect memory is only the reproduction of past thought, accompanied with the judgment that this thought was, at the first, presentationally obtained. Again, *no general truth* is intuitional. Every general conception or proposition is formed by a process of abstraction; its truthfulness depends on the correctness of that process. Many general convictions are styled intuitions; nor do we find fault with this; but such language signifies only that they are immediately formed from intuitions. The general truths, that matter and its qualities exist, and that spirit and its powers exist, are intuitions or presentations only in a secondary sense. In the next place, *no merely probable conviction* is intuitive in the sense of which we now speak. Every judgment of probability is of the nature of an inference; it is the selection by the mind, from several possible consequents, of that consequent which is supported by the greatest number of chances (§ 86). Probable judgment may also be distinguished from this intuition, because the latter is always the perception of an object, while, in the former, we deal not with things, but only with conceptions which may, or may not, be found to agree with reality. Once more, *no doubtful belief* is intuitive. We distinguish a judgment of doubt from a judgment of probability, because in the former our minds are not determined to any degree of confidence, but remain unfixed and wavering. By means of these rules, which refer to the negative characteristics of our original perceptions, we can reject from the list of these intuitions any beliefs whose characteristics are such as have been described.

The use of the positive rules presupposes that of the negative.

Let us now consider some rules which refer to positive characteristics, and which are much more determinative than the negative tests. The consideration of these positive rules shows, at once, that absolute confidence with which we may rest on presentational cognition, and the method by which we may satisfy our

selves whether any particular belief be intuitional or not. The use of these rules is based on the supposition that a certain number of our beliefs will stand the tests already considered. Let a conviction be neither a mere deductive conclusion—nor the memory of a past perception—nor an abstract and general proposition—nor a probable judgment—nor a doubtful belief—but, so far as we can see, the presentational perception of either contingent or necessary fact. We have now what might be called a “*prima facie*” case of intuition; and are in a position to apply further, and more conclusive, rules of philosophical criticism.

Three positive marks of intuition. Irresistible conviction. Universal acceptance. Logical consistency. Hamilton, McCosh, Hume.

§ 157. These have been variously enumerated by eminent writers, but they may all, we think, be reduced to three. In the first place, our intuitions, or presentative perceptions, are marked by that *absolute and irresistible conviction*, which they produce; in the second place, the intuitions of each individual mind are marked by *an agreement with those of all other minds*, of which fact the common possession by our race of a large body of assured beliefs is a sufficient proof; and, in the third place, the intuitions of the mind are marked by a perfect *logical consistency and coherency with each other*.

These tests, when faithfully employed, leave no ground for speculative skepticism, and render our analytic acceptance of intuitional truth as unconditional as our practical acceptance of it always is.

The first rule is the most fundamental; the other two furnish secondary proofs, whereby the perfect self-evidence of intuition may be more clearly seen and more fully acknowledged. For, if our immediate perceptions were not absolute and irresistible convictions, it would matter little whether they were experienced by all men alike, or whether they were logically consistent with one another.

This fundamental mark—immediate absoluteness of conviction—is that to which Hamilton refers when he speaks of *consciousness* as “the only revelation, the only unerring criterion, of philosophy;” it is that also which President McCosh points out when he mentions “*self-evidence*,” as the primary test of intuition. There is, however, an apparent solecism in the statement that “consciousness”—by which we are to understand immediate and absolute knowledge—is the proof of immediate and absolute knowledge, and likewise in the statement that the self-evidence of a thing is the proof of that self-evidence. The objection suggests itself that the premise, in such argumentation, is identical with the conclusion. This is not really the case. The irresistible conviction, mentioned as the mark of an intuition, is not the simple certainty which ordinarily attends immediate perception. It is the conviction which accompanies experiments made for the purposes of philosophy, and which, in this way, falls under the scrutinizing observation of the

investigator. We appeal to that special and speculative exercise of self-consciousness which has sometimes been distinguished as reflection (§ 147). This appeal is legitimate, and, when properly made, has always but one result.

Most philosophical schools, indeed, claim that consciousness, in some way, favors their theories; just as most theologians are able to find all their doctrines in the Bible.

“Hic liber est in quo quærit sua dogmata quisque,
Invenit et pariter dogmata quisque sua.”

But the difficulty with many is that they cite consciousness rather in support of their own opinions than as a simple relator of truth. Many, also, expect an instantaneous decision of general questions, when they should look simply for the immediate presentation of the facts of spiritual life. Consciousness testifies only that our immediate and individual perceptions have an absolute and irresistible certainty. If the testimony of this witness be accepted, and be rightly taken, many things will be put beyond dispute. If one doubt whether there be such a thing as thirst, let him eat salt victuals for a week without drinking water or any other fluid; his doubt will be removed. In like manner, let one gaze upon some prospect, or listen to some strain of music, endeavoring, at the same time, to believe that there is nothing external to himself—that he is deluded in supposing that he hears or sees anything. He will find the task an impossibility; that the presented facts admit of no denial.

The most extreme skeptics allow that this testimony of consciousness would be perfectly conclusive save only for certain speculative objections; and they confess that, even as it is, their philosophy is powerless to affect their own immediate convictions. “Nature,” says that prince of doubters, David Hume, “is always too strong for principle; and, though a Pyrrhonian may throw himself or others into a momentary amazement and confusion, by his profound reasonings, the first and most trivial event in life will put to flight all his doubts and scruples, and leave him the same, in every point of action and speculation, with the philosophers of every other sect, or with those who never concerned themselves in any philosophical researches. When he awakes from his dream, he will be the first to join in the laugh against himself, and to confess that all his objections are mere amusement, and can have no other tendency than to show the whimsical condition of mankind, who must act, and reason, and believe, though they are not able, by their most diligent inquiry, to satisfy themselves concerning the foundation of the operations, or to remove the objections which may be raised against them” (Hume’s “Inquiry,” part ii. § 12). Let us note *Hume’s only reason for skepticism*. It is, that he cannot remove philosophical objections to the validity of our cognitions. Let us remember that these objections applied only to an old and imperfect theory

of perception, and that they have been rendered void by the progress of philosophy. We think that even Hume himself, if he were living, would acknowledge, without qualification, the reliability of our immediate cognitions.

§ 158. The essential strength of the argument in favor of the reliability of our immediate cognitions lies in the irresistible self-evidence of the cognitions themselves, as attested by the reflective consciousness. But, as a strong tower, resting on a solid rock, may be rendered more immovable by buttresses, so our faith in the intuitions of which we are conscious, may be corroborated by a comparison of our convictions with those of our fellow-men, and by an attentive consideration of the consistency and coherency of the intuitions with one another. It is true that the strength of an immediate perception is in no way affected by any sense that we may have that the convictions of others agree or disagree with our own. When a man has the toothache, he is absolutely sure that he has it, and that he can have it, and cannot help having it; and will hold these convictions in spite of any assertions, on the part of others who have never had such a feeling, that they do not believe it to be a possible experience. In like manner, a laboring man who handles a pick or a spade, is absolutely certain that these tools have weight and solidity, shape and size; and could not be shaken in this belief though the whole world should combine against him. But we must remember that the present discussion concerns the foundations of philosophical faith, and that this faith does not rest immediately in our presentative cognitions, but in general and abstract conceptions of them. This mode of conviction may be weakened, and it may be strengthened, by argument.

The principal reason, on account of which any of our opinions become corroborated when they are found to agree with those of others, is that this agreement is taken as a proof that we have committed no mistake in the formation of our opinions. We consider that others, who have similar powers and grounds of judgment with ourselves, could not, naturally, in cases separately submitted to them and to us, come to the same conclusion with ourselves, unless the facts of the case warranted the conclusion. This reasoning assumes that other beings exist, whose opportunities and abilities for judgment are similar to our own and with whom we can communicate—a greater assumption than is involved in the argument from the revelations of consciousness. Nevertheless, it is an assumption which few think of denying, and the proof of which is very convincing. All opinions and beliefs whatever, whether they be deduced from things immediately perceived, by a train of reasoning, or be merely the generalizations of immediate perceptions themselves, as these may be remembered by us, are capable of corroboration in the method now explained.

The absolute unanimity of our race in regard to matters pre-

sentationally known, and to such other matters as are fully subject to the knowledge and understanding of all, has been styled the "communis sensus," or "common sense," of mankind; and this is an arbiter of opinion whose authority on fundamental questions is so great that many have taken it as the chief starting point of all their reasonings; while even the most erratic pay it some respect. The universal belief of men was a corner-stone in the philosophy of Aristotle. He declares, "What all believe, that we affirm, and whoever rejects this will find nothing more worthy of confidence" ("Ethics," book x. chap. ii.). Cicero considered the natural judgment of all men unquestionably correct. "De quo omnium natura consentit, id verum esse, necesse est," are his words. Reid's constant appeal is to "the universal consent of mankind, not of philosophers only, but of the rude and unlearned vulgar." Kant's "practical reason" is but a sublimated misconception of common sense. Even Hume, who, beyond any other, rejected the control of this monitor, formulates for us an excellent rule, the violation of which is magnificently illustrated in his own writings. "A philosopher," he says, "who proposes only to represent the common sense of mankind in more beautiful and more engaging colors, if, by accident, he commits a mistake, goes no farther, but, renewing his appeal to common sense, and the natural sentiments of the mind, returns into the right path, and secures himself from any dangerous delusion" ("Essays," vol i. p. 5).

As already remarked, the agreement of mankind in any belief has its principal philosophical value in that it proves the conviction to have been correctly constructed. Without adding to the native force of intuition it gives assurance that this force has been rightly used and formulated; which assurance is produced alike whether the beliefs which are found to agree be those of particular perceptions or those of general convictions. Wherever one goes, all over the world, he finds that other men perceive the same things—for example, the same objects in some rural scene—in the same way that he does himself; and, also, that the general views of men, formed from their particular perceptions, are similar to his own. In this way many fundamental convictions concerning the existence and the nature of entities, and the laws of their being, have become the common property of mankind. The parts of the physical universe, the operation of natural causes, the relations of time and space and quantity, the daily life and experience of men, and the inward workings of the human mind and heart, are all the objects of the concordant particular perceptions, and of the uniform general convictions, of the whole family of Adam. Evidently this unanimity involves a sameness in the original data of our belief, as well as in our deductions from them. In short, our natural judgments, being made honestly, and without any other aim than the ascertainment of the truth, our agreement in them may be compared to that of a number of mathematicians, whose independent

solutions of the same problem prove their work to be correct. Only it is to be noticed that, in complicated questions, we often accept opinions on the authority of others, while our appeal to that common sense of which philosophy speaks, simply confirms convictions which we have already found ourselves competent to form.

The second part of the argument from common sense.

Another reason, on account of which our faith in intuition is corroborated by the consent of mankind, —or rather another form of the same reason—is founded on the fact that *no conflict ever occurs between the intuitions of one man and those of another*. If it could be shown that different and discordant natural beliefs were experienced by different men or classes of men, and that no reason could be given why one set of such convictions should be received, and another rejected, this would indicate a radical inability on the part of the human family to perceive the truth. The authority of common sense cannot be impeached on the ground of any such discord. It is true that the judgments of insane persons, even as to things extremely evident, differ from those of other men. This difference, however, can be plainly traced to the substitution of unreal fancies for actual cognitions, and is always connected with manifest absurdities; for which reasons no weight of authority attaches to it. On the other hand, if a Bedlamite were able to consider his own case rationally, the difference between himself and the rest of the world, as to his being made of glass or iron, or being a millionaire or an emperor, would furnish him sufficient ground for investigating into the origin of his views, to see whether they were anything more than wild imaginings. But lunatics, like many great philosophers, are distinguished by a mental independence which elevates them above the authority of common sense.

Recapitulation.

Such is the argument from the universal agreement of men. The scope of it is not to show that things self-evident are to be believed because all men believe them, but to show that certain truths must be self-evident or necessarily connected with the self-evident, because all men believe them. And this argument assumes two forms. *First*, the consent of men enables us to determine more accurately what intuition teaches; which teaching is then to be believed simply for its own truth: just as many witnesses might testify that some honest man made a given statement, which statement we would then believe, not because of the testimony of the witnesses, but because of the honesty of the man. And, *secondly*, the absence of conflict between the immediate cognitions of different rational beings, shows that no flaw can be found either in their account of their intuitions or in the intuitions themselves. No disagreements can be detected in the statements of the honest man, as learnt from many witnesses; we therefore accept with confidence that understanding of his words which is common to all. The argument from common sense presupposes that all

men have a faculty of perceiving truth, and then shows that the experience of the race agrees fully with that supposition.

§ 159. Our concluding argument in favor of the reliability of our immediate cognitions, is derived from the consideration that the acceptance of these never involves any absurdity, while the rejection of them always does. This reasoning is allied to the secondary form of that just considered, and has even been identified with the argument from common sense. Hamilton, in his "Discussions," says, "The argument from common sense postulates, and founds on the assumption—THAT OUR ORIGINAL BELIEFS BE NOT PROVED SELF-CONTRADICTIONARY." In this statement, however, we suppose that Hamilton lays no emphasis on the word *common*. What we are taught is, that the self-evidence of our immediate cognitions, no matter whether they may be considered as convictions of the individual or as convictions of the race, becomes especially clear when we observe their perfect logical consistency.

But—to complete the strength of this argument—we may add that the truth of intuitions is illustrated, also, by their logical *coherency*. In other words, our speculative faith in our cognitions is corroborated, not only by the consideration that they do not conflict with each other, but also by the consideration that they support one another. This latter fact has been somewhat overlooked by philosophers; it is neither so noticeable nor so important as that with which we have connected it. Some even deny that an intuition admits of any proof save that which comes from its own light. Reid asserts that "first principles are incapable of direct proof" ("Essay," vi. chap. iv.). McCosh teaches that "inductive truths do not admit of probation" ("Intuitions," p. 41). These statements are true only in the sense that no ultimate generalization of intuitional truth can be deduced from some other truth by means of logical specification. When we say, "Men are mortal; Hindoos are men; therefore Hindoos are mortal," the result is obtained by the analysis of *Hindoo* and the perception of its radical identity with *man*; so that what is said of man may be said of Hindoo. By this process the less general may be derived from the more general truth, and many complex truths which may be intuitively known may be deduced from ultimate generalizations. We can say, "Action presupposes a power of action. Thought is a kind of action; therefore thought proves a power of thinking." "All substance occupies space; the human body is a substance, therefore it occupies space." These conclusions are presentationally known; but they may be inferred from the general truths. But, that substance occupies space, and that action involves power, are first principles which cannot be derived from any truths more general than themselves. While this is admitted, it seems also true that presentational convictions, whether in their individual or in their generalized forms, often condition one another logically, and may be said to

The consistency and coherency of our intuitions. Hamilton, Reid, and McCosh, quoted.

stand to one another in the relation of reason and consequent (§ 59). In perceiving the substance of one's own body or soul, we perceive that it must occupy space, and in perceiving our own activities, we perceive that they must come from some powers or potencies; therefore, the existence of the space may be inferred from that of the substance, and the existence of the power from that of the activity. A little consideration will make it evident that all things of which we can have presentational knowledge, whether immediately connected with each other or not, are so bound together by a network of conditions that they may be also inferentially known. Such being the case,—since every confirmatory inference goes back to an immediate cognition,—it seems clear that every immediate cognition may be proved from an immediate cognition. The perception of a polecat by smell may be confirmed by the simultaneous sight of the animal, or, to use a more pleasant illustration, the hearing of a voice or footstep may be confirmed by the entrance of a friend, or the remembered cognition of some scene may be corroborated by a second survey of it.

Thus the absurdity of rejecting any form of presentational truth results in part from its inseparable connection with other similarly self-evident truths. The denial of space is absurd because involving the denial of body and of motion, and, indeed, of all objects and events; for nothing can exist, or take place, save as in space. And the extreme absurdity of disbelieving one's senses arises from the fact that we cannot do so without rejecting many connected intuitions. "I resolve not to believe my senses," says Reid. "I break my nose against a post that comes in my way; I step into a dirty kennel; and, after twenty such wise and rational actions, I am taken up and clapped into a mad-house." The folly of such conduct—and of such theory—as is here described, is complex, and made up of correlated parts: it is thorough-going.

This logical connection of our presentational perceptions is worthy of study, because it is the first logical connection of things of which the mind is cognizant; and that in which the radical principles of all reasoning are first found. Hitherto, it has been overlooked; chiefly, we think, because, as a philosophical doctrine, it is less important than either the logical independence or the logical consistency, of our immediate cognitions. The independence, or self-evidence, of the intuitions, and their consistency, or freedom from mutual contradiction, are more essentially necessary than their logical connectedness or coherency, to any true doctrine of knowledge. Because, as inference is valid only as it rests on cognition, it is plain that argument against cognition is impotent unless one cognition can, in some way, be cited against another. When it is seen that no inconsistency can be found between our first perceptions, or our deductions from them, then these "judgments of nature" speak

The logical connection of intuitions worthy of more attention than it has received.

with an authority as unquestioned as it is absolute. On the other hand, if inconsistency could really be shown, we could no longer show how human knowledge rests on any good foundation.

Different ingenious systems of philosophical skepticism have been advocated in different ages of the world; and even correct argument has been used to show the falsity—that is, the unreliability—of our perceptions. In every case, however, in which the reasoning has been correct, the premises have been doctrines in no way derivable from presentative cognition, and the controversy over the system has resulted in the detection of the initial error. The heresies of Hume and Kant, each of whom, though in a very different spirit from the other, undermined man's faith in the perception of truth, illustrate this point. The skepticism of Hume, like the idealism of Berkeley, was strictly deduced from the old theory of mediate perception. Its logical character is well described by Sir Wm. Hamilton. "Hume," says Hamilton, "could not assail the foundations of knowledge in themselves. His reasoning is from their subsequent contradiction to their original falsehood; and his premises, not established by himself, are accepted only as principles universally conceded in the previous schools of philosophy. On the assumption that what was unanimously admitted by philosophers must be admitted of philosophy itself, his argument against the certainty of knowledge was triumphant. Philosophers agreed in rejecting certain primitive beliefs of consciousness as false, and in usurping others as true. If consciousness, however, were confessed to yield a lying evidence in one particular, it could not be adduced as a credible witness at all. '*Falsus in uno, falsus in omnibus.*' But, as the reality of our knowledge necessarily rests on the assumed veracity of consciousness, it thus rests on an assumption implicitly admitted by all systems of philosophy to be illegitimate." In this quotation, consciousness, according to its Hamiltonian sense, signifies immediate perception in general. Kant's theory of perception was an attempt to provide a system which should not be open to skeptical objections. So far from accomplishing this end, it originated the most subtle form of disbelief which has ever received philosophical expression. The radical assumption of Kantianism is that we perceive only phenomena, that is, the observable states and changes of things; the things themselves, and the conditions of their existence, are not perceived. Substance, together with space, time, power, and their relations, are not cognized as real objects, but are forms of thought imposed by the mind on the phenomena which it perceives (§ 57). This assumption of a phenomenal, as distinguished from a real, perception, affects the thinking of Hume no less than that of Kant; it was, in fact, a tradition which both received from the old philosophy, and which even yet retains some vitality. Kant, however, recognizes the

The agnosticism
or nescience of
Hume, Kant, and
Hamilton.
Hamilton quoted.

objectuality or externality of the phenomena, and, to this extent, accepts a teaching of common sense, which the Scotch philosopher rejected. The doctrine of Kant is to be commended, also, as involving that mind alone is the origin of thought, and that all cognition is the exercise of a spiritual power. On the whole, however, and even because of its evident deference to common sense, Kantianism is a more dangerous delusion than the idealism which it strove to supplant. In making the greater part of our perception to be merely the imposition of forms of thought, and not the intuition of real things, it, also, is guilty of "rejecting certain primitive beliefs of consciousness as false, and in usurping others as true."

Kant himself never fully understood the skeptical tendency of his theory; but this tendency (*mirabile dictu!*) was developed, and accepted as true philosophy, by Sir Wm. Hamilton, in his doctrine of the "Relativity" of human knowledge. This doctrine is little else than a new version of the German heresy; and is in no sense to be preferred to the original. Acknowledging realities, it asserts that these, being known only as related to our faculties of knowledge, cannot be conceived of as they really are. "Our whole knowledge of mind and matter," says Hamilton, in his "Discussions," "is relative—conditioned—relatively conditioned. Of things absolutely, or in themselves, be they external, be they internal, we know nothing, or know them only as incognizable; and we become aware of their incomprehensible existence, only as this is indirectly and accidentally revealed to us, through certain qualities related to our faculties of knowledge, and which qualities, again, we cannot think as unconditioned, irrelative, existent in and of themselves. All that we know, therefore, is phenomenal,—phenomenal of the unknown. The philosopher, speculating the worlds of matter and of mind, is thus, in a certain sort, only an ignorant admirer. In his contemplation of the universe, the philosopher, indeed, resembles Æneas contemplating the adumbrations on his shield; as it may equally be said of the sage and of the hero—

“ ‘Miratur; rerumque ignarus imagine gaudet.’ ”

What a position for the expounder of the doctrine of presentative cognition! In this piece of splendid and impressive absurdity, the weakness of a powerful mind reveals itself. The opinions of Hamilton resulted rather from an eclectic criticism of the doctrines of preceding philosophers, than from the patient and independent analysis of mental phenomena. The doctrine of relativity teaches truly that nothing is perceived save as in relation to the soul, that is, save as an experience of the soul itself, or as, in some way, a cause or condition of that experience (§ 150). External objects, especially, are perceived only as their qualities and operations affect the soul. This doctrine of relativity, also, is supported by the traditional dogma that we have imme-

mediate knowledge of sensible qualities only. But it is directly contradicted by the common sense of men. This asks, "Why should we reject that perception of things which every human being claims for himself? May not our cognition of things that are truly related to us, be also a true cognition? Why should we say that things seen in relation are not seen as they really are? For they are in relation. And may we not, after we have thus perceived realities, think of them without reference to the original relatedness, save so far as such reference may be indicative of their permanent nature?" As a matter of fact, we do thus perceive and think of things every day. The doctrine of *relativity*—like that, also, of the *conditioned*, with which Hamilton has connected it (§ 67),—confirms the truth by exhibiting the weakness of error.

CHAPTER XXXIII.

THE OBJECTS OF DIRECT PERCEPTION.

§ 160. The great majority of man's perceptions are acquired or mediate, and are inferences based on his original or immediate cognitions. Therefore, an understanding of original perception precedes that of acquired perception. The latter mode of cognition is dependent on the former, not only for its conceptions, and for the data of its inferences, but also, in a sense, for the principles on which its inferences proceed; if this be so, the doctrine of original perception is very completely the basis of the philosophy of perception in general.

We have discussed the nature of immediate perception, and have seen the reliability of it as a source of knowledge. Let us now consider *the objects of our immediate cognition*, and endeavor to conceive clearly, and define, *the generic nature* of the objects which become known to us in the exercise of this power. These may be regarded as either direct or indirect—the former being the proper objects of sense-perception and consciousness, the latter being more properly the objects of concomitant perception (§ 143). The direct objects of consciousness are our spirits, together with their powers and operations; those of sense-perception are the matter of our bodies, and its powers and operations. Let us consider, first, these direct objects of our perception, and then (Chap. XXXIV.), those the cognition of which, though no less immediate, are less direct.

Substance.
Reid and Stewart
quoted.

Foremost among the objects of direct perception, we find substance—that is, what we have already mentioned, under its generic forms, as matter and spirit. The leading philosophers of the last century taught that we are not directly cognizant of substance, but only of its powers

or qualities, and of its operations and changes. Reid declares, "The objects of perception are the qualities of bodies" ("Essay," ii. chap. xvii.); Stewart says, "Our own existence is not a direct or immediate object of consciousness, in the strict and logical meaning of that term. We are conscious of sensation, thought, desire, volition, but we are not conscious of the existence of the mind itself. The very first exercise of my consciousness necessarily implies a belief, not only of the present existence of what is felt, but of the present existence of that which feels and thinks. The latter is made known to us by a *suggestion of the understanding consequent* on the sensation, but so intimately connected with it that it is not surprising that our belief of both should be generally referred to the same origin." These modes of statement may be traced to Locke, who confines the action of consciousness to "what passes within one's own mind"; and who makes external perception to be of ideas only, and ideas to be of qualities only (bk. ii. chap. viii.).

There is no good ground for asserting that matter and spirit are perceived by the suggestion of the mind, and not in the same manner as their qualities and operations; but the adoption of this doctrine by philosophers may be accounted for by various reasons. The fact that substances are seen only as in operation, and that the interest of the mind is specially determined to the operations and the qualities manifested in them, has much to do with it; this is the truth which has given vitality to the error. A cause more closely connected with philosophical thought, may be found in the confusion and obscurity with which the idea of substance has been affected from the earliest times; and from which it is not entirely free at the present day. In the metaphysical and logical treatises of ancient writers, and particularly of Aristotle, substance is frequently mentioned, and many statements are made concerning it, but no one yet has combined these statements into a consistent and intelligible account; nor does this seem a thing possible. For sometimes what is said applies to a metaphysical substance only—that is, to that substance in which powers may be inherent, but, more frequently, it refers to the logical substance, that is, to any entity whatever, considered independently and as an actual or possible subject of predication (§ 125). The confusion of these two notions threw obscurity on both. Because the logical substance, with which ancient philosophy mainly concerned itself, has this peculiarity, that it may be identified with the sum of its attributes, being precisely the same complement of entity with the attributes, though viewed in a peculiar light; but the metaphysical substance is really, objectively, different from its attributes, and is not the same thing thought of in a different way. Such being the case, two opposite mistakes resulted. *First*, the logical substance was supposed to have an existence distinct from that of its attributes, and, *secondly*, the metaphysical substance was denied to have any existence other

History of the doctrine of substance.

than that of its attributes. These mistakes, together with the difficulty inherently belonging to an abstruse subject, led some philosophers to speak of substance as the mysterious and incognizable substratum of attributes, and others to question the existence of any such thing as substance. This latter view is too directly contradicted by common sense to merit much attention; but the former is supported by great authority.

Before Locke's time two definitions of substance prevailed among the schools. That which sets forth substance as "*ens substans accidentibus*," was generally preferred to that according to which substance is "*ens per se subsistens*." Each of these was applied to both the metaphysical and the logical substance; but, of the two, the former is more applicable to the logical, and the latter to the metaphysical. With regard to both kinds of substance, the expression "*ens per se subsistens*"—from which Spinoza reasoned to one only substance—erroneously interprets that independence of conception, which belongs to the idea of substance, as if it were an independence of existence belonging to substance itself. Rejecting this definition, Locke took the other, conjoining with it what had long been taught by philosophers, that substance is a thing mysterious and incognizable. His views are fully expressed in the second book of his "*Essay*," and may be illustrated by the following quotation. "When we talk or think of any particular sort of corporeal substances, as horse, stone, and so forth, 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 use 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 of substance, though it be certain that we have no clear or distinct idea of that thing we suppose a support. The same happens concerning the operations of the mind, viz., thinking, reasoning, fearing, etc., which we, concluding not to subsist of themselves, nor apprehending how they can belong to body, or be produced by it, are apt to think the actions of some other substance which we call spirit." Remark- ing on these teachings, Locke says, "He that would show me a more clear and distinct idea of substance, would do me a kindness I should thank him for" (bk. ii. chap. xxiii.). In the fore- going, one sees how Locke does not distinguish the metaphysical from the logical substance; which he should have done. The perplexity of subsequent thinkers may be illustrated from Reid's writings. "I perceive in a billiard ball," he says, "figure, color, and motion; but the ball is not figure, nor is it color, nor motion, nor all these taken together; it is something that has figure and color and motion. This is a dictate of nature and the belief of all mankind. As to the nature of this something, I am afraid we can give little account of it, save that it has the qualities

Locke, Reid, and
McCosh quoted.

which our senses discover. It seems to be a judgment of nature that the things immediately perceived are qualities which must belong to a subject; and all the information that our senses give us about this subject is, that it is that to which such qualities belong. From this it is evident that our notion of body or matter, as distinguished from its qualities, is a relative notion; and I am afraid it must always be obscure until men have other faculties" ("Essay," ii. chap. xix.). In opposition to such teachings as these, and their evil consequences, Dr. McCosh remarks, "It is high time that those metaphysicians who defend radical truth should abandon this unknown and unknowable substratum, or noumenon, which has ever been a foundation of ice to those who would build upon it. . . . We never know quality without knowing substance; just as we cannot know substance without knowing quality. . . . True, the substance is never known alone, or apart from the quality, but as little is the quality known alone or apart from a substance. Each should have its proper place, neither less nor more, in every system of the human mind" ("Examination of Mill," chap. v.). In his "Intuitions," also (book i. part i.), McCosh describes substance as a form of being endowed with power and permanence. This is not an analytic definition, but simply the determination, or indication, of a conception, by the use of distinguishing properties. It is important to remark that the notion of substance is no more capable of analysis than are those of space, time, power, and change; it is something simple, and to be defined only by the relations which belong to the nature of substance. The attempt to define substance analytically has been one cause of the confusion of philosophers respecting it. To say that substance is actual entity as permanently related, or as having permanent attributes, which is the teaching of Pres. Porter ("Human Intellect," §§ 644-646), is not satisfactory. For substance—that is, metaphysical substance—is a peculiar and indefinable *kind* of being, and is distinguished by its own essential attribute of *substantiality*, as well as by other properties, which connect themselves with this. Moreover, logical, no less than metaphysical, substances, may be either actual or possible, and may have permanent relations and attributes. The definition misses the mark; and this because the mark, that is, the kind of definition to be given, was misconceived. Accepting metaphysical substance as having an undefinable peculiarity, as being in fact one of the *summa genera* of entity, the distinction between this and the logical substance becomes plain. We see, too, how these conceptions are so related to each other that the same object may, in one aspect, be a metaphysical, and, in another, a logical, substance. The former, when distinguished from its powers and other attributes, is conceived of as having its own essential attribute of substantiality; the logical substance, whether it be a metaphysical substance or not, is simply a complement of entity viewed indeterminately, *i. e.*, as *materia secunda* or as *materia prima* (§ 127); and, therefore,

when distinguished from its attributes, is conceived simply as an entity, or an existence.

§ 161. Another source of error concerning substance has been the denial of one of the necessary properties of this kind of entity, viz., its extension, or spatiality. This denial has taken place in connection with the distinction between spirit and matter as the two kinds of substance. Till quite lately, modern philosophy, following Descartes, has taught that matter is the *unthinking, extended substance* and spirit the *thinking, unextended substance*; and that, therefore, there may be substance without extension. This doctrine is simply a philosophical assumption. While indicating a just and strong desire to contrast matter and spirit, it is supported only by the fact that the extension of matter is more noticeable than that of spirit. Hamilton, who holds this view, admits its modern origin. In his "Discussion" of the philosophy of the "Conditioned," he writes: "The difficulty of thinking, or rather of admitting, as possible, the immateriality of the soul, is shown by the tardy and timorous manner in which the inextension of the thinking subject was recognized in the Christian church. Some of the early Councils, and most of the Fathers, maintained the extended, while denying the corporeal, nature of the spiritual principle; and, though I cannot allow that Descartes was the first by whom the immateriality of mind was fully acknowledged, there can be no doubt that an assertion of the inextension and illocality of the soul, was long and very generally eschewed, as tantamount to the assertion that it was a mere nothing" (Wight's "Hamilton," p. 490). With us the difficulty, which Hamilton recognizes, of admitting the inextension of the soul, is insurmountable. We cannot conceive anything to exist save as in space, nor of any substance as existing save as occupying, or pervading, space.

Locke, writing twenty years after the death of Descartes, and knowing the views of the latter, by no means admits the inextension of spirit. "We have," he says, "the ideas of but three sorts of substances, God, finite intelligences, bodies. First, God is without beginning, eternal, unalterable, and everywhere; and, therefore, concerning his identity there can be no doubt. Secondly, finite spirits having had each its determinate time and place of beginning to exist, the relation to that time and place will always determine to each of them its identity, as long as it exists. Thirdly, the same will hold of every particle of matter, to which no addition or subtraction of matter being made, it is the same. For, though these three sorts of substances, as we term them, do not exclude one another out of the same place, yet we cannot conceive but that they must necessarily each of them exclude any of the same kind out of the same place; or else the notions and names of identity and diversity would be in vain, and there could be no such distinction of substances, or anything else, one from another" (bk. ii.

chap. xxvii.). This passage is conformable to the view, which we hold as a probable conjecture, that spirit and matter do not occupy space in the same way, and that psychological substances have a subtlety, a fineness, and a continuity of being, which enable them to penetrate the coarser substance, body, with as much freedom as if the space were vacant. We would not, however, say that spirit can occupy the very same space which is occupied by the ultimate atoms of matter; and perhaps the words of Locke do not suggest so much as this. Other passages in the writings of this philosopher show that he deprecated any undue distinction between material and spiritual substance. In a discussion subjoined to the third chapter of the fourth book of his "Essay," he says, "So far as I have seen or heard, the Fathers of the Christian church never pretended to demonstrate that matter was incapable to receive a power of sensation, perception, and thinking, from the hand of the omnipotent Creator. I know nobody before Descartes that ever pretended to show that there was any contradiction in it. So that, at the worst, my not being able to see in matter any such incapacity as makes it impossible for omnipotency to bestow on it a faculty of thinking, makes me opposite only to the Cartesians." To some these statements may savor of materialism, but it is to be observed that they are purely hypothetical, and that the matter mentioned in them simply signifies something possessing "extension and solidity," while this solidity is such only as must belong to any external object before it can affect the senses in accordance with the ordinary laws of sensation. Locke was no materialist.

Few, if any, of the leading philosophers of the present day, positively assert that spirits possess extension; this doctrine, however, is implied in the teachings of some. When Pres. Porter defines sensation, "A subjective experience of the soul as animating an extended sensorium," and when he says, that "in each sensation the soul knows itself to be affected in some separate part of the extended organism which it pervades ("Human Intellect," §§ 112-114), it is natural to infer that the soul, which animates an extended organism and perceives itself to be affected in every part of the organism, is itself an extended being. Some words of Pres. McCosh are similarly suggestive. He says that "we intuitively know the organism as out of the mind, as extended, and as localized," and that "at every waking moment we have sensations from more than one sense, and we must know the organs affected as out of each other and in different places." If the intuition of bodily parts, as different and separate, require the immediate presence of the thinking agent, this presence must involve a soul which can pervade the body. At the same time, we should note that Dr. McCosh does not consider this conclusion a necessary one. For, in another place, he writes, "I am inclined to think that our intuition declares of spirit that it must be in

Porter, McCosh,
Hamilton, quoted.

space. It is clear, too, that, so far as mind acts on body, it must act on body as in space, say in making body move in space. But, beyond this, I am persuaded that we have no means of knowing the relations which mind and space bear to each other. As to whether spirit does, or does not, occupy space, this is a subject on which intuition seems to say nothing, and I suspect that experience says as little ("The Intuitions," pp. 109, 220). With the foregoing statements we may compare those of Hamilton, who writes as follows: "In the consciousness of sensations relatively localized and reciprocally external, we have a veritable apprehension, and consequently an immediate perception, of the affected organism, as extended, divided, figured, and so forth. . . . An extension is apprehended in the apprehension of the reciprocal externality of all sensations" (Hamilton's "Reid," pp. 884-5). Sensations external to one another seem to indicate an extended soul.

To us it is clear that the extension of the soul and the extension of the body are perceived at the same time and as correlated with one another. But we allow that the space-relations of the soul are apprehended very indefinitely, and are probably not so fixed as those of the body; and they do not excite the interest or engage the attention of the mind. Moreover, the unity of the conscious spirit is inconsistent with the use of organs possessing distinct functions; and, no matter where within the sphere of the soul's presence any sensation or other activity may originate, it seems instantly participated in by the whole being. Hence the paradox of Aristotle, that the soul is all in every part of the body ("De Anima," i. 5).

We content ourselves, therefore, with the statement that spirit and matter are both discerned as substance, and that this form of entity is perceived, and conceived of, as having the occupation or pervasion of space for a distinguishing mark or property. For power, action, change, and the various accidents of substance, cannot be said to occupy space, but only to pervade or accompany substance in its occupation of space.

This brings us to conclude our account of the conception of substance, by saying that we generally think of it as the repository and possessor of power.

Power, whether active or passive, cannot reside in, or be exercised by, a space or a time, a shape or a relation, or anything, except a substance. Nothing can be done or endured unless there be something which has the ability to do or to endure; that something is a substance. The permanence of any power, or the continuance of its activity, is conditioned on the permanent existence of the substance to which it belongs. These things are intuitively perceived by us whenever we observe the operation of any power.

The description of substance which we have now attempted need not be regarded as fundamental to any system of philosophy, although the doctrine set forth in it may be allowed to have

The potency of substance.

some importance. In particular, this doctrine prepares us to seek some satisfactory determination of our *specific* conceptions of spirit and matter; to which task we now apply ourselves.

§ 162. Our first knowledge of these two entities is obtained from an intuitive, or immediate, cognition of our own souls and our own bodies—that is, from our consciousness of our own souls as in different states and operations; and from a perception of our own bodies as affecting our souls, and as being affected by them. All subsequent knowledge is derived and developed from this. The primary lesson which we learn from this immediate cognition is composed of two closely related truths. We perceive, first, that *the soul is not the body nor the body the soul*, and, secondly, that *the qualities, that is, the powers, of the soul, and the qualities, or powers, of the body, are extremely different in nature from one another*. Spirit in relation to matter, and matter in relation to spirit, is both *ἄλλοι* and *ἀλλότιον*. This double distinction, intuitively made by the human mind, is admirably illustrated by a passage which Hamilton quotes from a dialogue of Plato. Socrates is conversing with Alcibiades.

“Hold, now,” says Socrates, “with whom do you converse at present? Is it not with me? *Alcib.* Yes. *Socr.* And I also with you? *Alcib.* Yes. *Socr.* It is Socrates then who speaks? *Alcib.* Assuredly. *Socr.* And Alcibiades who listens? *Alcib.* Yes. *Socr.* Is it not, with language that Socrates speaks? *Alcib.* What now? Of course. *Socr.* To converse, and to use language, are not these then the same? *Alcib.* The very same. *Socr.* But he who uses a thing and the thing used—are these not different? *Alcib.* What do you mean? *Socr.* A currier—does he not use a cutting-knife, and other instruments? *Alcib.* Yes. *Socr.* And the man who uses the cutting knife, is he different from the instrument he uses? *Alcib.* Most certainly. *Socr.* In like manner, the lyrist, is he not different from the lyre he plays on? *Alcib.* Undoubtedly. *Socr.* This, then, was what I asked you just now,—does not he who uses a thing seem to you always different from the thing used? *Alcib.* Very different. *Socr.* But the currier, does he cut with his instruments alone, or also with his hands? *Alcib.* Also with his hands. *Socr.* He then uses his hands? *Alcib.* Yes. *Socr.* And in his work he uses also his eyes? *Alcib.* Yes. *Socr.* We are agreed, then, that he who uses a thing and the thing used are different? *Alcib.* We are. *Socr.* The currier and the lyrist are, therefore, different from the hands and eyes with which they work? *Alcib.* So it seems. *Socr.* Now, then, does not a man use his whole body? *Alcib.* Unquestionably. *Socr.* But we are agreed that he who uses, and that which is used, are different? *Alcib.* Yes. *Socr.* A man is, therefore, different from his body? *Alcib.* So I think. *Socr.* What then is the man? *Alcib.* I cannot say. *Socr.* You can say, at least, that the man is that which uses the body? *Alcib.* True. *Socr.* Now, does anything

Soul and body known by intuitive perception. The primary principles thus obtained. Plato quoted.

use the body but the mind? *Alcib.* Nothing. *Socr.* The mind is, therefore, the man? *Alcib.* The mind alone."

This dialogue brings out the intuitive conviction of mankind. The truth which it enunciates is to be found in the language and literature of all nations; and every form of monistic philosophy, in attempting to destroy the distinction between mind and matter, simply rolls up the stone of Sisyphus, that it may fall back again to the plain of common sense. The words of Hierocles express the judgment of the race,

“Σὺ γὰρ εἶ ἡ ψυχὴ; τὸ δὲ σῶμα σόν.”

Our specific conceptions of soul and body. Preliminary remarks.

§ 163. Let us now consider the specific conceptions of soul and of body which intuition enables us to form. These, for the most part, are entertained in contrast with one another. The distinctive attributes of the two kinds of substance being extremely different from one another, yet being constantly perceived in correlation, our conceptions of the substances which they characterized are naturally opposed. We do not always and necessarily conceive of the mental and of the material as differing from each other; each may be, and often is, regarded positively and independently. But, because the two are so frequently viewed in correlation, it is not strange that, in our ordinary conceptions of them, the idea of difference and negation should mingle with our apprehension of what is positive. This is especially noticeable in our conception of body. Hence many philosophers make the starting-point—the primary element—of their definition of matter to be that it is the *non-ego*: in other words, the substance which mind perceives as different from itself. In like manner, we find a tendency to define the soul as immaterial, that is, as devoid of the distinctive attributes of body. There is nothing wrong in this. In defining the leading cognitional conceptions of the intellect, we should present, as nearly as may be, the analytical expression of these conceptions *as they are actually and ordinarily entertained*. In this way only we can hope to exhibit truly the workings of the mind itself, and therein also to attain exact and clear views of the objects of its thought. Philosophical definitions, formed independently of the common sense and judgment of mankind, or without an impartial and careful interpretation of that judgment, have often proved the chief corner-stones for an edifice of error. Moreover, the cause of truth will be served most perfectly when the conceptions of the mind are given according to their full natural development.

Spirit and matter defined.

With these views, and remembering that substance is that form of entity which occupies space and is endowed with power, we venture two definitions. We say, first, that mind or spirit is the *thinking, self-active, and intangible substance*; and, secondly, that body or matter is the

unthinking, self-helpless, and tangible, or solid, substance. As these statements are opposed to each other throughout, they may be made the subject of a common discussion.

The first element in our definition of spirit has, in all ages, been regarded as the principal characteristic of this kind of substance and as sufficient of itself to form a distinctive definition. By a natural antithesis, also, matter has always been regarded as the unthinking substance. Mind—mind only—thinks. Thought, in this connection, is considered, not merely in its own proper nature, but as symbolizing all those peculiar powers which consciousness reveals. The term is employed in that broad sense which ordinarily should be shunned, and of which Descartes took an undue advantage, when he declared that the essence of the soul consists in thought. Although, in strict speech, intellectual activity is not even all of the experience of the soul—much less all of the soul itself—it is the most prominent part of psychical life, and the chief condition of its development. No emotion, desire, or voluntary action, can take place without thought. Only to sensation thought is not prerequisite; yet it is difficult to believe that sensation could take place save in a being which should, at least, have a consciousness of that experience.

When we define spirit as the thinking substance—that is, the substance endowed with sensation, intellect, emotion, desire, volition, and all those powers which we distinguish as psychical—we simply formulate the natural and intuitive judgment of man respecting his own nature. As might be expected, the doctrine thus presented is a very ancient one. Five hundred years before Christ, Epicharmus, the Herodotus of Grecian comedy, tempering his fun with wisdom, wrote,

“*Nōus ὀρῆ και νῶus ἀκῶνει, τᾶλλα κωφὰ και τυφλά.*”

—words which belong, not to Epicharmus, but to all the children of Adam.

“What sees is mind, what hears is mind;
And all things else are deaf and blind.”

For, when we conceive of spirit as the thinking substance, we plainly deny that the other substance from which it is distinguished, can think, or have psychical experience. This negative teaching of Epicharmus, and of common sense, is founded partly on the fact that matter never in any way manifests psychical activity, and partly, we believe, on our natural perception of the incapacity of matter to do so. Whatever evidences of plan and desire material things may at any time present, they never exhibit any intelligence or feeling of their own. The laws of their action, so far as these can be observed, are purely mechanical or molecular. Design, when indicated by any arrangement or organization in nature, presents itself exactly like design

when displayed in the construction and operation of some artificial machine. The most careful scrutiny finds nothing more in every such organization than an assemblage of correlated parts which act one upon another according to fixed laws, each part unvaryingly performing its own function and giving no token of conscious intelligence. Nor does the organization as such, being simply the sum of its parts in their correlation, show an intelligence of its own. Its action is merely the resultant of the operations of its parts. Not only so; we perceive a unity and simplicity in every thinking substance which we find wanting in every physical structure or arrangement. Thought cannot be conceived of as the interaction of any collection of heterogeneous substances whether great or small, but only as the activity of one simple, or indivisible, substance. And seeing that every physical organization is composed of parts and particles, we feel that we might as well ascribe the intention of pulling or holding to a rope or chain, as that of growing to a seed or of bearing fruit to a tree; or as well the purpose of shining and giving light to a candle as that of seeing to the eye or of hearing to the ear.

Moreover, being forced to concede an intelligent Being separate from those organizations which are the proofs of His existence, we do not confine the presence of this spirit to the structures of His own formation. We find abundant reason for ascribing to Him an unrestricted sphere of activity. A theory which would confine the unseen Author of the universe within his physical creations would be no less absurd than to say that the human spirit exists within the instruments and agencies it forms and uses. It is not credible that the marvelous Mind, which fashioned the universe and gave it laws, was employed, while doing so, in making chains and a prison for Himself. Such a task would be equally irrational and impossible for such a Being.

A second, and also secondary, element, in our conception of spirit, is that *it is self-active*; corresponding to which characterization, we have the attribution of *self-helplessness* to matter. The point of contrast between body and mind, thus presented, has not received much attention from philosophers; but we believe that it is realized and felt by men generally. We often think and speak of spirit as something active and living, and of matter as something dead and inert; of spirit as that which controls and moves, and of matter as that which is controlled and moved. Such statements express a truth, although, it may be, too strongly. As we have said, substance of whatever kind is known to us as endowed with powers, both active and passive, so that, on the one hand, we cannot deny active power to matter, nor, on the other, passive power to mind. The majestic motions of the heavenly bodies—the volcanic and oceanic changes which geology considers—the growth of plants and animals—the movements of clouds and currents overhead—the chemical dissolutions and compositions going on around us

The self-active,
and the self-help-
less, substance.

--attest the activity of material potencies. On the other hand, so far at least as the present condition of our race is concerned, it is plain that the human spirit is constantly subject to the action of physical agencies, as these operate, directly or indirectly, upon our nervous system. We cannot, therefore, make the distinction that mind is the substance which acts, and matter the substance which is acted upon. Matter, also, acts; and mind, also, is acted upon. Nevertheless, there is a difference, if we can only apprehend it, between the modes of action proper to each substance. Every spirit seems to be endowed with a power of activity within itself, so that the current of its life, once opened, flows on for ever. Human experience, while stimulated, guided, and modified, by influences from without, properly originates from powers within. Hence, a state of things is conceivable in which the soul, being freed from bodily conditions and affections, may pass a life, the producing cause of which shall be wholly the energy of the soul itself. Such is the activity which we naturally ascribe to God and to angelic spirits. No such capability of automatic action is found in any particle of matter, or in any material substance. No body acts save when it is acted upon. The most violent of physical agents lie perfectly inert and helpless, till some cause, external to themselves, arouses them. Chemical molecules show no independent activity, but simply act one upon another when the proper conditions are supplied. Mechanical motion is imparted from one body to another, and obeys the law that action and reaction are equal. Matter acts only when acted on by mind, or when acted on by other matter,—never in any other case; and this inertness, which is frequently included in our conception of physical agents, we have termed the self-helplessness of matter.

The tangible, and the intangible, substance.

Finally, we designate mind *the intangible substance* and matter *the tangible, or solid, substance*. Solidity or tangibility is the principal characteristic of matter, and has the same place in our conception of matter that thought has in our conception of mind. Thus, substance in general being characterized by the occupation of space and the possession of power, one kind of substance is distinguished by the peculiar nature of the power which it possesses, while the other kind is marked by its peculiar mode of the occupation of space. We think it a sufficient and distinctive definition to say that matter or body is the tangible or solid substance. Generally, too, our conception of spirit involves a negation of this attribute, just as that of matter excludes the power of thought.

Here it must be noted that we use words in a far wider signification than ordinarily belongs to them, and in a sense which only necessity can justify. By tangibility and solidity we mean precisely the same thing, using two terms that each may qualify the other. We mean that peculiarity whereby matter occupies space to the exclusion of all other matter—a quality which is made known to us only through sense-perception, and

which, as always involving a reference to this mode of cognition, might be styled the sensible occupation of space. This attribute has, we believe, a simple and indefinable character whereby it is distinguished from the occupation of space in general, just as the conception of thought, which is the essential mark of spirit, is similarly distinguished from that of action or movement in general. It is to emphasize this peculiarity that we have employed the expression *tangibility*. By this term we do not mean tactility or the capability of perception by touch, but that quality which makes material substances capable of impinging on the organs of sense and on each other; and which is the condition of all sense-perception whatever. The term *solidity* is more directly expressive of this idea, but must be received with qualifications. The solidity which belongs to matter universally cannot be contrasted with a liquid or aeriform condition; nor is it simple spatiality or extension. It is that kind of space-occupation which must belong to an agent before it can affect the senses in any way, by impinging upon their organs. For, as Democritus taught, nothing external can be perceived save through the affection of some bodily organ, by a contact. Some have styled this attribute the ultimate impenetrability or incompressibility of matter; we prefer the name solidity, and would treat impenetrability, or incompressibility, as the immediate consequence of the solidity.

§ 164. Our ordinary perception of material things as solid enters into, and helps to constitute, the exercise of our externally directed senses, and is especially a part of perception by touch. We question whether sight, hearing, taste, and smell, would, of themselves and aside from the tactile sensations which mingle with their proper and special feelings, impart a knowledge of solidity; this is properly indicated by sensible impact, which impact is perceived by touch. Experience, however, reveals that the agents which affect the other senses are the same, or of the same radical nature, with those which affect the touch. We trace hearing to vibrations in the air, smell and taste to finely diffused particles, and sight to the motions of a medium evidently material, inasmuch as it produces chemical and mechanical effects. Thus, a sort of tangibility belongs to every thing perceived outwardly. But, while a perception of solidity is part of our perception of things external to the body, and is especially connected with the sense of touch, there is reason to believe that our original perception of this quality, and that from which the conception of solidity is derived, takes place when one perceives the solidity of his own body.

Two theories, on this point, are possible. First, it has been held that the sense of touch alone enables us directly to perceive the solidity of those external objects and agents which may affect us by impact or pressure. This sense has been regarded as duplex, as acting in part by means of a titillation of the surface of the body and in

Our ordinary perception of solidity.

Our original perception of solidity.
Two theories,

part by a sense of pressure experienced in the muscular system; and it has been held that the mind, perceiving pressure from without, directly conceives and asserts an external solid substance as exercising the power manifested by this pressure. According to this view, the sense of pressure from without is an occasion on which, without any previous and more immediate perception, matter, or the solid substance, is conceived of and believed in. This view is that given by Locke, Reid, and others, and is allied to the doctrine of inferential realism (§ 55).

Later philosophers, attempting a more profound analysis, have held that the cognition and conception of matter external to our own bodies is not absolutely original, but is conditioned and consequent on the perception of the matter of our own bodies. They divide the sensations which result from causes within the body into two comprehensive classes—first, *the vital or organic*, which embraces such feelings as those of wakefulness or drowsiness, of vigor or languor, of hunger and thirst, of heat and cold, and all the various pains and pleasures directly resulting from health or from disease. None of these can be said to have a special organ, though some of them are localized, and others generally diffused. They pervade the whole sensory system. In connection with them, perceptions of extension and location may take place, but scarcely a perception of the solid. The second class of internal sensations are *the muscular*. These, probably, have nerves specially assigned to them, and, as distinguished from such organic feelings as may occur within the muscles, may be regarded as including two kinds of sensation, viz., that resulting from *the exercise of muscular power*, or “locomotive energy,” as Hamilton terms it; and that resulting from *the pressure of the muscular parts one upon another*. This latter feeling may be experienced alone, as when a hand lying on a table has some weight laid upon it; but it also is an accompaniment of the other. For, in all muscular effort or resistance, the muscular fibres press one upon another. The importance of these muscular sensations arises from the fact that the mind, while experiencing them, comes into immediate and unmistakable relation with two things, *force* and *matter*, the latter being seen as the subject in which the former dwells and the object upon which it is expended. The simple conception of matter may be supposed to originate in connection with the sense of internal pressure; for then the mind intuitively perceives the solidity of the sensorium which it pervades: the conception of force may be supposed to arise both in connection with this pressure, in which the compressing power, no less than the matter resisting it, is presented; and in the perception of muscular effort or resistance, that is, of man's own locomotive energy. Of the two theories of the origin of our idea of matter which we have now stated, we prefer the latter, as it makes the perception of solidity absolutely immediate, and thus conforms to the doctrine of presentational realism.

The definitions of matter and of spirit advocated in the present discussion are essentially those of Locke. He says, "Our idea of body, as I think, is an extended solid substance, capable of communicating motion by impulse; and our idea of soul, as an immaterial spirit, is of a substance that thinks, and has a power of exciting motion in body, by willing or thought. These, I think, are our complex ideas of body and soul, as contradicting" (book ii. chap. xxiii. § 22). Here, plainly, thought is made the chief attribute of spirit, and solidity, of matter. The capability of moving by impulse is added by Locke so as to define and complete the idea of solidity. Elsewhere he says, "Solidity seems the idea most intimately connected with, and essential to, body, so as nowhere else to be found or imagined, but only in matter. And, though our senses take no notice of it save in masses of matter of a bulk sufficient to cause a sensation in us; yet the mind, having once got this idea from such grosser sensible bodies, traces it further; and considers it, as well as figure, in the minutest particle of matter that can exist; and finds it inseparably inherent in body wherever or however modified. This is the idea which belongs to body whereby we conceive it to fill space. The idea of which filling of space is that, where we imagine any space taken up by a solid substance, we conceive it so to possess it that it excludes all other solid substances This resistance whereby it keeps all other bodies out of the space which it possesses, is so great that no force, how great soever, can surmount it. All the bodies in the world, pressing a drop of water on all sides, will never be able to overcome the resistance which it will make, soft as it is, to their approaching one another, till it be removed out of their way; whereby our idea of solidity is distinguished both from pure space, which is capable neither of resistance nor motion; and from the ordinary idea of hardness" (book ii. chap. iv.). In the first part of this passage, Locke might be construed to identify solidity with extension, when he speaks of the former as the idea whereby body is conceived to fill space. But that such was not his real meaning is evident, because elsewhere he distinguishes extension and solidity, and because, in this very passage, he explains himself, saying, "The idea of which filling of space is that, where we imagine any space taken up by a solid substance, we conceive it so to possess it *that it excludes all other solid substances.*" In another place, Locke gives the simple definition, "Matter is the substance that has the modification of solidity." All things considered, our conception of matter seems to be the same as that of Locke with such modifications only as are demanded by consistency and precision of thought.

The dynamical theory of matter.

In the foregoing discussion, we have not thought it necessary to notice the dynamical theory of body, which identifies matter with force. It is simply one form of the doctrine which denies the existence of substance,

and is similar in nature and origin to the idealism of Berkeley and the associationalism of Mill (§ 150). The argument for it is, that qualities, or powers, are the only things known to us and that we have no right to believe in anything else. The assumption here made is false. Substance is known to us as truly and as immediately as the powers which it possesses, or the force which it exerts. It is true that powers and qualities may be spoken of without mention of that substance to which they belong, and even whole books may be written after this style; but all such language has a tacit reference to substance. A few words of Pres. McCosh admirably express the truth on this topic. He says, "The dynamical theory of body, so far as it denies the existence of space, and body as occupying space, is utterly inconsistent with that fundamental conviction, of which the mind can never be shorn, which declares that the matter which has the force must be extended, and that the force exercised is a force in a body in one part of space over a body in a different part of space" ("The Intuitions," p. 126).

The attributes or qualities of matter. Preliminary. § 165. Having, according to our ability, defined spirit and matter, the remainder of this discussion may be devoted to this latter substance and its leading characteristics. Although few philosophers have attempted the exact definition of matter, almost all have undertaken to set forth the leading characteristics of this kind of substance. Some consideration of these is desirable, if we would conceive correctly the generic forms of human thought. The various attributes of spirit are studied directly and in detail elsewhere by the psychologist, and do not now call for special consideration; but matter is studied only in connection with sense-perception; and it is a part of the philosophy of this perception to determine the nature of our conceptions and convictions concerning material things. The end of metaphysical inquiry regarding any subject other than the mind itself is accomplished when we may have determined the principal ideas which we rightfully entertain concerning that subject.

The leading characteristics of body do not include its essential attributes only, nor even those only which, though not conceived of as essential to the very nature of matter, universally accompany that nature as its necessary properties or accidents. These characteristics include, together with the essential and necessary attributes, those, also, which, to any very wide extent, affect material substances and determine our more general conceptions concerning them. Some confusion has prevailed on this point; and this, united to an indistinct conception of the essential nature of matter, has retarded the progress of philosophy in the inquiry concerning material properties. Any one who desires to trace the history of opinions respecting this subject will find a full and masterly discussion in one of the "Dissertations" of Sir Wm. Hamilton; in which also the views of Hamilton himself are ably presented. One's estimate of these

views will be modified and determined by the conception and definition of matter he may be able to form; but, in any case, they may be accepted as an advance on the opinions of all preceding authors, and as the basis for the satisfactory settlement of questions that have been long debated.

Aristotle quoted.
Common and proper
sensibles.
Locke.
Primary and secondary
qualities.

Aristotle was the first who formally enumerated the necessary attributes of body, and distinguished them from others which do not of necessity belong to matter of every kind, and in every case. In his treatise concerning sense (cap. i.), he divides things perceivable by sense into two classes, the *common*, which are perceived by all, or most, of the senses, and the *proper*, the perception of which is peculiar to one sense or to another. The common sensibles according to Aristotle, are figure, size, motion, rest, and number (*λέγω δε κοινὰ σχῆμα, μέγεθος, κίνησιν, στάσιν, ἀριθμὸν*), elsewhere adding to these, place, distance, position, and continuity. The proper sensibles are such things as smells, colors, tastes, sounds, together with the percepts of touch, such as the rough and the smooth, the hard and the soft, the hot and the cold, the light and the heavy, and including also that radical property of matter which we have named solidity. Two thousand years after the Stagirite taught the doctrine which we have now explained, Locke made his noted distinction between the primary and secondary qualities of matter. "Qualities in bodies are," he says, "*first*, such as are utterly inseparable from the body in what state soever it be. . . . For example, take a grain of wheat, divide it into two parts; each part has still *solidity, extension, figure* and *mobility*; divide it again, and it retains still the same qualities; and so divide it on, till the parts become insensible; they must retain still each of them all those qualities. For division (which is all that a mill or pestle, or any other body, does upon another, in reducing it to insensible parts) can never take away either solidity, extension, figure, or mobility, from any body, but only makes two or more distinct separate masses of matter of that which was one before; all which distinct masses, reckoned as so many distinct bodies, after division make a certain number. These, therefore, I call *original or primary qualities* of body, which I think we may observe to produce simple *ideas* in us, viz., solidity, extension, figure, motion, or rest, and number. *Secondly*, such qualities as, in truth, are nothing in the objects themselves but powers to produce various sensations in us by their primary qualities, that is, by the bulk, figure, texture, and motion of their insensible parts, such as colors, sounds, tastes, and so forth, these I call *secondary qualities*." With these secondary qualities Locke classed also "The power that is in any body, by reason of the particular constitution of its primary qualities, to make such a change in the bulk, figure, texture, and motion of another body as to make it operate on our senses differently from what it did before. Thus the sun has a power to make wax white and fire to make lead

fluid" ("Essay," bk. ii. chap. viii.). Elsewhere Locke adds to the primary qualities situation, and texture, or consistency. Comparing Locke with Aristotle, as to his view of the universal attributes of matter, there is, at first sight, no important difference. Inspection, however, reveals that the modern differs from the ancient philosopher in two respects. *First*, his point of view is different. Locke speaks of common qualities, not of common sensibles; he regards the things perceived *as in their relation to matter*, the direct and fundamental object of sense-perception, rather than *as related to our various senses*, or faculties of perception. This is an improvement; for the inquiry and thinking of the mind is naturally objective, and, even in philosophy, we wish to know the objects of thought in themselves rather than in their relations to our means of knowing them. This latter point of view is subordinate to the former. *Secondly*,—and what is more important—Locke adds solidity to the list of Aristotle, and, in so doing, not only gives the most essential of all the sensibles, but also leads us to modify and determine correctly our conception of the attributes which Aristotle mentions. This addition was rendered possible by the point of view, which the inquiry of Locke assumed. There might be a question whether solidity is really a common sensible, as this attribute is specially discerned in connection with tactual and muscular sensations. But there can be no question that solidity is an universal and essential attribute of matter, and that attribute by which alone the affections of sense are rendered possible.

Such being the case, we may say that the remaining attributes are not things conceived of simply, but *things conceived of as perceptibly belonging to a solid substance*. Number, for example, belongs to spirits, and their thoughts and powers, as well as to material entities; in fact, the number here mentioned is simply the perceptible numerical difference pertaining to the separate or separable portions of matter. Hence it is often indicated by the term *divisibility*. So, also, rest and motion are not peculiar to bodies; for souls go and stay wherever the bodies containing them may go and stay. In like manner, size, as distinguished from mere spatiality, or extension, indicates that space-occupation which is perceivable by the senses; and figure denotes that definite shape which we are led to assign to every material body, and to the particles of which it is composed. All these are common sensibles, not simply *per se*, and by reason of their own nature, but specifically, and as they are related to matter and its solidity.

In connection with the foregoing, and confirmatory of it, we note that the radical characteristics of body, as given by Locke and Aristotle, are all conditioned on the space-relations of matter. They have nothing to do with time-relations. No mention is made of the endurance of matter, although it is evident that all bodies are perceived as having a permanency of existence; neither do they include the characteristic of potency, although all matter

is perceived as having causative power. The reason for this omission we find in the fact that the real aim of both authors was to enumerate the universal properties of matter, so far as these are immediately conditioned on its essential attribute, rather than an exhaustive list of the universal predicables of matter. This, at least, was Locke's intention.

The chief importance of this topic. Hamilton quoted. Aside from its historical interest, the discussion as to the primary characteristics of body, is important chiefly as confirming the thought that solidity is the essential attribute in our ordinary conception of matter. For this doctrine is the key to the whole inquiry. Hence some, who have supposed the question limited to the essential or constitutive characteristics, have discarded all attributes save "extension and solidity." M. Royer Collard, the able French advocate of the Scottish philosophy, took this position. But, in defining matter, we think that extension may be omitted, as it is really included in solidity; the mention of it only makes our conception of body more explicit.

Accepting, as the primary attributes of matter, extension, solidity, and such other characteristics as are universally and peculiarly connected with these, we are prepared to consider those attributes which very widely characterize material substances without being necessarily connected with the existence of matter everywhere and always.

These have been the theme of great discussions. A critical review of opinions concerning them, as also concerning the primary qualities, may be found in that extremely able and learned paper to which we have referred, and which is the most valuable of those "Dissertations" which Sir Wm. Hamilton published as "Notes" on the philosophy of Reid. For us the chief defect in Hamilton's discussion is that he does not sufficiently distinguish solidity as the central and essential thought in our conception of matter; he rather makes this to be extension, and solidity to be a necessary property of extension. We believe that no theory of body and its qualities, which misses the true distinction between these two attributes, can prove satisfactory. But the "Dissertation" is a masterly production and may be accepted as the basis for a final settlement of the vexed questions of which it treats. Hamilton's list of primary qualities is as follows "1. Extension; 2. Divisibility; 3. Size; 4. Density or Rarity; 5. Figure; 6. Incompressibility absolute; 7. Mobility; 8. Situation." Here divisibility is the same as the number of Aristotle; size and density are of the same radical nature, for each is a kind of quantity, and the two together form an absolute measure of the quantity of matter in anybody; and incompressibility indicates solidity, of which it is the immediate consequence (Locke's "Essay," bk. ii. chap. iv.). The list would seem to us incapable of improvement, provided only solidity were added immediately after extension, and allowed to qualify our conceptions of the remaining attributes.

The non-primary
qualities.
Distinguished and
divided.

§ 166. But the "Dissertation" is especially instructive in regard to those qualities which are not primary. These are divided into two classes, the Secundo-primary, and the Secondary. The ground of this division is not stated; but it plainly lies in the fact that matter exercises power in two ways. For, in the first place, matter can act variously upon other matter; and, secondly, it can act on the soul so as to excite various sensations, through the affection of our sensorial organization. The former class of qualities are styled *secundo-primary*, because they are perceived only in the action of body on body, as such; and, therefore, in a sense, may be said to involve solidity and the other primary qualities; but the latter class is termed *secondary*, because they are first perceived simply as powers (resident, of course, in some substance), to produce certain sensations within the soul. It is true that secondary qualities may often be explained, and may always be accounted for, as immediately resulting from some particular development of the secundo-primary; and cases arise in which powers belonging to these two classes may form a unity and be thought of together and under one conception. For example, hardness and softness, roughness and smoothness, may be regarded both as certain dispositions of the particles of solid bodies, and as the causes of certain sensations in our nervous system. The distinction, however, between the secundo-primary and the secondary is rightly made, even though it may sometimes call us to discriminate a thing as viewed in one light from itself as viewed in another. It is not weakened, but confirmed, by the analysis of those cases in which the two modes of quality combine; and it is necessary if we would describe and distinguish our conceptions of outer things according to their natural formation in the mind.

That a reference to solidity qualifies our conception of the secundo-primary characteristics of matter is taught by Hamilton when he says, that *these qualities are known by pressure*. For this is the indication of solidity. His words are, "They have all relation to space and to motion in space; and are all contained under the category of resistance or pressure." We would prefer to say that they all *become known to us in connection with pressure and resistance*. Moreover, we prefer a different statement from that of Hamilton, when he says that the secundo-primary qualities may be considered in two lights—the objective or physical, and the subjective or psychological; the latter referring to the sensations which they are able to cause. Whenever qualities are viewed simply as the causes of sensations, we would consider and call them secondary; but whenever they may be viewed as related to both physical and psychical effects, we would regard them as a combination of the secondary with the secundo-primary. But secundo-primary qualities, *per se*, seem wholly physical, or objective.

Finally, that third class of qualities which Locke mentions

may be regarded as secundo-primary qualities *perceived and conceived of by means of an external character or relation*. Though they refer to psychical results, they immediately relate to the action of matter upon matter.

With these remarks we shall give Hamilton's account of the *secundo-primary* qualities almost in his own words, simply dropping his identification of material force with the resistance or pressure in connection with which it is perceived. For these things are plainly distinguishable. His classification of the qualities has reference to the general nature of the forces manifested in them. These are of three kinds, viz., that of Co-attraction, that of Repulsion, and that of Inertia.

I. There are two subaltern genera of co-attraction, to wit, that of gravity, or the co-attraction of the particles of body in general; and that of cohesion, or the co-attraction of the particles of this and that body in particular. Gravity, or weight, according to its degree, which is in proportion to the bulk and density of ponderable matter, affords the relative qualities of the heavy and the light. Cohesion, using that term in its most unexclusive universality, is the source of many species of qualities. Without proposing an exhaustive list, we enumerate, (1) the hard and the soft; (2) the firm or solid, and the fluid or liquid; this last being sub-divided into the thick and the thin; (3) the viscid and the friable; (4) the tough and the brittle; (5) the rigid and the flexible; (6) the fissile and the infissile; (7) the ductile and the inductile; (8) the retractile, or cohesively elastic, and the irretractile; (9) the rough and the smooth; and (10) the slippery and the tenacious.

II. The force of repulsion is manifested in greater or less degrees of resistance to compression, that is, in (1) relative compressibility and incompressibility; and, also, in greater or less degrees of resiliency, or the elasticity of repulsion, that is, (2) in resiliency and irresiliency.

III. Inertia, or, more fully, the *vis inertiae*, is the tendency whereby body continues in a state of rest or motion till acted upon from without. Combined with bulk and cohesion, it results in the movable and immovable—that is, the easy and the difficult to move.

“There are thus,” says Hamilton, “at least fifteen pairs of counter attributes which we may refer to the secundo-primary qualities of body, all obtained by the division and subdivision of the resisting forces of matter.” In the foregoing list, the powers of chemical combination and of molecular adhesion are omitted, and should, perhaps, be added to those qualities which are enumerated under the general head of cohesion. The tendency to chemical combination is an important and widely-operative attribute of matter; and so, also, is that adhesive force, which is exhibited in capillary action, in the solution of a solid in a liquid substance, and in the saturation of one fluid substance by another. These, therefore, may complete our enumeration.

The secundo-primary qualities enumerated.

Secondary qualities are causes conceived of by an external mark.

§ 167. We now pass to the *secondary* qualities of matter. These may be defined as causes existing in body to produce the various sensations of which man is capable, *considered without reference to their own constitution, but simply as the causes of the sensations.* We may be ignorant of the nature of that which produces some sensation in us, while yet we are sure that there is something external to us which has a power to affect us in a given way. Only philosophic research reveals the nature of such things as color, sound, odor, heat, cold, and so forth; but every one knows that things are colored, sonorous, odoriferous, hot, and cold; for these are all the objects of special perceptions. We cannot approve of the language of Prof. Stewart and other authors, who speak of secondary qualities as the unknown causes of our sensations; this language is calculated to mislead. Every such quality is known as a cause, and much even may be ascertained of the character of the cause. But it is to be allowed, and to be noted, that our conception of the quality does not contain any reference to the particular constitution of the cause; and may be formed and entertained while we are ignorant of that constitution.

That secondary qualities are of the nature of causes is taught by Locke when he says that they are "nothing but powers to produce various sensations in us"; which doctrine has come down from Aristotle, and accords with the universal belief of men. When men say that fire is hot, and that grass is green, and sugar sweet, and thunder loud, they mean, not only that we have given sensations, but that there is a power in certain things to produce these feelings. To ascribe such a power to any object does not necessarily involve that any soul is or will be actually affected by it; but only that the proper affection can and will be produced whenever the object may be brought to act on the sensorium. There is literal truth in what the poet says:

"Full many a gem of purest ray serene,
The dark unfathomed caves of ocean bear.
Full many a flower is born to blush unseen
And waste its sweetness on the desert air."

Moreover, there is no reason to suppose that the external quality resembles the feeling in the mind, or partakes of its nature. The quality is simply a power in some material substance to cause a peculiar motion in the matter of our nervous system; and even this motion is something wholly different from sensation, the latter being an affection of the mind excited by the nervous action, but deriving its peculiar character from the activity of the mind itself (§ 18). The perception of the quality takes place when we perceive the sensation *as an effect and as determined by some cause not within the soul itself.* These remarks will explain that pretty war of words as to whether heat and cold, colors, sounds, tastes, and smells, exist in external objects, or in the mind only, or in both. They plainly reside in both, but in

different senses. The sensations of heat and cold, color and taste, are in the mind only; the external causes or conditions of these sensations reside in bodies. It is the part of such sciences as acoustics and optics to ascertain the nature of these causes and the mode of their operation; and modern investigation only confirms the conjecture which Aristotle ascribes to Democritus, that savors, odors, and colors, consist in the configuration and action of particles of matter ("De Sensu," chap. iv.).

The views which have now been advocated may be summed up as follows. By the qualities of body philosophers have meant those properties which belong exclusively to matter, or the solid substance. The principal primary qualities are, *solidity, size, figure, mobility, divisibility, and situation*; to which, possibly, two or three others less noticeable might be added. These are conceived of, not abstractly, but as attributes necessarily, and therefore universally, accompanying solidity.

The secundo-primary qualities are powers which bodies have to act upon one another. They, also, are immediately perceived, and conceived of, as *connected with solidity, yet not necessarily concomitant of it*. Only solid bodies are known to attract and repel each other in space, and to resist any change from a state either of rest or motion. Yet we might conceive matter to exist without any powers of attraction or repulsion or inertia. Science has established that some of the laws according to which matter acts upon matter are very general. The proposition has been ably maintained that gravity and inertia are universal attributes. It is the province of scientific inquiry, not of immediate intuition, to determine such questions and all others relating to the nature and extent of the secundo-primary qualities of body. Finally, the secondary qualities are *powers residing in material things to produce sensations in us*. We cannot accept the language of Hamilton when he says, "As we are chiefly concerned with these qualities on their subjective side, I request it may be observed that I shall employ the expression *secondary qualities* to denote those phenomenal affections determined in our sentient organism by the agency of external bodies, and not, unless when otherwise stated, the occult powers themselves from which that agency proceeds." Only confusion can result if we identify sense-affecting qualities with the affections which they produce. But we may conceive of powers without reference to the physical conditions out of which they arise, and even while ignorant of the nature of such conditions, the essential or differentiating element in our conception being purely relative, and based on the effect which the power produces: thus we conceive of the secondary qualities of matter.

The division of material properties which has now been presented is controlled by subjective as well as objective considerations. Viewed only objectively the secundo-primary and the secondary qualities would not be exclusive of one another. Be-

sides, our conception of the primary qualities arises from an intuitional perception of necessary relations, which is not the case with our conception of the other qualities. The real ground of the division lies in the different ways in which our perception and conception of solidity—or of extension and solidity, the essential properties of matter—are related to our perception and conception of material properties in general. For, while all the qualities, according to our ultimate understanding of them, are exclusively properties of matter, the primary attributes are perceived, and conceived of, as necessarily belonging to all extended and solid substances; the secundo-primary as belonging only to matter or the solid substance, yet, so far as we can see, contingently; while the secondary qualities are perceived, and conceived of, without any such perception of their relation to an extended solid. From the first they are perceived as powers belonging to a substance other than the soul, and external to it; but it is by subsequent comparison and judgment that they are connected with solidity in the substances which they characterize. Hence, our conceptions of them do not ordinarily contain any reference to solidity.

CHAPTER XXXIV.

CONCOMITANT PERCEPTION.

§ 168. Those intuitive convictions, which accompany our perceptions of material and spiritual substances and their powers, operations, and changes, do not differ in their own nature from these perceptions which they accompany. Therefore, on the one hand, they should not be regarded as having a purer and more perfect intellectual character than the cognitions proper of consciousness and sense-perception; nor, on the other, should they be considered as less reliable sources of information. We have the same reason to trust the one that we have to trust the other. Both, alike and equally, result from that power of immediate cognition with which the human mind is endowed. Both are indissolubly united in the action of this power, and are separable only in the analysis of thought. Whatever, therefore, may be said or shown as to presentational perception in general (§§ 143–145), may be taught concerning concomitant perception. This is an original fountain of thought, and a primordial source of knowledge and conviction; which, like our other faculties of primary acquisition, does not yield any abstract instruction, but contributes to the presentation of those complex and individual facts, from the memory of which the mind elaborates the thoughts of her discourse.

Concomitant perception compared with consciousness and sense-perception.

Concomitant perception defined and established. Aristotle and Hutcheson quoted.

Some systems of philosophy, such as Sensationalism, Associationalism, Kantianism, and Agnosticism (§§ 23, 57, 159), are especially adverse to the authority of concomitant perception. They deny, or explain away, our cognitions of space and time, substance and power, and the relations depending on them. It is sufficient, at this point, to say that all these systems are founded on mere hypothesis, and are as entirely without evidence as they are opposed to the universal judgment and sense of men.

The distinction between direct and concomitant perception has not received the recognition which it deserves. Most writers, and in particular those who have lived within the last one hundred years, have embraced all our immediate knowledge under the heads of consciousness and sense-perception. They have been induced to do so, partly because the same discussion applies largely to all our original cognitions, and yet more because our concomitant perceptions are so intermingled and united with those which are more direct, that the former have naturally been treated as subordinate parts of the latter. This method of treatment has a great disadvantage. It brings the language of philosophy into conflict with that of common speech; it makes philosophy use words wrongly, and teach what is not strictly and literally correct. To say that space is perceived by sense-perception, and duration by consciousness, is to teach what is not true according to our ordinary conception of the operations and objects of these powers; neither can we say that the relations of number, or quantity, or causation, are perceived by these powers, or by either one of them. But we can affirm that space, time, number, quantity, and causation are perceived *in connection with* the objects both of sense-perception and consciousness. The adoption of language other than this has led some to make a division of these common objects, so as to assign some of them to sense-perception, and some to consciousness—a division arising solely from the assumption that there are only two modes of immediate cognition. The better plan, in this case, as in every other in which it can be employed, is to conform the language of philosophy to that of daily life. In following this method we may hope to obtain more correct apprehensions, both as to our perceptions and as to the objects of our perceptions, than can be obtained in any other way.

Although concomitant perception has not received any formal place in the systems of philosophers, their writings contain intimations which greatly justify its more perfect recognition. Aristotle teaches that there are three kinds of sensibles, or—as the word might be translated—of sense-perceptibles, and that two of these are perceived in themselves (*καθ' αὐτά*), while one is perceived by its accidents (*κατὰ συμβεβηκός*). By this last we understand the object of acquired perception, as when, seeing a white thing, we recognize the son of Diareus; for to be the son of Diareus is something contingent, and not necessary, to the

whiteness perceived. About this kind of perceptibles we are sometimes mistaken. Of things sensible in themselves, and about which we do not mistake, there are two kinds, the *proper*, which belong severally to the several senses, and the *common*, which belong to all. The common are motion, rest, number, form, and size. But, adds Aristotle, "Of things sensible in themselves, the proper are pre-eminently objects of sense-perception, and things to which the nature of each sense is adapted." "τῶν δὲ καθ' αὐτὰ αἰσθητῶν, τὰ ἴδια κυρίως ἐστὶν αἰσθητὰ, καὶ πρὸς ἃ ἡ οὐσία πέφυκεν ἐκάστης αἰσθησέως." Thus he makes the common sensibles to be the objects of sense only in a secondary and improper way. Elsewhere he styles them the concomitants and consequents (ἀκολουθέντα, ἐπόμενα) of the proper ("De Anima," bk. i. 2, bk. iii. 1).

With Aristotle let us compare Hutcheson, the father of Scotch Philosophy. In his essay on the "Passions," he says, "Certain motions raised in our bodies are, by a general law, constituted the occasion of perceptions in our minds. These perceptions never come entirely alone, but have some other perception joined with them. Thus, every sensation is accompanied with the idea of duration; and yet duration is not a sensible idea, since it also accompanies ideas of internal consciousness or reflection; so the idea of number may accompany any sensible ideas, and yet may also accompany any other ideas, as well as external sensations. Brutes, when several objects are before them, have probably all the proper ideas of sight which we have, without the idea of number. Some ideas are found accompanying the most different sensations, which yet are not to be perceived separately from some sensible quality. Such are *extension, figure, motion, and rest*, which accompany the ideas of sight or colors, and yet may be perceived without them, as in the ideas of touch, at least if we move our organs along the parts of the body touched. Extension, figure, motion, or rest, seem, therefore, to be more properly called *ideas accompanying the sensations of sight and touch, than the sensations of either of these senses*; since they can be received sometimes without the ideas of color, and sometimes without those of touching, though never without the one or the other. The perceptions which are purely sensible, received each by its proper sense, are tastes, smells, colors, sounds, heat, cold, etc. The universal concomitant ideas, which may attend any idea whatsoever, are duration and number. The ideas, which accompany the most different ideas, are extension, figure, motion, and rest. These all arise without any previous ideas assembled or compared. The concomitant ideas are reputed images of something external."

In the foregoing, it will be noticed that the term *sensation*, according to the usage of older writers, is employed to express *what we now call sense-perception*; it will be seen also that no distinction is observed between mere ideas and the cognitions in which ideas are first experienced.

The present topic might be largely illustrated from Locke and Reid quoted. Locke, who, though very inadequately, recognizes concomitant perception as a "suggestion" of the mind. He says, "Existence and unity are two ideas that are suggested to the understanding by every object without and every idea within. When ideas are in our minds we consider them as being actually there, as well as we consider things to be actually without us, which is, that they exist or have existence, and whatever we can consider as one thing, whether a real being or idea, suggests to the understanding the idea of unity. . . . Besides these there is another idea, which, though suggested by our senses, yet is more constantly offered us by what passes in our own minds; and that is the idea of succession. For, if we look immediately into ourselves, and reflect on what is observable there, we shall find our ideas always, whilst we are awake, or have any thought, passing in train, one going and another coming, without intermission" ("Essay," book ii. chap. vii.). In much the same strain Reid writes, "Extension seems to be a quality *suggested* to us. . . . We are commonly told by philosophers that we get the idea of extension by feeling along the extremities of a body, as if there was no manner of difficulty in the matter. I have sought with great pains, I confess, to find out how this idea can be got by feeling; but I have sought in vain" ("Inquiry," chap. v. § 5). Elsewhere he says, "Space, whether tangible or visible, is not so properly an object of sense, as a necessary concomitant of the objects both of sight and touch" ("Essay," ii. chap. xix.).

The difficulty which embarrassed Reid is solved when we admit concomitant perception. It is to be remembered that all the writers, from whom we have now quoted, while speaking more of ideas than of cognitions, fully believed in the reality of the concomitant objects, and ascribed to the mind a power of knowing them. With respect to many of their disciples this cannot be said. For, no special power being named for the perception of the indirect objects of intuition, and it being admitted that these were objects of sense-perception and consciousness only in an improper sense, a door was left open for error. The explanation was received that our concomitant intuitions are mere forms of thought without any reality corresponding to them. When, however, we assign to these secondary elements of entity a power of appropriate cognition, and show that we have the same reason to trust in this as in that of direct perception, no ground is left for skeptical or Kantianizing theories.

Concomitant differs from direct perception *only as to its objects and our mode of viewing them, not at all in the radical character of its own action*. We style this perception and its objects indirect, not because they are any less immediate than those of other presentational cognitions, but because the attention and interest of the mind are less directly given to them than to the perceptions and objects which they accompany. The spectator of a

horse-race attends primarily to the animals and their action, and, in connection with these, he perceives less directly, but no less certainly, the space traversed, the time occupied, and the changing positions of the contestants with reference to one another. Hence, we divide his cognitions into the direct and the indirect, or the principal and the concomitant.

§ 169. The objects of perception in general are the same as the elements of existence in general. They may be enumerated as substance, power, action, change, space, time, quantity, and relation. These elements are never perceived save in the complexity which they form with one another. The first four, however, are conceived of by us as the direct, and the last four as the indirect, objects of perception. When a ball is rolled on the ground we perceive it as (1) a body, (2) endowed with inertia, and (3) exercising a momentum, which causes (4) motion, or change of place. At the same time these things are seen as (1) related to one another and to other similar objects, and to (2) space and (3) time, and as having (4) quantity. So, also, if the ball be propelled by one's own hands, he perceives (1) his own soul, and (2) his locomotive energy and (3) its action, and (4) the change in himself from one kind of activity to another. And these things are seen under their (1) mutual relations, and those of (2) space, (3) time, and (4) quantity.

The advantage of making our indirect perceptions a special object of study will become particularly apparent from two considerations. First, the fact that *necessary as well as contingent relations are, primarily, matters of immediate perception*, has not hitherto had that prominence which is due to it in philosophy; and, secondly, it is clear that *the cognition of non-existence can have no place in a system of the human mind, unless it also be assigned to the sphere of concomitant perception*.

For the sake of method in further discussion, the presentations of this power may be regarded as having three classes of objects, and so, with reference to their objects, as being embraced *under three heads*. Under the first head let us consider the intuitions of space, time, and quantity; under the second, our perception of relations of whatever kind, including those of contingency and necessity; and, under the third, our cognition of the non-existent and the impossible of every kind of entity.

The objects of the first class are perceived in connection with relations which depend on them, yet *they themselves are not relations*: they are fundamenta between which and other fundamenta relations exist. To say, with Leibnitz and others, that, "Space is an order of co-existences, and time an order of successions," may be profoundly philosophical; but it is a violation of common sense. Space and time are the antecedent conditions of co-existence and of succession.

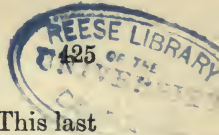
Moreover, not only are things related to these entities, but

The objects of concomitant perception.
Three classes.

Space, time, and quantity.

these relations may, in their turn, become the fundamenta of new relations. Two fields, as occupying certain positions, are related to space; and, by reason of these positions, may be contiguous to, or separated from, each other. The lives of two men are each related to those periods of time during which they are passed; and, by reason of these relations, they may be contemporaneous with one another, or the contrary. Two bodies each contain a fixed quantity of matter; and, with reference to their respective quantities, they are equal, or unequal, to each other.

Space, with its relations, is especially perceived in connection with body and its changes; exact measurements of space are possible for us only through the use of material standards. Yet spatial perceptions take place also in connection with the experiences of spirit. On the other hand, time is perceived especially in connection with the changes which occur in our own souls. Being conscious at once of the enduring sameness of the *ego* itself, and of its fleeting states and operations, we cannot but notice that peculiar kind of entity, in relation to which some things are permanent and others transitory. But body, no less than spirit, is intuitively seen as a permanent entity with transitory states; therefore, we doubt not, time is immediately perceived in connection with the existence and the changes of the *non-ego*. Some excellent authorities favor an opposite view. President Porter teaches that duration is originally known only in connection with mental experience, and that, in every case, temporal conceptions and judgments, so far as they concern material things, have been transferred from an internal to an external application ("Human Intellect," § 558). These views are related to those of Kant, who taught that space is the form of external sensibility, and time of internal, and indirectly of external, sensibility ("Ueberweg," § 122). In our eyes, it is more reasonable to hold that our original perceptions of time have immediate reference to both external and internal things. While we continuously attend to the action of any outward object, as the flying of a bird, or the movement of one's own body in walking or running or swimming, that object and its changes are perceived no less continuously than the action of the soul itself. This immediate cognition of an object and its changes is not an act of memory in the ordinary sense of the word; it is rather an *observation of the continued present*. But should one withdraw his attention for a time from outward things, and, on recurring to them again, perceive that the movement had continued during the interval of his inattention to them, this perception would involve an act of memory, as the term is commonly used, and also the judgment that the motion of the body, or of the bird, had occupied a period of time measured by the successions of psychical life. Such a judgment would be a "transference of the relations of time from the phenomena of spirit to the activities and phenomena of matter"; but it would not exemplify our



primary perception of the duration of external objects. This last is an immediate intuition. As such it furnishes a more satisfactory ground than we would otherwise have for the inferential transfer which we have just considered. Besides, it is clear that we sometimes ascertain the duration of an internal activity—for example, the study of some lesson—by referring to an external standard; indeed, our exact measures of time, like those of space, probably originated from an immediate perception of the duration of material operations and changes.

Here we must remark that, in the doctrine of immediate perception, the term *present* should not be limited absolutely to one point of duration, but *should include so much time as may be occupied by any act or object of unbroken attention*. We claim for the mind a power to perceive immediately the continuity of time as well as the continuity of space; and we include this among our presentational perceptions. This is no violation of ordinary thought and language. On the contrary, it is unnatural to call a continuous perception of the continued present a memory or recollection of the past. This ability to perceive the continued must be admitted if there be any such thing as an intuition of time. It may be regarded as the initial exercise of that power which develops itself into memory; in which light it furnishes a key—perhaps the only possible key—to an understanding of the faculty of reminiscence.

The element of quantity is so intimately united in existence and perception with the other elements of entity, that only some special analysis, caused by the comparison of quanta,—or things as having quantity—makes it a distinct object of thought. For this reason the perception of it does not have the character of concomitance to the same degree as the perception of space and time. But, when two things,—for example, two weights—alike in every respect save quantity, are compared and found to differ, then we give this name to that in respect to which they differ. We perceive, also, that the possession of quantity is the foundation for certain relations between things. It is as quanta that things are greater, or less, or equal, in respect to each other, and are capable of number, and of diminution and increase.

Here we may ask whether our first perceptions are confined to things of a limited nature, or do we have an intuition of the infinite? In regard to this point we remark, first, that knowledge need not be intuitive in order to be reliable. By far the greater part of human knowledge is not intuitive; the presentational character is not necessary to the certainty of knowledge. Many, however, assuming more or less explicitly, that the infinite cannot be known inferentially, have constructed doctrines as to the cognition of the infinite that are first of all difficult to comprehend, and then yet more difficult to accept. The student of such doctrines should be pardoned, if, at times, he become weary of philosophy, or, at

The term *present* in philosophy.

Have we an intuition of the infinite?

least, of philosophers. But the discussion of these teachings has this merit, that it prepares one to accept some theory by which the cognition of the infinite may be accounted for as a constructive and inferential perception. Therefore, we remark, secondly, that we find no serious objection to such a theory of inferential perception, and that, on the contrary, there is something unnatural, if not absurd, in ascribing the intuition of things infinite to finite creatures such as we are. It is certain that the knowledge of finite things greater than ourselves results from the employment of standards of measurement found in our own souls and bodies; in this way we attain to the cognition of things unspeakably great. May we not, then, in this way, become acquainted with things absolutely boundless? The infinite is that which is so great, in any one or more respects, as to be immeasurable by any standard. Take the perception of infinite space. In connection with the motion of our limbs we learn, that, if there be no obstructing power, body may move without hindrance in any direction and to any distance. We perceive that this is necessary by reason of the very nature of space. Thereupon, combining negative with positive thinking, we conceive and believe in a space which admits in every direction of endless motion, and which itself is limitless. In precisely the same way we recognize a duration without beginning and without end. Then, with but another step, we conceive of a Being whose presence fills immensity, whose life is eternal, whose power is the ultimate origin of all finite potency, and whose existence solves the mysteries of creation and providence. We admit that finite beings cannot attain to any exhaustive knowledge of the infinite; we allow that no human, no angelic, mind, can "find out the Almighty to perfection." But finite understandings can, and do, form true conceptions and convictions concerning boundless space and endless time, and the Infinite God.

Relations.
Their perception
twofold—
(a) As matters of
fact.
(b) As matters of
contingency and
necessity.

§ 170. The perception of relations is a very important part of intellectual action, and is equally concomitant of consciousness and of sense-perception. All things exist as related to one another, and as bound together in necessary or logical relations (§ 62). Relations have been described as intermediate entities; but, literally speaking, nothing exists between things related. The intermediacy pertains to our modes of conception, and not to the things conceived of. Every simple or single relation may be regarded as composed of two relationships, each of which belongs to and characterizes a relatum; and every relationship may be styled a sort of correspondence or opposition in the nature of one thing to that of another.

Relations exist between things viewed simply as entities, between the seven fundamental entities or their subordinate varieties, and between relations themselves. This class of objects, therefore, exhibit endless diversity and complexity. At present,

we are concerned with the *perception* of relations; and this, in common with the cognition of every other form of being, may be considered as twofold. First of all, we may perceive a thing simply as fact; and, secondly, we may perceive it as contingently, or as necessarily, fact—that is, in other words, and more briefly, we may perceive its contingency or necessity. So we may perceive a relation simply as a fact, and we may recognize it as contingent or as necessary.

Few will dispute that the relations belonging to the direct objects of the soul's immediate apprehension are also immediately apprehended, that is, so far as their simple reality is concerned. I perceive at once the relations of a leaden ball which I hold, for example, its contiguity and likeness to another ball beside it, its place in my hand, and the relations involved in its shape, size, weight, unity, mobility, and so forth. But, when we come to inquire how far these perceived relations may be contingent and how far necessary, it may be claimed that our judgments regarding these aspects of things are not properly perceptions at all, but merely suggestions which the mind cannot but make, but which nevertheless may, or may not, be true. This is the teaching of Kant when he speaks of the *à priori* origin of various judgments and notions, and contrasts them with *à posteriori* judgments and notions. For example, he says that our ideas of space and time, and our necessary judgments concerning them, are *à priori*, that is, independent of experience, and of the knowledge that experience gives of things without. For, with Kant, *experience is really identical with our perception of things external*. Thus, according to him, our *à priori* notions and judgments have no necessary objective truth—that is, no necessary truth at all. Such teaching is unsatisfactory. The terms *à priori* and *à posteriori*, as applied to our perceptions of the ontologically necessary, and the ontologically contingent, should be banished for ever from the use of philosophy. Their effect is to confuse our thoughts in regard to the true action of the perceptive power. There is a difference in perceptions; but this arises, not because some ideas are suggested from within and others obtained from without—not because some thoughts are subjective forms and others true cognitions; but because *the things perceived are themselves different from each other*. All our cognitions are equally the mind's own work, and result from the exercise of intellectual power, all are perceptions of realities; but, in some, we perceive the existence of things and their relations merely as matter of fact, while in others we perceive it as necessary or as contingent fact. Therefore, also, whatever priority our perceptions of ontological necessity or contingency (§ 225) may have over those of simple fact, is not subjective, but objective—it is logical rather than psychological; our distinction between these things arises primarily from the nature of the things distinguished, and only secondarily from the nature of mind as being able to perceive correctly things and their differences.

Contingency and necessity objects of concomitant perception.
Reid quoted.

The immediate cognition of things merely as existing may be divided, with a sort of equality, between direct and concomitant perception; but that of the contingency or of the necessity of any matter of fact, belongs to concomitant perception only. That the space occupied by any particular body necessarily exists, and that the body necessarily is an occupant of space, are things perceived immediately, but not directly. That the body does not necessarily occupy the space it is in, but may move into some other space, and that a neighboring body of the same size may occupy the space left vacant, are contingent truths perceived in the same way (§ 152). These perceptions of necessity and of contingency are not properly included within sense-perception. Hence Reid says, "There are determinations concerning matter, which, I think, are not solely founded upon the testimony of sense: such as that it is impossible that two bodies should occupy the same place at the same time; or that the same body should be at different places at the same time; or that a body can be moved from one place to another, without passing through the intermediate places, either in a straight course or by some circuit. These appear to be necessary truths, and, therefore, cannot be conclusions of our senses; for our senses testify only what is, and not what must necessarily be" ("Essay," ii. chap. xix.).

Contingency and necessity, which we have now given as objects to concomitant perception, may be regarded as *a kind of relation between the existence of things or relations, and the conditions or circumstances with which this existence is accompanied*. A thing is necessary or contingent with respect to any condition accordingly as its existence is, or is not, so united to that of the condition that no power can break the connection. It is on the immediate perception of the necessity and contingency of relations that general axiomatic propositions are based. For what is true either contingently or necessarily in one case is similarly true in all similar cases. Necessity and contingency exist in most intimate combination in regard to all the objects of our perception, and can never be found in separation. But we often perceive the same things to be in one light contingent, and in another necessary; and often we consider a thing only in one or other of these lights. A full discussion of this subject does not belong to the present topic (§§ 62-84).

§ 171. We now pass to the cognition of non-existence. Concerning this, we say, first, that it is a true cognition. Non-existence is a subject about which correct views are more easily formed than uttered. Thought and language refer principally to the existent; to non-existence merely in an occasional and subordinate way. Ordinary forms of expression properly apply to existence only, and, when applied to non-existence, sometimes present an appearance of contradiction and absurdity (§ 36). Nevertheless, both common sense and sound philosophy attest that we have

The cognition of non-existence.

as truly a perception of non-existence as of existence, that these things are totally different from one another, and that neither of them can be resolved into the other or even into mere distinction from the other. They are objects which we distinguish because they are different. Here we strain language when we call existence and non-existence things or objects; they are not things in the ordinary sense of the word. Yet, when we thus speak of them, we do not use meaningless or untruthful language. Though not objects, they have, in some sense, an objectuality; and, in particular, non-existence, because it *is* that which existence *is not*, has also a peculiar character of its own. Let two parallel planes be apart; we say that there is space between them: let them meet; we say that there is no space between them. In this latter case, the assertion of "no space," or of the non-existence of space, is as objectively true as the assertion of space, or of the existence of space, in the former case. The statement that "there is no money in the purse," when it is true, sets forth a fact, though it be a negative one, just as positively as the statement that "there is money in the purse," when it is true, sets forth the opposite and positive fact. The verdict, "The man is not guilty," if rightly rendered, has the same objective truthfulness as one which, in view of an opposite state of fact, asserts the existence of the man's guilt. Some have treated non-existence as if it were without any sort of objectuality—a mere mental conception. Others have endeavored to explain away the conception as a mere absence or vacuity of thought. This is the doctrine of Hamilton. We hold both to a notion, *sui generis*, within, and to a correspondent objectuality without. Nor will any great difficulty be encountered in connection with this view, provided only we conceive of non-existence according to its true nature, and not as if it were, in some way, either another form of existence, or a special kind of entity.

The importance of the thought of non-existence arises from a twofold fact. In the first place, this thought can combine with the formal conception of every entity, so as to constitute a negative conception, corresponding to the positive conception in which existence is the constitutive thought; and, secondly, all belief and conviction pertain to these two modes of conception. We can believe only in the existence or in the non-existence of things (§ 43).

Our original cognition of non-existence may, in the truest sense, be styled concomitant or consequent. This perception attends every mode of change and disappearance, which occurs within the sphere of intuitive knowledge. Let one be conscious of some pleasure, or other psychical experience, which passes away and is numbered among the things that are not. He retains a knowledge of the past existence of this pleasure, but, with respect to the present, he has no such knowledge. On the contrary, he perceives that the experience does not now exist;

and, combining the formal conception of the thing perceived with the notion of non-existence, he declares it to be a non-entity. Or let some physical phenomenon—for example, a sound—affect the senses; it is perceived as existing; but, when it ceases, its non-existence is also perceived.

Moreover, as the necessity of the existent is often intuitionally known, so also is the impossibility of the non-existent. Let a man transfer a ball from his right hand to his left. He will forthwith perceive the impossibility that the ball should be in his right hand and in his left at the same time. Such immediate cognitions of the impossible may be regarded as the starting-points for our inferential perceptions of non-existence.

We shall conclude our discussion of concomitant intuition with one general observation. It is that perceptions of this power accompany, and, in a sense, are consequent upon, not only those of sense-perception and consciousness, but those also of concomitant perception itself; in this way, doubtless, the mind builds up and perfects its intuitive knowledge of things. For example, we believe that the different members of the body are immediately perceived as in different parts of space, and, therefore, as external to one another. But how much more distinct and exact this knowledge becomes when one part of the body is made to touch another externally, as when a hand grasps an arm or is made to pass over one's forehead! Then each part is sensible of the other as external to it; *the boundaries of each become definitely known*. In some such way as this, we suppose, the infant gradually forms a correct conception of his own body as a material substance of a definite size, shape, and consistency. Thus, too, the mind becomes prepared for the intelligent cognition of solid substances wholly external to the body; which cognition is not properly intuitive, but inferentially consequent upon the knowledge of our own bodies and their attributes (Porter's "Human Intellect," § 130).

CHAPTER XXXV.

COMPOUND AND ACQUIRED PERCEPTION.

The term *acquired perception* first used by Reid. § 172. Reid was the first to employ the term *acquired perception*; and, although he confesses himself in doubt regarding the nature of this mode of mental action, he distinguishes it from immediate cognition. He says, "Acquired perception is not properly the testimony of those senses which God hath given us, but a conclusion drawn from what the senses testify. In our past experience we have found certain things conjoined with what our senses testify. We are led by our constitution to expect this conjunction in time to

come; and, when we have often found it in our experience to happen, we acquire a firm belief that the things, which we have found thus conjoined, are connected in nature, and that one is a sign of the other. The appearance of the sign immediately produces the belief of its usual attendant, and we think we perceive the one as well as the other. That such conclusions are formed even in infancy, no man can doubt; nor is it less certain that they are confounded with the natural and immediate perceptions of sense, and in all languages are called by the same name. We are, therefore, authorized by language to call them perception, and must often do so or speak unintelligibly. But philosophy teaches us in this, as in many other instances, to distinguish things which the vulgar confound. I have, therefore, given the name of acquired perception to such conclusions, to distinguish them from what is naturally, originally, and immediately, testified by our senses."

Subsequent philosophers, but pre-eminently Pres. Porter of Yale, have shown that this perception, which is *acquired*, and which is based on a *past experience*, is essentially an inference founded on induction. That it is an inference is especially taught by Dr. Porter when he says, "We use the knowledge directly given by one sense as the sign or evidence of the knowledge which we might, but do not, in this particular case, gain by another" ("Human Intellect," § 137).

The understanding of compound, antecedent to that of acquired, perception.

A satisfactory understanding of acquired perception will be promoted if we notice, and distinguish from it, a form of cognition closely related to it; and which, also, should be considered for its own sake. We refer to that act of the intellect whereby the immediate perceptions of the same object by two or more different senses are *combined into one perception*, which combination is itself *an act of intuitive and concomitant cognition*. This compounded perception differs from acquired perception, because there is no inference in it; the knowledge which it yields is presentationally given; but it is related to acquired perception because it is the source whence the constructions of thought and the rules of inference employed in acquired perception are originally obtained.

These remarks may be illustrated from the experience of the boy born blind, whose eye was couched for cataract by Cheselden, an English surgeon. After he had somewhat gained the use of his sight, he could not call the cat and the dog by their right names, or tell which was the cat and which the dog. But, being easily able to recognize each by the sense of feeling, he caught the cat one day, and, shutting his eyes, passed his hands over her, so as to ascertain which animal he had been seeing. Then, setting her down, he said, "So, puss, I shall know you another time." In this case, two cognitions of the same object were intuitive and independent of one another; and their union resulted from an identifi-

cation, also intuitive, of the object of the one with the object of the other. For the cat as seen and as felt presented relations of place and movement, of causation and simultaneity, which could not belong to two objects. The whole perception of the cat as an object with certain visible and certain tactual marks was an intuitive, though a compound, act of cognition. At the same time, it is evident that this immediate cognition prepared the mind making it, for another perception in which a mere exercise of sight would enable the boy to supply the tactual character of the object, or in which the mere handling of the animal would enable him to ascribe to it a certain visible appearance; and either of these perceptions would be properly an acquired one. In like manner, should one perceive quicksilver to be a heavy fluid, by dipping his hand in it, his identification of the quicksilver as seen with the quicksilver as felt would be intuitive; and this would be the basis of an inferential perception from sight alone of the heavy fluidity of that metal. Compound being thus a condition of acquired perception, a consideration of the former is our best introduction to a consideration of the latter.

First, then, we remark that compound perception is the beginning of any adequate knowledge of things external. Till we unite into one whole the partial cognitions of a thing presented by the different senses, we can scarcely be said to have any comprehension of an external object. But things internal, which are the objects of consciousness, cannot be said to be known by a composition of perceptions, inasmuch as they are perceived by a cognition which is complex, but which is not compounded of cognitions from different sources. Moreover, compound, in separation from acquired, perception, is adequate for the complete cognition of comparatively few objects, and, like the more simple intuitions of which it is composed, is more easily illustrated by examples that are not wholly intuitional than by those which exhibit its own workings only. The latter are mostly of a subtle character and are not matters of ordinary observation. This mode of procedure will not be objectionable, provided the illustration, in its essential feature, shows a composition of intuitions. My perception of the apple which I hold in my hand may not be purely presentational. Nevertheless the eye immediately perceives it as a circular, colored object, in a certain direction from the center of vision; the hand recognizes a round smooth object of a certain weight and hardness; while the nose discerns it as an odoriferous, and the tongue as a sapid, substance. Moreover, the peculiar taste is experienced only when the object held in the hand touches the tongue, the odor becomes faint and is lost when it is removed from the nostrils, and, when the hand moves hither and thither, the apple correspondingly changes its place and direction in the field of vision. These things are perceived intuitively, and, in connection with them, we learn, by intuition, that the object held in the hand,

that which we see, that which we feel, that which we smell, and that which we taste, are all one and the same. But other particulars about this apple—for example, its solidity and its distance from the eye—may not be intuitively known.

Pres. Porter quoted.
The term *percept*. The combination of separate sense-perceptions into the complete cognition of one object has been discussed by President Porter more fully than by any other writer; and the subject cannot be better presented than by giving the views of this author, together with a short commentary upon them. He says, "A material thing, or object, as known by sense-perception, is a completed whole, made up of separate percepts. We distinguish the knowledge of things from the knowledge of percepts. A percept, as has been explained, is the appropriate object of the mind's knowledge through a single organ of sense. A thing is the result of the mind's knowledge in apprehending several percepts as united into a finished whole with the relations which this combination involves. As an example, take an apple. The apple seen, touched, smelled, tasted, and heard, are separate percepts. The object perceived by the combination of all these percepts is the apple, or material thing. . . . Percepts are united into things by two successive steps or stages, to each of which there is an appropriate product. By the first, the mind unites these percepts into a material thing or whole, under the relations of space and time. By the second, it connects the whole and its parts, under the relation of substance and attributive quality. These several percepts, united in all these relations, constitute what is commonly known as a material thing" ("Human Intellect," § 161).

Believing the views of Porter on the topic now considered to be substantially correct, we are yet constrained to criticise the foregoing statements, with respect to both form and substance. As regards the language employed, the use of terms is ambiguous and confusing. The word *percept* is adopted from a suggestion of Hamilton in his "Logic" (Lect. III.), where we read, "I shall make no scruple in using the expression *concept* for the object of conception, and *conception* I shall exclusively employ to designate the act of conceiving. Whether it might not in like manner be proper to introduce the term *percept* for the object of perception, I shall not at present inquire." As a matter of fact, *concept* is used by Hamilton and others to signify, not the object, but the *product*, of the act of conception—that is, the idea of the thing conceived of; and so *percept* should signify the idea immediately received by the exercise of any one sense to which an object may have been presented. Pres. Porter sometimes uses the word in this way. In a previous chapter, he says, "The various knowledges, or percepts, obtained by the several senses, we combine into one separate and single object, occupying a limited portion of space"; and elsewhere he speaks of "a process, which results in the acquisition of a percept or idea (§§ 106, and 170). But, for the most part, he makes a per-

cept, not the product, but the object of the mind's perception—the thing itself as partially perceived. We do not object to either meaning; but, in the passage under review, neither is adhered to. We are told that "a material thing is a whole made up of percepts," which is not true, if percepts be ideas and not objects; and also that "a thing is the result of the mind's knowledge in apprehending several percepts," which can be true only of our *perception* or *knowledge* of the thing as resulting from the combination of several partial perceptions. The mind does not unite objects into objects, but only partial into complete conceptions. The term *percept* as used by Porter reminds one of *idea* as used by Locke; but Porter does not, like Locke, distinguish his applications of the term ("Essay," bk. ii. chap. viii.). It would be better to use the word *percept* only for the product of the act of single perception, and to say that compound perception produces—not the thing—but the complete cognition of a thing, by the union of the several percepts.

With respect to the matter of Porter's doctrine, we have two remarks to make. In the first place, other identificative relations beside those of space and time are immediately perceived and used by the mind in compound perception. We would therefore enlarge the list and speak of the relations of space, time, change, and causation. For the same object is perceived to be the same as *affecting several senses and producing in them changes* which mutually correspond. The perception of motion by the hand exactly agrees with the perception of the same motion by the eye.

Secondly, the whole process of cognition seems to us complete when the percepts are united; there is no subsequent synthesis of substance and quality. Porter says, "It is not till the second or advanced stage of the perceptive process that the percepts are connected under the relation of substance and attribute." For all that we can see, this union takes place, so far as it takes place at all, immediately, and as part of the act of identification. The object of every percept is perceived as having its own characteristics,—that of sight as having color, superficial extent, and boundaries, that of smell as having odor, that of taste as having flavor, that of touch as being solid, weighty, rough, or smooth, large or small, and so forth; and, when all these objects are found to be but one, then all qualities or characteristics are immediately assigned to that one object. There is no reason to believe that we make the object of one percept a substance and then attribute to it the objects of the other percepts, as qualities. In every act of cognition we immediately perceive substance and attribute, and in every act of sense-perception we perceive substance with sensible attributes. The abstract consideration of these things as related to each other may take place subsequently; but no such abstractive process is included in sense-perception ("Human Intellect," §§ 166, 167).

The determinate knowledge of one's own body.

The purest exercise of compound perception—and the most important—takes place when the infantile mind first forms definite conceptions of the members of his own body, and of the body as a whole. This, doubtless, is a gradual accomplishment, and results, principally, from an attentive exercise of the senses of touch and sight, in connection with muscular and organic feelings. The latter present the body and each of its parts as extended, as solid, and as possessed of physical power; they give also an indistinct notion of the location of the parts with reference to one another. Then touch and sight give definiteness to the rudimental perceptions of internal feeling. Of the two, touch may be considered to operate first. When one little hand grasps in succession the fingers and the thumb, the palm and the wrist, of the other, the boundaries of each member and its size become definitely known. In the same way, the features of the face, and other parts of the body, are touched and bounded. But this determination is greatly assisted by sight. While touch slowly traverses the surface of a limb, sight perceives it all at once; and the eye easily combines into one exact conception the explorations of the hand. In doing so, the superficial extent of portions of the body as ascertained by feeling, being immediately identified with the same as seen, any limb furnishes a standard for the measurement of the whole body. For this reason, the estimation of size and distance by sight, even as regards one's own body, is only partially intuitive.

The cognition of the extra-organic world not purely intuitional.

In this connection let us notice an interesting discussion respecting our perception of externality. The externality of the different parts of the body, one to another, is *immediately given in connection with muscular and organic sensations*, and becomes more apparent as these sensations receive attention. This perception is greatly strengthened when the hand touches different parts of the body. Then two definitely-bounded parts of the body are each immediately recognized as sentient and as solid and as external to one another. But the question has been raised whether any non-organic substance can be immediately known as external to the body, save by a deduction consequent upon the perception of the mutual externality of the parts of the organism itself. It has been held that without this perception, as an antecedent condition, all external objects would be recognized only as affections of the mind. This position is an extreme one. Hamilton suggests a simpler theory when he says, "The existence of an extra-organic world is apprehended . . . in the consciousness that our locomotive energy is resisted, and not resisted by aught in our organism itself" (Note D,* 28). In other words, we perceive, at the surface of the body, or of some limb, a power pressing upon us, or resisting our pressure, which power we know not to be exercised by ourselves or within our body. But power is perceived only as possessed and exercised by a substance; therefore, when we say that we perceive an external

power, this only partially expresses the fact that *a substance is perceived exercising the power*. It may be allowed that this perception of the external agent is inferential and is based on the knowledge of physical causes obtained from our bodily life and especially from our own muscular efforts—in other words, that we infer an external cause of motion similar to those we have observed within. But this ground of inference may be easily distinguished from a knowledge of the parts of the body as external to one another. At the same time, it is clear that this last-mentioned knowledge greatly contributes to render definite our perception of things external and enables us to determine their character as we could not otherwise. When one hand is laid on the other, each not only distinguishes the other from itself, but also feels the pressure or the resistance of the other. But when an extra-organic substance presses either hand, the sensation is in the hand alone. This contrast *brings into relief* the externality of the extraneous substance.

The solidity of external objects inferred from comparison with our bodies.

Moreover, comparing the object as felt with the body as felt, we determine its solidity, size, and shape, by the employment of rules obtained in the examination of our own limbs. This process, as regards solidity, or the space-filling property of matter, is well described by Pres. Porter. "When a blind man," he says, "grasps his own arm or wrist, he knows certain muscular sensations as extended through, and posited in, the space within the opposite surfaces that he touches. If his wrist is withdrawn from the inclosing grasp, and an extra-corporeal object is inserted in its place, the adjustments of the grasping hand are the same as before: the dim knowledge of the space which these adjustments involve is also the same. . . . The wrist is known by direct perception as space-filling; the inclosing hand is a measure of the space inclosed. The same inclosing or grasping hand measures the surface of another body; but this body yields no muscular percepts involving extension. It occupies, however, precisely the space which the other filled. It is known, therefore, as space-filling, and as filling other space than that of the body. . . . In this way it is possible for the mind, by touch alone, to reach the extra-corporeal world, and to know that all its objects, like the body, with which it is directly connected, occupy space."

This quotation sets forth the original perception of external solidity; the figure and size, direction and distance, of external objects are first perceived in a similar way. Indeed all man's knowledge of the universe originates from cognitions respecting his own body.

Acquired perception defined and illustrated.

§ 173. In discussing compound perception, we have insensibly entered upon the consideration of that mode of cognition for which this perception is the preparatory basis. Compound and acquired perception are so related that they are commonly discussed together as forming

but one process; we have preferred to distinguish them, the latter being inference from past experience, and the former the composition of intuitions, or presentations.

We have now to remark that *not every kind of inference from sense-cognitions can be called acquired perception*. In the first place, no inferred knowledge can claim this title unless it result from some impression which the object of it—the thing perceived—may make, more or less directly, on our nervous system, or sensorium. Hearing a clattering noise on the street, I may be said to perceive a wagon passing, but I cannot be said to perceive the driver, though I may conclude that there is some one driving. For the wagon, but not the driver, is immediately related to the noise. In the second place, the exercise of acquired perception excludes all formal or doubtful inferences. The action of this power being habitual and easy, quick and absolute, it can be distinguished from immediate intuition only by philosophical scrutiny. Therefore, should one, hearing such a noise as we have mentioned, be in doubt whether it were thunder, or cannonading, or the

“Car rattling o’er the stony street,”

his conviction regarding its origin would not be a perception, but only a probable inference. These remarks may be illustrated by the story of a traveler. When Captain Head was traversing the wild Pampas of South America, “his guide one day suddenly stopped him, and, pointing high into air, cried out, ‘A lion!’ Surprised at such an exclamation, accompanied by such an act, he turned up his eyes, and with difficulty perceived, at an immeasurable height, a flight of condors soaring in circles in a particular spot. Beneath this spot, far out of sight of himself or guide, lay the carcass of a horse, and over that carcass, as the guide well knew, a lion, whom the condors were eying with envy from their airy height. The signal of the birds was to him what the sight of the lion alone would have been to the traveler—a full assurance of its existence.”

This judgment of the guide was apparently instinctive, and was the unconscious application of a rule founded on the past experience of himself and others. Yet it was not properly the sense-perception of a lion, because it did not arise from any impression made by that object on his organs of perception. Much less could the articulate process of reasoning in which the judgment of the guide first originated, and by means of which the traveler was enabled to accept the conclusion as correct, be considered a sense-perception. The movement of the condors indicated that some carcass lay far beneath them. As they kept circling aloft, it was evident that some beast was yet in possession of the prey. This could not be a dog or a jackal; the condors would have driven such animals back, or at least contended with them for a division of the food. There

being only one kind of large carnivorous beast in that region, the conclusion followed that a lion was dining at a point beneath the condors. In this case, neither the instinctive nor the analytic judgment was a sense-perception. Both alike were exercises of the rational faculty. But, had the traveler heard the roar of the lion and so learnt of his existence, this would have exemplified acquired perception. In like manner, should one, smelling a flower in the dark, find it to be a rose, or, tasting a fruit, say that it is a peach or an apple, or, feeling some goods, know them to be silk or cotton, these would be acts of the description now considered.

Man's sphere of external cognition is amazingly increased by the development of that power of habitual and instinctive inference which we call acquired perception. Without this development our knowledge of the material universe would be replaced by a rude ignorance, and our control over the forces of nature by an infantile helplessness. Of all our senses, none has so remarkable a usefulness as that of sight, which, from the mere sensation of slender boundary lines and insignificant patches of color on the retina of the eye, enables us to perceive all objects, near and far, within the visible horizon, and even the distant heavenly bodies, so that the soul of man, employing this marvelous faculty, appears to make excursions whithersoever it pleases, and observes things remote as if they were near at hand. We believe that philosophers, at the present time, are generally agreed in their views concerning visual perception; but it has been through long discussion and much experiment and observation, that they have reached definite conceptions as to the nature and methods of it.

The exceeding crudity of the views of the first English writers may be illustrated by a passage from Locke. He says, "The next thing to be considered is, How *bodies* produce ideas in us; and that is manifestly *by impulse*, the only way we can conceive bodies to operate in. If, then, external objects be not united to our minds when they produce ideas therein, and yet we perceive these original qualities in such of them as fall singly under our senses, it is evident that some motion must be thence continued by our nerves or animal spirits, by some parts of our bodies, to the brain or the seat of sensation, there to produce in our minds the particular ideas we have of them. And, since the extension, figure, number, and motion of bodies of an observable bigness may be perceived at a distance by the sight, it is evident *some singly imperceptible bodies*, must come from them to the eyes, and thereby convey to the brain some motion, which produces these ideas which we have of them in us." Here Locke appears to regard the vision of distant objects, not as a judgment founded on experience, but as a conviction immediately produced or excited by the motion of singly imperceptible bodies (bk. ii. chap. viii.). Bishop Berkeley, in his

Belongs pre-eminently to sight.

“Theory of Vision,”—an admirable specimen of philosophical analysis—explained our perceptions of distance, shape, and size, as deductions from the sensations of colors by the eye; but, while doing so, he adopted the extreme position that sight, of itself, gives a knowledge of color only, and that we do not, from this source, have any knowledge of extension in any of its dimensions. Subsequent discussions have corrected this error, and have resulted in a more tenable doctrine.

The immediate cognitions of the eye. It is now held that *the eye is immediately cognizant of superficial distance, size, place, and figure.* This has been determined by the testimony of those who have suddenly acquired eyesight through a surgical operation; as was the case with a youth seventeen years of age, reported by Dr. Franz of Leipsic (“Trans. Royal Society,” 1841). The experiments tried upon him somewhat militate against the opinion which Locke quotes with approval as that of his contemporary, Mr. Molyneux, viz., that “a man born blind and now adult, and taught by his touch to distinguish between a cube and a sphere of the same metal, and nighly of the same bigness,” having gained his sight, “could not by means of that sense, before he touched them, distinguish and tell which is the globe and which the cube.” The young man distinguished cube and sphere by comparing their sensible appearances as projected on the plane of his vision, though he did not recognize them as solid bodies but simply as two flat figures. For sight, alone, can distinguish a circle from a square, but not a disc from a globe. When the eye of the young man was sufficiently restored, “A sheet of paper, on which two strong black lines had been drawn, the one horizontal, the other vertical, was placed before him, at the distance of about three feet. He was now allowed to open the eye, and after attentive examination, he called the lines by their right denominations. The outline, in black, of a square, six inches in diameter, within which a circle had been drawn, and within the latter a triangle, was, after careful examination, recognized and correctly described by him. At the distance of three feet, and on a level with the eye, a solid cube and a sphere, each of four inches diameter, were placed before him. . . . After attentively examining these bodies, he said he saw a quadrangular and a circular figure, and, after some consideration, he pronounced the one a square and the other a disc. His eye being then closed, the cube was taken away and a disc of equal size substituted and placed next to the sphere. On again opening his eye he observed no difference in these objects, but regarded them both as discs. The solid cube was now placed in a somewhat oblique position before the eye, and, close beside it, a figure cut out of pasteboard, representing a plane outline prospect of the cube when in this position. Both objects he took to be something like flat quadrates. A pyramid placed before him with one of its sides towards his eye, he saw as a plane triangle. This object was now turned a little, so as to present two of its sides to

view, but rather more of one side than of the other: after considering and examining it for a long time, he said that this was a very extraordinary figure; it was neither a triangle, nor a quadrangle, nor a circle; he had no idea of it, and could not describe it. 'In fact,' said he, 'I must give it up.' On concluding these experiments I asked him to describe the sensations the objects had produced; whereupon he said that, immediately on opening his eye, he had discovered a difference in the two objects, the cube and the sphere, placed before him, and perceived that they were not drawings; but that he had not been able to form from them the idea of a square and a disc until he had perceived a sensation of what he saw in the points of his fingers, as if he really touched the objects. When I gave the three bodies, the sphere, the cube and the pyramid, into his hand, he was much surprised he had not recognized them as such by sight, as he was well acquainted with mathematical figures by his touch."

With the foregoing we may compare the experience of Caspar Hauser, who is said to have been imprisoned till the age of seventeen in a dark room, where food and attendance were supplied to him in silence, so that he never heard the voice or saw the face of any one. As Dr. Porter remarks, his story, whether true or false, illustrates how the world out of doors may appear to an infant when brought to the window of a room after it has become somewhat familiar with the objects within. "I directed him," says his teacher, "to look out of the window, pointing to the wide and extensive prospect of a beautiful landscape that presented itself in all the glory of summer, and asked him whether what he saw was not very beautiful. He obeyed, but instantly drew back with visible horror, exclaiming, 'Ugly, ugly!' and then pointing to the white wall of his chamber, he said, 'There not ugly.' Several years after, his friend asked him if he recalled the remembrance of the scene, and of his own feelings, and he said: "What I then saw was very ugly; for, when I looked at the window, it appeared to me as if a window-shutter had been placed before my eyes, upon which a wall-painter had spattered all the contents of his different brushes, filled with white, blue, green, yellow, and red paint, all mingled together. Single things, as I now see things, I could not at that time recognize and distinguish from each other. That what I then saw were fields, hills, and houses; that many things which then appeared much larger were in reality much smaller, while many other things which appeared smaller were in reality larger than other things, is a fact of which I was afterwards convinced in the experience gained in my walks. He also said that, in the beginning, he could not distinguish between what was really round, and what was only painted as round, or triangular. The men and horses represented on sheets of pictures appeared to be precisely as men and horses carved in wood" ("Caspar Hauser; An Account," etc., p. 88).

Our cognition of solid shapes.

From what we have now said, it seems evident that, while a superficial or lateral figure is immediately recognized by sight, the shape of solid bodies is an original perception of touch and becomes perceptible to sight only by a habit of inference. Dr. McCosh, whose "Defence of Fundamental Truth" (chaps. vi.-viii.) contains a more complete presentation than we can make of the philosophy of acquired perception, tells of experiments, illustrative of this point, which he himself made with the assistance of Mr. Kinghan, principal of the Belfast Institution for the Blind. "I experimented," he says, "with very young children born blind. I put two small pieces of wood, one triangular and the other square, under the palm of the hand, and, without being allowed to move the hand over it, they at once told us the shape of each. When their head, and their legs, and their arms were pricked exactly alike, they at once showed us the seat of sensation, and knew the points to be out of each other. I moved their hand over a book seven inches long and then over a desk fourteen inches long, occupying the same time with each process, and they at once declared that the latter was much longer than the former. We allowed a boy to feel round a room with which he was unacquainted, and he at once declared its shape. One of these children was a girl of the age of eight, just entered the Institution, so ignorant that she did not know the meaning of angle or corner or point, calling the corners of the figures 'little heads.' She said the square had two little heads and two little heads, but was not sure that two and two make four." Experiments like these give proof, if any proof is needed, that figure, size, and distance, as in connection with every dimension of extension, are originally perceived by touch, and measured by the motion of the body and its members.

The sight cognition of solid figures, and of their distance in front, first begins when the mind is able to connect certain lines and shadings of color with the shape and place of near and tangible objects. Having thus gained a standard of judgment, the eye gradually extends its perceptions to objects more remote. The perception of solid shape is well illustrated by Locke. Having remarked that "the ideas we receive by sensation are often, in grown people, altered by the judgment without our taking notice of it," he continues, "when we set before our eyes a round globe of any uniform color, *e. g.*, gold, alabaster, or jet; it is certain that the idea thereby imprinted in our mind, is of a flat circle variously shadowed, with several degrees of light and brightness coming to our eyes. But we having by use been accustomed to perceive what kind of appearance convex bodies are wont to make in us, what alterations are made in the reflections of light by the difference of the sensible figures of bodies; the judgment, presently, by an habitual custom, alters the appearances into their causes; so that, from that which is truly variety of shadow or color, collecting the figure, it makes it pass for a

mark of figure, and frames to itself the perception of a convex figure and an uniform color; when the *idea* we receive from thence is only a plane variously colored, as is evident in painting." Those who have long been accustomed to perceive solid bodies by sight can scarcely believe that their ability to do this is wholly acquired; yet nothing seems more abundantly proved. What Ruskin says is literally true, "The perception of solid form is entirely a matter of experience. We see nothing but *flat* colors; and it is only by a series of experiments that we find out that a stain of black or gray indicates the dark side of a solid substance, or that a faint hue indicates that the object in which it appears is far away. The whole technical power of painting depends on our recovery of what may be called the *innocence of the eye*; that is to say, of a sort of childish perception of these flat stains of color merely as such, without consciousness of what they signify, as a blind man would see them if suddenly gifted with sight" ("El. Drawing," p. 5).

§ 174. Some claim that the eye can determine lines of direction radiating from itself, without any extraneous aid. This is doubtful; but, unquestionably, the visual perception of objects as in given directions and as at a distance, is a very easy and early attainment. This cognition must take place at once, when it is found that the hand of the observer can come between his eye and the object seen. Some observations of Trinchinetti, an Italian surgeon, bear on this point. "He operated at the same time on two patients, brother and sister, aged eleven and ten years respectively. The same day, having caused the boy to examine an orange, he placed it about one meter from him, and bade him try to take it. The boy brought his hand close to his eye (*quasi a contatto del suo occhio*), and closing his fist, found it empty, to his great surprise. He then tried again a few inches from his eye, and at last, in this tentative way, succeeded in taking the orange. When the same experiment was tried with the girl, she also at first attempted to grasp the orange with her hand very near the eye (*colla mano assai vicina all' occhio*); then, perceiving her error, stretched out her forefinger, and pushed it in a straight line slowly till she reached the object." Trinchinetti "regarded these observations as indicating a belief that visible objects were in actual contact with the eye" (Abbot on "Sight and Touch," p. 150). So, also, the boy born blind, on whom Cheselden operated, said that objects at first seemed "to touch his eyes as what he felt did his skin."

A difficulty considered.
A. Smith.

Dr. Adam Smith, in his "Essay on the Senses," notices an objection to the doctrine now taught. This objection is based on the observation of the lower animals, many of which, from the very day of their birth, possess a good apprehension of distance and direction. "The hen," he says, "never feeds her young by dropping the food into their bills, as the linnet and the thrush feed theirs. Almost

as soon as her chickens are hatched, she does not feed them, but carries them to the field to feed, where they walk about at their ease, it would seem, and appear to have the most distinct perception of all the tangible objects which surround them. We may often see them, accordingly, by the straightest road, run to and pick up any little grains which she shows them, even at the distance of several yards; and they no sooner come into the light than they seem to understand this language of vision as well as they ever do afterwards. The young of the partridge and the grouse seem to have, at the same early period, the most distinct perceptions of the same kind. The young partridge, almost as soon as it comes from the shell, runs about among long grass and corn, the young grouse among long heath; and would both most essentially hurt themselves, if they had not the most acute as well as distinct perception of the tangible objects which not only surround them, but press upon them on all sides. This is the case, too, with the young of the goose, of the duck, and, so far as I have been able to observe, with the greater part of those birds which make their nests upon the ground." Dr. Smith meets the difficulty presented by such facts, by claiming that instinct is given to the lower animals on account of the necessity of their condition; that man, being cared for in helpless infancy by his mother or nurse, has no need of any such faculty; and that, therefore, human beings are allowed to await the required development of their powers. But he also thinks it likely that infants have an instinctive perception of size and distance, though to a very limited degree. "Children," he says, "appear at so very early a period to know the distance, the shape, and the magnitude, of the different tangible objects which are presented, that I am disposed to believe that even they may have some instinctive perception of this kind; though possibly in a much weaker degree than the greater part of other animals."

For ourselves, we admit the existence of instinct, that is, of a tendency and power, given to animals by the Creator, to seek some rational or necessary end without having that end in view; doubtless some immediate pleasure is attached to instinctive activity, and leads to its performance; but we are not inclined to ascribe to instinct everything that animals may do. Moreover, in the present case, we think it not incredible that the intelligence of such actions as those adduced may have originated in a *very short experience*. We have seen chickens only one day old, which a little girl, our Bessie, had taken from the mother and fed, refuse to follow the mother, while they did follow Bessie about the yard. They no sooner had left the shell than they exhibited this power of forming a habit of judgment respecting the source of care and food.

We assume that cognitions of space and position arise in connection with muscular, organic, and tactual sensations, and that a power of thinking involving these cognitions is developed

before any exercise of sight takes place. Probably, when the eyes are first opened, objects are seen as on a surface close to the organ. But, when the young animal moves its head and touches near objects with its mouth or beak, then things are discovered not to be contiguous to the eye, but to occupy stationary positions in space. The lateral and vertical movements of the head show the object to be stationary, and the forward motion shows that some space must be traversed before contact. At the same time, also, the direction of objects is determined; they are instantly located on lines connecting them with the center of vision. Nothing further is now requisite save some serviceable measure of short distances; and, should we hazard the conjecture that objects within reach of the young animal possess a certain degree of visible distinctness, or cause a certain convergence of the optic axes, or in some other way peculiarly affect the organ of vision, this would present a rule of judgment which could be learned and applied at once. The determination of greater distances might involve a further process, and somewhat more experience. It is also to be remembered that the bodies of the lower animals at birth possess a greater development than that which is exhibited by the new-born infant, and are more capable of that automatic action which, though purely nervous and physical, is complementary and coadjutant to the intentional guidance of volition. The co-ordination of the motion of limbs of birds and beasts in walking, running, and flying, is very much automatic, and so, also, are some tendencies to act under the stimulus of any distinct impression made on the organs of sense. The foregoing considerations do not take away the necessity for instinct, but justify a greater limitation than is usually given to the sphere in which that power is exercised. But, whether the sight perceptions of animals involve instinct or not, there is little need of accounting for human vision otherwise than as the acquisition of experience.

We have now sufficiently considered the perception, by sight, of the direction of objects and of their solid shape. But something must be added respecting our estimations of size and distance. As already stated, our original or primordial perceptions of these things arise from internal sensations acting in connection with the sense of touch. Having in this way ascertained the length of one's foot or arm, and, in general, the size of our different bodily members, we use these determinations as standards for the measurement of other things. The original "foot" of length was doubtless taken from the foot of some man of authority, just as the standard yard-stick kept in the Tower of London is said to have measured the length of the right arm of a king of England. A cubit, as the term indicates, was originally the length of the fore-arm from the point of the elbow to the extremity of the fingers. After such standards of length had been determined others were easily obtained which are based on the movement of our limbs, as known

Perceptions of size
and distance.

through the muscular sense. Every full step of a medium-sized man traverses a distance of three feet or thereabouts. Hence the original mile was "*mille passuum*;" hence, too, the passage of time, as connected with the regular continuance of bodily motions, is employed to indicate distance. The traveler in Europe is often told that one place is a given number of hours distant from another, each hour being equivalent to a league of three miles, that is, to the length of road ordinarily passed over by a pedestrian in an hour. The extent to which such muscular measures of space can be employed may be illustrated by the case of a Mr. John Metcalf, otherwise called "Blind Jack," mentioned in the memoirs of the Manchester Philosophical Society. "He became blind at an early period; but, notwithstanding, followed the profession of a wagoner, and, occasionally, of a guide in intricate roads during the night, or when the tracks were covered with snow. At length he became a projector and surveyor of highways in difficult and mountainous districts, an employment for which one would naturally suppose a blind man to be but indifferently qualified. But he was found to answer all the expectations of his employers; and most of the roads over the peak in Derbyshire, in England, were altered by his directions. Says the person who gives this account of Blind Jack, 'I have several times met this man, with the assistance of a long staff traversing the roads, ascending precipices, exploring valleys, and investigating their several extents, forms, and situations, so as to answer his designs in the best manner.'"

In order to communicate the faculty of measuring magnitudes and distances from the locomotive or muscular sense to the eye, there is need only that a course traversed by the feet should be submitted to the sight. Then another course of similar length would affect one's sight in a similar manner. But the more frequently such comparisons are made and tested, the more thoroughly is the habit of judgment formed. Thus our acquired perception of magnitude and distance results directly from a comparison of the sensations of sight with those by which these quantities are more directly measured. It does not involve any knowledge of the nature of the eye or of the operations of this organ in receiving, transmitting, directing, and concentrating rays of light.

Nevertheless, scientific investigations have shown how the eye is affected by variations in magnitude and distance; and, in so doing, they have revealed the causes of those ocular sensations which the mind interprets. First of all, it is ascertained that when an object is near at hand, and in proportion to its nearness, the optic axes,—that is, the lines passing through the pupil and the center of each eye,—are made to converge, so as to admit light from the object, in the most perfect way, upon the retina. This convergence is effected by muscles connected with the eye, whose action is indicated by

Rules of visual judgment.

a sensation. Hence one can more quickly and exactly seize a pin or a pea suspended in the air at a little distance, when both of his eyes are open, than he can when one eye is shut. The visual *size* of objects close at hand is of course at first immediately interpreted by its identification with that of objects felt. Again, it is known that, as a rule, nearer objects make a more distinct impression on the retina than those which are remote. Hence one looking, from some distance, across a ravine or river, can easily distinguish the foliage on the side next to him from that which is visible on the other. Hence, too, in such countries as Colorado, where the air is remarkably clear, mountains many miles distant appear to the new-comer only a short way off; while those who have been accustomed to such a transparent atmosphere, find themselves adding unduly to the space-separations of a more hazy region.

In the next place, the intervention of various objects assists our judgments of distance, while the presence of adjoining objects aids our estimate of size. The length of a procession is better perceived than the distance of a single object; we make allowance for all the intervening spaces that are occupied or marked: and the size of an elephant at a distance, or even near by, is better appreciated if it can be immediately compared with that of a man or a horse. The sun and moon and other heavenly bodies seem to us both near and small, because the eye can neither compare them with any known magnitudes, nor measure the distance between them and our planet. They are granted only such size and distance as would *ordinarily* be indicated by their appearance.

But the most important law governing our perceptions of distance and magnitude, is founded on the fact that rays of light travel in right lines from the object to the eye. This being the case, the apparent size of any object—that is, the space which it occupies in the field of vision—varies inversely as the square of the distance from the eye. This law enables the mind to estimate distance when magnitude is known, and magnitude when distance is known. A man, standing at the distance of two rods from the eye, occupies one half the length, and one fourth the superficial extent, in the field of vision, that the same man occupies at the distance of only one rod. If the mind knows the visual size of an object at the distance of one rod, and perceives the same object as having only one fourth that size, it locates the object at the distance of two rods. On the other hand, if it knows some object of similar appearance to be only one rod away, while its visual size is no larger than that presented by the known object at two rods, the object now seen, though similar to that previously observed, is concluded to be only one fourth as large. Of course no formal calculations of size and distance take place in the use of the foregoing rules; yet it is wonderful with what accuracy and ease our ordinary judgments of sight are made.

The fallacies of sense. They are inferential.

§ 175. We must not conclude the discussion now in hand without remarking that the so-called "fallacies of sense"—which really are mistaken inferences from the presentations of sense—take place only in connection with acquired perception. The immediate and original cognitions of the mind, whether of sense, or consciousness, or concomitant perception, are reliable; they present realities; in them no mistake is possible. But errors may occur in the inferences we make from them. Moreover, our liability to error first arises in connection with the exercise of that very power of judgment whereby we are enabled to infer what is true. It does not originate in the associative tendency of thought. This merely attaches conceptions to one another, without any necessary reference to their logical relations. He who says that truth, or falsehood, or our belief in either, is the result of association, misses the mark sadly. Mistakes become possible for us when, by a power of judgment, we begin to unite things in the relation of antecedent and consequent. This relation, in some cases, is absolutely perceived, and then rules are formed which admit of no exceptions; in other cases, it is not absolutely perceived, but only supposed or accepted with greater or less probability and confidence; and the rules arising in such cases may admit of exception. By far the greater part of human judgments are formed in this way; for absolute or perfect truth is sometimes unattainable by the mind, and sometimes, though attainable, is beyond the practical aims and necessities which shape our ordinary modes of thought and determine the degree of their development. This power of forming imperfect rules is a most necessary and useful attribute; for it yields a less perfect apprehension when absolute knowledge may be undesired or unattainable. But it indicates a limitation in the cognitive faculties of the being using it; and it results in a liability to error. Mistakes from this source are specially likely to occur whenever any imperfect rule of judgment is applied in circumstances differing from those of its first formation and original use.

We allow, also, that association and habit, which contribute greatly to the ease and rapidity with which our judgments are formed, increase that liability to error which we have just mentioned. The force of habit hurries the mind into the adoption of conclusions—as it were instinctively—which the circumstances do not warrant. In this way we sometimes find ourselves making judgments which we know to be wrong, and which we immediately correct.

These remarks may be illustrated from every mode of acquired perception. Should one cross his fingers—say the second and third fingers,—and then move the end of a pencil back and forth between their extremities, he will find some effort necessary to disabuse his mind of the feeling that two pencils are employed in the titillation. The reason is that the sensations now caused

by one instrument, require the use of two when the fingers are in their ordinary positions. This instance suggests a fact well known to surgeons, and cited in Müller's "Physiology." "When, in the restoration of a nose, a flap of skin is turned down from the forehead, and made to unite with the stump of the nose, the new nose, thus formed, has, as long as the isthmus of skin by which it maintains its original connections remains undivided, the same sensations as if it were still on the forehead; in other words, when the nose is touched, the patient feels the impression on the forehead." Here evidently the object felt is referred to the accustomed place of the sensation.

In the same way we account for the phenomenon that the sensations of an amputated limb are referred to the lost extremities. Müller gives the following instances. "A student named Schmidts, from Aix, had his arm amputated above the elbow thirteen years ago; he has never ceased to have sensations as if in his fingers. I applied pressure to the nerves in the stump; and M. Schmidts immediately felt the whole arm, even the fingers, as if asleep." "A toll-keeper in the neighborhood of Halle, whose right arm had been shattered by a cannon ball in battle, above the elbow, twenty years ago, and afterwards amputated, has still, in 1833, at the time of changes in the weather, distinct rheumatic pains, which seem to him to exist in the whole arm; and, though removed long ago, the lost part is at those times felt as if sensible to the draughts of air." The explanation of these and similar experiences by Pres. Porter seems sufficient. "A man," he says, "who has no foot, will feel pain in the foot. Why? Because he experiences precisely the same sensations which he suffered when he had the foot, and knew it was the seat of pain. But if he had never had a foot, he would never have assigned pain to it; for he would never have had the means, by eye or hand or muscular sensations of connecting these sensations with it." Pres. McCosh, on the contrary, inclines to believe that the wrong judgment, if it resulted from past experience, would more easily give way to the teachings of a subsequent experience, and concedes that the physiological fact reported by Prof. Valentin, that "individuals who are the subjects of congenital imperfection, or absence of the extremities, have, nevertheless, the internal sensations of such limbs in their perfect state," necessitates the admission of an instinctive or immediate judgment ("Defence," etc., p. 163).

We rather think that the class of phenomena in question may be accounted for by an acquired perception strengthened by a strong association. We see no necessity to suppose an original or immediate judgment, though, doubtless, there may be an inherited tendency in our nature, which, in the cases referred to, intensifies the operation of the associative power. With respect to the testimony of persons with amputated limbs, it is to be remarked, *first*, that it is not uniform, some saying that their sensations do not long remain fallacious, while others assert that they do;

secondly, this testimony does not mention muscular sensations, in connection with which our perceptions of place are tolerably determinate, but vital and organic sensations, regarding which our original localizing judgments are indefinite; therefore, *thirdly*, we may allow the feelings of the shortened limb to be similar to those of the same member while perfect, holding, at the same time, that such feelings do not of themselves definitely mark position; and, *fourthly*, the positive associations of early life may be supposed to have in them a power of continuance compared with which that of any subsequent negative experience must be very feeble. The congenital cases reported by Dr. Valentin may be satisfactorily explained. Let us take the following, "A girl aged nineteen years, in whom the metacarpal bones of the left hand were very short, and all the bones of the phalanges absent,—a row of imperfectly organized wart-like projections representing the fingers,—assured M. Valentin that she had constantly the internal sensation of a palm of the hand, and five fingers, on the left side, as perfectly as on the right. When a ligature was placed around the stump, she had the sensation of 'fornication' in the hand and fingers; and pressure on the ulnar nerve gave rise to the ordinary feeling of the third, fourth, and fifth fingers being asleep, although these fingers did not exist. The examination of three other cases gave the same results." Here, it will be noticed, that the girl speaks of the "internal" sensations in her left hand as being, notwithstanding her deformity, similar to those in her right. We can see nothing very extraordinary in this, if it be allowed that each hand was furnished with a similar set of nerves similarly distributed; nor is it unnatural to suppose that conceptions associated with sensations in the stronger hand, and logically connected with them, should be recalled by similar sensations in the other and be the means of momentary error. But a person *born destitute of both hands*, could not, we think, have the interpretations of feeling which properly attach themselves to those members.

In respect to the errors of vision and of the external senses generally, there is—or at least, need be—no serious dispute. No philosopher claims that the oar bent in the water—or the landscape made yellow by the jaundiced eye—or the ringing in one's ears produced by large doses of quinine—or any of the extraordinary sensations of a diseased organ, are proofs that our senses are deceitful. Our immediate cognitions are always reliable even when our inferences from them may be wrong.

Moreover, our acquired perceptions, like other inferences, admit of critical analysis, and can, for the most part, be tested by their consistency with each other, and by their logical connection and agreement with accompanying perceptions that are more immediate. In this way, whenever any doubt arises, our perception can be confirmed, or modified, or rejected, after a sufficient investigation. Even acquired perception, therefore, is most reliable, and is regarded by all men as a proper and satisfactory source of knowledge.

The errors of sense easily corrected.

The ease with which the mind detects and corrects errors in its inferential cognitions, is evident from the fact that *we are seldom really deceived by such errors*, unless it be for a short time, but only amused, and interested to know their cause. Illustrations of this statement occur in the daily experience of us all; the following instances are remarkable only because recorded by scientific men. "I remember once," says Dr. Abercrombie, "having occasion to pass along Ludgate Hill, when the great door of St. Paul's was open and several persons were standing in it. They appeared to be very little children, but, on coming up to them, were found to be full-grown persons. In the mental process which here took place, the door had been assumed as a known magnitude, and the other objects judged of by it. Had I attended to the door being much larger than any door that one is in the habit of seeing, the mind would have made allowance for the apparent size of the persons; on the other hand, had these been known to be full-grown persons, a judgment would have been formed of the size of the door" ("Intellectual Powers," part ii. 1). A writer in the "Edinburgh Encyclopedia" (Art. "Science"), mentions a more complicated case of optical illusion than the foregoing. "In examining a dioramic representation of the inside of Rochester Cathedral, which produced the finest effect from the entire exclusion of all extraneous light and of all objects except those on the picture itself, he was struck with an appearance of distortion in the perspective, which he ascribed to the canvas not hanging vertically. Upon mentioning this to the gentleman who exhibited the picture, he offered to walk in front of it and strike its surface with the palm of his hand, to show that the canvas was freely suspended. Upon doing this a very remarkable deception, or illusion rather, took place. As his hand passed along, it gradually became larger and larger till it reached the middle, when it became enormously large. It then diminished till it reached the other end of the canvas." Here the eye was deceived, first, as to the distance of the painted object, then, as to the place of the hand which appeared to touch the object, and, finally, as to the size of the hand. In this case, as in the other, the observer was not long deceived, but was able immediately to correct his false conclusions.

CHAPTER XXXVI.

MEMORY.

§ 176. The reproductive or representative phase of mental activity is characterized by the predominant exercise of the reproductive power. It comprises those operations in which, for the purposes of contemplation, the mind recalls and elaborates thought

or knowledge already acquired. This phase of activity exhibits itself in two principal forms, that is, as Memory, and as Phantasy or Imagination. Hence, we speak of the memory and the phantasy as the reproductive faculties. The first of these is distinguished by the knowledge and belief with which its representations are attended; the other by a kind of synthetic judgment whereby constructions of thought are formed, sometimes with little design or effort, at other times with great skill and with well-considered aims.

The phenomena presented by memory are more evidently reproductive of the past than those of phantasy; for this reason, we shall attend first to the former power. Sir Wm. Hamilton finds fault with

Memory is an immediate knowledge of the past. Reid and Hamilton quoted.

Dr. Reid for saying, "*It is by memory that we have an immediate knowledge of the past.*" Sir William says, "An immediate knowledge of the past is a contradiction. For we can only know a thing immediately if we know it in itself, or as existing; but what is past cannot be known in itself, for it is non-existent" ("Met." Lect. XII.). Certainly, if immediate knowledge imply that the thing known exists at the time of the knowledge, and is immediately present to the percipient soul, remembrance is not immediate knowledge. But Reid never meant to teach anything so absurd as this. By immediate knowledge he signifies that which is not ratiocinative, or in any way inferential. He meant to teach that a thing distinctly remembered is known simply because it is remembered—or rather, simply in being remembered—and by reason of the constitution of the mind. That such was his doctrine may be shown very easily. In his third "Essay" (chap. ii.), he says, "Memory is an original faculty, given us by the Author of our being, of which we can give no account, but that we are so made. The knowledge which I have of things past, by my memory, seems to me as unaccountable as an immediate knowledge would be of things to come; and I can give no reason why I should have the one and not the other, but that such is the will of my Maker. I find in my mind a distinct conception and a firm belief of a series of past events; but how this is produced, I know not. I call it memory, but this is only giving a name to it—it is not an account of its cause. I believe most firmly what I distinctly remember; but I can give no reason of this belief. It is the inspiration of the Almighty that gives me this understanding." Here Reid expresses himself almost too strongly in saying that remembrance is as unaccountable as an immediate knowledge of things to come would be: his language, also, concerning the inspiration of the Almighty, is figurative; it merely enforces the statement that "memory is an original faculty given us by the Author of our being"; and his repeated assertion, "I can give no reason of this belief," explains what he means by immediate knowledge. Again, in the sixth "Essay," treating of first principles, Reid says, "Another first principle I take to be—that those things did really happen

which I distinctly remember. This has one of the surest marks of a first principle, for no man ever pretended to prove it, and yet no man, in his wits, calls it in question: the testimony of memory, like that of consciousness, is immediate; it claims our assent upon its own authority." Here, it will be noticed, Reid does not teach that the testimony of memory is always as reliable as that of consciousness, but he does teach that it is always as *immediate*, in that "*it claims our assent upon its own authority.*" In short, his doctrine is, that remembrance, properly and of itself, contains no ratiocination, but consists of two elements: first, a conception of some event or fact; and, secondly, a conviction that this event or fact really existed at some past time.

We accept this doctrine as correct. We believe that *memory, in its essential work, simply reproduces past perceptions, or rather the knowledge gained in such perceptions, this reproduction being accompanied by the attribution of new temporal relations to the fact recalled.* If this be so, then memory, in an important sense, is an immediate knowledge of the past. As, in original sense-perception, we do not first perceive an idea of the object, and then, in some way, become convinced that this idea represents a reality, but, on the contrary, immediately perceive the object itself as in relation to our sentient spirit, so memory immediately and directly reproduces from former knowledge, both the conception and the conviction which are included in that knowledge. There is no process, but a simple reproduction of the original conception and conviction, together with a perception of the lapse of time.

This doctrine conflicts with two others, in each of which memory is made a *mediate* cognition of the past. First, we have that of Hamilton, who even goes so far as to deny that memory is worthy of the name of knowledge. He says, "I remember an event I saw—the landing of George IV. at Leith. This remembrance is only a consciousness of certain imaginations, involving the conviction that these imaginations now represent ideally what I formerly really experienced. All that is immediately known in the act of memory, is the present mental modification; that is, the representation and the accompanying belief. Beyond this mental modification, we know nothing; and this mental modification is not only known to consciousness, but only exists in and by consciousness. Of any past object, real or ideal, the mind knows and can know nothing, for *ex hypothesi*, no such object now exists; or, if it be said to know such an object, it can only be said to know it mediately, as represented in the present mental modification. Properly speaking, however, we know only the actual and present, and all real knowledge is an immediate knowledge. What is said to be mediately known, is in truth, not known to be, but only believed to be; for its existence is only an inference resting on the belief that the mental modification truly represents what in itself is beyond the sphere of knowledge. . . . So far, therefore, is memory from being an

Hamilton's doctrine of memory criticised and condemned.
Three reasons given.

immediate knowledge of the past, that it is, at best, only a mediate knowledge of the past; while, in philosophical propriety, it is not a knowledge of the past at all, but a knowledge of the present and a belief of the past" ("Met." Lect. XII.).

These statements are extremely erroneous. They are wrong, *first*, in teaching that remembrance is not a knowledge, but only a belief; *secondly*, in saying that it is mediate and inferential belief; and, *thirdly*, in asserting that the immediate object in memory is a mental modification. As to the first of these points, we say that, whether remembrance be inferential conviction or not, it is often absolute and well-founded conviction, that is, what men generally call knowledge. The man who distinctly remembers that it rained yesterday has as perfect a conviction of that fact as he has that it is fine to-day, if he perceives this fact. We once heard a woman swear in court that the prisoner at the bar was the man whom she saw walking along a certain road at a certain hour. She said that she saw his face plainly, and could not be mistaken. This evidence completed the proof of the man's guilt; he was hung for murder. Memory could not be thus used in capital cases if it did not afford a knowledge of fact. Hamilton's limitation of knowledge to our immediate cognitions is preposterous. It is ridiculous to say that a man has no knowledge of anything save of that which is now passing beneath his eyes or within his breast. Probably Sir William himself would admit that memory produces absolute and well-founded conviction; and, if that be so, his definition of knowledge may be passed by as simply an eccentricity in the use of terms.

We may also regard with leniency the statement that the belief produced by memory is inferential and mediate. Doubtless the inference mentioned here is not like any ordinarily experienced in the exercise of ratiocination. If it were, memory would not be a distinct power, but only a species of reasoning. Hamilton nowhere teaches any such doctrine as that. His use of the word *inference*, in the present connection, only expresses the idea that, in memory, our conscious knowledge of a present mental modification originates, and is followed by, a belief in the past reality of the thing conceived of, and this without any logical reason, but simply from the operation of our mental constitution. Such a doctrine reminds one of that inferential realism (§ 55), according to which substance is perceived by immediate inference from its qualities, and power by an immediate inference from its operations. The phenomena of memory, however, unlike those of perception, do not admit of any such inferential or suggestional theory. As Hamilton himself teaches, the very "mental modification" itself includes not only a conception of the event remembered, but also a conviction of its reality. For "the representation and the accompanying belief" are "immediately known." We may reason that, because a thing is perceived to exist, it does exist, or that, because we remember a thing to have been fact, therefore it was fact. But such argumentation

is merely analytical; so far from accounting for perception and memory, as valid grounds of belief, it starts out with the assumption that both these grounds of belief are valid. The simple memory of fact is not, in any sense, inferential, but, in contradistinction to all inference, is "an immediate knowledge of the past."

We now come to the third error of Hamilton, in which he asserts that the immediate object of memory is a modification of mind. This was his initial and radical mistake; for it led him to divide memory into two parts, one of which was knowledge, and the other belief, the latter being a kind of inference from the former. We have just seen that such inference involves a *petitio principii* and is of no logical value; but it is clear that the theory of such inference depends on the doctrine that there is a present object which the mind, in some way, assumes as representing the absent and past. In opposition to this doctrine, we hold that memory has no immediate object whatever. There is a sense in which memory is an immediate knowledge; but there is no sense—no natural or proper sense—in which it has an immediate object. As Reid says, it is a knowledge, not of the present, but of the past. It is true that presentative cognition accompanies memory; we are conscious of our conception of some object and of the conviction that it existed at some past time. But this consciousness is no part of the remembrance; it is a concomitant. Memory is the direct reproduction of our original cognitions, modified by a judgment as to time. As such, it does not have, and does not need, any existing object. On the contrary, it is attended by the conviction that the object remembered, as such, does not exist at the time of the remembrance. Many things remembered cannot in any way exist at the present time, and are known to have no present existence. They are the deeds and changes of the past. Things past are the only objects of memory; if it be denied that such things are strictly and properly objects,—since they exist no longer,—then we say that memory, like imagination, is an exercise of *objectless thought*, in which we think, not of objects, but only *as if* of objects. It is certain that the objects of memory are not those which exist here and now.

Another unsound theory.

The other theory which denies the immediacy of memory resembles that which we have considered, in making our remembrances dependent, and consequent upon, perceptions of consciousness; but it is more plausible. It is rather to be gathered from the leading doctrines of some eminent writers, than to be found expressly stated by them: for which reason we shall give it in our own language.

According to this view, the conception of a past fact is not immediately accompanied with conviction, but may be immediately identified with a past cognition, and then, because our cognitive conception agreed with fact, we conclude that our recollective conception agrees also with the same fact. We reason thus, "My present thought corresponds exactly with my

previous thought: but my previous thought was cognitive and corresponded with fact and was true; therefore, my present thought is true." This theory can scarcely be called absurd. It is especially plausible as an account of our remembrance of things external. It assumes two ultimate and inexplicable data: first, the conviction that a present corresponds with a past thought; and, secondly, the conviction that the past thought was cognitive; this latter datum being nothing else than the immediate *remembrance* of the past cognition. From these assumptions, the past existence of the thing thought of is deduced.

A little reflection discovers the weakness of this theory. In the first place, it is *self-destructive* in assuming that *we can immediately recall the knowledge, gained by consciousness, of past conceptions and convictions*. If the knowledge of consciousness may be recalled and relied upon, why may we not do the same with the knowledge gained by sense-perception,—in short, with every kind of immediate knowledge? Reid's teaching makes no greater assumption than the theory now considered, and has the advantage of superior simplicity, which is a great advantage in philosophy.

In the next place, this theory is yet more self-destructive *in assuming the memory of cognitions as such*. Because the memory or knowledge of a past cognition, as the basis of a new knowledge of fact, involves that the fact is *already known*, and need not be learned in this way. We cannot know that we knew any particular thing, without therein already knowing that thing. Finally, we say that our daily consciousness does not favor this doctrine, but that of immediate memory. Never, in any perfect remembrance, do we find ourselves first referring to our past cognition, and then making inferences from it; on the contrary, we immediately reproduce our cognitions, whether objective or subjective, and therein immediately remember the objects of these cognitions.

But, while rejecting the theory which makes the remembrance of one's self as cognitive the *basis* of belief in things formerly perceived, we allow that a reference to one's self as previously percipient enters into, and helps to constitute, every act of remembrance. This, at least, is true of memory as commonly conceived of. When a man says that he remembers something, we understand that he himself has perceived that which he remembers. If he tells what he has heard from some one else, he remembers hearing it, but not the thing itself. If he tells that of which he is sure, yet is not now certain whether he originally perceived it himself, or learned it from others, or inferred it from some sign, we do not call his certainty or knowledge remembrance; it is simply a recalled knowledge.

This re-knowing is of the same essential nature with memory, and might be included under memory, provided the term were used in a wide philosophical sense. But that might lead to con-

The memory of a fact involves the remembrance of its cognition.

fusion. Besides, however confident one might himself be of some fact learned, he knows not how, his testimony regarding it could not avail with others so much as if he knew whence he had obtained his knowledge. Nay, perhaps he himself could not be absolutely sure of it. For this reason, we commonly wish to know concerning any reproduced conviction whether it first originated from inference, or from testimony, or from observation; in the latter case only we call it memory.

Almost every other circumstance connected with a past event or fact, except that it was personally observed, may be forgotten, while the character of memory remains. One may be confident that he has heard another making a certain declaration, but may be entirely unable to say in what place, or at what time, or in what company; he may even forget how he himself was affected by the declaration; but he must recollect that he himself heard it, or there is no remembrance.

In memory the two primary powers of mind—thought and belief—are always exercised together; and nothing is more necessary to a right understanding of this faculty than that we should bear in mind the distinction between these powers. The want of a right apprehension of this distinction has rendered possible two related forms of error: *first*, that which regards memory as merely a clear and vivid exercise of reproductive thought, and, *secondly*, that which explains memory as an energetic kind of thought, resulting from an unimpaired, or reinforced, condition of the suggestive power. The first of these views naturally accompanies Mr. Locke's account of memory and is involved in it, though rather from his carelessness and want of precision than from any positive adoption of the error. Locke, failing to distinguish between ideas and cognitions, makes perception the faculty by which ideas are first received, and memory the faculty by which they are retained and revived ("Essay," book ii. chap. x.). The same doctrine is taught by those who describe remembrance as a distinct and life-like conception of something past. Vividness of conception should not be confounded with confidence of conviction. The former may often accompany the latter and for this reason may be mentioned as suggestive of it. But the two are not inseparable, and, even when conjoined, may be distinguished. Our conception of a well-told tale and our belief in its truth are different things. Were it not so, there would be no difference between distinct memory and distinct imagination.

Memory is not strongly reproduced thought or feeling.
Herbert Spencer.

The second error, mentioned above, is held by those philosophers who account for all the beliefs and convictions of the mind on the principle of the association of ideas. According to them, we have, first, sensations, then reproduced sensations, or ideas, of different kinds, then association of ideas; that is all. This system confounds sensation with thought, and thought

with knowledge, and makes all knowledge renewed and refined sensations. It is shallow and inadequate to the highest degree. But it signally fails in attempting to account for memory. Admitting all its assumptions, it is impossible to see how any conception of things as existing in past time—much more, how any conviction as to their past reality—is nothing more than a strongly reproduced feeling. A sensation of pain or uneasiness to-day, though it be reinforced by some influence from the pain of yesterday, has in it no reference to yesterday, much less any conviction that such reference is correct. These things are an *addition* to the present experience, however that may have been produced or compounded. In short, associationalism cannot explain the simplest exercise of remembrance. This fact, in the course of discussion, became so evident to Mr. J. S. Mill that, in his “Examination of Sir Wm. Hamilton’s Philosophy,” he candidly admitted memory to be an ultimate ground of belief. In opposition to his own teachings, he says, “Our belief in the veracity of memory is evidently ultimate: no reason can be given for it which does not presuppose the belief, and assume it to be well-grounded” (p. 174). Those materialistic associationalists, who identify sensations with molecular changes, and then make all mental action molecular, need scarcely be mentioned. They are not worthy of consideration in the present connection. But we commend Mr. Herbert Spencer’s chapter on memory to any one who has a fondness for sublimated nonsense (“Psych.” part iv. chap. vi.). The following is the most intelligible sentence in that chapter. “To remember a motion just made with the arm is to have a feeble repetition of those internal states which accompanied the motion—is to have an incipient excitement of those nerves which were strongly excited during the motion.” That is, a feeble excitement of nervous tissue is the same thing with a feeble sensation of the mind, and the feeble sensation is the same thing with a recollection. “Thus,” says Spencer, “these nascent nervous excitements that conflict with one another. . . . are the objective sides of those changes which are ideas on their subjective sides.” This author should have lived in those ancient times when the soul, with its thoughts and feelings, was identified with fire, which gives light and heat, or with air, that moves and blows. His theories would have been great improvements on those old teachings, and, perhaps, would have supplanted them altogether.

Memory, in its twofold character as the reproduction of both thought and belief, admits of excellence and of imperfection. An absolute recollection of the past, in which all things submitted to one’s observation should be recalled in all their details and with the full assurance of sight, could belong only to an ideal memory. A less complete exercise of the faculty passes for perfection with human beings. In general, when we speak of a perfect remembrance, we mean one which retains all those particulars of some scene

Memory admits of degrees. Why?

or transaction which may have been specially noticed, and which includes a full assurance of belief respecting them; and a memory is imperfect so far as it differs from such a standard, in either respect. While these two modes of excellence often accompany each other, they are also often separated. One witness may dimly recall the circumstances of a transaction which he remembers with absolute assurance, and another, of livelier imagination, may have distinct conceptions of particulars, while he would not like to swear that everything happened just according to his description. Differences of ability are noticeable also in the same man at different times. The causes controlling these differences are, in the main, the same as those which govern the acquisition and the revival of our ideas. Hence, although every recalled belief, like every recalled idea, arises in the mind directly from the action of a reproductive power, we often can explain how one remembrance has arisen rather than another, and how one remembrance is more or less vivid, or confident, than another. What has been interesting, what has been observed carefully, what has occurred recently, what has been witnessed alone, and without distraction, and while one is in good health and vigor, will be recalled with special ease and confidence (§§ 112-116).

The relations of memory to reason or judgment.
1. An imperfect memory may be confirmed or disannulled.

§ 177. Hitherto we have insisted upon the negative relation of judgment to memory, and have taught that, in remembering a thing, we believe it, with greater or less assurance, simply because we remember it. It is, however, true that the memory of human beings is not exercised apart from their reason or judgment, but continually in conjunction with the latter faculty, and that the relations arising from this fact are very important. Judgment may confirm or disannul remembrances; it may scrutinize and test the action of memory; it may intermingle and combine its own inferences with remembered facts; and it may control and direct the mind in the effort to remember things forgotten. A great influence is exerted in these several ways.

First, judgment confirms or disannuls remembrances. This happens only when the alleged fact is not remembered perfectly. In that case, to terminate doubt, the fact supposed to be remembered may be regarded in its external relations, and we may find good reason to believe that such an event must, or must not, have taken place. For instance, we may find that certain necessary consequences of it are, or are not, visible. If one, during the night time, had seen a great fire at a short distance, and on the next morning were not sure that he had not been dreaming, his memory would be confirmed if he should find the blackened and smoking remains of some large building in the neighborhood to which his recollection pointed. If no such remains could be found, he would conclude that he had been only dreaming.

2. Reason may scrutinize and test the action of memory.

In the *next place*, judgment may scrutinize the action of memory, and the degree of its reliability. This is done whenever a remembrance is intentionally and deliberately repeated, and so subjected to the notice of a reflective and attentive consciousness. Under such conditions we may become sure that our conviction really arises from memory and is not a delusion of fear, or hope, or passion, or interest; and we determine with what amount of confidence we really remember a thing, whether with full assurance or with doubt and hesitation. Then, also, we may compare our recollection with other recollections and beliefs, and may inquire whether there be any likelihood of our having erroneously combined the elements of our acquired knowledge. Let one remember a portrait on the wall of a certain drawing-room, and have the doubtful impression that the picture, which he saw, was a Madonna. He can now ask whether his idea of the Madonna may not have been obtained from some other picture that he has seen elsewhere, and wrongly substituted in his present recollection for that of Beatrice, or some other lady. If he have seen no such picture in similar surroundings, his recollection is probably a correct one.

A remembrance is also confirmed or rejected by testing its power to excite other remembrances. When our attention is fixed on a fact the redintegrative tendency operates to recall particulars connected with it, so that a little study may bring before us all the prominent features of some scene or transaction in which we have been once interested. In this way circumstances naturally connected with the point regarding which we are in doubt, are frequently brought to mind; whereas, if no effort can recall additional or confirmatory circumstances, there is increased reason to distrust the recollection. For this cause witnesses in courts of law are often required to confirm their testimony concerning some fact by relating, so far as they may, the time, place, and circumstances of its occurrence; and, in general, testimony is the more acceptable, the more detailed and circumstantial it may be.

3. In the estimation of time judgment combines with memory. How such estimates originate.

In the *third place*, judgment intermingles and combines its own beliefs with those furnished immediately by memory, and thus performs an important function. Next to the doctrine that memory is an original and immediate source of knowledge, none other is so indispensable to a satisfactory understanding of this faculty as the doctrine that memory has a development, and that, in addition to the essential power of the reproduction of old cognitions and beliefs, there is an acquired memory, which is related to the original and simple power somewhat as original is to acquired perception. *This developed or acquired memory is that which we commonly exercise, is what we commonly call memory, and, while including an immediate knowledge, contains a considerable admixture of what is rational and logical.* The mystery and diffi-

culty which many an able thinker has encountered, in connection with the philosophy of remembrance, have arisen from his failure to trace the workings of the recollective faculty to their first beginnings, and to comprehend the duplex character of them as cognitions. The initial exercise of memory takes place in immediate connection with the perception of things as existing in time, and is scarcely distinguishable from the operation of the perceptive power. One can perceive time only as passing; the very cognition of things as existing in the present, must be accompanied by the knowledge of them as existing in the immediate past. These two modes of cognition are inseparably connected, and together form what may be denominated a perception of the continued present (§ 169). In this perception we gain those conceptions of time and of the relations of time, which are involved in every act of memory. Here, too, the mind obtains those *measures of duration* which it afterwards applies.

The first memories of the infant are very imperfect. Its powers of attention and discrimination are feeble; and its interest is wholly occupied with the immediate present. Under such conditions the action of the reproductive power is confused and weak. Even after the mind remembers things with some distinctness, and realizes how memory differs from both perception and imagination, its judgment as to the time of past events remains indefinite. Any one acquainted with little children knows their incapacity to tell the time of occurrences which they remember. The infant probably begins his measurement of duration while noticing short sensible events which succeed each other with regularity. The footsteps of the nurse, her monotonous song, the rocking of the cradle, or the successive breathings of the child itself, mark the passing moments. The remembrance of a number of such events together—of as many steps as the nurse takes in crossing the room, of the syllables composing one stanza of her song, of a succession of cradle rockings, or of a number of excited breathings after being laid down from the nurse's arms—would yield a further measurement of time, and prepare for greater judgments. Before many years, our earlier measurement of duration is succeeded by observation of the time consumed by regular artificial movements; and so seconds, minutes, hours,—marked by the ticking of pendulums, or the movements of hands over the face of a timepiece, or the creeping of the shadow on the dial, or the falling of sand through the hour-glass—are learned and accepted as definite portions of duration. Thus, by different immediate judgments, we determine the duration of such regular processes, natural and artificial, as submit themselves to our continuous attention. After that we use such phenomena as standards, whereby we may determine with accuracy the duration of other things. But, the measurement of the time of any standard event being once perfected, the time occupied by its subsequent recurrence may be recognized infer-

entially, and may be inferentially applied to any other event contemporaneous with it. Having once attained to the conception of a day as that length of time which is occupied by the diurnal revolution of the earth, there is no need that we should again measure the successive portions of the day. We may sleep during part of the twenty-four hours, and, during the remaining part, may give no special attention to the passage of time, yet we can know that one day only has passed, if there have been only one alternation of darkness and light.

It seems quite evident that our determination of the time occupied by past events, and of the time which may have transpired since their occurrence, is mostly made by means of inferences in which we first measure time by reference to some regular and well-known phenomenon, and then assign the time thus measured to the periods that we have more immediately in view. For example, when we remember that such or such an event happened a day, or a week, or a year, ago, this remembrance—like the perception of distance by sight—involves the use of rules which have been gained in a past experience.

4. Judgment guides the effort to recollect. In the fourth place, and finally, judgment controls and assists memory, in the effort to recall things forgotten. The reproduction of belief, as well as the reproduction of thought, is, to a certain extent, subject to the influence of the will; and, with reference to this fact, memory has been divided into the spontaneous and the intentional. We cannot recall what is not connected with our present thought, nor even that of which we do not already have some conception. But it is often possible to recall the forgotten particulars of some scene or transaction which we partially remember. The intellectual effort in which this end is accomplished is named *recollection*, because it is a collecting again of things into one's conscious knowledge. In this process the mind appeals to the laws of the reproduction of thought. We dwell on the partial remembrance and wait, expecting a redintegration. If this do not take place soon, then we try one form of completion after another till at last some happy conjecture, nearer the truth than the rest, recalls the particulars desired. For any past cognition is reproduced with special ease whenever our present thought may be similar to it. Having forgotten the name of some boy, we have not, of course, forgotten that he has a name; therefore, we try first one name and then another, till, at last, striking the right name, or one similar to it, recollection takes place. Such is a very frequent method of intentional memory. But often we seek the forgotten, not through the similar merely, but through that also which may have been in any way associated, in past cognition, with the object of our search. For instance, if one were desirous of recalling some remarkable saying of another's, he might dwell on the occasion of the utterance, on the temper and aims which animated the speaker, on the company which he addressed, and on the general character of the dis-

course, and might hope that the remark might be suggested through its connection with some of these things. For any recollection tends to revive that which has previously been associated with the fact which we recollect.

§ 178. In spontaneous memory remembrances succeed each other simply according to the laws of mental suggestion, and without any immediate guidance of the will and judgment. For this reason differences of intellectual tendency, whether original or acquired, are more observable in connection with this mode of memory than in connection with intentional recollection. Here, therefore, we may notice certain different styles of memory resulting from different objective habits of thought; among which what may be termed the circumstantial and the methodical may be especially signalized. Some persons, naturally, have a penetrating strength of mind, which immediately lays hold of the important particulars of some transaction, neglecting the rest; which talent is, for the most part, developed by use and education; while other persons are greatly deficient in this respect. Accordingly some memories are merely receptive; the particulars of any event or scene are recalled by them indiscriminately and are mentioned in the evident, obvious, relations of time and place; but other memories, as if guided by an instinctive judgment, bring up only those particulars which are appropriate to the occasion or conducive to some desired end. Lord Kames, in the first chapter of his "Elements of Criticism," excellently describes the diffusive and circumstantial style of memory. "In the minds of some persons," he says, "thoughts and circumstances crowd upon each other by the slightest connections. I ascribe this to a bluntness in the discerning faculty; for a person who cannot accurately distinguish between a slight connection and one that is more intimate is equally affected by each: such a person must necessarily have a great flow of ideas, because they are introduced by any relation indifferently; and the slighter relations, being without number, furnish ideas without end." The same author calls attention to that humorous illustration of vulgar memory which Shakespeare has given in the speech of Mrs. Quickly to Sir John Falstaff. "What," said the knight, "is the gross sum that I owe thee?" his hostess replied, "Marry, if thou wert an honest man, thyself and thy money too. Thou didst swear to me on a parcel-gilt goblet, sitting in my Dolphin-chamber, at the round table, by a sea-coal fire, on Wednesday in Whitsun-week, when the Prince broke thy head for likening him to a singing man of Windsor; thou didst swear to me then, as I was washing thy wound, to marry me, and make me my lady thy wife. Canst thou deny it? Did not Goodwife Keech, the butcher's wife, come in to borrow a mess of vinegar; telling us she had a good dish of sprawns; whereby thou didst desire to eat some; whereby I told thee they were ill for a green wound. And didst not thou, when she was gone downstairs, desire me

to be no more so familiarity with such poor people, saying that ere long they should call me madam? And didst thou not kiss me, and bid me fetch thee thirty shillings? I put thee now to thy book oath, deny it if thou canst." A similar particularity of recollection is exhibited by the coachman in *Scriblerus*, who, giving an account of a fight, runs through all the categories of Aristotle. "Two men fought for a prize; one was a fair man. a sergeant in the Guards; the other black, a butcher; the sergeant had red trousers, the butcher blue; they fought upon a stage, about four o'clock, and the sergeant wounded the butcher in the leg."

In contrast with the foregoing, a skilled and methodical recollection may be illustrated from Mark Antony's oration over the dead body of Cæsar, in which every circumstance calculated to excite the sympathy of his hearers is artfully recalled.

"You all do know this mantle: I remember
 The first time ever Cæsar put it on;
 'Twas on a summer's evening, in his tent,
 That day he overcame the Nervii:—
 Look, in this place ran Cassius' dagger through:
 See what a rent the envious Casca made:
 Through this the well-beloved Brutus stabb'd;
 And, as he plucked his cursed steel away,
 Mark how the blood of Cæsar followed it,
 As rushing out of doors to be resolv'd
 If Brutus so unkindly knock'd, or no;
 For Brutus, as you know, was Cæsar's angel:
 Judge, O ye gods, how dearly Cæsar lov'd him!
 This was the most unkindest cut of all;
 For when the noble Cæsar saw him stab,
 Ingratitude, more strong than traitors' arms,
 Quite vanquish'd him: then burst his mighty heart;
 And, in his mantle muffling up his face,
 Even at the base of Pompey's statue,
 Which all the while ran blood, great Cæsar fell."

A similar skillful selection of circumstances characterizes every good description of familiar scenes. The "Cotter's Saturday Night," by Burns, and the "Elegy in a Village Churchyard," by Gray, both largely composed from recollections, contain excellent illustrations.

Had we time to discuss other modes of memory, analogous to those just considered, it would be interesting to notice the effect of one's prevailing temperament, of his regular business, or of his chief interests and inclinations, upon the current of his recollections. But we shall now pass to the contemplation of those characteristics upon which the usefulness of one's remembrances, whatever be their objective character, immediately depends. These are three in number; namely, ease of acquisition, strength of retention, and readiness of reproduction. The memories of different minds differ greatly in all these respects, partly by reason of their natural constitution, and partly by reason of their acquired

The qualities of a
 good memory.
 How cultivated.

habits; and it is seldom that any one mind excels in all these particulars at once. Very often those who memorize with facility do not long retain what they have learned; and often those whose memories are sufficiently retentive, find it difficult to recall instantly circumstances which they desire to mention. This separation of qualities does not take place necessarily, but is owing to a variety of causes. A person who learns easily is not compelled to any great or prolonged exercise of the attention, and frequently on this account fails to secure his acquisitions. This deficiency generally may be supplied if he repeat to himself what he desires to remember and make it a special subject of consideration and of recollective effort. As a rule, we retain only that which we have acquired with some effort and attention. The late Sir Thomas Fowell Buxton said to his sons, "What you know, know thoroughly;" and added, "There are few instances in modern times of a rise equal to that of Sir Edward Sugden. After one of the Weymouth elections I was shut up with him in a carriage for twenty-four hours. I ventured to ask him what was the secret of his success. His answer was: 'I resolved, when beginning to read law, to make everything I acquired perfectly my own, and never to go to a second thing till I had entirely accomplished the first. Many of my competitors read as much in a day as I read in a week; but at the end of twelve months, my knowledge was as fresh as on the day it was acquired, while theirs had glided away from their recollection'" ("Memoirs," chap. xxiv.).

The difficulty, which many experience, in recalling what they certainly know, is not always easily remedied. It arises from a slowness of mind which is often natural, but which is also produced by various depressing or retarding influences. This difficulty will be lessened by the systematic exercise of recollection; but it is to be counteracted chiefly by the cultivation of a cheerful and collected frame of spirit, by the maintenance of bodily freshness and vigor, and by a wise participation in that social intellectual intercourse, which brings our faculties into lively exercise. Stupidity and dullness sometimes take possession of the most successful student. Let him quit his books; let him seek the open air and the scenery of nature; let him devote himself for a time to practical affairs, let him mingle with the life of men. He will return to his studies with new zest and with a surprising increase of mental activity.

The faculty of invention as related to memory.
Lord Kames and Prof. Stewart quoted.

The doctrine has been taught by some that the faculties of invention and of memory never exist together in the same mind to any eminent degree. It is true that the exclusive or special cultivation of either of these faculties, while the other is comparatively neglected, tends to lessen the uncultivated ability. "A man of accurate judgment," says Lord Kames, "cannot have a great flow of ideas; because the slighter relations, making no figure in his mind, have no power to introduce ideas. And hence

it is, that accurate judgment is not friendly to declamation or copious eloquence. This reasoning is confirmed by experience; for it is a noted observation, that a great or comprehensive memory is seldom connected with a good judgment." The first sentence in this passage may be too unqualified; in many men, the exercise of sound judgment does not interfere perceptibly with correct and ready memory. Yet that intense and peculiar thought which belongs to inventive and speculative minds undoubtedly tends to carelessness and incapacity in all matters of mere acquisition and reproduction. Hence men of philosophical genius often present a poor appearance in comparison with others whose talent is of a lower grade, and sometimes, even, are hesitating and uncertain with respect to questions which they themselves have investigated and settled. An extreme readiness and confidence in expounding the details of any system indicate rather the faithful disciple and the able advocate, than the master himself. Prof. Stewart remarks that, "they who are possessed of much acuteness and originality, enter with difficulty into the views of others, because they cannot adopt opinions which they have not examined, and because their attention is often seduced by their own speculations;" then he continues, "It is not merely in the acquisition of knowledge that a man of genius is likely to find himself surpassed by others: he has commonly his information much less at command, than those who are possessed of an inferior degree of originality; and, what is somewhat remarkable, he has it least of all at command on those subjects on which he has found his invention most fertile. Sir Isaac Newton, as we are told by Dr. Pemberton, was often at a loss, when the conversation turned on his own discoveries. It is probable that they made but a slight impression on his mind, and that a consciousness of his inventive powers prevented him from taking much pains to treasure them up in his memory. A man of original genius, who is fond of exercising his reasoning powers anew on every point as it occurs to him, and who cannot submit to rehearse the ideas of others, or to repeat by rote the conclusions which he has deduced from previous reflection, often appears, to superficial observers, to fall below the level of ordinary understandings; while another, destitute of both quickness and invention, is admired for that promptitude in his decisions which arises from the inferiority of his understanding" ("Elements," chap. vi. 8). These observations contain comfort for some earnest and independent thinkers; but they should not be interpreted as teaching that slowness of recollection is a mark of genius.

Many examples of notable memory are recorded in history. Till the decay of Pascal's health had impaired his memory, he is said to have "forgotten nothing of what he had done, read, or thought, in any part of his rational age." Niebuhr, according to his biographer, "mastered languages and sciences, signs and the things signified,

Notable examples
of memory.

with equal ease, and with such certainty, that, with the mind's eye, he saw each in its own individuality, separate from its fellows, and yet intimately and variously related to them. His memory was equally retentive of perceptions and of thoughts, of view and feelings, of sights and sounds; whatever came within the sphere of his recognition took up its due relative position in his mind with equal certainty and precision." The late Dr. Addison Alexander was able to repeat a discourse verbatim after one reading; and on one occasion, a considerable matriculation list of students having been mislaid, he immediately made out another from memory. Hortensius, the Roman orator, at the close of a large auction sale, could enumerate all the articles sold in their order, together with the prices paid, and the names of the purchasers. "Nature," says Cicero, "gave Hortensius so happy a memory that he never had need of committing to writing any discourse which he had meditated, while, after his opponent had finished speaking, he could recall word by word, not only what the other had said, but also the authorities which had been cited against himself. Cæsar, and other great military leaders, both of ancient and of modern times, have been remarkable for being able to recall the name and the exploits of every officer or soldier who had ever distinguished himself in their armies. It is related that Alexander the Great knew the name and face of every individual in his army of thirty thousand men. A fellow-student of the father of the present writer had the whole of the New Testament so thoroughly learned by heart that, on the mention of any sentence, he could give the chapter and verse where it is to be found, and, on the numbers of chapter and verse being given he could repeat the words thus called for. In ancient times the practice of committing literary productions to memory was more common than it is at the present day, when reading is universal and books are plentiful; and it resulted in achievements which would now be considered more remarkable than they were considered then. The two great poems of Homer, each containing twenty-four books, and about fifteen thousand lines, were probably composed before "the art of writing and the use of manageable writing materials were known in Greece and the Grecian islands"; and it is certain that they were fully committed to memory by "rhapsodists," who recited them for the entertainment of others. A very wonderful exercise of memory was exhibited by Morphy, the chess-player of New Orleans. This man sat alone in one room in a New York hotel, while six of the best players in that city sat in an adjoining room, each with a chess-board before him. The six players severally made moves at their pleasure; and each move, when made, was announced to Morphy, through an open door. With very little hesitation he directed another move in the game reported from, and so he continued playing till he had beaten the greater number of his antagonists, one or two coming off with drawn games. Such a feat is most extra-

ordinary; it reminds one of those wonderful calculators, who, using memory instead of slate and pencil, perform complicated arithmetical problems in their heads. These are prodigies whom the Creator sends into the world that we may see what a marvelous thing the human mind is, and of what undreamt of accomplishments it is capable.

§ 179. Men of ordinary talent cannot hope to equal the attainments of genius. They should satisfy themselves with the reflection that extraordinary mental powers are not essential to honorable success. Yet those who would pass their lives to the most advantage, and who would participate in that nobility which intellectual advancement confers, should remember that the powers of the mind are more capable of development than those of the body, and that, of all our mental endowments, memory is the most improvable.

This is particularly noticeable in the education of children, who at first are incapable of learning even the shortest verses, but who soon show themselves able for considerable lessons. Presently all the rules and methods, forms and paradigms, of grammars and arithmetics, are mastered; the mind is stored with the facts of history and geography, and with the principles and illustrations of science; while whole pages of poetry and oratory are so studied that they become part of one's mental furniture, and are rehearsed with ease. Moreover, in subsequent life, should one's position call for the regular use of memory, a command of this faculty is found to be gained rapidly by means of practice. In certain denominations of Christians young ministers are expected first to write out and then to commit to memory the sermon for Sabbath morning; and it is the common experience of such that this work, laborious at first, soon becomes easy. One or two attentive readings fixes an imprint of the discourse upon the mind. Men, too, who are accustomed to employ their memory receive a peculiar satisfaction from the exercise of this faculty and resort to it as a means of mental discipline and enjoyment. This was a pleasure of Lord Macaulay, a man whose memory resembled that of Pascal. In October, 1857, after he had retired from public life and, in great part, from literary composition, he writes, "I walked in the portico and learned by heart the noble fourth act of the Merchant of Venice. There are four hundred lines, of which I knew a hundred and fifty. I made myself perfect master of the whole, the prose letter included, in two hours." About this same time he committed long passages from Lucretius, Catullus, and Martial. Also, having studied the Peerage at odd moments, he "could soon repeat off book the entire roll of the House of Lords"; then, taking up the Cambridge and Oxford Calendars, he soon "had the whole of the University Fasti by heart." "An idle thing," he adds, "but I wished to try whether my memory is as strong as it used to be; and I perceive no decay" ("Life and Letters," chap. xiv.).

The improvability
of memory.

Natural mnemonics. The aid given memory by proper arrangement and connection of ideas.

Faithful commemorations and frequent rehearsals may be depended upon as the principal means for the permanent improvement of the memory. But we must add that the recollective faculty may receive great immediate assistance from *our arranging in our minds the particulars of any given case in some orderly connection*; and that this process tends also to a happy development of the reproductive faculty. The mind loves to act according to some law; therefore, it loves order; for order is an arrangement of things according to a rule or law. Any one accustomed to master the details of comprehensive topics can testify that these details are recalled much more easily and completely, if they have been arranged according to some one or more of the natural principles of order. An order of recollection may be derived from the succession of events in time, or from the position of things in space, or from that similarity and difference of objects whereby they are thrown into logical classes, or from a continuous connection of cause and effect, or from association with other things that have a fixed order, or from grades of importance or of excellence, or from degrees in the possession of any quality, or from a combination of any two or more of these grounds of arrangement. The order of time is observed in the composition of chronicles or annals, in which no further departure takes place from simple successiveness than the nature of the history absolutely necessitates. Most private narratives, also, are constructed on this principle. The order of place applies to the description of any territory and its contents. Thus a farmer might describe his property by mentioning the different fields in succession as they lie in rows running east and west, and the various farm buildings with reference to some central structure. So one who had seen an exhibition of paintings might remember them according to the several places on the gallery wall in which they successively met his attention. Persons have been known who, after one or two readings, could repeat the entire contents of a daily newspaper; in which feat their memory, doubtless, was assisted by the order of place according to which the articles and advertisements followed each other in the columns of the paper. The collection of things to be remembered, into logical classes, according to the agreement and disagreement of their natures, is a principal step in the construction of any science, and, together with their proper subdivision, is an aid to the memorization, no less than it is to the comprehension, of facts and principles. This rule applies only so far as the matter of any department of knowledge admits of classification. Always helpful, it is more useful in relation to some topics of study than to others. Only classification enables the botanist and chemist to retain and recall the results of long-continued observation and experiment; no philosopher, statesman, man of letters, or man of business, can hope to have a large store of information at command if he do not digest the details of his

knowledge and arrange them under appropriate heads. Often, again, the connection of things in our recollection is maintained, not by any order belonging to the things themselves, but by an order in other things to which they are related. Should some city officer desire to remember personally all the men of business within his territory, he might recall them according to the local order of their places of business; or he might arrange them in his mind with reference to their modes of employment, each trade constituting a class by itself; or he might form an alphabetical list of their names and familiarize himself with them in this way. Finally, the arrangement of things in memory, according to their importance, or their degree of the possession of some quality, is often adopted. For in practical matters we desire to remember first that which is of most consequence, and then things of less importance; while, for the ends of display and impression, we begin with things of small moment, that the interest of our hearers may increase and may culminate at last. This order of importance is naturally followed when we would enumerate the individual persons or things in any class which we may have formed; and then it is supplementary to the order resulting from logical collection and division.

For one principle of order often co-operates with another in the guidance and assistance of our recollection. The order of place and that of time are concurrent with reference to objects viewed upon a journey. Those of time, causation, and written language, may unite in history. For the most part, one principle supplements the work of another, and arranges the details of some subordinate subject that has already found a place for itself as a whole. Thus the topics of history are first arranged according to the order of time, but each of them is then treated with reference to its own origin and development, contemporary occurrences being for the moment neglected. Sometimes, too, history must describe scenes according to an order of locality, and sometimes she must descend to mere descriptive lists or enumerations.

The foregoing observations may indicate in what way the mind, with more or less consciousness of purpose, elaborates its acquisitions so as to facilitate future recollection. They apply only to cases in which such elaboration is found desirable, and not to cases which call for no work save that of simple memorization. But it is to be observed that in this arrangement of materials for remembrance, the mind does not slavishly adhere to any one law which may have served a purpose, but employs some other law so soon as another may suggest itself as better fitted to group and unite together the materials to be remembered. Hence, the natural order, even of our most considered recollections, cannot be said to follow any principles fixedly, but rather uses one principle after another, and this with a frequent freedom of choice; in having which freedom memory differs from the reasoning power.

Artificial
monics.

mne-

Moreover, while care and ingenuity may greatly improve those mnemonic arrangements of acquired knowledge which the mind makes spontaneously, and this especially in collections of fact which admit of scientific arrangement, we believe that no "art of memory" can supersede the methods of nature, and that the work of nature admits of no improvements, save such as may result from the development and application of her methods. For this reason certain artificial devices, which have been recommended in both ancient and modern times as powerful aids to memory, have been found to be of limited application, and consequently of limited value. These devices may be illustrated by that of a pious servant girl, who connected the successive parts of the sermon on Sabbath morning, with the different panels in the ceiling of the church, and who thus, when the sermon was over, had a kind of map of it in her mind. Possibly, the instructions to which she listened, may have been improved in connectedness by having the order of place added to the order of thought; but, ordinarily, the parts of a well-composed discourse suggest each other better without such external aids. The recollective location of the several parts of a discourse upon those segments of a plane with which they had been previously associated, would tend to prevent the omission of any part from our rehearsal, but we question whether it would directly aid the remembrance of it. The effort needful to form the artificial association would weaken somewhat one's attention to the true and proper relations of the parts of the discourse, and in this way more might be lost than gained.

But, if an external association could be formed so easily and quickly as not to interfere with the perception of internal connections, the memory might be assisted by such an association. Hence, a good reader more easily learns sentences from a book than as repeated from the lips of another person. For he sees them in their places. Hence, too, historical charts, in which the comparative duration of kingdoms and the times of events are denoted to the eye, may be of considerable value to the student. Moreover, there is an especial advantage, when things have no close connection of their own, if we can impose one upon them by some easily-remembered device. Those who have studied Hebrew grammar may remember the Hæmantic and Begadkephath letters, which designations, and others like them, are simply mnemonic words, each composed of the class of letters which it names, and containing all of them. In like manner, the ancient Latin prosodists arranged lists of words in hexameters, so that they might be more easily committed; and of this sort is "The Memoria Technica of Mr. Grey, in which a great deal of historical, chronological, and geographical knowledge is comprised in a set of verses, which the student is supposed to make as familiar to himself as school-boys do the rules of grammar." A more familiar illustration is presented by the

old stanza, which begins, "Thirty days hath September," and by means of which the number of days in each month is fixed in our remembrance. That, too, was a marvelous piece of ingenuity by which Petrus Hispanus—afterwards Pope John XXII.—indicated in a few lines the character as to figure and mood of all lawful syllogisms, and the mode in which those of the second and third figures might be reduced to the first. He made a few short and easily remembered symbols express a great number of truths, not easily associated together. For we acquire and recall with special ease what may have been happily expressed in some rhythmical form of words.

CHAPTER XXXVII.

PHANTASY.

The reproductive phase defined.

§ 180. The reproductive phase of mental life comprises more than the mere exercise of the reproductive power, that is, more than the simple reproduction of past thought or knowledge, according to the laws of suggestion (Chap. XXVI.). It includes analysis, synthesis, judgment, quest, elaboration. It may be defined as that development of activity in which reproduction is the most prominent factor, and in which the mind, without making any advancement in knowledge, recalling and reconstructing the remembrances and ideas of its past acquisition, supplies itself with matter for contemplation. If we would sharply distinguish the reproductive from the elaborative phase, we must emphasize the fact that contemplation and the satisfaction to be immediately derived therefrom, constitute the principal and ultimate aim of the former mode of activity. When some recollection or imagination is used in the course of argumentative, or scientific, or moral, thought, not for its own sake, but for the purposes of conviction, or instruction, or guidance, this would belong to the rational, rather than to the reproductive, intellect. For the mind exercises all of its elementary powers in each of the phases of its activity. But, because such uses of reproduced thought can be exhibited well in connection with others in which contemplation is the end aimed at, they have sometimes been discussed in connection with the latter, and then assumed as understood in the philosophy of the discursive faculty. This course is not objectionable; there is rather an advantage in it, provided the reasons for it be understood.

Two names for the reproductive faculty. These names differently specialized.

We have already considered those mental operations in which the mind recalls and modifies its past *cognitions* (Chap. XXXV.). We shall now discuss those operations in which conceptions and ideas, abstracted from the conviction which originally accompanied them, are reproduced and elaborated. The

general faculty corresponding to these operations has received two names from philosophers. Some, adopting a Greek word, have called it the *phantasy*, or power of producing appearances; while a greater number have employed the Latin term *imagination*, which signifies the power of constructing likenesses. Both designations are figurative; and both direct attention to the principal function of the faculty, which is to furnish ideal or mental objects. But, while both terms have been applied to the general faculty, there is a difference in their use; the one emphasizes the reproductive, and the other the constructive activity, of mind. This difference becomes especially marked when either term is opposed to the other. Then the word *phantasy* signifies that development of the reproductive power, whose action receives little or no guidance from the will or judgment, in which a succession of fleeting appearances combine with each other, according to the spontaneous operation of the associative tendency. *Imagination*, as contrasted with *phantasy*, signifies that development of reproduction which is controlled by an intelligent purpose, and which accomplishes a desired work—that is, the elaboration of mental images or representations.

The reproductive faculty divided. Phantasy contrasted with imagination.

Those who have employed the term *imagination*, in the generic sense, have distinguished the two modes of the faculty as the reproductive and the productive imagination, the former of these being identical with the *phantasy*, in its specific character, and the latter with the *imagination*, as contrasted with mere *phantasy*. Yet we should notice that reproduction is not confined to the *phantasy*, nor production to the *imagination*. Reproduction is the essential basis of each style of activity; and the creations of either power are equally wonderful with those of the other. But, because *phantasy* works without the direction of skill and judgment, her constructions are largely accidental; they fall together like the patterns in a kaleidoscope; while *imagination*, being an intentional exercise of intellect, exhibits productions specially worthy of the name.

Characteristics of the general faculty.

1. Does not regard objects as real.

Before entering upon the discussion of either specific faculty, some remarks are due to that general character which belongs to both. Let us note the significant fact that *imaginative thought presents itself without attendant belief in the reality of its objects*. The essential difference between memory and *phantasy* is that, in the one, both the conceptions and the convictions of our original cognition are reproduced, while, in the other, conceptions only are recalled and used. A tailor may imagine himself a king; yet, unless he be deranged, or deceived in some way, he cannot believe himself to be one; but, when he remembers his customary occupation, he has both the conception and the conviction that he is a tailor. Thus nature herself distinguishes thought from belief—conception from conviction—a most important distinction in philosophy.

2. Its objects for the most part non-existent.

Again, let us remark, that *the objects of the imagination do not, for the most part, exist.* We may locate imaginary events in real places, and, in other ways, mingle knowledge with fancy. But the objects which imagination furnishes, and with which she is especially concerned, do not exist; when we call them objects, or more expressly speak of imaginary or ideal objects, we use a figurative sort of language to indicate that we are not really thinking of objects, but only using ideas in the same manner as if we were.

3. And all individual.

Adopting this mode of speech, we say, further, that *the objects produced by the imagination are all individual.* This statement does not conflict with the doctrine that generalization and its results, and the secondary powers generally, are employed in the reproductive phase of mental life. General notions furnish the rules which the imagination follows; and the attributes with which she clothes her creations, are abstracted from many sources. But those ideal objects which imagination produces are individuals. If they were of a general character they would belong to the discursive phase of thought, and would present laws or types such as reason uses. Imaginary objects and constructions may contain much that is indefinitely conceived, and may nearly approach universality, but they are always granted individual difference (§ 132). For, in contemplation, the mind loves individuality and whatever else may make thought more to resemble fact.

4. Employs the thoughts of existence and non-existence.

With respect to the ideas of existence and non-existence, the composition of imaginative does not differ from that of other thought. We conceive of things as existing, and as non-existent, and as matters of question, in the same way as we do in a narration of fact. The story of Mother Hubbard and her dog may furnish a good illustration, for those who are not high-minded. For Mother Hubbard and her dog and the cupboard, are conceived of as existing; but there is at first an imaginary question as to the existence of a bone, and whether or not the dog will get one; and then these latter conceptions are united with that of non-existence.

“For when she got there
The cupboard was bare;
And so the poor doggy got none.”

Imaginative thought, in its exhibition of objects, employs the same existential statements and conceptions that are employed by assertive or actualistic thought; but the propositions and conceptions of imagination are merely enunciative, while those which assert fact express also belief, or knowledge (§ 40).

5. Includes hypothetical judgment and belief.

In the next place, while imagination exhibits ideal objects as existing variously, without any judgment or belief as to the reality of this existence, it yet also *includes much judgment and belief concerning the imaginary existence of its own entities.* The judgments and beliefs thus

formed are hypothetical (§ 48), and are of two classes. They comprise, *first*, those pertaining to the relations which must exist, even in imagination, among any given set of entities, according to their nature and the nature of things in general; and, *secondly*, our judgments in regard to the fitness or unfitness of any element of conception to enter into the construction which we may be endeavoring to complete. The first of these modes of judgment belongs alike to phantasy and imagination; the second to imagination only. These judgments are hypothetical; they do not affirm the real existence of anything, but only assert that, on the supposition of the existence of certain objects, they must exist in certain relations, or in connection with certain other objects, which, therefore, must be supposed to exist also. Should one form to himself the conception, or read the description, of the capital of some ancient empire, he could not do so without giving the city a location in some country or province, or without supposing builders who erected it out of suitable materials, and houses and streets accommodated for private and public use, and inhabitants to occupy these. He would also conceive some governmental officers and regulations to be a necessary part of its constitution. Or were it his desire to plan a model capital for some Utopian kingdom, he would exercise judgment with respect to the site of the city, and the width, length, grade, and direction of its streets; with respect to the materials for building, the location and construction of buildings according to their several uses, and the disposition of parks, squares, fountains, trees, statues, and other ornamental additions; and the political, educational, and benevolent institutions, which might insure the well-being of the inhabitants. This exercise of judgment is a principal part of the work of the poet; it is because of his skill in the employment of it that he is called a poet—a *maker* of things beautiful and pleasing.

6. Not literally a creative, but only a reproductive and plastic, power.

The formations of fancy are often wonderfully different from anything to be found in actual existence, and, therefore, because of their great novelty, they have been styled creations. But it is scarcely necessary to observe that *imagination is only a reproductive and constructive faculty*; it is not literally a creative one. The novelty of her productions pertains only to their construction. Phantasy does not provide for herself a single elemental thought, but obtains all the materials for her building from the faculties of perception and acquisition. Hence, it is true, philosophically, that fact furnishes all the materials for fiction.

7. Is limited only to the sphere of abstract possibility.

Finally, we say that *the realm of phantasy* includes all things that have in them an element of possibility, and is, therefore, *bounded only by the absence of possibility*. The purely impossible—that which contains no element of possibility—cannot be conceived. We cannot imagine a change to take place without any cause, or two things to be one in the same sense in which they are two, nor anything to

be and not to be at the same time. Nor can anything impossible be conceived so far forth as it is impossible. But we can imagine things impossible which contain elements of possibility, provided only we confine our attention to these elements. The Lady Frangrantia asked of Baron Munchausen, "Pray, my dear Baron, were you ever at the Falls of Niagara?" "Yes, my lady," he replied, "I have been, many years ago, at the Falls of Niagara, and found no more difficulty in swimming up and down the cataracts than I should to move a minuet." In this story of the Baron we can discover no love of truth. He asserts, as a feat of his own, what would be a downright impossibility for any human being. Yet the statement has a sort of conceivability; for no one could swim without a sufficiency of water, and there is always plenty in the Falls of Niagara.

§ 181. We pass now to phantasy, or the spontaneous mode of the reproductive phase of thought. As contrasted with the imagination some have called this a passive power, because, in mere phantasy, voluntary agency is suppressed, and the associative tendency operates according to any influences that may be brought to bear upon it from within or from without. Nevertheless, in one sense, the mind is pre-eminently active in reproductive thought. In this case, the term *passive* can signify nothing more than that voluntary activity is either absent, or, at the least, subordinated, to that which is spontaneous.

Phantasy, like our other intellectual powers, never works wholly by itself. Generally, its operations mingle in that thronging crowd of activities which pass over the track of one's conscious life. Sometimes the soul is so engaged in the observation of fact, or so absorbed in memories of the past, or so intent upon the solution of some problem, that the contemplation of idealities is excluded; but, when our minds are not thus earnestly pre-occupied, we often entertain ourselves with passing fancies. This especially occurs when one's surroundings naturally suggest similitudes or suppositions. In a journey through a wild wooded country, strange shapes, to which the phantasy has given a nature not their own, present themselves to the lonely traveler; incidents, adventures, dangers, and escapes, are experienced, which have no nearer relation to reality than is to be found in the possibility of their occurrence and in their congruity with surrounding scenes. The lively images of phantasy fill up the intervals of observation and reflection.

But, in order to find this power in its purest and most uninterrupted exercise, we must turn to times at which the mind is freest from the influence of external objects and from the guidance of its own rational energy. For the first of these causes continually recalls the soul to the apprehension of fact, and the other determines its thoughts into some definite line of recollection or elaboration. This freedom is especially experienced whenever the general energies of body and mind are in a reduced

Phantasy. In what sense a passive power.

Never exercised alone. Its prominent manifestations.

or a disordered condition; and, for this reason, the phenomena of reverie, of dreams, of somnambulism, of the hallucinations of sense, and of insanity, all illustrate the workings of the phantasy.

The style of thought called reverie attends a condition of mind in which the vigorous exercise of our faculties is either prevented by weakness or exhaustion, or laid aside through indolence. The first thinkings of the infant are probably of this description; such also are the wanderings of extreme old age. In reverie an unprompted and unchecked succession of thoughts pass before the mind, and are contemplated with equal interest whether they be recollections or mere imaginings. But the principal part of reverie, and that which gives character to its operations, is the exercise of the phantasy. Persons fully occupied with care and business have little time for this indulgence; but those who are disengaged often spend hours in it. Thus employed, the ambitious youth lays out for himself a long course of exciting adventure or honorable achievement; and the maiden surrounds herself with the delights of a happy home in which she reigns the queen.

Less energy is needed for the action of phantasy than for the exercise of our other mental gifts. A noticeable degree of vigor is required even for distinct and satisfactory recollection. One whose remembrance may be undecided, by reason of apathy, or distraction, or weakness, or somnolency, may sometimes overcome this difficulty if he rouse himself to energetic and attentive thinking. An equal, if not a greater, degree of psychical force is demanded for any mode of external cognition. Mere sensation may not require much tension of mind, but the exercise of judgment or perception in connection with the sensation involves considerable. A yet larger draft on mental vigor is made by the elaborations of the imagination; while rational and abstract thought, in constructing its theories and solving its problems, calls for the highest exercise of energy and attention. For then we detain the passing idea, scrutinize remembered details, select significant, and reject insignificant, facts, carefully join consequents to antecedents and one correlate to another, and guide the whole work of reason to a satisfactory conclusion. Phantasy has no such labors to perform, and therefore works with ease.

In the grand Centennial Exposition, which recently took place in Philadelphia, there was one prominent building, called the Machinery Hall. In this hall, many steam engines, all supplied with power from one large boiler, were engaged in various labors. Some drove card-printing, silk-weaving, type-setting, pin-making, and other light machines; some assisted in the heavier tasks of cutting nails, stamping coins, turning fanning-wheels and furniture-lathes, and twisting ropes of wire or hemp; others gave motion to heavy mill-stones, or worked huge

Phantasy involves only a slight exercise of mental energy; the reason given.

pumps, or exerted enormous pressure upon bales of cotton or plates of iron, so as to alter these in bulk or shape. Now, we might suppose a time at which the supply of steam from the central reservoir would be insufficient to move the larger engines and their attachments, while yet those engines which had only light operations to sustain would be as busily at work as ever. And it is evident that, if the steam were shut off from the larger engines at any time, the smaller ones, when supplied with all the force to be expended, would work yet more vigorously, and that, too, with a less amount of motive power than would be usually employed for the whole collection of machinery. Something like this occurs in the economy of mind; and, for this reason, the operations of phantasy frequently appear more extensive, and even more vigorous, in proportion to the state of weakness or abeyance which may affect our other powers. Hence, persons who have recovered slowly from some severe sickness can tell how their enforced leisure and their convalescent weakness together, have been attended by many reveries.

Dreams.
Their origin.

This same law of mind is illustrated by an experience akin to reverie,—that is, by the dreaming which takes place in sleep. In this experience the exercise of the phantasy is more uninterrupted and complete than at any time during our waking hours. For this there are two reasons. *First*, the perception of external things is wholly, or in great measure, suspended during sleep, and so the influence of this perception to arrest and control the course of reproductive thought, is removed. And, *secondly*, that peculiar condition of inactivity, which the brain assumes in sleep, reduces the active energy of the soul more powerfully than fatigue, or languor, or indolence, or any other cause which operates while we are awake. In very deep sleep mental action probably ceases entirely; we are as devoid of thought and of sensation as when in a swoon. But in ordinary slumber those operations only are suspended which involve the more energetic action of the soul; the movements of the phantasy, and such others as may prove of equal facility, continue. The extent to which one's powers of attention and discrimination are suppressed in sleep is manifested in various ways, but especially in the acceptance by the mind of its own fancies for realities, in our failure to discover and reject the absurdities which enter into the composition of our dreams, and in the incoherent thinkings often exhibited by those who are but partially awakened. That the condition of sleep is peculiarly favorable to the exercise of phantasy is evident from the experience of all, but particularly from the fact that persons who show little or no play of imagination during their waking hours, can often entertain us with an account of wonderful dreams and visions which have come to them during the night. Most men have witnessed stranger and greater things while asleep, than they have ever been able to imagine when awake.

Belief in dreams
accounted for.
Prof. Stewart's
views.

The exercise of belief in dreams arises from several causes which act in conjunction with the suppression of our more energetic modes of thinking. Prof. Stewart ascribes our delusion in dreaming to "a suspension of the influence of the will," including therein the suspension of "recollection and reasoning" as voluntary operations. ("Elements," part i. chap. v.) But, inasmuch as some part of our suppressed activity seems independent of the will, it may be more satisfactory to say that sleep suspends, not merely the volitional control of our faculties, but also every really powerful exercise of them, whether voluntary or not. Such being the case, we are not only liable to be imposed upon by a succession of images over which we have no control, and which, in this respect, resemble our actual perceptions, but, our ordinary vigor of discrimination being lost, we are less able to judge respecting the real character of those images which pass before us. These causes, together with our separation from conscious contact with external objects, and from their stimulating and regulating influence, may account sufficiently for the delusiveness of dreams. But Prof. Stewart—though in a different connection—adds another thought to the explanation mentioned above. He teaches that *a momentary conviction of reality attends every exercise of the imaginative power*, and that it is only by a judgment immediately consequent upon the imaginative act that this belief is corrected. If this were so, our failure, through the want of mental vigor, to make the requisite correction, would allow the instinctive error to remain. The professor says, "The impression which the objects of imagination make on the mind is so momentary and is so immediately corrected by the surrounding objects of perception, that it has not time to influence our conduct. Hence we are apt to conclude that the imagination is attended with no belief; and the conclusion is surely just in most cases, if by belief we mean a permanent conviction which influences our conduct. But, if the word be used in the strict logical sense, I am inclined to think, after the most careful attention to what I experience in myself, that the exercise both of conception and of imagination is always accompanied with a belief that their objects exist. When a painter conceives the face and figure of an absent friend, in order to draw his picture, he believes for the moment that his friend is before him. The belief, indeed, is only momentary; for it is extremely difficult, in our waking hours, to keep up a steady and undivided attention to any object we conceive or imagine; and, as soon as the conception or imagination is over, the belief which attended it is at an end. We find that we can recall and dismiss the objects of these powers at pleasure; and, therefore, we learn to consider them as creations of the mind which have no separate and independent existence" ("Elements," chap. iii.). This doctrine can scarcely be maintained in its full extent. We do not think that a painter who conceives the face and figure of an absent friend, believes,

for the moment, that his friend is with him. And, however this may be with persons remarkably endowed, it is certain that ordinary people do not believe that the absent friends or distant scenes and objects of which they may be thinking, really exist before them. The writer recalls the appearances of two noble men, his uncles, Hugh and John, without for a moment believing them to be present here in the land of the living. The truth is, that the mind, when in the full normal exercise of its faculties, can judge immediately of the character of its passing states. When a sensation may be felt, and its external cause perceived in connection with it, this is recognized as a sense-perception. When the thought of former things is reproduced, with belief in their past reality, this is accepted as remembrance. And conceptions which occur without sensation, or presented object, or belief in the past, are known to be imaginations. We believe, too, that these differences are understood at a very early age, probably at the very commencement of distinct thought. But, while we cannot admit that momentary belief in things imagined is an original and constitutional principle, nor even an ordinary rule, of mental action, *we must allow that an involuntary and irrational belief is frequently experienced*; and we account for this belief by the well-known tendency of the intellect to form instinctive habits of judgment. In this way, principally, we explain the fact, noticed by Dr. Reid, that "Men may be governed in their practice by a belief which, in speculation, they reject. I knew a man," says he, "who was as much convinced as any man of the folly of the popular belief of apparitions in the dark: yet he could not sleep in a room alone nor go into a room in the dark. Can it be said that his fear did not imply a belief of danger? This is impossible. Here an unreasonable belief, which was merely a prejudice of the nursery, stuck so fast as to govern his conduct, in opposition to his speculative belief as a philosopher and a man of sense." We are satisfied with this theory, that the belief was a "prejudice of the nursery." A similar momentary delusion, resulting from the wrong application of acquired principles, may explain the anger occasionally manifested when one is suddenly struck or injured by inanimate objects, and that timidity which some experience when looking down from a lofty battlement, or standing near an instrument of death or torture. Mr. Locke knew a gentleman who was restored from insanity by a harsh and exceedingly painful operation; and he relates that this gentleman, "With great sense of gratitude and acknowledgment, owned the cure all his life after as the greatest obligation he could have received; but, whatever gratitude and reason suggested to him, he could never bear the sight of the operator; that image brought back with it the idea of that agony which he suffered from his hands, and which was too mighty and intolerable for him to endure." One might maintain that such cases as these may be accounted for by the mere excitation of feelings, unattended by any belief in the pres-

ent existence of objects suitable to cause them, the feelings being excited immediately and simply by the conception, or imagination, of the objects. But we rather think that a momentary delusion often occurs in such cases; and there can be no doubt that such delusions take place in cases where our emotions are not concerned, and where the error must result from a misapplied habit of judgment. Such mistakes especially affect our acquired sense-perceptions and the methods of our daily occupations. And, certainly, if instinctive habits of judgment may cause momentary delusion during our waking hours, we may expect them to cause a more perfect and prolonged delusion during sleep. The force of habit, therefore, is a cause which intensifies the operation of that already named, whereby conceptions, because of their involuntary character, or their complete occupation of our attention and interest, are sometimes mistaken for perceptions.

Although the general principle, that mental energy is reduced during sleep, is supported by too many facts to admit of denial, certain phenomena are occasionally observed which seem to conflict with it.

These phenomena exhibit results such as are ordinarily obtained by persistent mental effort. Persons have remembered things in dreams which they had vainly endeavored to recollect while awake; others have solved problems upon which they had been long pondering; others have composed speeches and poems which they could afterwards recite. "Condorcet, a name famous in the history of France, told some one that, while he was engaged in abstruse calculations, he was frequently obliged to leave them in an unfinished state, in order to retire to rest; and that the remaining steps and the conclusion of his calculations have more than once presented themselves in his dreams. Franklin has made the remark that the bearings and results of political events which had caused him much trouble while awake, were not unfrequently unfolded to him in dreaming. And Mr. Coleridge says that, as he was once reading in the Pilgrimage of Purchas an account of the palace and garden of Khan Kubla, he fell into a sleep, and in that situation composed an entire poem of not less than two hundred lines, some of which he afterward committed to writing. The poem is entitled *Kubla Khan*, and begins as follows:

"In Zanadu did Kubla Khan
A stately palace dome decree,
Where Alph, the sacred river, ran,
Through caverns measureless to man,
Down to a sunless sea."

Such experiences as these are not of common occurrence. They belong, for the most part, to minds of extraordinary talent, and indicate the natural effortless workings of genius in some accustomed channel. They occur while slumber is light and the brain in an excited condition. Moreover, the new insight occasionally obtained in dreams may be accounted for by the free play of the

suggestive power about subjects with whose important relations the mind has become familiar. For it is well-known that great discoveries, though not made without long study and research, have generally flashed into the mind of the investigator at some unexpected moment. Thus, by a happy intuition, Newton discovered gravitation, Archimedes the principle of specific gravity, and Goodyear the vulcanization of rubber.

Although sense-perception does not ordinarily take place in sleep, except to a limited extent in our lighter slumbers, the mind is not unconscious of various *sensations*, and is often influenced by them in the formation of its dreams. Every one can remember instances of this phenomenon which have occurred within his own experience. Sometimes a noise indistinctly heard suggests some violent occurrence; or pressure upon one's person excites the idea of a struggle with an overmastering antagonist. Often an undigested supper produces incubus, or nightmare, in which one vainly attempts to escape from troubles and burdens, by which he is surrounded and oppressed. "Dr. Gregory relates that, having occasion to apply a bottle of hot water to his feet, he dreamed that he was walking on Mount Etna, and found the heat insupportable. A person suffering from a blister applied to his head, imagined that he was scalped by a party of Indians. A person sleeping in damp sheets dreamed that he was dragged through a stream. By leaving the knees uncovered, as an experiment, the dream was produced that the person was traveling by night in a diligence. Leaving the back part of the head uncovered, the person dreamed that he was present at a religious ceremony in the open air. The smell of a smoky chamber has occasioned frightful dreams of being involved in conflagration. The scent of flowers may transport the dreamer to some enchanted garden, or the tones of music may surround him with the excitements of a well-appointed concert."

We have seen, in the discussion on memory, that our estimates of time are, for the most part, founded on our experience of the duration of events, and are made by a habit of judgment in which transactions are accepted as indicating the time occupied by them. Such being the case, it is evident that a mistaken belief as to the reality of events will be naturally accompanied by a corresponding delusion as to the passage of time. A deception is experienced analogous to that effect which is sometimes produced in connection with the sense of sight. "When I look into a show-box," says Prof. Stewart, "if the representation be executed with so much skill as to convey to me the idea of a distant prospect, every object before me swells its dimensions in proportion to the extent of space, which I conceive it to occupy; and what seemed before to be shut within the limits of a small wooden frame, is magnified in my apprehension to an immense landscape of woods, rivers, and mountains." Moreover, since phan-

The influence of sensations in dreams.

The estimation of time in dreams.

tasies may succeed each other with great rapidity, a long series of events sometimes seems to transpire during a short dream. "Our dreams," says Dr. Upham, "not unfrequently go through all the particulars of some long journey, or of some military expedition, or of a circumnavigation of the globe, or of other long and perilous undertakings, in a less number of hours than it took weeks, or months, or even years, in the actual performance of them. We go from land to land, and from city to city, and into desert places; we experience transitions from joy to sorrow, and from poverty to wealth; we are occupied in the scenes and transactions of many long months; and then our slumbers are scattered, and, behold, they are the doings of a watch in the night!" Dr. Abercrombie relates that a friend of his "dreamed that he crossed the Atlantic and spent a fortnight in America. In embarking on his return he fell into the sea, and, having awoke with the fright, discovered that he had not been asleep above ten minutes." Count Lavalette, while under sentence of death in Paris, had a dream which has often been used to illustrate the present topic. The following is his account of it: "One night, while I was asleep, the clock of the Palais de Justice struck twelve, and awoke me. I heard the gate open to relieve the sentry but I fell asleep again immediately. In this sleep I dreamed that I was standing in the Rue St. Honoré at the corner of the Rue de l'Echelle. A melancholy darkness spread around me; all was still; nevertheless, a low and uncertain sound soon arose. All of a sudden I perceived, at the bottom of the street, and advancing towards me, a troop of cavalry, the men and horses all flayed. This horrible troop continued passing in a rapid gallop, and casting frightful looks on me. Their march, I thought, continued for five hours, and they were followed by an immense number of artillery wagons, full of bleeding corpses, whose limbs still quivered; a disgusting smell of blood and bitumen almost choked me. At length the iron gate of the prison, shutting with great force, awoke me again. I made my repeater strike; it was no more than midnight, so that the horrible phantasmagoria had lasted no more than two or three minutes, that is to say, the time necessary for relieving the sentry and shutting the gate. The cold was severe and the watchword short. The next day the turnkey confirmed my calculations."

Somnambulism.
A theory of.

§ 182. The phenomena of the phantasy, in connection with *somnambulism*, or abnormal sleep, are *essentially the phenomena of dreaming modified by certain affections of the brain and nervous system*. On the immediate nature of the action of this organ no one has ever yet thrown any light. We know that mental changes are conditioned on cerebral. The function of the brain seems to be a regulative limitation imposed by creative wisdom upon the present exercise of our faculties. In ordinary sleep a general dormancy invades this whole organ. This dormancy admits of degrees, so that certain modes of psy

chical operation may continue, while others are totally or partially suppressed. If, to this statement, we add that some parts, or specific functions, of the brain may be affected with somnolency, while others are in an excited and active condition, we shall have a sufficient basis for a theory of somnambulism. Even in ordinary sleep our different faculties do not cease to act at once or equally. Cabanis, a French savant, after certain experiments, held that sight becomes quiescent first, then taste, then smell, then hearing, and, lastly, touch. This order probably is often departed from; but the statement of Cabanis may be accepted as a general rule. Moreover, some of our senses sleep more profoundly than others. Often, when a loud noise will not awaken one, if the soles of his feet be tickled, or even if he be touched anywhere, he is immediately aroused. And our internal and vital sensations almost always exhibit some activity.

Should we now suppose a special excitement of the brain in one part or function whereby psychological life in some one direction should be facilitated or stimulated, while, in other directions, our powers should cease to operate, this would explain the phenomena of somnambulism, especially in cases where a cerebral excitement may have arisen in connection with an excitement of the mind itself. For, in attempting to account for the singular modes of activity now under consideration, we must have regard to one's existing mental tendencies as well as to the cerebral conditions under which these act.

An instructive description of somnambulism, as it is ordinarily experienced, is to be found in Shakespeare's account of the conduct of Lady Macbeth, after she and her husband had obtained the throne of Scotland through the foul murder of King Duncan. The great dramatist misses none of the essential features of the phenomenon, and, therefore, we shall quote at full length the passage to which we refer. It is the opening scene of the fifth act of the tragedy.

Illustrated from
Shakespeare.

[*“Enter a Doctor of Physic, and a waiting Gentlewoman.”*]

“Doct. I have two nights watched with you, but can perceive no truth in your report. When was it she last walked?

“Gen. Since his majesty went into the field, I have seen her rise from her bed, throw her night-gown upon her, unlock her closet, take forth paper, fold it, write upon it, read it, afterwards seal it, and again return to bed; yet all this while in a most fast sleep.

“Doct. A great perturbation in nature! to receive at once the benefit of sleep, and do the effects of watching. In this slumbry agitation, besides her walking and other actual performances, what, at any time, have you heard her say?

“Gen. That, sir, which I will not report after her.

“Doct. You may, to me; and 'tis most meet you should

“Gen. Neither to you, nor to any one; having no witness to confirm my speech.

[*“Enter Lady Macbeth, with a lighted taper.”*]

Lo you, here she comes! This is her very guise; and, upon my life, fast asleep. Observe her; stand close.

“Doct. How came she by that light?

“Gen. Why, it stood by her: she has light by her continually; 'tis her command.

“Doct. You see, her eyes are open.

“Gen. Ay, but their sense is shut.

“Doct. What is it she does now? Look, how she rubs her hands.

“Gen. It is an accustomed action with her, to seem thus washing her hands: I have known her to continue in this a quarter of an hour.

“Lady M. Yet here's a spot.

“Doct. Hark! she speaks: I will set down what comes from her, to satisfy my remembrance the more strongly.

“Lady M. Out, damned spot! out, I say!—One, two; why, then 'tis time to do't.—Hell is murky!—Fie, my lord, fie! a soldier, and afeard? What need we fear who knows it, when none can call our power to account?—Yet who would have thought the old man to have had so much blood in him?

“Doct. Do you mark that?

“Lady M. The thane of Fife had a wife; where is she now?—What, will these hands ne'er be clean?—No more o' that, my lord, no more o' that: you mar all with this starting.

“Doct. Go to, go to; you have known what you should not.

“Gen. She has spoke what she should not, I am sure of that: Heaven knows what she has known.

“Lady M. Here's the smell of the blood still: all the perfumes of Arabia will not sweeten this little hand.—Oh, oh, oh!

“Doct. What a sigh is there! The heart is sorely charged.

“Gen. I would not have such a heart in my bosom, for the dignity of the whole body.

“Doct. Well, well, well,—

“Gen. Pray God, it be, sir.

“Doct. This disease is beyond my practice; yet I have known those which have walked in their sleep, who have died holily in their beds.

“Lady M. Wash your hands, put on your night-gown; look not so pale:—I tell you yet again, Banquo's buried; he cannot come out of his grave.

“Doct. Even so?

“Lady M. To bed, to bed; there's knocking at the gate: come, come, come, come, give me your hand; what's done, cannot be undone: to bed, to bed, to bed, to bed.

“Doct. Will she go now to bed?

“Gen. Directly.

“Doct. Foul whisperings are abroad: unnatural deeds
Do breed unnatural troubles; infected minds
To their deaf pillows will discharge their secrets.”

Analysis of the illustration.

In the foregoing scene, let us note, *first*, that Lady Macbeth is evidently sleeping. This agrees with the doctrine that somnambulism is nothing else than an unnatural or morbid sleep. In the *next* place, she has complete command of her limbs and bodily motions. She is able, not only to walk, but to dress, to take up and carry a candlestick, to write, to speak, and, in short, to do whatever other action may be pertinent to that collection of conceptions and delusions with which her mind is occupied. For somnambulism is so called, only because walking is the most notable performance of persons who may be thus affected; as a matter of fact, they show themselves capable of a variety of actions; though this capability is greater in some cases than in others. In the *third* place, Lady Macbeth exhibits a partial or limited exercise of the perceptive faculties. Her open eyes doubtless receive images of the persons and objects about her. She apparently has the *sensations* of vision, but she *perceives* only those objects which are immediately related to her own internal activity. Her conduct resembles that of an obsequious courtier who, in the presence of a great man, is oblivious of the existence of all other persons. What mental energy she has is entirely engrossed in one way of thinking; none can spend itself in any other direction. She neither sees nor hears the doctor and the nurse. This limitation of perception is a significant feature in somnambulism, as those can testify who have looked into the bright, yet vacant, eyes of their friends, who have been thus affected. *Again*, the thoughts of Lady Macbeth evidently run in a channel prepared for them by her previous experience. Persons who walk in sleep do so usually after some excitement which they have encountered, and their actions and words have reference to circumstances in which they have become deeply interested. *Further*, the incoherence of Lady Macbeth's utterances is noticeable. Each sentence has sense in itself and relates to a common general subject; but it is not rightly connected with those that precede and with those that follow. Here, also, Shakespeare reproduces nature. Sometimes the sayings of the somnambulist may not be so inconsequent as those of Lady Macbeth; but, as a rule, they do not yield any connected sense. *Finally*, it is clear that Lady Macbeth, on the succeeding morning, had no remembrance of her strange conduct; this agrees with the observation that somnambulists either entirely forget their eccentric performances, or remember them only as parts of a dream. Dr. Abercrombie tells the story of a young nobleman, living in the citadel of Breslau, who was observed by another boy, his brother, "to rise in his sleep, wrap himself in a cloak, and escape, by a window, to the roof of the building. He there tore in pieces a magpie's nest, wrapped the young birds in his cloak, returned to his apartment, and went to bed. In the morning he mentioned the circumstances as having occurred in a dream, and could not be persuaded that there had been anything more than a dream, till he

was shown the magpies in his cloak." The somnambulist probably does not differ from other dreamers with respect to the recollection of his performances during sleep.

Beside the somnambulism which we have now described, and which may be regarded as that ordinarily experienced, there are forms of the phenomenon which may be styled extraordinary, and which, for the purposes of discussion, we shall distinguish into the magnetic and the ecstatic. The former of these is remarkable for its origin; the latter for its exhibition of talent. Magnetic somnambulism is so named from the supposition that it is produced by a force somewhat similar to magnetism, and which, therefore, has been called animal magnetism. The doctrine has been taught that this force, being generated in connection with our corporeal functions, accumulates largely in some animals and persons, and can be emitted by them at their will, so as to control organizations specially liable to be affected by it. Dr. Francis Mesmer advocated this theory in France during the latter part of the eighteenth century, and made it the basis of a system of therapeutics, which, after investigation by a governmental commission, was rejected as of no value. Mesmer was quite successful in producing somnambulism by means of passes of the hand and with the aid of apparatus addressed to the imagination and suggestive of some mysterious influence; since his time, the term *mesmerism* has been applied to the theory and practice of his art. Although there is no evidence of the existence of any such thing as animal magnetism, it is certain that some persons can effect a wonderful change in the mental and bodily state of others who submit to be manipulated by them. It is an established fact that when one is overcome by the mesmeric sleep, he becomes obtuse to all impressions save those which have relation to the operator; the very succession of his thoughts and actions follows the suggestion and guidance of the operator. From this it will be apparent that mesmeric sleep resembles ordinary somnambulism in permitting only a limited exercise of the perceptive faculties, but differs from it in being caused and controlled by an artificial influence. It seems to be the immediate result of the action of a peculiar mental excitement upon a susceptible, nervous system. In connection with the mesmeric sleep we may mention a similar phenomenon, which may also be regarded as of artificial origin. For some persons exhibit the power of putting themselves into a somnambulist condition, during which they develop trains of thought and of speech on subjects with which they have become familiar. This power is sought and cultivated by those spiritualistic "mediums," who profess, by means of it, to put themselves into communication with another world.

That form of somnambulism which we have termed Ecstatic somnambulism. ecstatic is a development of either the natural or the artificial somnambulism, under conditions which produce a remarkable exercise of one's gifts. "The somnam-

bulist," says Pres. Porter, "sometimes displays great acuteness of judgment. He sees resemblances and differences which had not occurred to him in his waking states, and which astonish lookers-on. He is quick in repartee; solves difficult questions; he composes and speaks with method and effect; he reasons acutely; he interprets character with rare subtlety; he understands passing events with unusual insight; he predicts those which are to come by skillful forecast. He appears to be another person endowed with new gifts, or quickened by some extraordinary inspiration." Dr. Porter qualifies this description afterwards by saying, "These efforts themselves are single and isolated sallies of subtlety and insight, rather than sustained and connected trains of judgment and reasoning." He accounts for them by a special concentration and excitement of mind, during which one's thoughts are occupied with but few objects, and exercised in the line of his previous efforts and training. This ecstatic somnambulism resembles that wonderful dreaming in which intellectual feats have been easily accomplished, or in which, so to speak, they have accomplished themselves. It may sometimes indicate a genius which slumbers under the ordinary conditions of one's life. But as it is generally, if not always, accompanied with intense cerebral action, we are inclined to ascribe it chiefly to the stimulus given to our mental powers by a morbidly excited brain.

The supernatural production and control of an ecstatic state, whereby one is rapt from earthly things and made the mouth-piece of celestial wisdom, is an important subject, which, however, lies beyond our present purpose. Such inspiration is a possibility; but it should not be assumed, as a fact, without sufficient evidence.

In connection with ecstatic somnambulism we should notice some extraordinary claims made by those who practice the art of mesmerism. They assert that the somnambulist often sees objects in the profoundest darkness and without the use of the ordinary organs of vision; that he can behold places and persons on the other side of the globe as if he were there with them; and that he is able to divine the seat and cause of disease, and to foretell future events. So far as the perception of things distant or future is concerned, we may safely hold that nothing occurs beyond the deceptive imaginations of the dreaming state: the man who sees Lake Lucerne, or Righi Kulm, in a vision, only imagines what appearance the lake, or the mountain, would have, if he saw them in reality. The mediumistic diagnosis of disease seems to be simply guesswork and quackery. But we allow that the sensitiveness of our organs, and of our minds in connection with them, is often quickened to a very great degree during somnambulism, so that sensation and perception may take place under conditions which would not ordinarily suffice for their production. In this way we explain such feats as those of Jane Rider, mentioned in Dr. Oliver's physiology

(chap. xxx.). The eyes of this woman were securely bandaged with two large wads of cotton and a black silk handkerchief. "The cotton filled the cavity under the eye-brows and reached down to the middle of the cheek; and various experiments were tried to ascertain whether she could see. In one of them a watch inclosed in a case was handed to her, and she was requested to tell what o'clock it was by it; upon which, after examining both sides of the watch, she opened the case, and then answered the question. She also read, without hesitation, the name of a gentleman, written in characters so fine that no one else could distinguish it at the usual distance from the eye. In another paroxysm, the lights were removed from her room, and the windows so secured that no object was discernible, and two books were presented to her, when she immediately told the titles of both, though one of them was a book which she had never before seen." Occurrences like these have led some to conjecture that the soul may become independent of organs, and be able, even while in the body, to perceive objects without intervention of the senses. This view is not warranted by necessity. The theory of an ecstatic state of the powers of sense is to be preferred.

Hallucinations. The part which phantasy plays in producing those hallucinations and apparitions which sometimes substitute themselves for realities, is to be distinguished from the operation of this power in connection with the delusions of dreaming. In the latter, deception results from a reduction of the energies of the soul and the absence of the corrective influence of external perception; but the hallucinations of sense mingle themselves with our veritable cognitions and take place in spite of the exercise of a sound judgment and of our condemnation of them as fanciful. In this they resemble those errors of perception which spring from our instinctive habits of judgment. The principal cause of these hallucinations is a morbid condition of the organs of sense. When these organs become unnaturally susceptible of action, it is possible for the sensations appropriate to the perception of some object to be produced in them while the object itself is absent. This happens, for the most part, we believe, through the influence of the phantasy; though it may result, also, from the stimulation of a reproductive tendency in the organ itself, under some physical excitement. In either case the sensible impression of the organ combines with the action of the intellect, and produces a phantasm or image which closely resembles an object of perception. Sometimes this phantasm is indistinct and transitory, as when, waking from feverish sleep, one may fancy that he sees and hears, when no real perceptions take place. These hallucinations are easily rejected, and are soon forgotten; but when, through the strength of disease, apparitions become vivid and stable, sober discrimination is needed to perceive that they are merely mental images,

“ false creations,
Proceeding from the heat-oppressed brain.”

When the power of discrimination is wholly lost, as it is in delirium and insanity, the deception becomes complete and prolonged. We remember the conduct of a poor lieutenant whom we visited in his hut during the late war, and who was suffering from delirium tremens. “These, sir,” he said, pointing here and there about him, “are the reptiles that are going to devour me.” Then, springing up, he rushed out into the company street, seized whatever missiles came to hand, and flung them, with all his force, at the doors, corners, and chimneys of the huts of his comrades, and wherever else he could spy his imaginary tormentors.

The fact that sense-hallucinations attack those who are addicted to the habitual use of spirituous liquors, or of opium, cannabis Indica, or other narcotic stimulant, shows that this phenomenon has its principal origin in a disorder of the nerves. Generally the beginning and the ending of every experience of hallucinations can be connected with some physical cause. Two cases, chiefly remarkable for being scientifically recorded, may illustrate the general character of hallucinations. The first, which

Illustrations.

is reported in the “Edinburgh Medical Journal,” is that of a citizen of Kingston on Hull. This man had a quarrel with a drunken soldier who attempted to enter his house, during which “the soldier drew his bayonet, and struck him across the temples, dividing the temporal artery. He had scarcely recovered from the effects of a great loss of blood on this occasion, when he undertook to accompany a friend in his walking-match against time, during which he went forty-two miles in nine hours. Elated by his success, he spent the whole of the following day in drinking. The result of these things was an affection—probably an inflammation—of the brain: and the consequence of this was the existence of those vivid states of mind which are termed apparitions. Accordingly, our shop-keeper, for that was his calling, is reported to have seen articles of sale upon the floor, and to have beheld an armed soldier entering his shop, when there was nothing seen by other persons present. In a word, he was, for some time, constantly haunted by a variety of specters, or imaginary appearances; so much so, that he even found it difficult to determine which were real customers, and which were mere phantasms of his own mind.” The other case, that of Nicolai, a distinguished Prussian bookseller, is preserved in a memoir read by himself before the Royal Society of Berlin, on the 28th of February, 1799. We abridge the quotation given by Dr. Upham. Mr. Nicolai was a person of unusual intelligence and of vivid imagination, and at the time of the occurrence of the hallucinations, had been agitated by a great trouble. “My wife,” he says, “came into my apartment in the morning to console me, but I was too much

agitated to be capable of attending to her. On a sudden I perceived, at about the distance of ten steps, a form like that of a deceased person. I pointed at it, asking my wife if she did not see it. My question alarmed her very much, and she immediately sent for a physician. The phantom continued about eight minutes. I grew more calm, and, being extremely exhausted, fell into a restless sleep, which lasted half an hour. At four in the afternoon, the form which I had seen in the morning reappeared. I was by myself when this happened, and, being uneasy at the incident, went to my wife's apartment; there, likewise, I was persecuted by the apparition, which, however, at intervals disappeared, and always presented itself in a standing posture. About six o'clock there appeared, also, several walking figures, which had no connection with the first. After the first day the form of the deceased person no more appeared, but its place was supplied with many other phantoms, sometimes representing acquaintances, but mostly strangers; those whom I knew were composed of living and deceased persons, but the number of the latter was comparatively small. The persons with whom I daily conversed did not appear as phantoms. These appearances were equally clear and distinct at all times and under all circumstances, both when I was by myself and when I was in company, as well in the day as in the night, and in my own house as well as abroad. They were less frequent when I was in the house of a friend, and rarely appeared to me in the street. When I shut my eyes, they would sometimes vanish entirely, though there were instances when I beheld them with my eyes closed; yet, when they disappeared on such occasions, they generally returned when I opened my eyes. All these phantasms appeared to me in their natural size, and as distinct as if alive, exhibiting different shades of carnation in the uncovered parts, as well as different colors and fashions in their dresses, though the colors seemed somewhat paler than in real nature. The longer they visited me, the more frequently did they return; and they increased in number about four weeks after they first appeared. I also began to hear them talk; they sometimes conversed among themselves, but more frequently addressed their discourse to me. Sometimes I was accosted by these consoling friends while I was engaged in company, and not unfrequently while real persons were speaking to me." In both the foregoing cases it is to be remarked that, although the hallucinations were involuntary and could neither be banished nor recalled at pleasure, their true character became speedily and perfectly known to the persons who suffered from them. In both cases blood-letting was found an effectual remedy.

The exercise of phantasy is a prominent feature in most forms of insanity, as those know, who have listened to the amazing claims and wild vagaries of madmen. This is the natural result of that distraction and dissipation of energy, and that loss of the power of attentive judgment, which are the essential elements

of mental derangement. The false beliefs of madness arise from the distraction and dissipation, just as the delusions of dreaming result from the suspension or reduction, of our mental vigor.

CHAPTER XXXVIII.

IMAGINATION.

§ 183. Prof. Stewart has discussed the subject of Imagination defined. imagination at greater length than any other English author. He teaches that imagination is not a simple power, like attention, conception, and abstraction, but a combination of faculties. More explicitly, he says, "Imagination is a complex power. It includes conception, or simple apprehension, which enables us to form a notion of those former objects of perception or of knowledge, out of which we are to make a selection; abstraction, which separates the selected materials from the qualities and circumstances which are connected with them in nature; and judgment, or taste, which selects the materials and directs their combination. To these powers we may add that particular habit of association to which I formerly gave the name of fancy, as it is this which presents to our choice all the different materials which are subservient to the efforts of imagination." This enumeration of constitutive powers cannot be taken as exhaustive. We are convinced that all the elemental powers of mind, whether primary or secondary, take part in the work of imagination, though some of them only in a subordinate degree. Belief or conception, for example, is subordinated to thought or conception, analysis to synthesis, and the power of generalization to that of individualization. But Prof. Stewart's enumeration sets forth those powers which are the principal factors in the imaginative work of mind and whose predominance determines the peculiar character of this mode of thought. Moreover, we think that the power of "conception," of which Stewart speaks, and that "habit of association," which he calls fancy, and which we may identify with representation, may properly be united in one, inasmuch as they are both included in the power of reproduction or suggestion (§ 109). We shall, therefore, define the imagination as *the reproductive power considered as producing ideal objects under the intentional guidance of an abstractive and synthetic judgment*—a definition which is really that of Prof. Stewart, modified to accord with a later terminology than his.

This faculty is distinguishable from mere phantasy by reason of that special exercise of judgment which we have just named. In imagination, the mind always aims to form for itself objects in the contemplation of which some end of pleasure, knowledge,

useful direction, or practical influence, may be promoted. The elements of those conceptions, which are presented by the suggestive power, are chosen or rejected according to their fitness to serve the end. Hence the faculty of imagination, like that of reasoning, involves a voluntary control of our thinking powers. Dr. Brown somewhat imperfectly expresses this truth by saying that the higher imagination is a combination of association or suggestion with intention or desire (Lect. XLII.).

This author also signalizes the fact that imagination is a faculty exercised by every human being.

“Our romances of real life,” he says, “though founded upon facts, are in their principal circumstances, fictions still, and, though the fancy which they display may not be so brilliant, it is still the same in kind with that which forms and fills the history of imaginary heroes. The dullest plodder over the obscurest desk, who sums up, in the evening, his daily tables of profit and loss, and who rises in the morning with the sole object of adding a few ciphers to that book of pounds and pence, which contains the whole annual history of his life—even he, while he half lays down his quill to think of future prices and future demands, or future possibilities of loss, has his visions and inspirations like the sublimest poet—visions of a very different kind, indeed, from those to which poets are accustomed, but involving as truly the inspirations of fancy.” The truth of this statement is evident; for all those hopes and fears, ambitions and aspirations, plans and prospects, which occupy and control the minds of men, derive their existence, in great part, from the exercise of the imaginative power.

The comparatively insignificant place which has been granted to imagination, in most metaphysical writings, is to be accounted for, partly because philosophers have been mainly interested in those operations by which truth and knowledge are secured, and partly because there is not much in the theory of the imagination to exercise philosophical acumen and subtlety. This faculty, nevertheless, is an essential part of the constitution of the mind. Were man’s thoughts confined exclusively to memories of the past, and cognitions of the present, together with such views of the future as can be obtained from accurate inference, life would be a dull affair indeed. But now, bright hopes animate our efforts, lofty ideals present themselves for our realization, and gentle fancies soften the rough realities with which they mingle; thus we are solaced in the midst of cares, and are beckoned onward in the pursuit of noble ends.

Although imagination belongs to all men, it is a gift granted to some in vastly more abundant measure than to others. For men differ far more as to their mental than as to their bodily endowments. The distance between a stupid clown and a cultured, educated genius, is greater than that between a feeble gentleman and a practiced athlete. Persons remarkable for imagination commonly

But pre-eminently possessed by some.

possess quick and lively sensibilities. This partly results from the vividness of their conceptions, but it also stimulates and increases their ability to form such conceptions; for this reason, the natural difference of persons in imaginative power, becomes greatly increased as their minds and characters develop.

The faculty of imagination sometimes works on its own account; that is, it creates scenes and objects simply for the satisfaction of surveying them. But, at other times, its operations are subservient to purposes more remote than any included in this satisfaction. We cannot do better than to consider it, first in the one, and then in the other, of these relations. Moreover, if, in our discussion, we should chiefly refer to extraordinary instances of the exercise of this power, it is to be remembered that the nature of what is common is often best illustrated by means of what is remarkable.

The poetic imagination.
The fancy. That development of imagination which elaborates im- mental objects for the satisfaction of surveying them, may be distinguished as the poetic imagination. But when exercised with little rational control, without any attempt at a serious and systematic work, and simply for the purpose of providing pleasing images, it is often called the fancy—a name, which implies that this is a mode of thought not far removed from simple phantasy. The poetic imagination, again, with reference to two well-known developments of genius that depend upon it, may be subdivided into the poetic imagination proper, and the artistic imagination. Poetry and art are pursuits of a kindred nature, and yet easily contrasted with one another. The thought of the former expresses itself in language; while that of the latter is embodied in painting, music, statuary, and whatever other material things may be made to exhibit the pleasing and the impressive. The sphere of poetry is vastly more extensive than that of art. Language can utter, with wonderful exactness, whatever the mind conceives: every change and turn of events, every motive and thought, affection and desire, of the heart, can be made known in befitting words. But the productions of art, however skillfully constructed, set forth only the outer side of things, and leave more unsaid than they express. At the same time, works of art, in appealing to our senses, and not to our minds alone, are better calculated than poetry to produce a strong immediate effect.

The objects which the poet and the artist endeavor to prepare for our contemplation, are, in the first place, the beautiful and the sublime; the former comprising whatever may be pleasant to contemplate either in itself, or both in itself and its associations, and the latter being that which conveys the suggestion of power and greatness. In addition to these objects, whatever may move and interest the heart is delineated. For, to use a phrase of Hamilton's, the productions of both art and poetry are "exclusively calculated on effect."

External conditions of poetry and art.

The external conditions favorable for the development of one of these pursuits differ from those in which the other flourishes. Both require a time of comparative peacefulness, when the minds of men are not occupied with wars and civil commotions. But poetry delights in an age characterized by simplicity of life and manners, in which the spirit of men is unconventional and easily impressed, and in which the memory of great achievements and the desire to emulate them, are fresh and vigorous. The poet then gives shape and expression to the sentiments which burn within his own breast and those of others. Art, on the other hand, waits for times of greater repose, and is roused to exertion when the extension of a cultivated taste, the facilities for artistic work, and the accumulation of wealth, create the demand for meritorious productions, and encourage those whose genius can supply the demand. As a rule, the great poets, in every country, precede the great artists. We allow that the power of genius is wonderful in every age and in every condition of society; but, without opportunity, even genius can accomplish nothing of value, and, in general, favorable times are needed in order to any grand achievement.

Versification—reason for. Poetic labor.

It is noticeable that the poetry of every language employs versification, or rather is composed in lines of a length and accentuation more or less regular. This may have been adopted at first to assist memorization, but must be chiefly ascribed to a natural fitness of rhythmical language to be the instrument of poetical expression. The ear delights in that regularity of intonations which is produced by the observance of metrical rules, while a higher sense is pleased by the skill which makes the accentuation of the verse and the emphasis of the thought coincident with each other. These remarks may be illustrated from any well-composed poem. Let us take the following stanza from a hymn of Addison,

“How are thy servants blest, O Lord!
How sure is their defense!
Eternal wisdom is their guide,
Their help, Omnipotence!”

or this, from another hymn by the same author,

“The spacious firmament on high,
And all the blue ethereal sky,
And spangled heavens, a shining frame,
Their great Original proclaim.”

These stanzas would lose much of their beauty if they were changed into the language of prose. This leads us to say that the composition of poetry, even for those who are capable of it, is a more laborious task than is commonly supposed. Doubtless, when one is in the proper spirit, the work is not irksome; yet it involves earnest and persevering application. There is always

that kind of effort which one puts forth in any business which deeply interests him. This view is confirmed by the experience even of those poets who have been most perfectly the children of nature. Robert Burns says,

“The muse, nae poet ever fand her,
Till by himsel’ he learn’d to wander,
Adown some trotting burn’s meander,
An’ no think lang;
O sweet, to stray an’ pensive ponder
A heart-felt sang!”

And the following passage from the correspondence of Burns proves that his songs were not hurriedly got up, but composed with the utmost care and attention: “Until I am complete master of a tune in my own singing,” he writes, “I can never compose for it. My way is this: I consider the poetic sentiment correspondent to my idea of the musical expression, then choose my theme; compose one stanza. When that is composed, which is generally the most difficult part of the business, I walk out, sit down now and then, look out for objects in nature round me that are in unison, or harmony, with the cogitations of my fancy and workings of my bosom, humming every now and then the air, with the verses I have framed. When I feel my muse beginning to jade, I retire to the fireside of my study, and there commit my effusions to paper, swinging at intervals on the hind legs of my elbow chair, by way of calling forth my own critical strictures as my pen goes. This, at home, is almost invariably my way.”

Poetical exertions cannot be maintained with that regularity which serves a good end in ordinary business; creative genius must often wait till the muse is willing, that is, till one’s mind is filled with fresh fervor and activity; but still it is true that the work of the poet engages all the energies of his soul. And after the song may have been first produced, the labor of revision and emendation equals that of the original composition. This task was carefully performed by the most famous poets of both ancient and modern times; and it has imparted to their productions a perfection which all succeeding ages must admire and emulate.

We need not discuss that exercise of talent which produces novels, and similar works of fiction; it is of the same radical nature with the poetic faculty. But it appeals less to the sense of the beautiful, and more to our curiosity.

The artistic imagination follows the same general methods and the same general aims as the poetic, and is distinguished from it by the fact that it is directed to a more specific work. The painter, the sculptor, and the composer of music, aim to produce beautiful and engaging things by the employment of material means, and, in order to do so, they form mental conceptions of the things which they would produce. Persons of ordinary gifts cannot make much progress in these pursuits. Original-

The artistic imagination.
Ideals.
The true function of imagination.

ity in art calls for a great endowment of taste and talent. The "Nascitur, non fit," of Horace, applies even more emphatically to the artist than to the poet. Assiduity may make a respectable copyist; only nature produces the creative genius. Hence those who have attained distinction by artistic achievements, have found themselves attracted to art by a power which has compelled them to reject and forsake every other occupation.

That imaginary object which the artist endeavors to realize is called his "Ideal." In general, *ideals are objects which one imagines and endows, to the best of his ability, with every excellence suitable to their nature, and with which, as standards, he compares things really existing or in the process of production.* While these *concepta* belong to every mode of the productive imagination, they are most consciously employed in the arts of painting and sculpture. The ideals of the poet and of the musical composer are immediately embodied in their verses and melodies; those of the scientific thinker are surrounded by many other thoughts which equally occupy his attention; the plans of the ordinary mechanic or man of business are but roughly sketched, and must be modified according to the course of circumstances; our conceptions of duty are very abstract and are rather referred to than contemplated. But the designs of the painter and the sculptor are long retained in memory as the objects which they desire to express in their productions. At the same time, it is evident that ideals are formed and followed, not only by all artists and poets, but also by every one who imagines for himself things excellent and perfect. The doctrine which sets forth the origin and character of ideals is one of very general bearing. The essential point in this doctrine is that ideals are entirely new creations or constructions of the mind, and are not merely copies of objects presented to us by nature. Genius conceives of things such as never existed, and produces objects more beautiful and perfect than any to be found in the natural world. Therefore, as Pres. Porter says, we sometimes "measure Nature by what Art has done, and commend her by epithets taken from Art. We say of the stem of the pine or the elm, 'It shoots up like a pillar'; we call the forest 'a pillared shade'; we say of a man 'He stands like a statue'; or 'He is an Apollo for graceful strength'; or, of a woman, 'She is a Venus for beauty.'" That theory, which asserts Art to be simply a reproduction of Nature, cannot be sustained. The Venus of Milo, and the Apollo Belvedere, are not copies of any forms that ever were seen, but are more perfect than any; the wonderful music of Mozart, Beethoven, and Mendelssohn, is the expression of harmonies never heard before and whose birth-place was within the soul of the composer. It is the duty of Art to improve upon Nature. Even Eden, when Adam was put there, "to dress" the garden, was not so perfect that it could not be improved by skill and care. Art reduces the redundancies, supplies the defects, heightens the charms, and unites the attractions, which are to be found in natural scenes and objects.

Therefore it is quite inaccurate to say that the function of the imagination is merely to recompose, in some new way, objects or parts of objects which have been previously perceived. The work of this power includes not simply the partition and composition of objects, but that more searching and perfect separation and combination which we call analysis and synthesis (§ 119), and which, in their fullest development, become abstraction and conception (§ 124). Dr. Porter rightly remarks, "The lines and shapes of grace which have been copied in marble or drawn upon canvas, in respect of delicacy of transition and ease of movement, far surpass those of any living being or actually existing thing. They are suggested by, but are not copied from, any such beings or things. The story that the Grecian painter assembled from every quarter the most celebrated beauties, that he might borrow some charm from each, could never have been true." And, when Prof. Stewart says that Milton did not copy his Eden from any one scene, but selected the most beautiful features from the most beautiful scenes with which he was familiar, we are to understand that, however this or that prospect may have contributed some grace to the imaginary Eden, this was only by furnishing a fruitful suggestion, in which the plastic mind of Milton found material for its work. That work itself was a synthesis of elemental conceptions in which shapes and colors, sizes and distances, sounds and motions, uniformities and diversities, were first modified at will, and then combined into one harmonious scene, so as most to please the taste. This wonderful power, which, out of old material, makes things wholly new, is yet more evidently displayed in that description, which Milton gives, of Satan's dreadful home; where

"round he threw his baleful eyes,
That witnessed huge affliction and dismay,
Mixed with obdurate pride and steadfast hate.
At once, as far as angels ken, he views
The dismal situation waste and wild.
A dungeon, horrible on all sides round,
As one great furnace, flamed. Yet, from those flames,
No light; but rather darkness visible
Served only to discover sights of woe.
Regions of sorrow, doleful shades, where peace
And rest can never dwell; hope never comes,
That comes to all: but torture without end
Still urges, and a fiery deluge, fed
With ever burning sulphur unconsumed.

There the companions of his fall, o'erwhelmed
With floods and whirlwinds of tempestuous fire,
He soon discerns."

This description was in no sense copied from any scenes that Milton ever saw. If one can understand how ideal creations are thus formed, different in every part from objects previously perceived, and surpassing them in excellence, or beauty, or grandeur, he has mastered the principal point in the philosophy of the imagination.

Law limiting the
work of poetry and
art.
Conditions of
success.

But, while originative genius is not merely a re-productive and compositive, but a plastic and creative, power, it is to be noted that poetry and art are under the necessity of maintaining a *certain analogy with nature*. They must take those scenes and objects which are witnessed in the real world as the basis of their new creations. Ideal excellence can be obtained only by the imaginative development of that which really exists, and it can affect the soul only as having a certain verisimilitude—that is, as having an essential agreement with reality in those features which are to engage our admiration and excite our sensibilities. The sphere of poetry and art, therefore, being confined to classes of scenes and courses of events similar to those which actually affect our lives, is not so extensive as that which we may assign to the imagination simply. Hence, it is plain that natural ability is not of itself sufficient for success in these pursuits. The mind must be stored with knowledge suitable to furnish suggestion in the kind of work that is to be performed; for this reason, the productions of the most original genius are always formed upon previous experience and acquisitions. The following remarks, by a great painter, on this point, are worthy of remembrance. "Invention," said Sir Joshua Reynolds, in a discourse before the Royal Academy, "is one of the great marks of genius; but, if we consult experience, we shall find that it is by being conversant with the inventions of others that we learn to invent, as by reading the thoughts of others, we learn to think. It is in vain for painters or poets to endeavor to invent without materials on which the mind may work, and from which invention must originate. Nothing can come of nothing. Homer is supposed to have been possessed of all the learning of his time; and we are certain that Michael Angelo and Raphael were equally possessed of all the knowledge in the art, which had been discovered in the works of their predecessors."

The arts of creating landscapes, and of designing grand and beautiful buildings, do not admit so varied an exercise of the imagination as those others which we have now considered. Nevertheless, they have often worthily employed the efforts of genius. Those who can remember the northern end of Manhattan Island, as it was twenty years ago, a rocky desolate tract, covered here and there with miserable shanties and stagnant pools, and who now admire the Central Park of New York, with its lawns and lakes, its bridges and terraces, its pleasant retreats and broad prospects, its winding drives and shaded walks, can understand what is meant by "the prophetic eye of taste"; that eye, which "sees all the beauties of a place before they are born," and, when a seedling is planted, anticipates the various effects, which the tree will afterwards produce in the views to be enjoyed from different directions and distances. Then, when we consider what judgment and ingenuity are needful in architectural design, that every part of the building

may have that form, and size, and place, and degree of prominence, that shall be both pleasing in themselves and conducive to the best general effect, we see that an equal, if not greater, exercise of talent is called for here. The temples of ancient Greece, the cathedrals of Europe, and many other magnificent buildings in our own and in other lands, are the enduring monuments of genius.

The influence of art on poetry. We need not dwell on the humanizing and elevating influence of poetry and art upon the character of any people who may cherish them. The better productions of imaginative genius awaken the nobler susceptibilities of our nature, and urge us to the pursuit of all honorable possibilities. They exert an influence greatly to be desired, both in its public and in its private operation. In the ruder ages of society

"The sacred name
Of poet and of prophet were the same";

the bard was regarded with religious reverence. "Among the Scandinavians and the Celtæ," says Prof. Stewart, "this order of men was held in very peculiar veneration; and, accordingly, it would appear, from the monuments which remain of these nations, that they were distinguished by a delicacy in the passion of love, and by a humanity and generosity to the vanquished in war, which seldom appear among barbarous tribes; and with which it is hardly possible to conceive how men in such a state of society could have been inspired, but by a separate class of individuals in the community who devoted themselves to the pacific profession of poetry." The influence of the works of genius was illustrated, also, in the life of the ancient Athenians. "Among the Greeks," says an eloquent writer, "wherever the eyes were cast, the monuments of glory were to be found. The streets, the temples, the galleries, the porticoes, all gave lessons to the citizens. Everywhere the people recognized the images of its great men; and, beneath the purest sky, in the most beautiful fields, amid groves and sacred forests, and the most brilliant festivals of a splendid religion; surrounded with a crowd of orators, and artists, and poets, who all painted, or modeled, or celebrated, or sang, their compatriot heroes; marching, as it were, to the enchanting sounds of poetry and music that were animated with the same spirit, the Greeks, victorious and free, saw, and felt, and breathed, nothing but the intoxication of glory and immortality." In modern times, poetical and artistic productions do not exert so great an influence as they once did. Philosophy, science, history, and the practical pursuits of an advanced civilization, engross the minds of men and render them less susceptible to æsthetic influences. Nevertheless, it is the part of wisdom to cherish the poet and the artist, and to encourage labors which, when rightly directed, tend to the elevation and refinement of our race.

The scientific imagination defined.

§ 184. We now turn to those uses of the imagination which are less exclusively connected with its own nature, and which do not belong distinctively to the reproductive phase of thought, but must be regarded either as occupying a middle ground, or as forming parts of the discursive phase. With reference to these uses, three different modes of the imagination may be distinguished and characterized. They may be named the Speculative or Scientific, the Practical or Ethical, and the Incentive or Motive. Exercising the first of these, we form conceptions of fact or possibility, so as to assist our understanding of truth; using the second, we fashion plans and ideals for our practical realization; and employing the third, we stimulate our desires by placing before them definite aims and aspirations. All these ends may be advanced by productions of artistic or poetic merit, as when epics, allegories, hymns, tales, and pictures, are made the vehicle of moral instruction; but they may also be pursued without æsthetic aids; each, therefore, may claim for itself a specific exercise of the imagination.

Those who are accustomed to regard scientific discovery and invention as the especial and crowning work of man's reasoning faculties, may be surprised to hear that success in these labors depends greatly on the exercise of the imaginative power. We naturally surrender the ideal world to Homer and Virgil, Shakespeare and Milton, Dickens, DeFoe, and other kindred spirits; we regard Aristotle, Euclid, Kepler, Newton, Davy, Faraday, Agassiz and the like, as men whose minds are wholly conversant about fact and reality. But the truth is that philosophic investigation, which discovers the laws of nature, and scientific invention, which discovers the modes in which these laws may be rendered practically useful, can make no progress without a vigorous employment of constructive and creative thought. This may not ordinarily be called imagination; it is certainly to be distinguished from that exercise of the faculty which the poet displays; yet it is essentially of the same nature with this, and differs from it only because its operation is continually modified and controlled in the interest of a peculiar end, namely, the rational pursuit of truth. We, therefore, discuss the scientific in connection with the poetic imagination, and regard both as developments of that one comprehensive faculty which has been called the productive imagination.

Compared with poetic imagination. Philosophical invention.

At the same time, we need not adopt an extreme inference from this doctrine, which some make. It has been taught that philosophic is so nearly allied to poetic genius that the same man may be expected to distinguish himself in both lines of effort, or, at least, to have the ability to do so. The philosophic imagination endeavors to form correct conceptions of the working of causes as these operate in nature, so that, by means of such conceptions, the operations of nature may be anticipated

and understood. In this mode of thought, we are at liberty to imagine only what may naturally exist or happen under conditions which may naturally exist. We build upon fact, and employ the known elements and laws of actual existence so far as these may be applicable; and, where they no longer apply, we still follow, as closely as possible, the analogy of nature, and carefully shun whatever may conflict with real possibility (§78). The poetic imagination, on the contrary, regards possibility only so far as not to offend by evident absurdity, and seeks conformity to nature only in those features which may excite our sympathy and interest. Philosophic genius cares neither for the beautiful nor the affecting, but for the true and the probable; it may even co-exist with a very moderate sense of what is tasteful and pleasing; it avoids the weakening of scientific discourse by much æsthetic illustration. But the spirit of poetry delights in the graceful, the beautiful, the touching, the wonderful, the sublime, and aims at no other end than the production of such objects. It is plain that the disposition and habit of mind proper to the philosopher differ from, and even somewhat conflict with, those characteristic of the poet. A conjunction of the two forms of genius in one mind is not a thing to be expected, but rather the reverse; and, in point of fact, it would be hard to find any instance in which the same person was eminent both as a poet and as a philosopher.

That form of imagination employed in speculative thought is sometimes known as philosophical invention, the term invention, in this phrase, being used in a wide sense, so as to include purely theoretical conjecture, as well as that which looks towards practice. This mode of imagination is always completed by supposing the object of it to be fact, that is, by distinctly uniting the idea of existence with that of the thing invented. Therefore, the products of it, commonly, and with reference to their use, are called suppositions. For the rational faculty deals with, and conceives of, things only as existing, or as supposed to exist. Different modes of philosophical invention may be distinguished according to the different ends for which suppositions are employed. These ends are three in number, *first*, the discovery and ascertainment of truth; *secondly*, the application of truth, in deduction from things possible, and in useful invention; and, *thirdly*, the explanation and illustration of truth. These aims are not pursued in separation; they are so related that the attainment of one is often an important step in the prosecution of another; yet a special exercise of imagination, which belongs to each, may be distinctly conceived.

The imagination of discovery. Hypothesis and supposition distinguished and defined.

The philosopher is chiefly concerned with that mode of invention which seeks the discovery of truth. This is that which he himself employs; it is that, also, which calls most for elucidation and discussion. The thought constructions, to which it gives rise, are distinguished from other suppositions by the name *hy-*

pothesis. Originally, the terms *hypothesis* and *supposition*—as their formation indicates—had the same meaning. They denoted those constructions of the imaginative power which we employ to explain phenomena, and in which causes and conditions are figuratively placed under those observed facts which are believed to rest or depend upon them. This specific meaning is now retained by the word *hypothesis*; which signifies *a supposition used for the purpose of explaining phenomena and, in connection with that, of showing its own truth or probability*. For any hypothesis which rationally accounts for fact may be true, and, if it be the only hypothesis by which the fact can be explained, it must be true. *Supposition*, on the other hand, has assumed the more general sense of imagining a thing to be fact, with reference to something which would follow if it were fact, whether that thing be the explanation of phenomena and the ascertainment of causes, or not. When we speak of a supposition, we emphasize the conceived existence of the thing supposed; but, in the idea of an hypothesis, the emphasis rests on the explanatory relation of the thing supposed, to the facts immediately perceived. These remarks exhibit the reason on account of which a scientific conception, even though designed for purposes of explanation, is not commonly called an hypothesis, unless its explanatory value be immediately taken into account. We should note in passing, that the peculiar and specific meaning of the noun *hypothesis* is not always retained by the adjective *hypothetical*. An hypothetical case is simply a supposed case; an hypothetical syllogism means a syllogism in which one fact is supposed as the antecedent—not as the explanation—of another.

The twofold use of hypothesis.

While every hypothesis has a double end in view, viz., to account for facts, and to ascertain whether the supposed cause exist or not, some hypotheses aim more at the former and others at the latter of these ends. The famous speculation of La Place respecting the origin and movement of planetary bodies, is interesting chiefly as an explanation of phenomena. He conjectured that the atmosphere of the sun originally extended beyond the present limits of the solar system, and that planets were formed by the cooling and condensation of successive rings of fiery vapor, their orbital motion being caused by a combination of their centrifugal force with the centripetal attraction of the sun, and their diurnal motion by similar forces operating within each separate mass of matter. Scientific theories, in general, are principally valuable as explanatory of fact. On the other hand, those hypotheses which are made in the course of judicial proceedings, are mainly intended to show the truth or falsehood of the hypothesis itself. In a trial for murder, it was shown that a certain money-lender was discovered one morning, in a wood, beaten to death, and that this individual and the prisoner had entered that wood together the previous evening. It also appeared that the accused was a person of bad character, and had been a debtor to the murdered

man in a considerable amount. The prosecution advocated the hypothesis that the prisoner had committed the crime in order to free himself from debt. The counsel for defense argued that the murder *might* have been committed by some other man. The jury found that the facts could be explained only on the hypothesis of the prisoner's guilt; and the man was executed. In this case, the important question concerned, not the explanation of fact, but the correctness of the hypothesis.

Those systematic views of phenomena and their conditions, as mutually related, which hypotheses enable us to form, are called theories. A theory differs from an hypothesis in being more comprehensive,—it includes, in one view, both fact and explanation. The conception of it, also, is less suggestive of unreality. One's theory of a phenomenon is a view confirmed by investigation and accepted with more or less confidence. His hypothesis respecting a phenomenon is a conjecture yet to be tested, and which may prove incorrect. While, therefore, these terms are allied, and may sometimes supply the place of one another, there is a difference. In particular, after an hypothesis may have been fully verified, we incline to speak no longer of it, but of the theory established by it. Before Newton's time, three laws of planetary motion had been discovered through the observations of Kepler. These were that the radius vector of a planet describes equal areas in equal times, that the path of every planet is an ellipse, and that the squares of the times of revolution of the different planets vary as the cubes of their mean distances from the sun. Newton conjectured that a force directed towards the center of the sun, and varying inversely as the square of the distance from that point, would produce these phenomena; and he was able to demonstrate that this was the only force which could produce them. Therefore, now, we speak, not of the Newtonian hypothesis, but of the Newtonian theory, of solar attraction—or of universal gravitation.

At the same time, any digested view of fact—or of what may be assumed as fact—considered as united with its explanation, is properly termed a theory; and, indeed, the imaginative character of our hypotheses is often remarkably exhibited in those theories which originate from them. For not only many theories have been constructed wholly by the imagination, with no aid from reason, and no reference to the analogy of nature, but—what is specially to be noted—*many even of those theories, in which the laws of existence are correctly set forth, present idealized objects and operations, such as are never to be met with in reality.* This separation of even correct hypothesis from literal fact, takes place whenever we desire to have an *abstract or independent conception of the proper effect of some law.* The powers of nature do not work separately, nor do they always operate under the same conditions. Each plays its proportionate and variable part in producing the com-

Theory defined and characterized.

Scientific idealization.
The reason of it.

plex actualities which we see. In order to comprehend some simple law, we must conceive of a certain power acting alone under given conditions; and thus we form the conception of a phenomenon which never really takes place, yet which truly sets forth the operation of an existing law. We may conceive of an iron ball at rest in space, or driven forward into empty space, and thereafter free from the influence of every force save its own inertia or momentum. Then, with the aid of these conceptions, we state the law that any material body will for ever maintain its condition of rest in the same place, or of motion in a right line and at the same rate of velocity, if it be not influenced by some external power. No such phenomena as these are ever witnessed; yet the phenomena actually observed justify our ideal conceptions and the law which they enable us to enunciate. The actual motion and rest of bodies obey this law, so far as the operation of other laws permit; and they can be accounted for by the combination of this law with others.

This power of forming and using ideal theories throws light on a class of objects sometimes considered in scientific thought, which differ, in point of perfection, from any that have ever been met with. The conditions of a law affecting any class of objects, lie partly in the nature of the objects themselves; therefore, the absolute, or perfect, exemplification of the law, may call for a perfection in the nature of the object, which is nowhere to be discovered. A perfect reflector, which absorbs none at all of the light which falls upon it, or an absolutely opaque body, through which no light can find its way, or a substance so transparent that light can pass through it without any, even the slightest, obstruction or diminution, has never been found. Yet such objects can be imagined; and laws of optics, which apply approximately to real cases, can be formulated with reference to these imaginary standards. For realities sometimes approach so near perfection that no appreciable error follows from regarding them as perfect; and, in other cases, when the imperfection seriously affects the result, this can be estimated and taken into account in our calculations.

The ideals of geometrical theory have that perfection to which we now refer. The scientific conceptions of the point, the straight line, the plane, the curved surface, and the regular solid, set forth things of a finer quality than any which present themselves to the senses. The ordinary definitions of some of these ideals have been the occasion of perplexity both to metaphysicians and to those mathematicians who have critically examined their own conceptions. In particular, the point, the line, and the surface, as described in geometry, are impossible entities. The existence of that which has neither length, breadth, nor thickness, but position only, or of that which has length, position and direction, but no width and no thickness, or of that which has length

The ideals of geometry. A difficulty explained.

and breadth, but no thickness or depth, is inconceivable. Thus, apparently, geometry sets out by asking us to accept absurd conceptions. The difficulty here presented cannot properly be ascribed to the imaginary perfection of the entities considered. There is nothing impossible or absurd in imaginary perfection. The difficulty originates in connection with the peculiar scientific use for which the ideals of geometry are intended, and which they serve. Yet, as it could have arisen only where such ideals were employed, it may be considered in the present connection. A solution of it is offered in the two following

Geometry con-
cerned with attri-
butes rather than
with bodies.

statements. First, strictly-speaking, geometrical science is not concerned with any independent entities which can be called points, lines, and surfaces, but only with those inherent parts of solid

bodies which these names may indicate, or rather—to speak more strictly still—with *the characteristic attributes of these parts*. A surface, as its name signifies, is properly the boundary of a solid body; a line is the edge at which one surface meets with another; a point is the termination of some sharp projection of the solid; the first of these is considered only with reference to its superficial extent, the second with reference only to its length and course, and the third with reference to its position only. Even the solid body itself, though possessing an independent or substantial existence, is thought of only so far as it has shape and size, so that, in truth, the shape and size of the solid, rather than the solid itself, are considered. This fact—that the proper objects of geometrical thought are not independent entities, but attributes of solid bodies or of their inherent parts, helps to explain the character of geometrical definitions. Though no surface can exist without solidity, we can think of its breadth without thinking of the solidity beneath it; though no line can exist save as a slender solid strip, we can think of its length without thinking of the solidity accompanying that; and, though no point can exist save as the terminal part of a line or sharpened body, we can think of its position, or of the position of the center of it, without thinking of its solidity. Therefore, in a science which concerns itself with surfaces, lines, and points, only that it may consider their characteristic attributes, it is natural that these entities should be spoken of as if they possessed these attributes alone, although, as we have said, these attributes cannot exist—nor even really be conceived to exist—in separation from each other and from solidity.

Geometry uses
auxiliary concep-
tions.

This mode of speech will be further justified by the second statement which we have to make. This is that *ideal conceptions of lines, points, and surfaces*, as separate entities, are used by us as *supports of geometrical thought*. The mind dislikes to conceive of mere attributes, even though these may be the proper subjects of its consideration; so, instead of attributes, simply, it conceives of objects as having them. In this way one's conceptions are made

more to resemble fact. But, in the combinations of thought, it is needful that each attribute—or each system of attributes—should be allowed its own proper value and effect; therefore we fashion for ourselves objects in which all other attributes than those specially given to them exist in the lowest conceivable degree. In short, we imagine entities which have no appreciable force or value except in those particulars with which we have characterized them. Hence geometrical ideals are things more perfect for the purposes of thought than any that can be made or found. But they are not absurdities. The point occupies space, though it is infinitesimally small; the line has width and thickness, but it is of the utmost conceivable attenuation, and is without the slightest roughness or irregularity; the superficies is a film of indescribable thinness, and absolutely continuous; while the solid is bounded by such surfaces, and is free from all interstices, so as fully to fill the space assigned to it. These conceptions involve no absurdity; they conform to the laws of being. But the size of the point, the width of the line, the thickness of the surface, are so insignificant that they can be disregarded in reasoning. And the solid, being of perfect density, is such that it is measured exactly by the space it occupies. When, therefore, the geometrician says that the point has position only, the line length only, and the surface breadth only, and identifies the solid with the possible content of a given space, we are to understand that these ideals are such as may simply represent certain attributes, and such that by means of them we reason, more easily than we otherwise could, regarding the position, length, superficial extent, and solid contents, of material objects.

The formation and use of scientific hypotheses.

The manner in which men of genius form hypotheses and scientific theories is essentially the same with that in which we form suppositions to account for facts which interest us. The phenomenon to be explained is attentively studied, and is compared with similar phenomena whose causes are known. Thereupon a cause is conjectured similar to some known cause or causes, but differing from it or them in some way to account for the peculiarities of the case in hand. But often an hypothesis, when made, is found unsatisfactory. Deductions from it conflict with some of the observed facts, or with facts not previously considered. Then that conjecture is abandoned for another, constructed in a similar way, but either wholly or partially different. Another process of trial takes place with this hypothesis; and so one continues till either hope of discovery is given up, or an hypothesis is framed which satisfactorily explains the facts. Then, if the cause assigned by this supposition be found really to exist and operate, or if, in any other way, we can prove that no other cause can possibly produce the results to be accounted for, the hypothesis becomes a doctrine fully received and confidently held. Such has been the history of almost all important theories.

The second use of hypotheses. That use of philosophic invention in which *we suppose things to exist for the purpose of deducing from them imaginary consequences*, is next in importance to that which aims at the explanation of facts and the discovery of causes. Indeed the formation of hypotheses or conjectures would be comparatively ineffectual towards the ascertainment of truth, if these could not be tested by a deductive process. This is done when one combines the hypothesis to be tested with some known fact or principle, and then marks the legitimate inference. For he can now inquire whether this inference agrees with the various facts known to him, which relate to the subject in hand, or with such facts as he can discover, or with the results of his experiment, that is, with such facts as he can create. If there be agreement, the hypothesis is confirmed; if there be conflict with fact, it is overthrown. Thus suppositional inference is a test of hypothesis.

But it has uses more immediately its own. Because the full significance of any scientific truth cannot be understood unless we combine it with one supposition and another, so as to perceive its different possible bearings. For example, the importance of solar light and heat cannot well be estimated, unless we should suppose them suddenly to cease to illuminate and warm the earth, and should consider what midnight darkness and frigid death would then inwrap all beings that are living now.

Useful invention. A yet more notable use of imagination, in connection with a deductive process, is exhibited in useful invention. Such was the invention of the air-pump, by Otto Guericke; of the thermometer, by Sanctorius; of the reflecting telescope, by Gregory; of the safety-lamp, by Sir Humphry Davy; of logarithms, by Napier; and of the Calculus, by Sir Isaac Newton. The steam-engine, the cotton-gin, the electric telegraph, the telephone, the daguerreotype; and machines for carding, spinning, weaving, knitting, sewing; for type-setting and printing; for mowing, reaping, threshing; and many others employed in modern civilization, are the products of that invention of which we now speak. For invention, in the narrower sense, indicates only one species of philosophical imagination or invention, and signifies the work of discovering methods by which laws and instrumentalities already known may be made to serve useful ends. This work is similar to that of discovering the causes and conditions of phenomena, but it is more fully dependent on the constructive power of the imagination. That conjecture which uses hypotheses for the purpose of discovering antecedents, starts out from the perception or assumption of facts; but this invention, which aims to realize an end through the use of means, has only a possibility in view. Moreover, causes may often be found by simple inquiry and search, without the aid of supposition: but mental combination, alone, can afford us any hope of the production of a new agency. Sometimes the discovery of a useful adaptation may appear to

result from chance; but it seldom or never results from chance alone. Ordinarily, the inventor must try many combinations, one after another, without producing the effect hoped for. But, if the end be a possible one, his work makes progress. Every new attempt reduces the likelihood of failure in the next, and increases the probability of success. But, generally, some uncertainty still remains, so that, in most instances, the end seems attained or suggested, at last, by some fortunate circumstance, and has the appearance of being found rather than achieved. Hence it is that the term *invention*, which originally signified only discovery, has come to be applied to the laborious process of contrivance, and especially to the contrivance of useful instrumentalities.

Imaginative illustration.

That exercise of the philosophic imagination *which furnishes illustrations of truth* may be passed without extended discussion. It is a fact that a principle is sometimes better stated and understood by means of suppositions and similitudes than it can be by means of direct statement, or even by describing any actual example of its operation. The right illustration of truth is a work of less difficulty than the formation of wise hypotheses, or the invention of useful applications. Yet it involves care and skill. An illustration which does not truly present the point to be considered, only confuses the mind; and an illustration, which sets forth with equal or greater prominence, some other point also may be the cause of positive error.

Practical imagination defined and divided.
Practical imagination proper.

§ 185. We now pass to that mode of imagination which we have named the practical, or ethical. This form of activity, like the philosophical invention which we have considered, is not commonly characterized as imaginative, because it employs the constructive powers of thought for purposes ulterior to those of mere contemplation. Yet it is evidently a development of that faculty which creates ideal objects. It is a mode of thinking related to that invention which devises useful instrumentalities; but it may be distinguished from this as being more immediately connected with the guidance of human effort, and as originating mental products of a less fixed and definite nature. It has been styled ethical, not because it always considers moral laws and aims,—frequently these are not considered,—but because the ideals of duty are the highest product of the practical imagination, and because the conception of duty should be a pervading element in all our plans of action. Yet, as many of man's schemes, even when qualified by some ethical principle, aim at natural rather than moral ends, while other, and quite different, conceptions of conduct are directly subservient to the realization of what is right, the non-ethical, or natural, exercise of the practical imagination may be distinguished from that which is moral, or ethical, in a strict and exclusive sense. Indeed, this distinction is necessary for the purposes of satisfactory discussion. The instruction we have to give respecting plans for the attainment

of desired ends is very simple, and consists merely in the recommendation of some self-evident rules.

The first of these is similar to that already prescribed to theoretical thinkers: We must *adapt our schemes to fact and reality*. Everything visionary and impracticable must be avoided. The circumstances with which one has to deal, the extent of his means, and the character of his abilities and qualifications, must be consulted. One's natural wishes and inclinations are not to be disregarded, but even these must submit to the regulation of reason. Sometimes it is the part of wisdom to repress our more forward tendencies and to aim rather at what can be attained than at what is most desired. The necessity of careful and adaptive foresight has been recognized by men of overmastering genius as binding on them no less than on men of moderate ability. Napoleon Bonaparte, before his great campaigns, is said to have spent hours over military maps, scrutinizing the different roads, the villages, hamlets, valleys and elevations, the plains and forests, the rivers and mountains, of some distant region, and measuring accurately the distances from point to point. By the use of pins with variously colored heads he marked the positions which he expected the forces of his adversaries, and his own troops, to assume, day after day, in the stages of a conflict; and it is related that the predictions, thus formed, respecting the movements of opposing armies, and the ultimate result of the contest, were mostly marvelously correct. Those who would engage in any undertaking should consider every difficulty to be encountered, every labor to be performed, every instrumentality to be employed, every contingency to be provided for. Many a business has been wrecked, and many a life wasted, in the pursuit of projects which should never have been seriously entertained.

Another counsel to be observed, in the conduct of life, concerns *the resolute spirit* with which our plans should be prosecuted, after they have been formed and adopted, according to our best and deliberate judgment. Most enterprises of any importance encounter unexpected obstacles; and the greater and more difficult an undertaking may be in itself, the greater, also, will be the extraneous difficulties attending its prosecution. This is particularly the case if the work be one which needs, and may properly claim, sympathy and support from persons in some way connected with it. We question whether even so unobtrusive a labor as the production of a new system of philosophy, was ever accomplished without encountering the opposition of showy and self-exalting mediocrity, and the neglect and coldness of those by whose approval the patient thinker might have been encouraged. Success in any extraordinary undertaking can be expected by that man alone who is "tenax propositi." Irresolution and fickleness are faults which can neutralize the wisest plans, and render the greatest enterprises productive only of loss and disappointment. Again let us

take a lesson from the career of Bonaparte. After he had collected his troops in Switzerland, that he might cross the Alps, and descend in the rear of the Austrian forces, he met Marescot, who had been exploring the wild passes of the Great St. Bernard. The engineer gave an appalling account of the difficulties of transporting an army, by that route, into Italy. "Is it possible to pass?" said Napoleon, cutting the narrative short. "The thing is barely possible," answered Marescot. "Tres bien," said the chief consul, "En avant!" The Alps were crossed; Marengo followed; and, within thirty days, Napoleon entered Milan, for the second time, as the conqueror of Northern Italy.

One other suggestion, important chiefly as a qualification of that just considered, must be added. *We should not cling tenaciously to projects* after they have lost all reasonable prospect of success. Sometimes means, or arrangements, on which we have confidently relied, are swept away. Then, if we can think of no new modes in which to employ our resources, we have accomplished only failure. But, if the need of change be recognized, and the elements of power yet remaining to us be recombined, some other plan may still be successfully carried out. Once more let us refer to the great Corsican. For a long time the invasion of England was a cherished purpose of Napoleon; and immense preparations for this enterprise were made by him during the autumn and winter of the year 1803. But, when the destruction of his fleets and the vigilance of the English cruisers had frustrated this design, he immediately formed new combinations. He broke up the camp at Boulogne, concentrated several armies on a new theater of operations, and won the overwhelming victory of Austerlitz. Often the life of a resolute active spirit appears to be one uninterrupted course of success, not because he never encounters failure,—that never is the lot of any,—but because, instead of yielding to failure, he addresses himself at once to some more hopeful undertaking.

The ethical imagination.
The origin of moral rules, or constructions of thought.

The distinctively ethical, or moral, exercise of the practical imagination, commonly combines with the natural exercise of this faculty, and acts in modification of the latter. But sometimes it takes a leading, and even an exclusive part, in the formation of some scheme of conduct. Our moral, as well as our natural, constructions of thought, should have a certain conformity to reality, yet, as their office is more to furnish models and ideals for our remembrance and imitation, than plans for our exact accomplishment, they are not so closely tied to fact. The work of the moral imagination is to devise such conceptions of conduct as will accord with the requirements of duty; and the great importance of this work lies in the fact that the moral law, as conceived by any individual, or by any community of men, consists of generalizations formed from his, or their, conceptions of right conduct. In this statement we set forth the natural foundation of ethics, as distinguished from that revealed law,

which the enlightened conscience receives as the most perfect expression of its own convictions. As the rules which should regulate mercantile business are fashioned from methods suggested and approved by the experience and judgment of business-men; and as the more general rules of wisdom for the care of our worldly interests, were first particular judgments which recommended themselves in the recurring exigencies of life; so the rules of ethics have arisen from individual conceptions which men have formed in the recurring conjunctures of moral life, and which have had for their end the realization of right and duty. For all mankind have a moral sense or judgment, whereby they recognize some ends, and some actions closely connected with such ends, as being morally right, and as being obligatory upon persons capable of perceiving those ends and of performing those actions. All men, also, assert that ends and actions, which conflict with what is right, are morally wrong, and ought to be rejected and opposed. Mankind differ in the definition of those things which they regard as right; but they all agree in recognizing the distinction between right and wrong, and in asserting the obligatoriness of what is right.

Philosophers, on the other hand, and those who have given themselves to analytic thought, have been greatly perplexed with respect to the radical nature of moral rightness. Some have taught that moral rightness is a simple and ultimate quality of certain actions and ends; others, that it is capable of explanation and definition. Some have identified the right with the duties of benevolence and beneficence, especially as exercised towards all rational beings; others, with public utility as a general and dominant end of action; others, with the sanction given to the authority of a Supreme Power by the declaration of future rewards and punishments. The views entertained on this subject by the writer of these remarks, may be found in an article contributed to the *American Presbyterian Review*, in the year 1870, and entitled, "A New Analysis in Fundamental Morals." At present, we have only to say that whether moral rightness be capable of explanation or not, it is certainly *sui generis*, among the ends of human pursuit. Those systems which have made it a modification or combination of other ends, have failed to satisfy thoughtful inquiry, and this because they explain away what they set out to explain. Moreover, that peculiar obligatoriness—that legal supremacy over personal life—which belongs to the morally right, and which originates from its moral rightness, is also *sui generis*; and it may be questioned whether its peculiarity admits of any analysis.

We have already remarked that the variation in the moral ideas of mankind pertains to those specific actions which they judge to be right and obligatory; it does not affect those radical conceptions of the right and its obligatoriness which are common to all men. This is an important fact. It indicates that the moral sentiment

The differences in the moral conceptions of men accounted for.

of men contains an underlying sameness which must be connected with the very constitution of human nature, and with the necessary relations of rational life. But, in connection with this fact, the question remains, "How does it happen that beings who are influenced by the same general principle of action, exhibit so great differences in those specific conceptions of duty, in which that common principle is manifested?" The answer to this inquiry is the principal point in the philosophy of ethical imagination or moral conception. This answer we take to be twofold.

The first reason of it. In the first place, *the requirements of duty are not exactly the same at all times and under all circumstances.* The exchange of commodities is common to all men; but those methods of conducting mercantile business, which are excellent for a civilized people, would be unwise and ruinous among a savage or barbarous race. The exercise of constituted authority is found an universal necessity; but those forms and modes of government which are the rightful privilege of an enlightened country, would be unsuitable and injurious to a nation marked by a low grade of intelligence and principle. The conception of private interest is shared alike by the Hottentot and the Laplander; but they do not follow the same rules of life; each, under the guidance of rational judgment, forms practical conceptions for himself, according to the circumstances of his lot. In like manner, man's determinations and conceptions of duty, and the rules derived from them, vary according to the diverse requirements of right as a moral end. This principle suggests a reason for those diverse laws of marriage and divorce, which belong respectively to the Mosaic and the Christian dispensations of religion. It accounts for the fact that the institution of slavery, which is intolerable to the moral sense of a free Christian community, was not prohibited in ancient times. And it explains the general and gradual enlargement, among Christian nations, of the sphere of human rights and duties. The possibility of moral attainment is greater than formerly; therefore, the standard of duty is higher than formerly. For duty demands whatever excellence is attainable.

A second reason for it. We apprehend, however, that the moral conceptions of men would show much less diversity than they have hitherto done, if the only reason for difference consisted in the different requirements of duty. A more powerful cause is to be found in the tendency which men have always exhibited to adjust their conceptions of morality to their natural inclinations, or their views of interest, or their cherished pursuits and customs. Hence, in a warlike nation, bravery is the greatest of the virtues; among a trading people, honesty is the "principle" most esteemed. Hence the methodical Chinese make reverence for parents and obedience to authority the chief duty of man; while the Hindoos sacrifice the rights of human nature and the lives of innocent beings to the pretensions of their fanatical religion. Hence, heinous crimes

have been transformed into meritorious deeds, and men of exalted virtue have been condemned for impiety and wickedness. To this cause we ascribe that great prominence which men give to those virtues which are immediately related to the protection and conservation of temporal interests, and the neglect and obscurity to which those virtues are relegated which demand personal purity or self-restraint, or which call for self-sacrificing devotion to the good of others: and from this source all low codes of morality proceed. Even thieves and robbers devise for themselves rules of conduct which shall not conflict too much with their nefarious deeds; and they sometimes boast of the moderation and magnanimity, the equity, and good faith, and charitable liberality, with which they pursue a cruel and systematic course of crime. The possibility of such error arises from the fact that our original ethical convictions are the products of the practical imagination, acting under the guidance of the moral judgment. They are not perceptions of what is, but conceptions of what ought to be. So long as men are blinded and led astray by one powerful influence after another, we cannot expect their theories of duty to be free from error. But, as this perversion of one's judgment results, in great part, from carelessness respecting right ends, and from a willful partiality for evil, it is attended with grave responsibility. Let us cultivate a sincere desire to know our duty. Let us strive to avoid moral misconceptions, and to form true and high ideals of conduct. This can be done, if, depending on promised aid, we enthrone God and the right within our hearts, and do not neglect the examples of holy men and the counsels of heavenly wisdom.

§ 186. The last mode of the imagination proposed for present discussion, as being determined by uses ulterior to those realized by mere contemplation, is the incentive or motive. This kind of imagination

is intimately related to the practical or ethical; the two often combine in one. But a conception may be called practical as giving the idea or plan for some action or course of conduct; and it may be called motive as presenting to us some end or object of desire. Besides, a conception may serve only the one or the other of these uses: the plan of building a fire may be entirely instrumental, while the ideas of the warmth and comfort of the parlor may present merely objects of desire.

The incentive or motive force of our ideas does not come from anything in their own nature,—many ideas have no such force—but originates in the fact that *the desires and impulses of the mind are excited by the consideration of certain objects*. The incentive force of any conception arises wholly from its specific, objective character, and is derived from the nature of some end which it presents to our motivity. At the same time, the different ends of our pursuit all aim essentially at the condition and experience of sentient beings. That which can in no way affect the life or welfare of sentient being is incapable of becom-

The incentive imagination.
The nature of ends, they are ideal objects.

ing an end of desire; whatever can produce gratification, happiness, or welfare, is naturally sought for.

The first excitants of our desire are real things considered with reference to their power to affect the experience of ourselves and others. We see food, and seek it to satisfy our appetite; we hear a sound, and wish to know its cause; we behold friends, and solicit their fellowship and sympathy; we notice others in want, and desire to share our benefits with them; we mark a case of wrong-doing, and demand that it be arrested and redressed. But while realities thus attract our attention, *the essential object of the desire, or motivity, is not that which actually is, but only that which may be hereafter.* In seeking food the true end is a satisfaction which has not yet taken place; in the questioning of curiosity we ask to know what we do not yet know; the longing for the sympathy of friends is a desire that their fellowship may hereafter be enjoyed; and the urgent wish that some wicked action should be prevented or punished presupposes that, up to the present time, that prevention or punishment has not been effected. We often speak of desiring things actually existing, such as food, clothing, money, mercantile goods, mechanical tools, lands, houses, and so forth; but, in all these cases, the object really sought for is some end to be attained in connection with these things. Strictly speaking, even money itself is not what men desire, but the continued or further possession and control of money.

Such being the case, it is plain that present objects are the excitants of motive feeling, not directly, but by reason of other possible objects which they suggest and bring before our contemplation; therefore, even our first objects of desire are not real but possible things, and creatures of the imaginative power. Such ideal objects may be brought before the mind merely by the laws of mental association, and without the presentation of any real object. In this case, the ideal creation being the same as in the other, it would be natural to suppose that an excitation of desire would take place similar to that effected by the presented object. The correctness of this expectation is fully attested by experience. A man may desire a new coat or a new book, or the satisfaction to be derived from the possession and use of it, as well when he merely thinks of such an object, as when he may see or handle it. Probably nothing can be regarded with desire or aversion unless we have first actually witnessed some reality of a corresponding nature which has affected us either with an attractive or a repellent influence. But, after a motive conception may once have been received, the simple recurrence of this conception awakens our desire.

Indeed, the power of a motive thought to excite desire is only incidentally connected with its relation to any real object, or with the possibility of the gratification of the desire. The actual presence of the book or coat may stimulate one's desire to have it; and

The strength and
feebleness of mo-
tives accounted
for.

so may the likelihood of his being able to obtain it; yet this happens only incidentally. The essential causes of the strength or feebleness of our desires lie partly in the condition of our motive tendencies themselves, and partly in the character of that energy with which any motive conception may be entertained. Some men, by their very constitution, have strong desire for certain objects; other men for other objects; and in any one man the motivity, which seeks some end, varies in vigor and excitability. One's bodily appetites change with his bodily condition; his propensities participate in the general freshness or exhaustion of his spirits, and exhibit also a freshness and an exhaustion of their own; even one's affections and moral sentiments are sometimes affected with sluggishness, so that the man of principle seeks new strength for resistance to temptation and the efficient discharge of duty. In addition to the variable energy of our motive nature itself, the strength of our desires depends greatly on the completeness and power with which any object of pursuit may captivate the attention of the intellect. The more perfectly any end of desire receives one's exclusive and intense regard, the greater will be the energy displayed by the corresponding motivity. To this cause we ascribe the influence, already alluded to, of presented objects, and of the possibility of the attainment of our desire. The object, being obtrusively present, impresses the conception of the end upon the mind; while the possibility of attainment, and yet more the actual effort to attain, fixes and concentrates the attention upon the thing desired.

Using the foregoing analysis, we may trace the methods which the soul employs in controlling and guiding the motive forces of its own life. They all arise from giving the attention and energy of the mind to some ends of pursuit rather than to others.

First of all, one greatly influences the direction of his own activity simply by the entertainment of motive conceptions, or ideals of pursuit. To this cause, among others, we attribute the remarkable

difference exhibited in the history of those who have commenced life under very similar circumstances. The scholars at the same village academy, the playmates of the same country neighborhood, are often widely separated in their subsequent employments and positions. One becomes an adventurous seaman, and explores many lands; he visits home to tell of tempests and calms on the ocean, of frozen polar regions, of the torrid zone and the fruitful tropics, and of the strange people who inhabit distant countries. Another enters the military service, and mingles in the tumultuous excitements of war. He can relate stories of the camp and the picket line, of the march and the bivouac, of the dangerous skirmish, of fierce personal encounters, and of hard-fought battles. Another finds in the business of mercantile exchange occupation for his energies and advancement in his fortunes. The wisdom of his purchases, the expedition of his sales, his enterprise in new avenues of trade,

Man directs his own life, first by the entertainment of motive conceptions.

his promptness in the discharge of his obligations, and his closeness in the securing and collecting of his claims, obtain for him honorable wealth. Another, who devotes himself to public life, becomes a leader of parties and the advocate of important measures; another qualifies himself for a learned profession, devoting his life to the care of the temporal or spiritual interests of his fellowmen; still others—and perhaps the greater number—make choice out of those occupations which offer them opportunity for immediate employment. Thus, for a short time, we follow the same pathway, and then separate to enter upon widely different scenes and occupations. This change results in part from that force of circumstances from which no strength of character or greatness of genius can secure exemption; but it is largely due to the adoption of certain objects of pursuit as specially suited to one's character, or taste, or talent. No more important duty devolves upon those who are entering upon life's career, than the formation of a wise and high ideal.

Secondly, by the contemplation of excitant objects.

In the next place, the soul stimulates its aspirations by the contemplation of such objects as illustrate the nature or the attainment of its chosen ends.

When some fixed purpose or desire controls the mind, the current of one's interest no longer diffuses itself over the multitude of things which continually present themselves. As one who surveys the map or picture of some widespread region directs his attention to those places with which he is familiar and where his affections have their home, and regards other places only as they may be related to these, so the man who has made some ends the objects of his ambition specially observes whatever may be connected with those aims, and passes over other things. One's transitory thoughts, as well as his more elaborate fancies and imaginings, have reference to his favorite pursuits; and the realities of history and of observation, together with the circumstances of one's personal life, are made the excitants and supports of his desires. The soldier sees in the world a battlefield; the statesman, a collection of territories under laws and rulers; the merchant, a great mart for business; the philanthropist, the home of weak and suffering humanity. Some persons cannot restrain their thoughts from images and tales which suggest sensual pleasures; others turn their eyes towards the glitter of gold and the magnificence of wealth; others ponder those great deeds whereby power and glory have been won; others contemplate the achievements of learning and science; and others the labors and sacrifices of noble men who have devoted themselves to the enlightenment and elevation of mankind. In this way the consideration of objects—but especially of real objects—increases one's eagerness in the pursuit of his chosen aims.

Thirdly, by entertaining the assurance of success.

Finally, the mind often strengthens a desire by entertaining as great an assurance as possible respecting the accomplishment of its end. Many objects of human aspiration are matters of only probable attainment.

It is the part of reason, before beginning the pursuit of them, to compare the chances for failure with the chances for success, and to determine whether the hope of gaining the end be worth the effort and sacrifice consequent upon the adoption of it. When this estimation is made to the best of one's ability, with the simple desire to know the truth, and not in the service of any specific desire, we regard our course as determined by truth and fact rather than by any agency of our own. But even this rational conception and determination of chances is an act of personal self-direction. This is the more evidently true because the judgment of reason varies in different persons, and because, in most cases of probability, the ratio of positive to negative chances cannot be exactly ascertained, but may, within certain limits, be determined by a sort of voluntary guess. But when that control of one's faculties, which should be left to reason, is usurped by some strong passion, the mind specially manifests its power to make for itself assumptions of probability. In such cases the error of judgment is often perceptible to those who are disinterested and dispassionate, and frequently becomes evident, sooner or later, to those who have had the misfortune to make it. The origin of such delusion is to be found in that limited view of facts and possibilities to which the mind confines itself while under the influence of haste, or excitement, or strong desire. Those facts, and the chances connected with them, which favor the desired result, are fully considered, while those which are adverse are more or less neglected; in this way, one judges according to a partial view of the case, carelessly or stubbornly assumed to be a fair and total presentation.

Every mode of the imagination has a tendency to influence the judgment unduly; such is the weakness of the human mind, and its liability to substitute supposition for fact. But the motive imagination is an especial cause of error; for, in this case, the tendency common to every exercise of the imagination is re-inforced by the engrossing power of some strong desire. Hence, the passion of love, creating the perfection which it desires to worship,

Hence, "Sees Helen's beauty in a brow of Egypt."

"Hope springs eternal in the human breast."

Hence, the words of Butler,

"The difference is as great between
The optics seeing as the objects seen;"

and that other saying,

"The man convinced against his will,
Is of the same opinion still."

Hence, the unconquerable prejudice of party; and the confidence, not always assumed, but often fully felt, of party leaders.

Hence, the enlargement of threatening evil produced by fear, and the expectation of want which afflicts the miser, and the line of the ancient moralist,

“*Multa inopiæ desunt; avaritiæ omnia.*”

In whatever relation the incentive imagination may be viewed, whether as to the conception of ends, or the consideration of excitant objects, or the suggestion of probable results, the importance of its operation cannot be over-estimated. The use of this faculty is a factor not only in the achievement of temporal success, but also in that religious faith and hope by which man is prepared for another and a higher state of existence. If it be exercised with wisdom, it is grandly productive of good; but, when conjoined with folly, it becomes a powerful agency for evil. Of all the sayings of the Royal Preacher, none should be more constantly remembered than this, “Keep thy heart with all diligence; for out of it are the issues of life.”

The pathematic imagination.

The effect of the imagination on the emotional, as distinguished from the motive, feelings of our nature, might furnish a further topic of discussion; and this would suggest to us the pathematic imagination, as a general faculty of which the poetic imagination is the most remarkable development. We shall not now enter upon this discussion. It is evident that the excitement of our sensibilities by imaginary objects in general, is to be accounted for by essentially the same laws as account for impressions from poetic and artistic productions.

CHAPTER XXXIX.

THE RATIONAL FACULTY.

§ 187. That power of thought which manifests itself prominently as the controlling element in the rational or discursive phase of intellect, is commonly known as reason.

The common definition of the rational faculty.

Most logical and metaphysical writers define this faculty as that by which the mind forms general notions and uses these in inference and in other operations pertaining to the perception of truth. This definition does not appear to be strictly correct; on the one hand, general notions are employed in operations which belong to the perceptive and reproductive faculties; and, on the other, certain exercises of the reason do not involve general notions. The cognitions of acquired perception, which are common to man and the brutes, and are not exercises of reason, involve the instinctive use of rules of inference, which rules are of the nature of general notions. In short, several operations which are often

described as belonging to the rational faculty exclusively, occur in mental phases which are contrasted with reason. And the doctrine, that every exercise of reason involves the use of general thought, cannot be sustained. It is now commonly admitted that trains of geometrical ratiocination can, and often do, take place from the simple inspection and consideration of diagrams, and without the intervention of universal principles. Yet such reasonings are among the purest products of the rational faculty.

Locke says that reason is "that faculty whereby man is supposed to be distinguished from beasts and wherein it is evident that he much surpasses them" (bk. iv. chap. xvii.). To make this definition explicit and satisfactory we must say "that faculty of perception and judgment"; for man surpasses the brutes in imagination as well as in reason. As Locke's "Essay" was directed to the consideration of the understanding, the limitation we have suggested was doubtless in his mind. Indeed, this is evident, for he goes on to describe reason as the faculty which first distinctly ascertains the grounds for belief or knowledge, and which then applies them so as to obtain either certainty or probable conviction.

Other authors, such as Kant, Coleridge, and Morell, give the name *reason* to a faculty which they distinguish from the understanding, or reasoning power, and by means of which we immediately possess ourselves of the necessary elements or eternal principles of truth. We can discover no good ground to believe that we have any such independent faculty, and, therefore, shall not dwell on this meaning of the term. Nor need we discuss those teachings which make reason something impersonal, separate from the soul, and communicated to it, a revelation of the Absolute Intelligence! Philosophers should leave such language to orators and poets.

An exact definition of the rational faculty can be obtained only by a careful scrutiny of that conception of reason which those employ who use the term without making it the expression of any philosophical theory. An examination of this usage, together with a consideration of the mental facts immediately related to it, will lead to the following results. In the first place, reason is not a single power, but rather a *collection of powers which operate in connection with each other*. Both thought and belief, together with attention, association, analysis, synthesis, abstraction, conception, generalization, specification,—in short, all the intellectual powers, whether primary or secondary—enter into this complex faculty. In the next place, reason involves a *peculiar endowment of mental ability*. The powers which this faculty employs, are employed by our other faculties of perception, but in lower degree. Man is said to be distinguished from the brute by his reason, and, undoubtedly, the development of reason in man is far beyond what any brute exhibits; yet a weak and lim

Kant's employment of the term *reason*.

Reason is not a single power, but a peculiar endowment of mental ability.

ited degree of reason cannot be denied to some of the brute creation; for we call any perception rational which is the product of some thought and study. Again, we notice that the special ability out of which reason springs is manifested in connection with both the primary powers of mind. First of all, there is a peculiar power of *comprehension*, whereby a collection of things naturally related—whether present or absent, actual or possible—can be thought of at once, so that the things presented in actuality often occupy but a small portion of one's rational attention; and, secondly, there is a peculiar power of judgment, or *penetration*, whereby the relations of things, and especially their necessary relations, are perceived; and so the mind discovers the inner nature of things and their more remote causes and consequences. By reason the savage is instructed to shoot the poisoned arrow, and is informed that, when wounded by such a weapon, he must die. The mere brute cannot fashion such an instrument and anticipate its effect. It is further evident that *this peculiar ability* of comprehension and penetration which we have now described, *affects the operation of the secondary powers*, so far as they contribute to that increased perception of truth which is the work of reason. Rational analysis is thorough, exact, and definite. The synthesis of reason is comprehensive, unites parts or elements by complex and important relations, and forms conceptions wholly its own. The associative or suggestive power of a rational thinker chooses from a wider range of ideas, and selects those of special significance and value: while abstraction and generalization, which are hidden factors in the lower modes of cognition, are marked features of rational thought. From these causes operations arise—such as the definition and division of notions, formal predication, the systematization and arrangement of topics, and analytical and connected argument,—which are wholly peculiar to rational beings. This leads to the remark that the exercise of reason exhibits *a greater voluntary control of our thinking powers* than is to be seen in connection with our other faculties. Some might even conjecture that reason originates in a peculiar ability to direct one's mental powers to the accomplishment of their proper ends. But this would be a very imperfect view. The truth is that the will shows more direction because reason both furnishes powers capable of being guided to a peculiar efficiency, and also indicates the ends and methods of this guidance. The increased mental grasp is of itself sufficient to account for the phenomena without supposing any simultaneous and independent addition to the strength of the will.

Reason, or the rational faculty, defined.

Reason, therefore, may be defined as *that comprehensive and penetrating faculty by which man obtains a distinct knowledge of the nature of things and can discover objects and the relations of objects, which lie beyond the sphere of his immediate or acquired perceptions—a faculty by which we not only analyze and perfect such knowledge as is merely pre-*

sentational or of easy and habitual inference, but also add to this knowledge by the power of widely embracing conception and far-reaching judgment.

A twofold division of reason, into the intuitive or practical, and the discursive or speculative.
Milton quoted.

The older English writers divided the exercise of reason into the intuitive and the discursive, in this following some of the Schoolmen. In the fifth book of "Paradise Lost," Milton makes the angel Gabriel, in his address to Adam, to say,

"The soul
Reason receives, and reason is her being,
Discursive or intuitive; discourse
Is ofttest yours; the latter most is ours;
Differing but in degree, of kind the same."

The intuition referred to in such language as this does not signify, according to the primary meaning of the word, an absolutely immediate or presentational cognition: as Milton says, the two modes of reason differ, not in kind, but in degree. We are here taught that there is an exercise of reason which resembles literal intuition, in being without a process, or—to speak more accurately—in being without any deliberate and conscious process. In this mode of reason, because either of intellectual superiority, as might be supposed in the case of angels, or of acquired and habitual skill, as in the case of human beings, the action of the mind is instantaneous or nearly so: the whole nature and all the bearings of some fact or collection of facts, are seen and understood by a single glance. This kind of perception is often exhibited by men in the practical affairs of life, and, with reference to this, the faculty corresponding to it might be called the practical reason. But the other mode is slower, and more under the conscious direction of the mind. Its suggestion of thought is in answer to continued inquiry; its analysis scrutinizes each element in succession; its synthesis is deliberate systematization; its inference considers, one after the other, antecedent, consequent, and the connection between them; in short, the energy of its attention is directed in turn to all the several elements of an act of knowledge, so that the nature and use of each may be properly apprehended. On this account this mode of reason has been called the discursive. It has also been styled the speculative, and, under this title, may be properly contrasted with that practical reason which we have just defined. But, while reason is divided into the *intuitive and the discursive*, or the *practical and speculative*, these are radically the same power, and differ only in the mode of their operation. The elements and methods of thought and of belief are the same in both. Intuitive reason may be compared to a practiced military genius who perceives at first sight all the capabilities of a field of battle; discursive reason is the less experienced, and, it may be, less talented, commander, who surveys each part of the field in succession, and forms his plan of action gradually.

Such being the case, it is plain that the term *reason* cannot be exactly replaced by the expression *discursive faculty*, one form of reason being, in a sense, intuitive. Yet reason may properly enough be called the discursive faculty, provided only it be understood that such language is adopted, because discourse is the more prominent mode of reason, and that alone in which the nature and workings of this power can be directly seen and studied. The intuitive exercise of reason is too rapid for either contemplation or control; it can be understood and influenced only through a knowledge of the nature of rational discourse and of the rules by which this should be regulated. The philosophy of reason must mainly concern itself with the discursive development of this faculty. Only, in speaking of reason as discursive, we must guard against misapprehension.

The reason and the understanding identical.

In this connection, let us notice an *unwarranted distinction* which has been made between the reason and the understanding. Some have confined the former term to what we have called the intuitive reason, and have assigned the latter to the discursive faculty; while others, adopting an opposite use of language, have given intuition to the understanding and discourse to reason. The fact is that both terms indicate the same thing, though under different points of view. The designation *reason* is derived from the essential work of the faculty, that is, from that perception and collation of things and their relations (*res, reor*) whence our higher knowledge takes its rise; while the name *understanding* springs from a reference to the result of the foregoing perception, whereby one figuratively *stands under* the facts he has considered, that is, below their superficial appearance and among their causes. This result is directly indicated by the verb *to understand*, and, therefore, the noun *understanding* more immediately suggests that discursive faculty, by the use of which, ordinarily, one consciously attains to rational intelligence. To the common mind the term *reason* is without this suggestiveness. But that both terms have essentially the same application is chiefly evinced by a fact which will become more manifest during the course of our future discussions, viz., that the phenomena ascribed to both faculties, when sifted and explained, call only for the existence of one complex faculty.

The rational faculty, or reason, distinguished from the rational phase of thought.

Such is reason. We may now inquire whether the rational, or discursive, phase of thought (§ 13), as distinguished from the rational faculty, should be held to include every mental operation in which reason participates; or should it be *confined to those in which reason is the prominent and controlling factor*? If we adopt the former alternative, we must allow the rational phase to include every exercise of the productive imagination, because this imagination constantly employs the reason and judgment (§ 183). But it will contribute better to clearness of conception and statement if we limit the discursive phase to exercises of



mind which are distinctively logical—whose proper purpose and result is the attainment of truth. This course will render more defined the distinction between the reproductive and the rational phase of thought, and will agree with that frequent mode of conception according to which complex objects are named and distinguished with reference to their preponderating character. The rational phase should include *every mental activity in which the ascertainment and understanding of truth is the main purpose and result of the employment of reason*; while those rational operations, which are simply elements in the work of the creative imagination, may be relegated to the reproductive phase. And thus, as certain modes of scientific imagination may be claimed for the rational, so certain plastic exercises of reason may be granted to the reproductive, intellect.

Our discussion necessarily logical. Three necessary forms of rational thought.

§ 188. The elemental powers from which reason is constituted, are the same with those which enter into our lower perceptive faculties, and have been discussed as the primary and secondary powers of mind. In treating of them (Chaps. XI. to XXIX.)

much matter was introduced which might have been reserved for the topics upon which we now enter, it being thought that our earlier studies might advantageously bear some of the burden of our more advanced investigations. In consequence of this we are not now called to discuss the radical nature of those modes or forms of thought which reason uses, but have to consider these in those specific lights and relations to which our attention is called when we make the rational phase of intellect the object of special study. The notion or conception, the proposition and judgment, and the inference, having been handled as to their essential nature, we must now deal with them from a point of view peculiarly logical. Not that we propose to formulate a logic, but because any satisfactory philosophy of the reasoning power can be nothing else than a discussion of those principles which lie, or should lie, at the basis of logical science.

The notion, the proposition, and the inference, to be considered in their order.

Very intimate relations exist between the forms of thought which reason employs, propositions being framed from notions and inferences from propositions. Considered merely as a mode of thought the proposition is little else than an existential

notion; it sets forth either the existence of a thing simply, or its existence as related to some other thing. Of course it may set forth non-existence likewise, but, for the sake of simplicity, we mention existence only. "There is a king," presents the conception of the king as existing; but, "The king is just," sets forth the quality of justice as existing in a king. The universal statement, "Man is mortal," presents "mortality necessarily existing in man." The proposition differs from the existential notion in emphasizing that element of existence which is not emphasized in the notion, and which, indeed, is not necessary to a notion at all. Therefore, when these forms of thought become vehicles

of belief, the reality of the thing is only implied or supposed in the use of the notion, while it is expressly enunciated in the proposition. When we say, "The king is wise," the proposition sets forth "the existing wisdom of the king"; the existence of this wisdom is expressly propounded; but the existence of the king is not asserted; it is simply taken for granted.

Again, the inference, contemplated as a mode of thought, may be regarded as consisting of two propositions connected with each other as antecedent and consequent. The antecedent proposition may be either simple or compound, according to the nature of the fact or truth presented by it; but the inference can always be reduced to two propositions, and, in a certain sense, always consists of two only. This may be seen, first, in the case of those inferences which logicians call immediate. In the example, "Nine inches are part of a foot, therefore they are less than a foot," there are two simple propositions, the latter being the consequent and the former the antecedent. But should we say, "John is older than Hugh, and Hugh is older than William; therefore John is older than William," the antecedent might be said to contain two propositions, as it certainly does; yet neither of these by itself constitutes an antecedent; both must be taken together to express one compound fact, viz., "John is older than Hugh, who is older than William." This compound proposition is the antecedent; so the argument is reduced to two propositions; though one of them is compounded and double. In those inferences which logicians call mediate, the antecedent consists of one proposition; that is, of the statement of one fact, though it be compounded of two. When we say, "Hindoos are men, and men are mortal," there are two propositions, neither of which alone would lead to any conclusion; but the compound proposition, resulting from their union, is a logical antecedent. For we may say, "Hindoos belong to the class, men, who are mortal," or "Hindoos have the nature of man, which is subject to death"; whence we infer, "Hindoos are mortal," or "are subject to death." As every inference is constructed from propositions, and every proposition arises from a peculiar use of notions, simplicity of progress requires that we should first consider questions concerning the notion, then, after that, questions pertaining to propositions and predications, and, finally, questions relating to inference and argument.

CHAPTER XL.

THE NOTION IN LOGIC.

The notion defined. All notions save two, concern forms of being, or entities.

§ 189. A notion, in the most general sense of the term, is the same thing as a thought; it is the result or product of the mind's thinking about anything in any way. As there is a sense in which anything whatever may be called an object, so the thought of anything may be called a notion. The word originally signified the act of knowing, and then came to indicate the product of the act.

We may have notions of every object that does or may exist, and of every element of every object, and also of their existence and their non-existence. As, however, our notions of existence and non-existence, like the things themselves, are *sui generis*, and the immense multitude of our ideas represent entities—or things that may, or do, exist—the discussion of notions must almost entirely concern our conceptions of entities; nor is it any wonder that many writers, neglecting the ideas of existence and of non-existence, have treated the notions of entities as if they were the only ones entertained by the human mind. Without committing this error, we shall devote the following discussion to the notions of entities alone; for the thoughts of existence and of non-existence have been carefully considered in another place. The first formation of notions has been explained in connection with the topics of analysis, synthesis, abstraction and conception; we have also seen the nature of that synthesis, or conception, which, under the guidance of the spontaneous exercise of reason, has resulted in those forms of thought to which the forms of language correspond (§ 130). We shall now study those affections and relations which specially attach themselves to notions in our rational pursuit of truth; and an understanding of which is essential to the philosophy of the discursive faculty. These affections and relations can be better understood in connection with certain logical distinctions than in any other way; and they have generally been discussed in connection with such distinctions.

Complete and supplementary notions. Categorical and syncategorical terms.

First, let us consider notions with reference to their use in providing the terms of propositions, and divide them into *the complete and the supplementary*. By the former we mean those capable in themselves of serving either as subject or as predicate of a proposition; by the latter those which can enter into terms only in combination with other notions. In the assertions, "Grass is green," "Rain-drops fall," the ideas expressed by *grass, green, rain-drops, fall*, are logically complete. But in

the propositions, "The blades of grass quiver in the wind," "The drops of rain sparkle like diamonds;" the ideas expressed by the *the*, *of*, *in*, and *like*, are supplementary. Moreover, these last two propositions; though containing eight notions logically complete, have only four terms, two of which, viz., "The drops of rain," and "The blades of grass," are subject notions, while the other two "Quiver in the wind," and "Sparkle like diamonds," are predicate notions. From this we see that complete notions may be either simple or compounded; each term of every predication sets forth one complete notion.

This distinction, which we have now explained, is related to that division of words into the categorematic and the syncategorematic, which is commonly found in works on logic; a categorematic word being sufficient of itself for a term, and the syncategorematic being that which can only assist in the formation of a term. The two distinctions may even be regarded as the same. But we have avoided these well-known terms, because logicians give no satisfactory instruction as to the use of them. Some apply the name categorematic to single words only, others to compound words as well; some say that only nouns in the nominative case are categorematic; others admit adjectives and verbs or equivalent expressions; while all exclude adverbs, and expressions equivalent to them. These views and differences arise from considering the forms of language and grammar with reference to their original force in predication, and without perception of the secondary capabilities of expression which these forms assume. It is tacitly held that the same form of words always enounces the same mental proposition; and that the grammatical one. In the statement, "The man speaks truly," they would say that one term is *the man*, and the other *speaks truly*. But a predication may always be regarded as the answer to a question telling one that which he wishes to know. If, then, one knew that the man spoke, but was uncertain whether he spoke truly or not, the whole force of the predication would lie in the word *truly*, and this adverb would set forth the predicate of the mental proposition. In such cases the adverb should be regarded as the predicate. Any logic, to be successful, must not rest in verbal expressions, but should pass from them to the mental propositions, regarding even these, not only as to their own primary construction, but yet more as to their actual force in stating truth and fact. In short, the logician should regard notions, rather than words, as being primarily the terms, or extremes, of predication, and should interpret the verbal proposition according to the mental assertion which it is intended to express. If these statements be correct, then adverbial, no less than verbal and adjective, notions, may be used as predicates and be logically complete in the discourse of reason and of language. Therefore, the ordinary distinction between categorematic and syncategorematic words is insufficient for the purposes of logic. But even our division of notions into the complete

and the supplementary indicates rather a difference in our mode of using them, than any necessary distinction between the notions themselves. For any notion is capable of becoming the subject or predicate of a proposition; but some notions are so constantly employed merely as the modifying complements of other conceptions that the thought of this attaches itself to our ordinary use of them. It is seldom, and then only by a special directness and emphasis of attention, that they are brought out of their subordinate position. Such are the ideas expressed by articles, prepositions, and conjunctions; and such, also, to a less degree, are adverbial conceptions.

Notions are subjective or predicative. The distinction, which we have now discussed, leads to another, more fundamentally connected with the structure of rational thought. Notions, considered as complete, that is, as fitted to be the extremes of propositions, are either *subjective* or *predicative*. By a subjective notion we mean that which may be the subject of a predication, and which, in a sense, subjects the object of the notion to the predication; and a predicative notion is that which may be the predicate of a proposition, and using which we predicate something of the subject.

The first of these forms of thought is invariably a substantial, or substantive, conception. It must present a substantum or logical substance, that is, some object or element viewed independently, or rather with only an indefinite reference to any relations other than those included in our conception of its nature. When an object is thus independently conceived of, we are prepared to assert either that the object itself exists or that something else exists in some relation to the object. But it is impossible to make statements about anything which we do not conceive of directly and independently. At least, in that case, our statement would concern, not that thing alone, but something else also along with it. In the vocal expression of thought, the principle now enunciated requires that every subject of a proposition should be a noun in the nominative case, or its equivalent. For every oblique case presents the object as in some relation.

On the other hand, a predicative notion, though it may include a substantial conception, is never such a conception simply, and may not include such a conception at all. The statement, "Socrates was wise," asserts that wisdom existed in Socrates, yet does so by means of an attributive—not a substantial—notation. Some say that every predicate adjective has a noun understood; but this doctrine is unwarranted. There is no evidence for it in language; and it conflicts with the common consciousness of men. When we say, "The bird flies," the flying is asserted simply as an action, and without any substantive attachment to the verb *flies*. When we say, "The queen is in the parlor," "She is eating honey," neither predicate is a substantive, though each contains one; the first has a relation for its leading thought; the

second an action. Even when we seem simply to predicate one substantum of another, as when we say, "The man is a king," "Angels are spirits," "Patience is a virtue," what we really assert is not substance, but substantial identity. We do not assert that either object exists, but only that both objects are the same thing or substance. Whether the objects really exist, or are merely ideal, is supposed to be already known. If every predication is an assertion, and every predicate that which is asserted, we do not here assert a substance of a substance, but only, as we have said, a substantial identity. We allow that every predicate may be made to assume the form of a substantial expression, but we deny that this is the only proper form of predication, or that we ever predicate substance simply. Of this we shall speak again.

The true doctrine is that the predicative notion always sets forth something as in some relation to the subject, and that the predication enunciates or asserts the existence—or the non-existence—of that something as in that relation. The specific nature of the relation varies according to the nature of the things related. This general relation of predicate to subject has been expressed by saying that the predicate is *in the subject*, in which language the preposition indicates relationship in general, and serves to abbreviate that figure of speech according to which one thing is said to exist *in some relation* to another. The Schoolmen indicated this thought by saying that the predicate *inhered* in the subject, and, in this, they reproduced Aristotle, who says, that every enunciation or proposition is "a voice significant about something being inherent or non-inherent," which inherency means only to exist in some relation to something.

§ 190. The "Categories," or "Predicaments," of Aristotle, as their name and nature, and his general treatment of them, indicate, are a classification of our natural predicable—or predicative—conceptions; and, although his detailed discussion of them loses sight of this character, and becomes confused in the extreme, the classification itself has more merit than Hamilton and Mill and most modern logicians have allowed to it. The first category, *substance*, really sets forth that substantial identity of which we have spoken. Using it, we assert the fact of the identity of the subject with the predicate. It is true that by means of this we generally assert something else and more; but this is the immediate act.

The second category does not set forth simply that the subject has *quantity*; for such a predication would differ little in nature from one of quality; but it asserts that the subject has quantity, and that this quantity is of a certain amount or measurement. We say that a certain period of time is ten years, that a certain weight is one hundred pounds, a certain distance one thousand yards. This mode of predicative conception is radically one of relation; but it has the peculiarity that the at-

The "Categories" of Aristotle explained. They are a classification of our spontaneous predications.

tion of the mind is given almost exclusively to the quantum as measured, and not to the standard of measurement. When a man asks how many dollars he has in the bank, he does not consciously think of the one dollar with which his tens or thousands are tacitly compared. This category, therefore, sets forth the existence of definite or measured quantity as inhering in the subject. *Quality* is asserted when we say, "Man is mortal," "Snow is white," and in all propositions intended to qualify the subject by setting forth attributal parts in their relation to it as a whole. For, in logic, attribute and quality may be used as convertible terms. The category of *relation* includes those statements which present simply the existence of some relation. Knowing the size of two objects, we say that one is greater or less than the other, or equal to it; or, knowing their positions, we say that one is within or without the other, or before or behind it; or, knowing two men, a lawyer and a physician, we may say that the lawyer is like the physician, or is his son or neighbor. But, should we say, "The lawyer is the son of a physician," intending to characterize the father, this would not be a simple predication of relation; it would be a compound predication, and would answer two questions, first, "How is the lawyer related in the present case?" and second, "What is the occupational character of the person to whom he is related?" Evidently, relations are predicated as inherent in the subject.

The categories *where* and *when* refer to compound propositions somewhat similar to that just mentioned. For, when we say, "The man is here, or at home, or abroad,—the event occurred to-day, or yesterday, or a year ago,"—the importance of the statement depends as much on the *particular place or time of the relation* as on the relation itself. The emphasis is not on the relation alone. Hence, the ancient languages usually answered the when and the where by one word; while modern thought, even when using a plurality of words, tends to a unity of conception. So with the next two categories, which we shall call *posture* and *condition*, meaning by the former an external state considered as resulting from internal causes, and, by the latter, an internal or adherent state, however produced. Standing, sitting, lying, fitness or unfitness for work or duty, capacity or readiness for speech or action, are postures; being shod or clothed, or sick or well, or weak or strong, as states of the body, and being informed or ignorant, virtuous or vicious, happy or miserable, as states of the mind, are conditions. Finally, *action* and *passion*, though often the same thing, differ as categories because they are predicationally conceived as related differently to different subjects. We say of one, "He strikes," and of another, "He is struck." Moreover, intransitive actions are conceived of without reference to any result attending them.

These categories are an excellent primary classification of those modes of predicative conception which are natural, or

spontaneous, to the mind. They appear both to exhaust the subject and to be exclusive of one another. They illustrate the nature of the predicative notion and especially exhibit that inhesive character by which it is distinguished.

A threefold division of our predicative conceptions proposed.

But a scrutiny of them encourages one to attempt a further classification, founded on further analysis. Considering the categories in their essential nature, that is, as so many channels whereby the mind receives, or imparts, rational information concerning objects, we perceive that every predicate belongs to its subject, either as an attribute, that is, as a part of its nature, or as an adjunct, that is, as something related to the subject without being included in it. The first three categories may be taken as presenting attributes, and the rest adjuncts. In this way a twofold division of predicative notions is suggested, according to which the substantial identity of the first category would be classed with attributes; inasmuch as it enters into the total nature or being of the subject. The assertion of this identity, however, has a significance that the ordinary predication of attributes has not; because it identifies the subject with that which may itself be the subject of other predications, and because, when one thing is identical with another, it has—and may be affirmed to have—all the attributes and adjuncts of that other. Thus the predication of substantial identity, which, for brevity, may be called *substantial predication*, has a logical effect and importance which are specially its own. Such being the case, we may recognize three classes of predicative conceptions; *first*, the Substantive, using which one substantum is identified with another; *secondly*, the Attributive, by means of which attributal parts are assigned to the substantial whole; and, *thirdly*, the Adjunctive, in which things are set forth as in external relation to the subject. The first of these may be said to identify wholly; the second, partially; the third, not at all. Which of these modes of conception may be employed by the mind in any particular case, should be determined from the analysis of one's thoughts, rather than by the forms of language which may be used. As President McCosh says, "In all cases we must look to the thought,—to the notion in the mind—and not to the mere words, to determine what is the notion, and what sort of notion it is" ("Logic," part i. § 2).

Conceptions are singular or individual, and general or universal.

§ 191. We now come to an important division, on the one side or the other of which all our thoughts may be placed, whatever be their use or signification. This division arises from the fact that we sometimes think of things as individuals, and sometimes of them in the general. Ideas, accordingly, are separated into the singular, or individual, and the general, or universal. The former kind of notions are such as are affected with the element of individual difference, and are applicable only to individual objects; the latter exclude the thought of individual difference, and are

applicable to a whole class of objects as being similar to each other in the aspect presented by the notion. A notion applicable to anything as being of a certain kind or class of similars, applies to that kind or genus, and to all the individuals in it, and, on this account, is called general and universal. These terms, therefore, indicate the same thing, under two closely related aspects. A notion is called singular as applying only to single objects, and is called individual as being incapable of logical division. But, when the terms *singular* and *individual* are so contrasted as to divide this class of notions, the latter signifies conceptions considered as formed from general notions and rendered singular or individual by the action of the mind; while the former indicates notions either derived from the immediate perception of things, or, at least, having in them no general reference. In this sense, proper names, and words so used, express singular notions; while such utterances as, "This man," "These apples," would express individual conceptions. We should add that the term *singular*, even in its widest signification, is not applied to those individual notions which are indefinite; such as, "A man," "Some apples."

Singular notions are of importance in logic. Mill's doctrine respecting proper names refuted.

By most logicians singular conceptions have been treated as scarcely belonging to the sphere of rational thought, or, at least, as discharging a comparatively unimportant function there. This is the case particularly with Sir Wm. Hamilton and those other writers who adopt Kant's theory of the origin and construction of our ideas. This class of thinkers incline to make all singular notions the derivatives of those which are general, saying that all thought, *i. e.*, rational thought, is essentially "mediate and complex cognition." And, because they consider the general notion to be the necessary and essential instrument of thought, they restrict the term *notion* to general conceptions. Pres. McCosh avoids these mistakes when he says, "All notions are either singular or universal," and again, "Our primary knowledge is of single objects."

While singular notions do not call for so much discussion as the general, their relations being simpler and more easily understood, they yet have a fundamental place in the economy of rational life; and they are the source whence general notions obtain their content and meaning. Therefore, we must dissent from an opinion of Mr. John Stuart Mill, who says that "proper names, strictly speaking, have no signification" ("Log." chap. ii.). If signification be the power of acting as the sign of an idea, and of the object corresponding to the idea, then proper names have more signification than any other names. This fact will be evident from the illustration employed by Mr. Mill to prove the contrary. He says that the chalk-mark made upon the house by the captain of the famous forty thieves, so that he and they might know the place again, did not declare anything about the house—it did not mean, "This is such a person's

house," or "This is the house containing rich booty." To us it is palpably evident that the mark did declare this very thing, and was chosen by the captain as fitted for that end. In like manner, when we and others agree to use the name Socrates to designate an individual, the term signifies to each of us all that he conceives to belong to that individual. But when Morgiana defeated the designs of the robbers by marking all the neighboring houses in a similar way, she succeeded, not because the original mark had no signification, but because her act destroyed the signification which it had. If the mark, as originally made, had been without significance, there would have been no need for her ingenuity. Let us grant that the multiplied application of a proper name may destroy its significance; this proves that the name has significance, and that the significance lasts so long as the original understanding can be carried out, which is that only one known object be indicated by the name.

The mistake of Mr. Mill, in calling a proper name "an unmeaning mark," resulted, probably, from a confusion of thought connected with his nominalism. Failing to comprehend the distinction between the singular and the universal, in thought and language, he failed also to comprehend another distinction closely related to it. It is true that singulars differ from general terms in that they cannot of themselves be the vehicles of any *new* knowledge. They recall what we know, but add nothing to this. Therefore, they may be said to have a *recollective*, and not an *informative*, force. But recollective is no less significant than informative language; it is even more so, and should not be compared to an unmeaning mark.

The individual, as distinguished from the singular, notion, is more closely allied to the universal. Regarding objects as singulars, we attribute to them, not merely individual difference, but also some definite characteristics which enter into that difference, and belong to them only; and the emphasis of thought rests on this singular difference. But, regarding objects as individuals, we neglect singular characteristics, and think of them as severally possessing some character which is common to a class of similars. Individual notions, as thus described, comprise all that are not either singular or general. With reference to their application to objects, they may be distinguished into the definite and the indefinite; the definite being those applicable only to one given individual, or set of individuals, and the indefinite those applicable to any one of a class of individuals, or to any set in a class. "The prisoner at the bar," "The prisoners in the jail," "This book," "These books," "Those ten men," are definite, individual notions. In this class of conceptions we include the distributive notion, to express which a common noun in the singular number is used with the adjective *each* or *every*; as when we say, "Every man," "Each member of the family;" and, likewise, the class notion, viz., that which is expressed by

The individual notion distinguished from the singular. It is either definite or indefinite.

the plural of common nouns, taken in their widest possible application, for example, *prisoners, books*, meaning *all prisoners, all books*. For, in this latter conception, we think of a set of individuals, and the notion is applicable only to the whole class as constituting one defined set. We do not think of the class as an ordinary whole, but as a plurality; and our notion is definite as setting forth this plurality in its entire extent.

Indefinite individual notions are indicated by such terms as *a prisoner, ten prisoners, some books, any books, a few books*, and by nouns used with a partitive signification. In the sentence, "He sent me letters, and gave me information," the words *letters* and *information* express indefinite individual notions. For, in all such cases as we have mentioned, our words and thoughts are applied to individuals as being members of a class, yet do not in themselves refer to one individual, or set of individuals, more than to another.

The class-notion is individual and not general.
Employed by nominalists.

Some, who have been accustomed to identify the class conception with the general or universal, may think it strange that the former should be spoken of as an individual notion. But those notions, only, should be esteemed general from which the element

of individuality has been eliminated, and all those should be set down as individual which present objects in their individuality. Therefore, there is logical consistency in the nominalistic teachings of Mr. Mill and others, who, while denying, or ignoring, the existence of general ideas, admit the existence of the class-notion. The plausibility of modern nominalism arises chiefly from the fact that, in a frequent and important mode of thought, the class-notion, and its expression, assume the place and force of the general notion, and its expression. Nevertheless, in such cases, the power and function of the class-notion can be shown to be secondary, and derivative, and dependent upon its affinity to the general notion.

A fivefold division of notions proposed.
Singular, individual, indefinite, the class-notion, the universal.

This brings us to say, that, *if notions should be considered with reference to their functions in predication and reasoning, as well as with reference to the mode of their application*, the classification, thus resulting, though no longer connected simply with the nature of the notions themselves, will yield a division more

fruitful in logical uses than the radical distinction which we have now considered, and which recognizes only the singular and individual, and the general or universal. Both the class-notion, in which we include the distributive (as also setting forth the whole class), and the indefinite individual notion, have functions in predication which separate them from the singular and ally them to the general. Therefore, instead of the division just discussed, and on the complex principle already stated, we propose the following fivefold division.

First, we have the *singular* notion in which we consciously and directly conceive of a thing with its individual peculiarities,

neglecting what community of character it may have with other things. This notion is expressed by proper names, or by simply pointing to objects, or by using descriptive language without reference to its common applicability. It may be either unital, *i. e.*, grammatically singular, or plural. "George," "That man over there," "The friend I saw yesterday," express unital notions; while in the statement, "George and Henry are the friends I was with yesterday," both subject and predicate are plural.

Secondly, we have the *individual* notion, which, also, may be either unital or plural. In this we regard an object, or objects, as having peculiarities of their own, yet our attention dwells less on this than on the character possessed in common with a class. When we say, "This man," "These men," "George, my brother," "My brothers, William and Henry," "The town constable," "The town officers," intending to characterize known individuals as having general marks, we use individual notions in the sense now described. This individuality is what we distinguished above as definite individuality.

Thirdly, we have the *indefinite* notion, being that already described as the indefinite individual notion. Using it, we think of an individual, or set of individuals, with reference only to some general character belonging to it or them, and without any conception of any peculiarities by which it or they may be distinguished from other members of the same class. Such a notion is indefinite, because it is indefinitely applied and does not mentally separate one member from another, but only, as it were, prepares to do so. Indefinite objects, which are the objects of such conceptions, resemble general objects, in that, so far as they are indefinite, they are mere products of the mind, and without reality. For, whatever is actual is definite as well as individual. If a man resolve to give ten pennies to as many Italian beggars, in a crowd who were all unknown to him, he might be said to have in mind the indefinite object, ten beggars; but he could not give the money save to ten definite individuals.

Fourthly, we have the *class-notion*, and this, both in its distributive, or unital, and in its collective, or plural, form—thus, "Every man," and "All men." This notion is connected with the general notion in necessitudinal predication. For, whenever, using the general notion, we can say, "Man is mortal," that is, "Is necessarily mortal," we can say also, "All men are mortal." Because these two kinds of conceptions afford convertible forms of predication, many have overlooked the difference between them.

Finally, we have the *general or universal* notion, which is formed by eliminating from our conception of a singular object all thought, not only of its peculiarities, but also even of its indeterminate, or material, individual difference. Both attributive and substantial notions may be thus generalized; both the adjective *canine*, and the noun *dog*, may express a general notion.

In technical language we reject what is individual in any notion, whether it be form, or matter, or both, and retain what is common, whether it be form, or matter, or both. The scholastic doctrine, that every general object presents form only, cannot be sustained. General natures are conceived of as consisting of form, but general objects as having matter also (§ 129). General objects are general *substantial* forms.

The general notion characterized. The general notion differs from the others of which we have spoken in that it ceases to exist in being applied; it is, therefore, neither unital nor plural. Other notions, as such, exist by reason of their application. But, though the general notion as such, is not applied and has not even that partial or incomplete application which distinguishes the indefinite notion, it is always applicable, and that to the fullest degree. It is applicable to every member of a class, and to some, or any, or all, of the members. Therefore the general notion is more indefinite than even the indefinite notion. "The latter does not indicate which individual, or set of individuals, in a class, are thought of, or to be thought of, in the further application of it; but the former, of itself, does not indicate even whether it is to be applied to one individual, or to several, or to all, in some class of similars. General conceptions are applicable to individuals in every possible way, but how they should be applied in any particular instance, is to be determined from the nature of the case, and not from the notion itself. In the sentence, "By man sin entered into the world," the notion *man* can be applied to one individual only; being applied, it loses its generality and enters into the individual notion, "The man Adam." When we say, "Man cultivates the ground," the notion *man* is applicable only to a portion of the human race; thus applied, it produces the indefinite notion, "Some men," or "Many men." In like manner, the statement, that "The German prospers in America," when mentally applied, produces an indefinite notion; for we mean that *most Germans* do so. And the predication, "Man is mortal," which asserts a necessary attribute or adjunct of man as man, is applicable to the whole race; being applied, it results in the class notions, "Every man," "All men." Thus the general notion is an applicable, but not an applied, notion. When applied, it ceases to be general, just as fuel, when burned, ceases to be fuel.

Moreover, this notion is called universal, or general, not because it is applicable only to the whole class, but merely because this applicability is a very prominent characteristic of it. If the term *universal* were to be given to that notion to which it is most immediately related, it should be transferred to the class-notion. This, however, would conflict with an established usage.

The terms indefinite and indeterminate distinguished. The term *indefinite*, in this discussion, has the meaning which attaches to it when we speak, in grammar, of the indefinite article, and, in logic, of an indefinite proposition. Sometimes the word signifies in-

determinate, not as to application, but as to meaning or essential signification; a notion being indeterminate as to meaning when it is not sufficiently specific for the purposes of the inquiry in which it is employed. If it were alleged, or could be shown, that certain sheep were killed by quadrupeds, this conception of quadrupeds would be indeterminate, if the important question were whether the killing was done by dogs or by wolves. Every general conception is indeterminate in comparison with those more specific; and notions formed from general notions may be indeterminate in their meaning while they are determinate—that is, definite—in their application. The notion “All men” applies definitely to the whole class, but is indeterminate in comparison with the conception of any particular class of men. When the terms *indefinite* and *indeterminate* are contrasted, in relation to conceptions, the former should refer to the application or extent, and the latter to the meaning or content, of the notion. The idea “That man” is definite, while the idea “An Asiatic” is indefinite; but the latter notion is more determinate than the former.

§ 192. That fivefold division, which has now been explained and recommended, is founded on certain relations of notions to their objects without reference to the nature of the objects. For every conception sets forth its object either in the general, or as a class, or as indefinitely considered, or as an individual possessing peculiarities yet marked by some common character, or as a singular object, that is, as an individual possessing peculiarities of its own and viewed without reference to its participation in class characteristics.

Another division has reference to certain general relations which arise between notions as setting forth the nature of their objects. We refer to that given in the five “predicables” of Aristotle and Porphyry. For the logical distinction of things into genera, species, differences, properties, and accidents is but the objective expression of the division of our notions into the generic, the specific, the differential, the proprietarial, and the accidental. It pertains to things considered, not in themselves merely, but as connected with our modes of viewing them as having related natures. In other words, this division sets forth mutual relationships of notions as indicative of natures mutually related. A generic, as distinguished from a general, notion, sets forth the common character of a class within which other classes are contained. A specific notion gives the character of objects as belonging to some particular one of the included classes. The differential notion presents the difference by the addition of which to the generic thing the specific thing is constituted. The proprietarial notion, that is, the idea of a property, sets forth that which is necessarily connected with the nature of a thing, without being included in it. And the accidental notion represents what is only contingently connected with a thing or its nature. These

The five predicables of Aristotle and Porphyry. Unsatisfactory as a general doctrine concerning the matter of predication.

terms and definitions are those of Porphyry, but are essentially also those of Aristotle, although the latter sometimes mentions definition as being equivalent to species, and omits difference as being convertible with genus ("Topics," bk. i. 4-5).

This list of notions was called the predicables, because it was held that predication consists essentially in asserting that one thing, when said of another, is either a genus, or the specific difference, or the whole species or essence, or a property, or an accident, and that, therefore, this division sets forth predicate notions in their fundamental relations to subject notions; a doctrine which is to be found in most systems of logic, both ancient and modern. It may be admitted that every proposition which does not immediately employ one of these predicables can be made the basis of one which does: but we cannot allow that the mind always or necessarily makes use of some one of these modes of predicative conception; nor is it true that the force of a proposition in reasoning requires that its predicate should be conceived in one or other of these modes.

Plainly, mere existential propositions, which have no predicates, do not conform to the predicables. As for predications proper, it is evident that whatever exists in a relation to a subject must be either included in the subject, or be the whole of it or be connected with it either necessarily or accidentally. Is then one of these things an element—and the essential element—in our thought, whenever we say something about something? So far from answering this question affirmatively, we believe that most assertions, positive and negative, have no reference to these thoughts at all. When we say, "Garfield is president—is wise and good—has been shot by an assassin," we have no intention of describing a part or the whole of the nature of the man, or of saying that certain things are necessarily or accidentally related to it. We simply set forth certain predicate facts in their own nature and their own specific relations to the subject. The first of these statements concerning Garfield has a substantive, the second, an attributive, and the third, an adjunctive, predicate; yet even these forms of conception and of language are not felt by the mind to be the essential elements of its thought; they are only, as it were, the shapes which our thought naturally and necessarily assumes. If, then, these modes of conception, which are always employed, are not the essential or vital part of thought, much less can those be which are not employed always. For, even as setting forth the non-essential forms of predicable conceptions, the threefold classification, which has just been illustrated, has more claims on our regard than the five-fold division of Aristotle. Every predication agrees immediately with some one of the three forms; even those various modes of conception which the "predicables" express, in some cases with equivocation or ambiguity, always conform to one or other of the three. Strictly and properly, generic, specific, and differential, are attributive; proprietarial and accidental, adjunctive, notions.

But the mind can vary its modes of conception and assertion, so that sometimes these predicables take the form of substantive notions; as when genus and species are expressed by saying, "Man is an animal—the rational animal," the attributive being displaced by the substantive conception. Sometimes, too, the predicables are understood to assign the subject to a class, as when we think or say, "He is one of the wise and prudent," in which case every predicate is relational and adjunctive.

This ancient doctrine of the predicables, however viewed, is unsatisfactory and misleading with reference to its professed end, that is, the explanation of the nature and forms of predication; it has been a stumbling-block in logical science.

The predicables useful in definition and division, and generally in discussions respecting natures.

Nevertheless, though unfit to illustrate predication in general, this classification is not without value. For it exhibits the use of propositions *when the nature of objects is made the subject of our investigations*, and it is especially helpful in regard to those

two important kinds of predication which we call *definition and division*. Predicate objects, so far as they are related to the nature or constitution of anything, are rightly distinguished into the internal or essential, and the external or non-essential; and these, again, being sub-divided according to their relations to the essence, produce the five predicables. Therefore, in philosophical inquiries, and whenever we set ourselves to determine the nature and natural relations of any object, these predicables are to be borne in mind.

The term *ascript* proposed as a general term including attribute and adjunct.

In the foregoing discussion the term *attribute* indicates those parts which belong to the metaphysical whole as such (§ 122), and which, from being frequently used to distinguish the kind of thing a thing may be, are also called its qualities (*πῶιονηρες*).

This is the ordinary meaning of the word as connected with the idea of the substantum, or logical substance, and whenever "substance and attribute" are contrasted with one another. Sometimes, however, attribute signifies *any predicate object other than a substantum*; in this sense, it includes adjuncts, as well as attributes strictly so called. Thus, the term, having become ambiguous, is opposed, sometimes to substance, and sometimes to the *subject of predication*. It is important that both these significations should find expression, and equally important that they should not be confounded with one another. Might we not, then, confine the term *attribute* to qualities, or metaphysical parts, and employ some other term for that comprehensive class of predicate objects which are not substantial? Perhaps, till some better word be found, attributes and adjuncts may be classed together as the non-substantial, or ascriptional, inhereents of any subject; and attributive and adjunctive might be distinguished from substantive, predicatives, under the term *ascriptive*. For, whether we say, "The crow is black," or "The crow flies," in either case we ascribe something to the crow. Then,

also, the non-substantial predicate-object, would be—not an attribute—but an ascript, or an ascriptum; since even strange and uncouth language is to be preferred to that which is ambiguous and confusing.

§ 193. Beside the distinctions between conceptions, which have now been discussed, none others are so fundamental in reference to the operations of the reason. Two, however, may be mentioned, which have some importance in the interpretation of thought and language; and, first, let us notice that between *absolute and relative* conceptions. This arises from the fact that sometimes the principal part of our notion of an object is that it is related to some other object. As a relation may be viewed in connection with either relatum, these notions generally go in pairs. Father and son, majority and minority, superior and inferior, are relative names, and express relative notions. The object of these conceptions is a metaphysical whole constituted by adding a relationship to some lesser metaphysical whole. Thus *father and son* are constituted by adding a relational qualification to *human being*. Even this is not sufficient, unless the relation be the emphatic element in thought and attention. The notions farmer, lawyer, preacher, though indicative of relations, are not called relative, because they present rather the occupations of men than the relations which these occupations involve. Relata—or the objects of relative notions—do not have a common part, but only each a part in a common relation. For every relation is composed of two relationships. When one thing is included in another, there is but one relation between them; but the relationship of the included is different from that of the inclusive. Since nothing can be related without a correlate, it is often said that correlatives involve the existence of one another. This may be accepted, subject to the following limitations. First, it depends on the nature of the relation whether correlatives must exist *contemporaneously or not*. An effect involves the existence of a cause, yet exists subsequently to the cause; and a son remains a son even after his father has died. And, secondly, relations which may be said to exist between *an ideal and a real object*, do not really exist, and do not involve the existence of two correlatives. The real correlate of an ideal relation does not involve the reality of its correlative. Strictly speaking, it is not a real correlate, but only a real object. The relation of similarity does not really exist between a mermaid and a woman: accordingly, we cannot infer that mermaids exist, because women do. These remarks apply to correlatives that are impossible, or merely possible; for these are a kind of ideal objects. Therefore, also, the relation between two contradictory objects not being a real and existing relation, we cannot infer that the one contradictory must exist because the other does. Such an object is an ideal construction combined with a judgment as to its non-existence and impossibility. It is used to set forth a fact of

Absolute and relative conceptions explained.

non-existence in the relation of incompatibility with a fact of existence. So far as there is any real relation, it exists only between these facts, and not between objects.

Finally, let us distinguish *positive from negative* notions. As this distinction is founded on simple diversity, which is the most universal of all relations, it might be regarded as a species of the distinction just mentioned. By *relation*, however, we ordinarily mean something of less extensive application than mere diversity, and which also is based on diversity as one of its conditions. This relation is mere otherness, and is recognized whenever we distinguish one thing from another.

Since the universe might be divided into any one thing, or set of things, and all things else, numberless divisions might be made in this way, each of which could claim its own pair of positive and negative conceptions. Let man be whatever has a certain nature; then "not-man" would apply to whatever has not that nature. As a matter of fact, however, we are seldom called to distinguish a thing from all other things, but only from others of some class to which it belongs. Therefore, when we speak of the guilty and the not-guilty, the wise and the unwise, the known and the unknown, the competent and the incompetent, the valuable and the valueless, or in any other way contrast objects as having, and as not having, some quality, we confine our thought to that class of objects in which the existence or non-existence of that quality may be matter of serious inquiry. In this way the negative notion acquires the positive force of expressing what might be, but is not. Moreover, the non-existence of important qualities is sometimes attended by the existence of other and opposite qualities, from which cause many negative words receive yet further significance. Such terms as *inconvenient*, *unpleasant*, *unhappy*, *uneasy*, may illustrate this remark.

Sometimes, too, words, which express negative thought, indicate the absence, not merely of attributes which may, or may not, belong to some class of beings, but of attributes which belong to them naturally and for the most part. Terms with this shade of meaning are said to be privative, and to express privative notions. The adjectives *blind*, *dumb*, *deaf*, are of this character; and so are the expressions, "A truncated cone," "A headless statue." A privative notion deprives a thing of some part or attribute which would otherwise belong to it.

Positive and negative conceptions explained.
Privative notions.

CHAPTER XLI.

LOGICAL DEFINITION.

§ 194. The terms *definition* and *division* are applied either to two kinds of propositions which reason forms and uses, or to the operations of reason in forming them. Process and product, however, are so intimately related in mental phenomena, that the same discussion exhibits the nature of both. In the present case, as in the philosophy of reason generally, our investigations will be best conducted if we make products the objects of our more immediate consideration, and study operations as they are connected with the products. For the correctness and value of the operation may be best determined from the correctness and value of its result.

Definitions and divisions are identificative propositions distinguished from other such propositions by reason of their use.

Both definitions and divisions may be regarded as identificative (or substantial) propositions. The former identify an object considered without analysis of parts or relations, with itself considered in the light of such analysis. The latter identify a class of similars with the subordinate or specific classes of which it is composed. But these acts differ from ordinary propositions in that they deal with things, not as actually existing, but only as conceived of by us. Their proper object is to explain and distinguish our conceptions. Whenever they do more than this, they cease to be simply definitions and divisions. They do not properly make any objective assertion, but merely suppose things to exist, and then tell us what they are and into what kinds they may be divided. We define a mermaid just as we do a Feejee maiden, and classify the inhabitants of Olympus as we do the men of Athens. Other propositions are mainly employed to present facts, and, even in imaginative statements, are not used in explication of conceptions, but have an essentially objective significance.

This explicative force of definitions and divisions is the chief ground of their separation from other propositions. Being used to render our ideas clear and definite, they perform this office for the subjects and predicates of propositions, and so render the propositions themselves definite. In this way, by reason of their use, they become contrasted with propositions.

Some say that definitions pertain to words, and show their meaning; others, that they pertain to ideas, and show their content; and others, that they pertain to things, and show their nature. Definitions are related to words and things, but their essential and proper connection is with ideas. The meaning of a word is simply the idea expressed by it, and the definition of a word can only be the ex-

Definition pertains primarily to ideas.

plication of this idea. In like manner, things are defined only by analyzing the conception we have of them. We do nothing whatever to the thing itself; indeed the thing may be only a figurative object, without any real existence. The assertion that we define *things* means only that definitional thought has an objective reference (§ 30), even while it may be devoid of objective assertion. We hold that definition primarily pertains to notions, and is intended to assist us in the comprehension and use of them.

The need of such aid is very evident. Often one's notions, being confused and vacillating, must be rendered clear and fixed by definitions; and yet oftener, definition is needed so that our thought and that of others may correspond. Half the controversies in the world might be avoided, if parties could agree as to the definition, or meaning, of the terms which they employ.

If definitions render our notions fixed and distinct, the question arises whether all our notions can be defined, or only some particular class of them.

Those logicians who know of general notions only, teach that these only can be defined; and this view is conveyed in the scholastic doctrine that all definition consists in giving genus and specific difference. For every species, as composed of genus and difference, is an universal or general object.

It may be allowed that definitions, for the most part, directly concern general conceptions; but it is not true that they pertain to these only. On the contrary, singular conceptions may have definitions of their own; while individual notions may participate fully in those definitions which apply to general notions. When we enumerate the peculiarities of some singular object, or attribute to it some singular difference, as when one might say, "Edward is my eldest son," this is a process of precisely the same nature as the definition of a general notion, though the difference, "My eldest son," and any other peculiarities thought of, could belong only to the one individual. Moreover, those definite individual notions, to which we have specially given the name *individual*—such as, "This man," "These words,"—and those indefinite individual notions which we have designated indefinite—such as, "A man," "Some words,"—plainly receive the definition of the general notion from which they are derived. There is an apparent absurdity in saying that definite notions may be defined, or made definite (since they are definite already), and yet more in saying that indefinite notions as such admit of definition (since this would destroy their indefiniteness); but these difficulties result from an ambiguous use of words. The term *definite*, as here used, first signifies *definitely applied*, which is its common meaning, and then *definitely*—i. e., *distinctly*—conceived, which is the meaning suggested by the word *definition*. So far, therefore, from being applicable only to general notions, definitions apply to all notions whatever; and one principal end

All notions capable
either of essential
or of accidental
definition.

of the definition of general notions is to render defined our conceptions of individual and singular objects.

The doctrine is also to be met with, that no notion is capable of definition which is incapable of analysis; and this statement may be partially accepted, as being true with respect to the most common kind of definition. But definitions may be effected in two ways. We may either analyze the thing conceived of, and enumerate its constituent parts, or we may distinguish the object from all others by means of one or more of its peculiar relations. A definition which presents a thing—or metaphysical whole—as analyzed, is called an *essential* definition, because it directly sets forth the essence or nature of the thing; while that which shows what a thing is, by mentioning its peculiar relations, is an *accidental* definition. In this case, the word *accident* signifies whatever falls into union, or connection, with the essence, and includes properties, as well as accidents, in the narrower sense. “The diamond is a brilliant stone, formed by the crystallization of carbon,” and “The diamond is the most costly of gems,” may serve as illustrations of the two modes of definition. The accidental definition is adapted for all things that are well known, yet, at the same time, either so peculiar or so simple that their analytic portrayal is difficult or impossible. The accidental definition has received comparatively little attention from logicians, but is of great value, both in philosophy and in common life. The thorough thinker will make frequent use of it, and will avoid the error of those, who assert that such and such a thing is incapable of definition, and there rest content; when they should say that it is incapable of essential or analytical definition, and thereupon define it by its accidents.

A definition may be partly essential and partly accidental. When we say, “A camel is an oriental beast of burden,” the term *beast* expresses an essential part of the camel, but the rest of the description does not belong to the very nature of the animal. Statements of this kind are often of equal value with analytical definitions; but for the explication of notions and natures, which is the primary purpose of definition, they are inferior; and may be classed with the accidental definition. A proposition, which employs the accidents of a thing to indicate its nature, imposes an equal burden of thought and decision upon the mind, whether it be composed entirely, or only in part, of accidental notions.

Besides, it is sometimes difficult to say whether a definition be essential or accidental. The mind can enlarge its conception of a thing, or metaphysical whole, so as to include some adjunct, which thereupon ceases to be an adjunct and becomes an attribute; after which the mention of it becomes part of the essential definition. Hence, the same term, in different connections, has meanings differing in their degree of comprehension, and calls for more than one definition. Thus, the word *action* may signify either a mere exercise of power, or an exercise of power which

The accidental
definition of great
importance in
philosophy.

produces a certain result, or an exercise of power which produces a given result and is intended to do so, or an exercise of power which not only produces the result and is intended so to do, but which also proceeds from a certain animus or motive. Falling, striking, taking, stealing, are all actions, but each in a somewhat different sense; what is essential to one of these actions, according to its kind, is accidental to another. Whether a thing be a part of a given whole or not, depends on the question whether the mind, to serve the ends of its thinking, has included the one thing within the other.

Essential, or analytical, definitions are either scholastic or notational.

§ 195. For the ordinary uses of rational thought the essential definition is of more importance than the accidental; it also stands in greater need of that assistance which is to be derived from an understanding of its modes and relations. Our discussion must refer chiefly to this kind of definition. With reference to it, we distinguish the *scholastic*, from the merely *notational*, mode of statement. The latter of these enumerates, one after another, those essential marks, or characteristics, which constitute the nature to which the defined conception corresponds. But the former divides the nature into two parts, each comprising, it may be, many characteristics, and regards the one as generic, and the other as differential. The notational is less artificial than the scholastic, method, but is fully competent for the proper purposes of definition. On the other hand, the scholastic has the advantage of compactness, and of using comparison and classification as instruments, and is preferable provided only genus and difference be themselves sufficiently defined.

Exhaustive or selective.

Another distinction, which pertains especially to essential statements, divides definitions into the *exhaustive* and the *selective*. Sometimes, in describing an object, we give every element which enters into our conception of its constitution. When we say, "A circle is a line on a plane surface, which returns into itself, and every part of which is equally distant from a fixed point," or "A square is a plane quadrilateral whose sides are straight and equal to one another and whose angles are right angles," we may be said, in either case, to give our whole conception. Generally, however, we do not give our whole conception, but only some leading characteristics, by which that conception, and the nature which it sets forth, may be distinguished from every other conception and nature. When we say, "Man is a rational animal," we do not express all even of our ordinary conception of man. For, as an animal, he has a certain shape, and size, and certain modes of action, and, as a spiritual being, he is not merely rational, but is also endowed with affections and motivities, engaged in a variety of pursuits, and related to other beings than himself. Indeed, one's ordinary idea of man is that of a being similar to himself in many notable particulars. The foregoing definition, instead of enumerating these, chooses two of the most important

as sufficiently indicative of the object to be defined. For, whether one may, or may not, include "two-legged," or "social," in his ordinary conception of a human being, he must, at least, regard man as a rational animal. This selective definition especially pertains to all substances—that is, *metaphysical substances*—whether material or spiritual. For a substance has many qualities and relations, some of which may be known to us and some unknown, some included in our idea of it, and some regarded as adjuncts only. Hence, different persons may entertain correct conceptions of the same substance, while yet these conceptions may be constructed somewhat differently. Ordinarily, the ends of rational thought are sufficiently secured, provided only the conceptions of men in respect to any kind of substance, agree in regard to the more prominent of its known characteristics. Then we not only think of the same object, but also, to a great extent, regard it in the same light. Of course, when things are practically related, the prominence of the characteristic very frequently arises from its importance. No one would conceive of man as the naked biped, when he can be conceived of as the rational animal. Therefore, in the construction of definitions, we should select, not merely distinguishing, but important qualities. Yet there may be a choice even of such qualities; and so there may sometimes be more than one correct definition. Coal might be described as a black, stone-like substance used for fuel, or as a mineral composed mostly of carbon and obtained from stratified deposits; either definition would be sufficiently correct.

We are thus brought to another distinction; definitions may be either *adequate* or *inadequate*. They are adequate when they fully serve the ends of definition; inadequate when they fail to do so. Every exhaustive definition is adequate. A selective definition may be inadequate, either by failing to distinguish its object, or by giving insignificant characteristics. The definition, "Oxygen is an inflammable gas," is inadequate, and, in fact, is no definition at all, because other gases are inflammable; while the definition, "Man is the naked biped," is inadequate, not because we could not distinguish man thereby (for no other biped is without natural covering); but because the marks given are "unessential" in the sense of being unimportant. Though distinctive, they do not sufficiently *characterize*.

But a certain cause may render a definition adequate, which otherwise would be inadequate, and even essential, when it would otherwise be accidental. This is the determination of the mind to view a set of objects only in a given light, or only so far as they have a certain general nature with its modifications. Hence, we have definitions which may be termed *technical*, and which may be opposed to those which are *unspecialized* or *ordinary*. "Man is the two-handed mammal," "Common salt is the chloride of sodium," are adequate and essential definitions

in the sciences of natural history and chemistry; but they would not be adequate with reference to our ordinary conceptions. The attributes given in the first definition have no prominence in ordinary thought; while those mentioned in the second are not ordinarily known or considered at all. Technical definitions are adequate because they set forth the important attributes of the object regarded simply as having a given nature; but if the object be viewed without that special limitation, these attributes are no longer the important ones, and even may not be recognized as attributes at all.

We now come to a distinction which applies to every kind of definition, yet which cannot be said so properly to exist between definitions, as *between definitions simply as such, and definitions as having a force additional to their own.* This distinction, which divides definitions into the *nominal* and the *real*, has greatly perplexed logicians; because it is connected with that radical difference between thought and belief, which logicians have never accurately apprehended. Archbishop Whately says, "Definitions have been divided into the *nominal*, which explains merely the meaning of the term defined, and *real*, which explains the nature of the thing signified by the term." Then, as might be expected, he finds no difficulty in showing that this is no true distinction; since there is no true difference between the explanation of the meaning of the term, and the explanation of the nature of the thing. Thereupon, he expresses the opinion that "any definition, which explains more of the nature of the thing than is implied in the name, may be regarded, strictly speaking, as so far a *real* definition." But he adds that such definitions should more properly be called descriptions, and that logic is concerned only with the nominal definition. These statements of the archbishop are by no means satisfactory. A real definition does not involve any additional attribution of characteristics; and the distinction between the real and the nominal definition is of great importance in logic. The distinction is that the nominal definition is simply explanatory of the notion, and, therefore, of the meaning of the term and of the nature of the thing, and is without any force of realistic assertion; but the real definition, in addition to this essential function, *implies the actual existence of objects* to which it is applicable. The distinction might be expressed in better terms, should we say that some definitions are *merely explanatory* while others are also *assertory*. The statements, "A harpy is a winged monster, with the face of a woman and the body of a vulture," "A dragon is a serpent breathing flame," can be taken only to explicate conceptions; but when we say, "Saltpetre is the nitrate of potash," or "A common triangle is a plane figure bounded by three straight sides," our thought implies that the things described really do, or may, exist. Since definitions, ordinarily, are intended to apply to real objects, it is plain that most definitions have this assertive force; yet, so far as they have it, their character is not that pecu-

liar to definitions, but that which belongs to predications in general; they are, in fact, not merely definitions, but postulates. For the purposes of logical illustration there is no absolute necessity for *real* definitions, but only for some that are assumed, or supposed, to be real; but when definitions are employed in the groundwork of any science, they must be real and describe real classes of things. Therefore, also, when definitions are rightly used as the sources of argument in geometrical and other reasoning, we do not build on mere explanations of our own notions, but on that knowledge of realities which these notions are employed to express. Moreover, when definitions are made at the beginning of any discussion, they are laid down as the correct representations of real objects; and a definition which should inadequately express the conception of an object, would be inadequate to describe the reality. Hence, the adequacy and the inadequacy of definitions may refer to their competency as representations of fact; and, in this way, these terms have a secondary signification.

§ 196. It is to be allowed that the importance of most definitions depends on their having not merely their own peculiar function, but that also of propositions in general; in other words, they are not merely explicative of notions, but assertive of fact—they are real and not merely nominal definitions. Such being the case, we may usefully close the present discussion, by considering, *in what sense, and how far, definitions can be the true representations of things.* The orthodox doctrine on this subject, and the metaphysical difficulties attendant upon it, are brought before us in the statement that a real definition, when correct, truly sets forth the essence of a thing. Let us seek the proper meaning of this expression, *the essence of a thing.*

The term *essence*, or *essentia*, is said to have been first used by Cicero. It is nearly equivalent, in philosophy, to the term *nature*, in that sense which the latter has when we speak of the nature of a thing. But under the term *nature* attributes are considered more as characterizing, and under the term *essence* more as constituting. Essence, also, in philosophy, is nearly the same as form, and may be said to be the same thing viewed in a different light. The form is the constitution of a thing considered as making it a thing distinct in itself and distinguishable from other things. An essence is the constitution of a thing simply as constituting it. The relation of identity governs the conception of essence; that of difference the conception of form. Essence has been defined as that “by which a thing is what it is,” or “which makes a thing to be what it is;” by which we are not to understand that the essence causes or produces the thing, but only that it is the constitution or make-up of the thing. The language is figurative, and is derived from the fact that the mind makes or forms the idea of a thing, by putting together the ideas of its different attributal parts. The

In what sense do definitions present the essence of things? The term *essence* discussed.

essence is the whole collection of such parts. Yet not absolutely the whole; in a more searching sense, the attributes of a thing taken collectively, its essence, or form, or nature, may be either the whole thing, or only a part of it. The ideas expressed by these terms are what logicians have called *notions of second intention*, and set forth things, not simply in their own nature, but also with a reference to the operations of the mind in viewing them. The essence, or form, or nature, is the constitution of an object considered, not simply as a whole, but as a whole composed of distinctly conceived, or conceivable, parts. As genus presents a nature thought of not only in itself, but also in its relation to other subordinate natures, and can be conceived of only by a secondary *direction* or *intention* of our thoughts;—which intention varies according to the diverse grounds and methods of our classification;—so essence implies that we not only know a thing, but that we know it analytically, or, at the least, *may* do so. Even though one be familiar with an object, he does not know its essence if he do not have a distinct conception of its constitution. Such being the case, although the essence or form be the whole constitution, this must be taken with the qualification that it is *the whole constitution only so far as this may be distinctly conceived*. For this, indeed, is the only constitution to which our consideration extends. If, therefore, one should have a perfect analytical conception of any individual thing, the essence of that thing as conceived of by him would be identical with the whole thing; but, if the conception did not include absolutely the whole constitution, the essence would be only the whole constitution conceived of, and would be a part of the absolute whole. In that case, whatever in the object might not be included in the distinct conception, would, in respect to that conception, be unessential, informal, or material. Moreover, our conceptions being supposed to be adequate and correct, the essential is commonly held to include what *should* be part of our conception of a thing under a given light, whether it is or not. Considering Cæsar simply as a man, whatever is comprised in manhood is essential to him, in that light; but all other particulars are unessential. Metaphysically speaking, they are merely matter. Certain logical applications of the terms *matter* and *material* have given them a different and almost opposite signification from that in which we have just used them; we now speak of their original philosophical meaning.

The name *essence* is the literal equivalent of the English word *being*, and, evidently, was suggested by the employment of the verb *to be* in predication. For, although that express form of predication in which this verb appears, is not used exclusively in definitions, or in giving the attributes of a thing, these are its most prominent uses. The definition, "Hominem esse animal rationale," may be regarded as the fullest and strongest of those predications in which the "substantive verb" is employed. It

should be noticed that essence, like entity, indicates, not attributive existence, but that of which existence may be predicated.

Let us now note *three different meanings*, or applications, of this term, in each of which the radical signification is retained and modified. First of all, there is *the general nature or essence*. This was naturally the primary meaning of the word. The first efforts of philosophy were employed upon the generalizations which are formed in ordinary thought, and sought to understand and define the nature of those objects which these generalizations present. The ancient thinkers, unable to explain correctly the objective character of general notions, imagined actual entities, which they called universals, to correspond with them; and ascribed to these universals real general essences. Individual things were supposed to derive their nature from the generative and multiplicative power of such essences. Hence, the idea of essence, as applied to these creatures of the imagination, became contrasted with the notion of an individual nature; and the term *essence* was applied to the general nature only. Such, too, was the influence of usage, that, even after Platonic realism had been pretty well discarded, philosophers still taught that an essence could not belong to an individual. Even Locke says, "There is nothing essential to individuals." Such a limitation is unreasonable. If essence be that constitution whereby a thing is what it is, then an individual essence may be the constitution of an individual, just as a general essence is the constitution of an universal.

We next notice a kind of essence which never, so far as we are aware, has received any express designation; but which may have been in Mr. Locke's mind when he spoke of "*sortal*" names. He does not, however, in any way, distinguish *sortal*, from general, names and essences. By the *sortal essence* we mean the nature of an individual object so far as it may correspond to one of those general essences already mentioned. Such *sortal* essences are individual, and may actually exist. Should we think, either definitely or indefinitely, of some song and of the singer of it, simply as individual objects possessing characters in common with the rest of a species or sort, we might say that we are thinking of the *sortal* essences existing in the song and in the singer.

It may be questioned whether any other essence should be mentioned than the two preceding. But, if essence correspond to definition, and we can define singular objects as such, then we may speak of *singular essences*, just as we do of singular natures or forms. At least, in the present discussion, we shall speak of the singular essence, and mean by it the nature of an individual thing with all its singular characteristics, so far as these may be distinctly conceived of. This essence differs from those already named in having a greater capacity of enlargement. One's conception of a general object or kind of thing, for example, of any species of flower, or mineral, or mechanical machine, or bodily organ, may be enlarged by the increase of one's knowledge con-

cerning it. But this knowledge of general natures can reach a fullness beyond which we find it difficult to pass. On the contrary, the particular elements in one's conception of any individual object may either be very few, or may be very numerous. One who never visited Switzerland may think of Mont Blanc simply as the highest peak of the Alps; but one who has made the tour of "The Giant," from Chamounix to Aosta, naturally includes many particulars of shape and appearance and surrounding relations, in his idea of the mountain. We have this range in conceiving of any individual thing whatever, whether substantial or insubstantial. For our conception of a thing is formed when the attention is fixed upon some individual instance of one of the fundamental forms of entity; and consists of this basis, or body, together with such adherents, be they few or many, as we may find naturally to coalesce with it. But whatever particulars are fairly included in one's idea of a thing are to him the elements of its essence. Hence, one's idea of an object at one time might comprehend more than his idea of it at another. But the explication of either conception would be a definition; and, indeed, on the principle of the selective definition, even a few singular characteristics might be sufficient to define, if these were at once distinguishing and prominent. Moreover, being such, these characteristics are often called the essence. Inasmuch as a definition is supposed to present the essence of a thing (whether general or singular), the characteristics chosen by the selective definition are often called the essence, even while they are not the entire essence. From this circumstance the word *essence*, in popular use, has come to signify, not the whole nature or constitution, but only the most prominent or important part of it. Hence, too, certain fluid extracts are called essences. Recurring to that essence which is equivalent to form or nature, we remark, in final illustration of it, that it is related differently to the logical, and to the metaphysical, substance. The former, being matter, is no part of the essence; but the latter is. In conceiving of any material or spiritual substance, its substantiality necessarily enters into our conception of its nature.

We know some natures perfectly, others truly and adequately yet only in part.

We now come to a question, the consideration of which has been the principal aim of our discussion concerning essences. It is this, "Can the nature of things be truly and adequately represented by the conceptions of the mind, or *is our knowledge of essences to be regarded as superficial, and pertaining only to the external appearances of things?*" To answer this query, let us divide our cognitional conceptions into two classes. In the first place, some of these set forth things *the conditions or elements of whose existence are wholly known to us*. Such are our conceptions of the shapes and sizes of things, so far as these can be accurately perceived, and of mathematical entities in general. We may be perfectly confident that the sphere seen in an apple and the parallelopipedon seen in a brick, are what we conceive them

to be, and no more. To form these shapes there is need of space, and of bodies occupying space, with defined boundaries; all of which things are discernible by our senses, or in connection with them. So with many general conceptions concerning spaces, times, quantities, substances, powers, changes, actions, and the relations subsisting among these things,—conceptions which pertain to every form of being. We see no reason to doubt that these, being generalized from our immediate perceptions, are adequate and true. And, of course, the individual conceptions corresponding to them possess the same character.

But, in the second place, some of our ideas are of *things the conditions of whose existence are not wholly and thoroughly known to us*. Take, for instance, any simple flower. We perceive perfectly its shape, size, color, and perfume; we can learn also the laws of its growth and reproduction, and the proper method of its culture. Yet, along with this reliable knowledge, we must confess an ignorance. We know the fact, but not the nature, of that vital force which resides in seeds and vegetables: neither can we tell how the plant which grows from one seed is small, while that produced from another seed is large, and of a totally different structure: nor can we distinguish those minute molecular arrangements on which colors and perfumes depend. This imperfection—or, rather, limitation—of knowledge especially affects our specific conceptions of material and mental substances,—for who can penetrate the minute and ultimate physics either of body or of spirit?—but it pertains to the conceptions of all natures which are characterized by something too minute, or too remote, or too complex, for our apprehension. The growth of vegetables, already noticed, the diversified color of the fixed stars, the changeable directions of the winds, have something in them mysterious and inexplicable. Moreover, the relations and characteristics of many singular objects are too numerous to be all regarded and conceived of. Aristotle seems to have had in view a singular nature or essence, conceived of exhaustively, and with absolutely all the characteristics which might be predicated of it, when he spoke of the *entelechy* (*ἐντελέχεια*), or completeness, of a thing. Our present knowledge falls short of grasping this entelechy (or enlarged and perfected essence) of most singular objects.

If these remarks be true, they show that man's powers of cognition are limited, but not that they are imperfect, or inadequate for right knowledge. For, in the first place, our conceptions, so far as they go, represent things in their true nature; and, in the second place, even the unknown elements of things are not wholly unknown. They are known to exist and to be related to those more perfectly known, and, as such, have a place in our more finished conceptions. The more occult elements of a thing, therefore, should not be regarded as constituting an essence by themselves, but only as fitted to occupy a subordinate place in the essences to which they belong. More-

over, so far as we can see, these occult elements derive all their importance from the effects which visibly attend the constitution which they help to produce. The molecular powers which result in the density, weight, color, and malleability, of gold, are important, not in themselves, but because these manifest qualities render gold valuable both for use and ornament. In addition to this, the constitution of articles made from gold, or wood, or any other substance whose molecular structure is inscrutable to us, depends only in part on that structure, and quite as much on other conditions which are entirely knowable. Among these we may mention the proper use of tools, and the skill of cunning workmen.

Locke's doctrine of essences. Extremely erroneous.

We have now illustrated the cognition of essences sufficiently to appreciate a doctrine concerning them taught by Mr. Locke, and which we cannot but regard to be exceedingly sophistical and dangerous. According to this doctrine, no human knowledge lays hold of the real essence of things, but only of that which constitutes their superficial appearance. In the third chapter of the third book of the "Essay" (§ 15), we read, "Essence may be taken for the being of anything, whereby it is what it is. And thus the real, internal, but generally, in substances, unknown, constitution of things, whereon their discoverable qualities depend, may be called their essence. This is the proper original signification of the word. . . . Secondly, the learning and disputes of the schools, having been so much busied about genus and species, the word *essence* has almost lost its primary signification, and, instead of the real constitution of things, has been almost wholly applied to the artificial constitution of genus and species. . . . Things being ranked under names, into sorts or species, only as they agree to certain abstract ideas to which we have annexed these names, the essence of each genus, or sort, comes to be nothing but that abstract idea, which the general, or *sortal* (if I may so call it) name, stands for. And this we shall find to be that which the word *essence* imports in its most familiar use. These two sorts of essences, I suppose, may not unfitly be termed, the one *real*, and the other *nominal*."

This doctrine of Locke, which is allied to his theory of substance (§ 126), is full of error. Had it been developed and applied by him it would have gone far to destroy the value of his system of philosophy; and such, likely, would have been the course adopted by any man of less powerful judgment. As it is, we wonder that some subsequent philosopher has not made the error of Locke the basis of an imposing system of delusion. After the discussion already had, we shall not undertake any detailed refutation of it.

We should note that Locke mentions the scholastic definition, as if that were the only kind with which he was acquainted, and, in connection therewith, speaks of the essence which it defines as artificial. But the essence of a thing, though it may be arti-

ficially conceived and defined, according to the scholastic method, is not artificial in itself. It is precisely the same essence which is presented by the notational definition. That essence which Locke calls nominal, is as real as the other of which he speaks, and is, indeed, the true essence. But, if any essence should be distinguished from this, as more emphatically real, it would not be that occult constitution which Locke honors as the real essence, but that complete constitution of a singular object, which, as the correlate of distinct and exhaustive knowledge, we identify with the *entelechy* of Aristotle.

CHAPTER XLII.

LOGICAL DIVISION.

§ 197. That second operation of reason, whereby our notions are made clearer and more distinct, is called the Division of Notions, and is closely allied to their definition; for it has the same general end in view. But definition advances this end by a detailed examination of the elements of a thing, while division works by comparing one thing with another.

Division compared with definition. The terms *clear* and *distinct* as used by Leibnitz and Hamilton.

A notion may be distinct in two ways, either as a whole distinguished from other wholes, or as a complement of parts distinguished from each other. Definition directly produces this latter kind of distinctness; division, the former. But each process

aids in accomplishing the work for which the other is specially suited.

Hamilton, following Leibnitz, calls that distinctness of a notion which division promotes, its *clearness*; and restricts the term *distinct* to notions whose parts are clearly discriminated, as by definition. This is not a happy use of terms. For clearness is always the cause of distinctness. Either whole or part is perceived distinctly, in relation to other wholes or parts, because it is seen clearly in itself. We should not distinguish these qualities as if that could be distinct which is not clear, or clear which is not distinct.

While distinctness, internal and external, is the immediate aim of definition and division, other ends, also, are attained. Definition, in particular, renders the statement of our knowledge exact; while division makes it perspicuous and comprehensive. Hence, also, well-made definitions and divisions promote the correct formation of propositions and inferences.

The usefulness of division depends on the structure of the universe. The origin of this structure.

The practical application and usefulness of logical division depends on the fact that all things in the universe can be classified with reference to their similarities and differences. For aught that appears, the universe might have been constituted of

fewer classes than it now contains. There might have been only

one kind of animal, one kind of vegetable, or one kind of organized being, every individual of the kind being dissimilar to every other save in those respects in which the whole class were mutually similar. This would have rendered classifications few and easy. On the other hand, the universe might have been made with a far greater number of classes than it has at present, that is, with many more groups of individuals characterized by common peculiarities. Moreover, the number of genera and species intermediate between the all-comprehensive class of entities and those lowest classes which we divide only into individuals, might have been either much greater or much less, than it actually is. Probably no universe could be constructed in which genera and species should not exist—certainly no universe worthy of the name; but there is no necessity that these should exist to that particular extent, and in that particular proportion, which are now discoverable. At the same time, it is evident that the existing state of things is well-adapted for the successful discipline and employment of a rational faculty, such as man possesses, and as may be supposed to belong to other finite creatures. From these considerations we may reasonably gather that the present universe was designed, by creative wisdom, as a field for observation and reflection, in which such faculties as ours might be fully occupied, and might satisfactorily progress in knowledge, without being overwhelmed with a multitude of diverse details.

Some have accounted for the existing classes of things by what they call principles of homogeneity and heterogeneity—or of integration and differentiation. If, by such principles, we are to understand that likenesses and unlikenesses affect all things so as to place them in genera and species, and that there are causes which more or less continue to maintain this state of things, this may be admitted: but this is not an explanation of the facts to be accounted for. It is only an explicit statement of them. On the other hand, the phraseology, above quoted, may mean that the generic and specific characters which things now possess result from an universal tendency in the necessary nature of things; and that no other explanation than this is needful or possible. We reject this theory as contrary to reason. We admit that no universe could exist without containing some radical genera, such as substances, powers, actions, changes, and relations. But the sortal similarities and diversities to which these relate would not be causes, but only *attendant conditions* of the production of the universe. For such things have no force in themselves. And, further, the *specific* diversities and similarities of existing substances, causes, powers, actions, and so forth, cannot be regarded even as the conditions of a universe; for these are not included in the necessary nature of things. In short, no cause for the existing logical structure of the universe can be discovered in the universe itself; we find ourselves compelled either to ascribe this structure to chance, which seems preposter-

ous, or to admit the existence of a creative power working with a wise design.

Division not an analytic process. Not classification. The definition of logical division has been found a matter of some difficulty. We must free our minds from any impression that a general conception, when logically divided, is, in any sense, separated into parts. The division of a notion is a metonymical expression, derived from the division of the class which the notion characterizes. It signifies what might be termed *the specialization of the notion*. Yet it includes more than this; it calls for a number of specializations, and for a co-ordination of the specific notions produced. The division of a general class into subordinate classes requires less abstraction, in thought and language, than the formation of specific notions from the general one, but it is equivalent in effect to the latter process. Hence, the name proper to the one operation has been given to the other also.

Logical division should be distinguished from classification. This latter ordinarily signifies the assignment of individuals to the classes to which they belong; and this is an act of judgment which supposes division to have taken place. But, sometimes, classification means the first formation of classes by the comparison of individuals so as to perceive their similarities. Then it is, in effect, that generalization which furnishes the materials for division. Sometimes, though seldom, classification has the more simple and general meaning of the formation of classes; in that case, we might say that division, in one aspect of it, is a kind of classification, but, even so, this classification would be rather the immediate result of division than the division itself.

Logical division defined and illustrated. Some have defined this process as the separation of a genus into its species, or the differentiation of a generic notion into its specific notions. But this definition must be qualified by saying that we do not, in dividing, give all the specific classes or notions into which the genus or general notion may be specialized; we only give a set of classes which are exclusive of one another, or of notions which are mutually incompatible. The essential aim of division is to present *a number of things, or kinds of things, as possessing a common nature, and as characterized severally by mutually incompatible additions*. And, along with this chief work, *grades of subdivision are employed to indicate the degrees of difference* which exists among the objects compared. Dividing animals into Vertebrates, Articulates, Mollusks, Radiates, and Protozoans, and subdividing Vertebrates into Mammals, Birds, Reptiles, and Fishes, we present five comprehensive species as having a generic agreement together with specific incompatibilities; while the subdivision of vertebrates shows that any one of the four species of this class is further removed from the nature of animals in general, or from that of an articulate or mollusk, or other general species, than from that of the vertebrates in general. Thus, division is the

methodical presentation of a number of notions and natures in their mutual agreements and disagreements.

The rules of division discussed. The members must be—
 (1) Exclusive,
 (2) Co-ordinate,
 (3) Exhaustive.
 Exceptions to these rules.

§ 198. If we have now properly described this operation of reason, it is plain that the first rule of valid division is, that specific notions must be so formed that no two of them shall be applicable to the same object; while a second, but less essential, rule is, that the co-ordinate members of each division and subdivision are to be produced by adding the same amount of difference to the genus or genera to be divided. This latter rule expresses what is frequently desirable rather than always necessary, and makes it a fault if a division fail to present grades of difference when it is necessary that it should do so. But this is not always indispensable. Indeed, many useful classifications would be made needlessly complex, if we must always indicate the degrees of difference. This rule forbids that any of the dividing members should, in comparison with the rest, be of a generic nature. Useful divisions often neglect this. For example, we say words are monosyllables, dissyllables, trisyllables, and polysyllables. But, if the rule under discussion be applied, we must first distinguish words into those of one syllable and those of more than one; then subdivide those of more than one into those of not more than three and those of more than three; and finally, divide those of three syllables or less into the dissyllable and the trisyllable. So we might replace the division of triangles into equilateral, isosceles, and scalene, by a division, first, into triangles which have some sides equal to each other, and those which have none mutually equal, after that subdividing the first class into those in which all three sides, and those in which two sides only, are equal to each other. Some grammatical classifications—those, for instance, giving the six cases of declension or the eight parts of speech, in Latin,—illustrate the point in hand. The division into six cases neglects the distinction between the direct and the oblique cases; and the eight parts of speech are correctly grouped by Zumpt into nouns, verbs, and particles, the noun including substantive, pronoun, and adjective, the particle including adverbs, prepositions, conjunctions, and interjections, and the verb standing alone as the only one of the eight parts of speech that has a generic breadth. Here, too, we might refer to Aristotle's categories of predication. These admit of similar grouping, substance being distinguishable from all the rest. Clearly, the rule in question is imperative only *when the design of the classification is not merely to state differences, but to express degrees of difference with the greatest attainable exactness.* This happens especially in those sciences, or parts of sciences, which employ division chiefly for the purpose of setting forth the nature of things.

Another rule of logic is that *division should be exhaustive;*—the dividing members must be equal to the generic whole. It may, however, be beyond one's power to give all the species of

a genus, and, quite as frequently, it is immaterial to his purpose whether he does or not. When a genus is divided to show what kinds of things it contains, rather than how many kinds, such a division need not be exhaustive. But, when a division—which is often the case when there is no understanding to the contrary—is professedly, or by implication, the account of a whole genus, it is faulty if not complete; and this happens especially, when an enumeration is made the ground of a disjunctive argument. We say, triangles are equilateral, isosceles, and scalene; this triangle is neither equilateral nor isosceles; therefore it is scalene—or, this triangle is not scalene; therefore it is either equilateral or isosceles. Here the whole force of inference depends on the exhaustive character of the enumeration. In all such cases the division must be complete.

(4) Division must be made on one *fundamentum*.
Exceptions.

We now come to a rule of division which logicians consider the most fundamental of all, and the most intimately connected with the essential nature of this operation. They say that every division should refer to some one attribute or property of the genus divided, which, in this relation, they call *the principle or foundation of this division*. The first rule of Hamilton is, "Every division should be governed by some principle," and the last rule of Thomson is, "The division must be made according to one principle, or ground." The importance of this precept cannot be questioned; but the universality of its application may.

The principle of the rule requires that the differences or modifications, by which the several species are distinguished, should all pertain immediately to one attribute or property of the divided genus, or, if they concern more than one, that the same composite basis or foundation of difference should be employed in the case of every specialization. When we divide man into the wise and the unwise, the basis of division is an essential characteristic of man, namely, his rationality. It is as rational that man is wise and unwise. When we say, "Man is either European, Asiatic, African, American, or Australian," the basis is a property common to the race. All men live somewhere on the earth; and this shows their differences in that respect. Each of these divisions affects man as to one characteristic, and is not immediately connected with his whole nature, or his properties in general. But, should we divide man into the savage, the barbarous, the semi-civilized, the civilized, and the enlightened, this would relate, not to one characteristic only, but to that complexity of characteristics, which makes man capable of diverse degrees of social and industrial advancement. In the foregoing divisions, the mind refers only to a part of the generic nature; and this is commonly the case with complex genera. But, should we take some simple genus, as color, and divide it into white, black, red, blue, yellow, etc., then the whole nature of the genus would be the "*fundamentum divisionis*."

to which the distinguishing differences should immediately attach.

Is there, now, any exception to this rule? We think there is, and that we often divide a natural genus of things by reference to prominent marks of its several species, when these marks, though pertaining to different characteristics, or aspects, of the genus, are yet recognized as distinctive of the species severally. We say that there are four simple gases, oxygen, hydrogen, nitrogen, and chlorine; and we distinguish the first as the life-sustaining gas, the second as the lightest of substances, the third as the most inert element, the fourth as the colored gas, adding to these peculiarities such others as we may note, without any reference to a basis of division. And, in general, chemical elements are divided in this way. In a similar manner, we classify vertebrates into mammals, birds, reptiles, and fishes. Each species is marked by a system of characteristics peculiar to it, without reference to any common basis for distinction. Our ordinary division of quadrupeds into the éléphant, rhinoceros, hippopotamus, lion, tiger, jackal, horse, cow, dog, etc.; and our classifications of vegetables, as potatoes, parsnips, onions, cabbages; and of flowers, as the rose, the lily, the anemone, the tulip, the hyacinth, etc., are without any one fundamentum. Division, in fact, can take place *whenever a number of specific differences, or systems of difference, are mutually repugnant*, whether we refer to one principium or not. This evidently happens in many common divisions of natural things. We see a certain number of members belonging to a genus which have a set of attributes possessed by no other members of that genus, and so we make them a species by themselves. In the same way we form another coordinate class, and another, and another, till the genus is divided. In short, the difference employed in each specialization may have a fundamentum of its own, if it only be incompatible with all the other differences employed.

The reason, on account of which a common fundamentum has been considered necessary for correct division, is, that, if we should neglect the actual constitution and laws of the universe, and have regard only to things abstractly possible, we could not separate a genus into repellent species without adopting a common fundamentum. We now distinguish the elephant as the largest of quadrupeds and the horse as a quadruped of a peculiar shape. In abstract possibility the same animal might be an elephant in size and a horse in shape. But when we distinguish both animals as to shape, or both as to size, then there is not even an abstract possibility of any animal belonging to both classes. It is abstractly possible that a gas having the life-supporting quality of oxygen should have the color of chlorine and the lightness of hydrogen. The rule as to the *principium* arose from an exclusive attention to what logicians have termed "Pure Logic"; which, in some cases, they make too pure to be of any practical use.

The illustrative and defining power of logical division. The *fundamentum divisionis* often not an essential attribute of the genus, but a property added to the essence.

But, while a common fundamentum is not needed in every division, it is true that divisions constructed with reference to one principle have a peculiar value. For, in addition to the main effect of division, which is the distinction and co-ordination of species, *they specially illustrate that characteristic which is the ground of division and the differences which attach themselves to it*; in this way they contribute to the analytic determination of thought.

This may be seen in cases where the whole nature of some simple genus is the "fundamentum divisionis." For example, when we enumerate and consider different kinds of color, both genus and species are set forth distinctly, and, in a sense, defined. But a similar result takes place where genus, or specific differences, or both, may be of a complex nature. We say, mankind are Christians, Jews, Mohammedans, and Pagans. As a division, simply, this teaches that the four classes named, notwithstanding their common character as men, have each a distinct nature of their own. But, as a division founded on a common principle, it illustrates the fact that all men have the property of being religious, in one way or another, and prepares us to obtain a correct conception of this property and of the differences founded upon it. For, considering the four different classes of men, we soon gain a distinct notion of the common religious character of the race; and after this, we conceive more definitely of each of the dividing species, when, bearing the common principle in mind, we perceive how far each species is like, and how far it is unlike, the others co-ordinate with it. For instance, a Christian is exactly like a Jew, Mohammedan, or Pagan, so far as general religious sentiment goes. That, therefore, is not sufficient to constitute a Christian; one must have that peculiarity of religious faith and life, which belongs to the disciples of Jesus Christ. Thus our conception of Christianity is rendered definite by its relation to the common fundamentum.

The foregoing example shows how, before a division is effected, the notion to be divided is often enlarged by the incorporation of some property of the genus, to which property the differences immediately attach themselves. This interesting phenomenon frequently occurs, and is of importance in the philosophy of our conceptions.

In this connection, we should notice a kind of division which may rest on a common fundamentum, yet which is without that determining force of which we have just spoken. It is that dichotomy, or division by negation, whereby a genus is separated into a positive and a negative class. Animals, with reference to their disposition towards the society and service of man, may be distinguished into the tame, and the not-tame; and the class apple is divisible into those which are sweet and those which are not sweet, the fundamentum in this case being taste or sapidity. But, because

Dichotomy a process of only limited value.

the difference, *not-sweet*, indicates nothing respecting the nature of any other taste, save only that it differs from *sweet*, and even leaves it a question whether there be any other taste at all, it is impossible to compare *sweet* with other tastes, so as to perceive the common fundamentum and then to distinguish each taste by its own peculiarity. Such a division throws one on his own resources without giving any suggestion as to determinateness of conception. Its value, as compared with that of more instructive divisions, is very limited. Yet some logicians say that this is the only kind of division which deserves to be called logical.

§ 199. We shall close the present discussion with a distinction, which may be of some service in preventing confusion of thought. It is not immediately connected with logical division in general, but with our classification of substances—that is, of metaphysical substances. Two modes of differentiation may be applied to a generic substance, and, consequently, two different kinds of species may be conceived of. The first mode of differentiation is that commonly applied to other kinds of entity. It simply adds a difference whose whole effect, as connected with the generic nature, is limited and easily understood. Thus, metals might be divided into those fit and those unfit for coining, or according merely to their color, or their degree of malleability, or fusibility, or their capability of forming compounds. In such cases, though we conceive of logical species as truly as in any other, we are not commonly said to do so, but only to think of different classes or varieties of the same species or kind of thing. The second mode of differentiation takes note of the fact that a constitution, or system of attributes characterizing a substance, is often found, by experience, to be connected with a larger system of attributes, of which it may be considered a part, and which may be regarded as the whole essence or constitution of that kind of substance. We often conceive of substances as having *that whole constitution given them by nature*, and not merely some more limited and defined essence. In this case, though all the attributes are conceived of as a possible ground of distinction and as having determinate existence, yet not all are determinately conceived as to their own nature. For every substance is such that many powers and properties may belong to it in addition to those by which we are led to distinguish it at first. Thus iron, in addition to being a hard, heavy, dark-colored, strong metal, malleable and fusible, and capable of sharpness and polish, which is the idea the ancients had of it, is now known to have medicinal, chemical, and magnetic properties, and probably has other characteristics not yet ascertained. Such being the case, a fixed complexity of constitution, comprising an indefinite number of attributes, is recognized as part of the specific nature of iron and as constituting that difference which separates this metal from all others. When, therefore, we divide the genus, metal, into iron, lead, silver, gold, platinum, copper, zinc, tin, and so forth, in

each specialization we add to the generic constitution a system of differences capable of indefinite enlargement; and this kind of differentiation is to be distinguished from any which would add only some difference, or differences, unconnected with a fixed natural constitution. Thus, in the case of substances, there are *natural species* which possess fixed constitutions of considerable complexity, and which have a superiority over those logical species which are based upon more superficial and less fruitful differences.

Passing from unorganized to organized substances, the difference between the two modes of differentiation is yet more marked. We at once allow that oak, pine, walnut, ash and mahogany, are kinds of wood; but, should we divide wood, with reference to the process of using it, into timber, logs, sawed lumber, dressed boards, and manufactured articles, we would scarcely call these different kinds of wood. Nor do we speak of males and females—or of children, youths, adults, the middle-aged, and the old—as being different kinds of men. It may sometimes be hard to determine by what marks a natural kind should be definitely distinguished; but the existence of such kinds cannot be denied. A desire to recognize their important place in the structure of the universe in some degree explains the tenacity with which the doctrine of realism was formerly held. The fixed typical forms according to which natural objects may be classified, and the peculiar fullness and fruitfulness of substantial essences, indicate that quite complex general conceptions have been employed, either at some one period, or from time to time, to determine the constitution and course of nature. This is the radical truth which realism endeavored to express.

In the foregoing remarks, the terms *genus* and *species* are employed only in their logical sense, and not with the limitations given them in natural history. It is evident that their peculiar application in this science has arisen from the perception of what we have called natural kinds. Moreover, we call these kinds natural and others logical or artificial, not because only the former indicate natural relations, and only the latter mental classification, but because nature has more to do with the former, and art more with the latter.

We must notice, also, that the terms *fundamentum* and *principium*, and their English equivalents, *ground* and *principle*, have a different sense when used with reference to divisions from that which they have when we speak of a ground of conviction, or a principle of reasoning. They signify merely that general quality or property which is specialized by a series of additions.

The terms *fundamentum*, *principium*, *ground*, *principle*, used in two applications.

CHAPTER XLIII.

PREDICATION.

The radical conception expressed by predication or proposition.
A tendency to specialization of signification.

§ 200. The second form of thought employed by the discursive reason, is the Proposition, or Predication. These terms have essentially the same signification, and may often be employed indifferently; but, as frequently happens with terms of psychological application, each is used to express shades of meaning which are more or less its own. The sense of words indicative of mental phenomena, is, for the most part, a variable thing, and resembles the pronunciation of words in the Arabic language. In Arabic, a word, sometimes, has several pronunciations, with one radical consonantal framework; Mohammed, Mahomet, Mehamet, Mahmoud, are all the same word; so, in psychology, a term may have several significations, all the developments of one radical conception.

By a *predication* men meant originally a statement or declaration concerning any object, whether real or imaginary, and by *proposition* the same thing, but with the idea that the statement is placed before some one for consideration. Hence, predication came to indicate, specially, a statement in its relation to the objects thought of, and proposition a statement in its relation to the thinking mind. Then, because most statements concerning objects present one object as existing in some relation to another, predication often limits itself to those declarations in which we affirm or deny "one thing of another"; while proposition still remains a designation for statements in general. On the other hand, since the mind may entertain an existential statement, without asserting it, a proposition sometimes signifies a mere enunciation of thought, without reference to its truth or falsehood, or the reality or unreality of its objects. This limitation does not so easily attach itself to the word *predication*. But the radical conception at all times common to both terms, is that of *existential statement*, or *the mental setting forth of things as existent or as non-existent*.

This is our definition of the essential nature of propositions and predications. Accepting it, we must explain the various limited meanings, in which, sometimes, these terms even become contrasted with one another; and, in connection with these meanings, we must seek a clear understanding of the forms and uses of propositional thought. In the prosecution of this work, which is one mainly of definitions and distinctions, we may advantageously follow a mode of procedure which naturally suggests itself, that is, the method of logical division.

The term *schematic* given a special meaning, also the term *schema*. Schematic, distinguished from existential, thought.

But before proceeding farther, we shall emphasize the distinction between existential thought, and thought which is not existential, by proposing a better name for the latter than the designation which we formerly employed (§ 35). The noun *form*, and the adjective *formal*, in this connection, are objectionable because of their ambiguity. Although we may think of the form or nature of a thing without thinking of its existence or non-existence, the word *form*, of, itself, suggests merely the object conceived of as possessing a distinct nature, and not that the object is thought of *only* as having it. We may either think of a form as existing or as non-existent, or we may think of it without any existential reference. Moreover, an object viewed without reference to its form, or simply as "matter," can be thought of aside from its existence or non-existence.

It is, therefore, in every way desirable that unambiguous names should be found, first for an object viewed without reference to its existence or non-existence, and, secondly, for the notion or conception of the object thus obtained. We can think of no better term for this purpose than one which Kant employs to signify an individual notion as immediately produced from, and supplying the place of, a general notion,—that is, what we have already described as the unital indefinite notion. Kant calls this a *schema*. The term, in this sense, is not needed in English philosophy, and could scarcely be used without some evil Kantian associations. We propose to signify by *schema*, not the notion of a thing, but the thing itself viewed without existential reference; and we shall call our notion of the thing as thus viewed, a *schematic thought*, or conception. If any one dislike this use of language, we shall retain it only till he may provide a better term.

When we say that a proposition or predication, in the most radical signification of these words, is an existential statement, we mean very little more than that it is an existential notion, the difference being that the thought of existence (or of non-existence) is more distinctly and separately entertained in the statement than in the notion. Hence, it has been correctly held that every proposition is an expanded notion; though the converse cannot be admitted, that every notion is a contracted proposition. For schematic conceptions are essentially different from propositional thought.

(a) Propositions are enunciative or assertive.

We shall commence our analytic survey of propositions with two divisions which we have already noticed as sources of the secondary significations of terms, and which are of fundamental importance in the philosophy of rational discourse. First, propositions (or predications) are *either enunciative or assertive*. By the former of these we mean statements enunciative or expressive of existential thought merely; by the latter, statements which also assert the truth or falsity of the thought, and which, therefore, are enunciative or express-

ive of belief. Though propositions always state existential thought, and may be dwelt upon simply as doing so, we frequently conceive of them as having also this assertive force; this is particularly the case when we use the term *predication*. Every conceivable object is either existent or non-existent; therefore every proposition must be either true or false. We can, however, state a proposition without asserting, even mentally, that it is true or that it is false;—as when one states a proposition without knowing whether it be true or false, and endeavors to find out which of the two it may be;—in that case, the proposition may be distinguished as enunciative, or an enunciation. More frequently, in making a statement, we intend to assert the truth of it, and, it may be, the falsity of the contradictory statement; in this case, a proposition or predication, is assertive, or an assertion.

As already suggested, there is a tendency in language to restrict the term *proposition* to enunciations, as when we speak of some statement as a mere proposition; and there is a similar tendency, though not so strong, to restrict the term *predication* to assertions. But logicians have not adopted either of these restrictions. The sole use of enunciation is to furnish a basis for assertion. Were it not for this, propositional thought would differ nothing in form and character from mere existential conception.

(b) *Inherential and presentential.*

The second division of propositions concerns them equally whether as enunciations or as assertions. It is that which we formerly made between improper and proper predications. It may be stated by saying that some propositions are *simply* existential, while others are *inherential*. Some set forth, and assert, the existence (or non-existence) of a thing viewed simply, and aside from its relations to other things; while others set forth the existence (or non-existence) of objects as in relation to something else, whose existence is known or assumed. "There are white elephants," "There may be black swans," are propositions of the first class; they are simple existential statements. "The elephant has huge tusks," "The swan moves gracefully," are propositions of the second class. These may be styled *inherential* statements, for they assert that the possession of tusks is a fact in relation to elephants, and graceful motion a fact in relation to swans. By far the greater number of propositions are of this latter kind; and the ordinary discussions of logic pertain to these almost exclusively. Such being the case, it is not surprising that the term *predication* is often used as equivalent to *inherential* statement, and may be allowed ordinarily to have this limited meaning. Hence, we do not wholly object to the well-known Aristotelian definition that a predication is a form of speech in which one thing is affirmed or denied of another. But, if all propositions may be styled predications, and *inherential* statements have this name only by a pre-eminence, then let us call these predi-

cations *proper*, and let simple existential propositions be *improper* predications.

It might, however, be an improvement in terminology, if propositions were made the generic class, and then were divided, by their relation to belief, into enunciations and assertions, and, with reference to their matter, into simple existential statements, and predications. Then, let a predication be either enunciative or assertive; and so, also, the simple existential statement.

Beside the two divisions which we have now mentioned, others of less radical importance exhibit different modes of propositional thought. All of these additional divisions relate to propositions as assertive, and to the thought of propositions only as conditionative of belief; but some of the distinctions emphasized in these divisions apply, either exclusively or pre-eminently, to predications as distinguished from simple existential statements.

We shall discuss five divisions which concern propositions in general, and then five relating to predications. For propositions may be (*a*) affirmative or negative, (*b*) true or false, (*c*) real or assumed, (*d*) categorical or conditional, and (*e*) definite or doubtful. And predications may be (*a*) historical or logical, (*b*) close or loose, (*c*) essential or accidental, (*d*) identificative or ascriptive, and (*e*) universal or particular.

The distinction of *affirmative and negative* belongs to propositions both as enunciations and as assertions. Affirmative and negative assertions are merely affirmative and negative enunciations accompanied with belief. But in thinking of propositions under these characters we refer chiefly to their assertive force. Logicians have considered propositions exclusively as assertions, and, therefore, have regarded assertive force to be the peculiar characteristic, or *differential quality*, whereby the proposition is distinguished from all other modes of thought. Hence, they say that the distinction of affirmative and negative pertains to the quality of propositions. This language may be allowed, though it is wanting in accuracy, and is far from being self-explanatory. When we contemplate the nature of belief, its dependence on existential thought, the two modes, positive and negative, of this thought, and the two correspondent modes of belief, the essential nature and the fundamental use of propositions, seem to be clearly analyzed and explained. With the conceptions thus obtained we may compare the view of the ancient logicians who make propositions and assertions to be a mental compounding and dividing of things, the putting of one thing with another, or the taking away of one thing from another;—and the doctrine of modern logicians who teach that judgment is the recognition of the agreement or disagreement, or the conflict or congruity, of ideas.

The division of propositions into *the true and the false* is intimately related with that into the affirmative and negative. Truth and falsity presuppose affirmation and negation. An affirmation is true when that

(c) Affirmative and negative.

(d) True and false.

which it sets forth as existent, really exists, and false when this is non-existent. A negation is true when that which it sets forth as non-existent, is really non-existent, and false when this exists. Truth is a sort of correspondence or conformity between a proposition, positive or negative, and fact; falsity is a non-conformity between them. In judging, or making a mental assertion, one's use of propositional thought may be purely objective; he may think only of the fact asserted without thinking of his own assertive thought. On the other hand, his assertion, especially if it be repeated or deliberate, may be accompanied by a subjective reference, that is, by a recognition of its own nature and relations as an assertion. In the former case, one asserts simply the proposition or predication believed in. He says, "A exists," or "A is B." But in the latter case the assertion is often made indirectly by asserting the *truth of the proposition*. We say, "It is true, that A exists," or "that A is B." Every assertion may be expressed in this modified way. Hence, some have defined judgment to be the setting forth of a thing as true, rather than the setting forth of a thing as fact—that is, as existent or as non-existent. This is an unsatisfactory definition. The perception of a thing—that is, of a proposition—as true, presupposes the perception of a thing, that is, of some form of being, as fact, and is itself only a special case of this latter perception. For, first we perceive, simply and directly, the fact; then we perceive our perceptive thought; and then that a correspondence exists between our thought and the fact, this existing correspondence being a correlated fact. Assertion, therefore, pertains radically and primarily to the reality of things and not to the truth of propositions. The doctrine, that every assertion may be reduced to a certain form of statement which asserts the conformity of a proposition with fact, can easily be distinguished from the theory that every assertion sets forth the congruence or the confliction of ideas, or of things. These doctrines never had any close connection. The one is true; and the other false.

In the next place, assertions may be either *real* or *assumed*. This division, unlike the last, has no reference to any difference in the mode of propositional thought, but only compares an assertion which expresses one's real knowledge or conviction, with an assertion merely conceived of and used as an object of consideration and study. The propositions presented in such logical formulæ as, "Every A is B," are of this latter description. The province of logic is not to investigate the original sources of our knowledge, but to define those rational methods whereby our knowledge is confirmed, improved, and enlarged. Therefore, the reality of data is assumed. Because the rules and discussions of logic, as the science of rational conviction, deal, for the most part, with assumed assertions and their consequences, many hold that logic deals with thought simply as such. They reason wrongly from the fact that an assumed is not a real assertion. They do not

perceive that an ideal object may serve the ends of abstract reasoning as well as if it were real, and even better. However logical principles may be immediately concerned with assumed truth, their whole value lies in their applicability to statements setting forth fact and reality.

(f) Mental or verbal. The distinction between real and assumed, is not to be confounded with that between *mental and verbal*, assertions. Both real and assumed assertions are mental. Logic is interested primarily with mental propositions, and with verbal only so far as these may express the mental. When verbal assertions are disconnected with mental, as in lies and falsehoods, they pass beyond the province of the logician.

(g) Categorical and conditional. Categoricals are either pure or modal.

§ 201. Propositions, again, are divided into the *categorical and the conditional*. Categorical assertions are those which are free from any *expressed condition*, for example, "Garfield is president," "Arthur may be president," "There is money in the bank," "There must be money in the bank." Those categoricals which simply assert fact, are *pure or indicative*; those which assert something as necessary, or possible, or contingent, or probable, are *modal or conditionative*, categoricals. Although these latter are not accompanied with any express condition, they contain a reference to some unexpressed condition, that is, to some antecedent either of necessity, or possibility, or contingency, or probability. For the term *condition* here signifies simply a logical antecedent. Aristotle speaks frequently of modal propositions, and mentions four kinds, the necessary, the impossible, the contingent, and the possible. We have ventured to change his list by omitting the impossible as being only one form of the necessary, and by adding the probable, which is a peculiar combination of the necessary and the contingent (§ 86). It is the characteristic of modals to assert the consequential dependence of the thing set forth on some understood condition. They do not differ from indicative propositions in presenting any peculiar quality or adjunct of the thing directly asserted to exist. They are called modal simply as indicating different modes of logical connection, and not as setting forth modes of action or of any kind of entity. The commentators on Aristotle, followed by the Schoolmen, failed to comprehend the character of the modals. They included in this class all assertions in which the emphatic thought is adverbial. "Brutus killed Cæsar justly," "Alexander conquered Darius honorably," were called modals. Later writers proved, easily enough, that such predications differ from ordinary indicative categoricals only in the form and order of expression. Instead of the propositions given above, we can say, "The killing of Cæsar by Brutus was just," "The conquest of Darius by Alexander was honorable;" and, in these statements, the predicate adverbs are replaced by predicate adjectives, which, like the adverbs, characterize modes of conduct. But terms expressive

of necessity, contingency, possibility, and probability, are not generally used to set forth modes of entity, but modes of logical connection.

Necessity and possibility may be asserted for their own sake, and without reference to any logical sequence flowing from them; as when one might say, "He *must* pay the debt; he *can* pay it easily," meaning to assert the necessity or the possibility simply as a fact. In such cases, the propositions are pure rather than modal. But they would not be pure were the assertion intended to set forth the payment as a thing certainly or possibly true.

Modal propositions, therefore, are justly separated from those merely indicative, because they assert that grounds of various degrees of confidence exist. By reason of this attribute modals are specially related to inference and reasoning.

To the categorical we oppose the *conditional proposition* as being founded on an express condition. We do so with some dissatisfaction, on account of the inadequacy of these terms to convey the meanings assigned to them by logical usage. The word *categorical* might naturally be applied only to pure, and not to modal, statements, and is sometimes given that limitation; while the word *conditional* might claim a wider application than that in which we are now called to use it. The conditional proposition of which we speak at present is essentially hypothetical, and founded on an "if." Undoubtedly, those conditioned propositions which we are mostly called to consider are of this character. But it tends to a confusion to identify the hypothetical with the conditional character of an assertion, as if every condition were only a thing supposed. The word *condition* is here used in a peculiar and limited sense. Primarily, in philosophy, a condition signifies that, the existence of which is necessarily involved with the existence of some object, so that the object could not exist without the existence of the condition. Then a *logical condition* is that which at once conditions and necessitates the existence of some object, and is that vital part which gives to every antecedent of necessity its logical force. But the condition now spoken of is simply the *logical antecedent* itself, which is here termed a condition, because it always includes a logical condition of the thing asserted, and because it commonly is the necessary condition of our belief in particular cases.

Conditionals are either real or hypothetical. Only the latter mentioned in logic.

It is evident that a condition in this, or in any of the senses just mentioned, may be either real or supposed, and that, consequently, assertions founded upon them may be divided into the real and the hypothetical. Real conditional predications might be illustrated by the following statements, "Because there is order in the universe, there must be an intelligent Creator," "The man will pay his debts; for he is honest." Hypothetical conditions would be such as follow, "If there is

order in the universe, there is an intelligent Creator," and "The man will pay his debts, if he be honest." In all such assertions the antecedent is no part of the proposition, but only its concomitant. Should we include both antecedent and consequent in our conception, we would be thinking rather of an inference than of a proposition. A conditional predication, therefore, might be defined as an inferred proposition attached to some antecedent of admitted validity; and might be distinguished by this name, whether the antecedent be accepted as real or be only supposed.

But predications founded on valid antecedents, known and allowed as fact, need not, in the discussions of logic, be separately considered as conditional propositions. If the fact, as well as the validity, of the antecedent be admitted, we either no longer dwell on the antecedent, but use the proposition by itself categorically; or we regard antecedent and consequent together as constituting a valid inference. And if the validity, or inferential force, of the antecedent be in dispute, whether its reality be admitted or not, antecedent and consequent are, in like manner, equally considered, and as together constituting an alleged inference. Hence, the special emphasis of our attention naturally falls on the consequent proposition *only in one case*. This arises when, the validity of an antecedent being undoubted, but its reality as yet undetermined or neglected, we find it desirable to consider what would follow, if the antecedent were fact. In that case, we regard the consequent as hypothetically true. On this account the hypothetical conditional predication has been distinguished by logicians as if it alone were conditional. Thus, in this connection, the word *condition* has doubly departed from its primary philosophical meaning. It has come to signify, not merely a logical antecedent, but also that antecedent as supposed or imagined.

This deceptive language might be avoided should we drop the word *conditional*, and employ the word *hypothetical* in its place. But this may not be necessary. Having guarded against misconception, let us conform to the *usus loquendi*, which in this connection gives the meaning of supposed antecedent. Then, dismissing the real conditional proposition, mentioned above, as being sufficiently considered elsewhere, we may sub-divide conditional propositions into the hypothetical—that is, the simple hypothetical—and the disjunctive.

The former of these has been already exemplified. It is simply a proposition asserted with an hypothesis for its antecedent: but the disjunctive conditional is of a complex and peculiar character. It is a condensed collection or collocation of hypotheticals, and, in addition to this, has a pure or indicative element. A perfect disjunctive proposition sets forth a number of alternative statements, asserting indicatively, but indefinitely, that one of them is true, and the rest false. We

The disjunctive proposition, though essentially hypothetical, has a categorical element or addition. Of two kinds.

say, "It is either day or night," meaning that the present time is one, and not the other, of these. This statement, thought explicitly, contains four hypothetical assertions, together with the indicative assertion that only one of them is true. We assert that, if it is not night, it is day; that, if it is not day, it is night; that, if it is night, it is not day; and that, if it is day, it is not night. The disjunctive proposition is a very condensed statement; it may always be formed when two or more propositions are so related to each other that, necessarily, one, and only one, of them is true. But when the alternatives are three or more, the number of hypotheticals involved in the explication is also greater.

A less forcible kind of disjunctive is formed when two or more things, though not conflictive with (or contrary to) one another, are so related that one at least must be fact. "The man is either a knave or a fool," might be equivalent to two propositions; first, "If the man is not a knave, he is a fool," and secondly, "If he is not a fool, he is a knave." At the same time the man may be *both knave and fool*. This peculiar disjunctive is often used. It can be made complete by supplying another alternative consisting of a combination of all those mentioned. Thus, "The man is a knave, or fool, or *both*." But this compound alternative is not always or necessarily included in our thought.

A convenient division proposed, into pure, modal, hypothetical, and disjunctive. Aristotle quoted.

Should we pass over the distinction into categoricals and conditionals, propositions, with reference to what we may term their conditionative character, may be more specifically divided into pure, modal, hypothetical, and disjunctive. Of these four classes, the first and last are always expressed in the language naturally and properly fitted to express them; but this is not the case with modals and hypotheticals. Sometimes, propositions which are pure in form may have a modal force, and sometimes propositions modal in form, a hypothetical force. When we say, "Man is mortal," "Man tills the ground," the statements are pure in form. But the former is used to assert that "Man *must* die," and the latter that "Man *may* be a cultivator of the earth." So used they are really modal, not indicative. And as modals may be expressed by indicatives, so hypotheticals may be expressed by modals. "If one be a man, he is mortal," is the essential significance of "Man *must* die." The latter statement, as really as the former, makes humanity the logical antecedent of mortality. "If a man steals he may be detected and punished," is the very thing asserted when we say, "The thief may be caught and punished;" here, also, the subject acts as antecedent and the predicate as consequent. Thus modal, and even pure, propositions may become expressions of inferential thought; and, when so used, are more than mere propositions. This truth is the chief lesson to be learned from the study of *hypothetical* propositions as such; were it not for this, these propositions might be discussed simply as a part of the subject of inference.

Let us note, also, that the true force and character of a predication should not be determined by reference to its form alone, but from a consideration of the thought which it is intended to embody. The logician should always seek the exact meaning of the mind in making any statement, and should express this clearly and fully. We may say of all logic what Aristotle says respecting the doctrine of demonstration; it pertains, not to the outer, but to the inner, word—that is, to thought itself, οὐ πρὸς τὸν ἔξω λόγον, ἀλλὰ πρὸς τὸν ἐν τῇ ψυχῇ λόγον (“Anal. Post.” i. 10).

Our last division of propositions in general regards them in their assertive aspect, and distinguishes them into the *fixed or determinate* and the *vague or indeterminate*. The degree of confidence with which a proposition is held is sometimes exactly determined, and sometimes not. In the former case, the judgment expressed is either certain, or of some given degree of probability, the proportion of chances favoring the assertion being accurately or approximately conceived. But we call those judgments or statements vague, which simply estimate that some supposition has more or less chances in its favor, without settling the degree of probability. These are *objectively* vague when the known facts of the case do not authorize a fixed judgment, and *subjectively* vague when one's faculties fail to form a correct conception of the chances. One who knows that an animal has been placed in a well-inclosed pasture, may be certain of finding it there, the antecedent in this case admitting only one chance or consequent. And if one knows that three animals have been placed in the pasture, two of them (he knows not which) being for sale, he can form the settled, and, in a sense, certain, judgment, that there is a probability of two to one of the animal which he has found being for sale. But if one knew only that some indefinite number out of a herd of one hundred are purchasable, he could form only a vague judgment as to the likelihood of securing any given animal; and his judgment would be vague, even though he were told that seventy-five out of the hundred were for sale, if he should fail to conceive his chances definitely. Logic deals principally with the fixed judgment, as being more perfect and more amenable to rules, but should recognize the vague judgment also.

§ 202. We have now to discuss *those divisions which pertain to predications as distinguished from simple or direct existential statements*. Before doing so, let us notice the want of any philosophical designation for these more simple statements. Predications, as we have seen, may be styled *inherential propositions*, but we have not found any term to characterize that more simple kind of proposition which sets forth a thing simply as existing. Perhaps the barbarous word *presentential* may be allowed, at least for the time, to fill this vacancy; if so, we may say that every proposition is either a *presentential*

The term *presentential* proposed.

or an *inherential* statement, the latter being the predication properly so called.

Our first division of these inherential propositions distinguishes the *composite* or *historical* from the *single* or *logical*. If one who knew only that there was once a certain king named Alexander the Great, should read that "Alexander the Great, king of Macedon, conquered Darius, the Persian monarch, in battle, near Arbela," no emphasis being laid on any particular word, this statement would not appear to him a single assertion, but rather a composition of assertions. He would learn from it a number of things equally and at once; namely, that Alexander was king of Macedon, that Darius was the monarch of Persia, that the former conquered the latter in battle, and that this event occurred near Arbela. Some of these statements are built upon others which precede them; for example, when we say that the conquest of Darius by Alexander occurred at Arbela, this takes for granted that Darius was conquered by Alexander. Nevertheless, it is clear that several different statements are made equally and together. When a proposition thus sets forth a number of things conceived of in their unrestricted plurality, it may be called *composite*, as being composed of a number of assertions. And each of the component assertions may be called *single*, because it sets forth only one object. Moreover, a composite proposition may become single whenever some one part of it is emphasized and the rest subordinated to that part as being qualifying additions. In the above statement let us emphasize the thought that Alexander was king of Macedon; then the composite proposition becomes equivalent to the single one, that "Alexander the Great was a king of Macedon, who," etc. Or let us emphasize the element that Alexander conquered Darius in battle; then the composite statement itself, without any change in the form of expression, becomes single. Or let place be the prominent thought; then the statement signifies, "Arbela is the place at which Alexander," etc.

Historical narratives abound in composite predications, but generally, in logical discussions, when we speak of propositions or predications, we mean those that are single. For this there are several reasons. First of all, composite propositions, when critically considered, naturally resolve themselves into single statements; and these then are treated as if they were the original form of thought: the scrutiny of reason is always analytical. In the next place, the science of logic, being the highest result of critical study, deals primarily and chiefly with those propositions which present themselves as single. And, finally, the operations of reasoning, which constitute the principal subject of logical discussions, always employ single, and not composite, statements. Generally, indeed, the inference flows from a single proposition which is included in some more complex single proposition as a part of it.

(1) Predications
are composite or
single, historical
or logical.

To understand a single proposition accurately, the principal thing to be done is to determine what part of it is subject and what predicate. In order to do this we should ask, to what question the proposition may be regarded as a proper answer, for *the predicate is always that part of the reply which imparts new information*. If we should regard mere grammatical structure, the statement already considered, as a single proposition, would answer the question, "What did Alexander accomplish?" etc., or, "What did he accomplish at Arbela?" But, with a different emphasis of assertion, the statement might answer some other question, for example, "Who conquered Darius?" etc., or, "Who was the king of Macedon that conquered?" etc., or, "Which Alexander conquered Darius?" etc., or, "Whom did Alexander conquer?" etc., or, "Where did Alexander?" etc., or, "In what battle did Alexander?" etc. As answering any one of these inquiries, the part of the statement known to the questioner constitutes the subject, and the asserted part the predicate, of the proposition. Often, also, subject and predicate may be found by using the formula, "It is," or "It was," together with a relative clause. Should one say, "John came yesterday," addressing another who knew that John had come, but not when he came, he would mean to say, "It was yesterday that John came;" and the first part of this sentence would show the predicate, and the second the subject, of the mental proposition. The assertion really would be, "John's coming was on yesterday." Very simple verbal statements may express composite propositions; and may, also, express different single propositions. The sentence, "John struck James," may, according to the intention of the speaker, answer the question, "Who struck James?" or the question, "What did John do to James?" or the question, "Whom did John strike?" In each of these cases it would express a different single proposition. Or it might be employed to assert all the facts in the case equally and at once; in which use it would be a composite assertion.

Our second division of predications refers to the mode in which the mind is led to conceive of inherent objects, and distinguishes *close* from *loose*, predication. Like the other divisions yet to be considered, it concerns only single or logical assertions. Sometimes, the predicate object is conceived of simply as a whole immediately related to the subject, while, in other cases, qualifying parts of the object are mentioned as being related to the subject only indirectly and through the intervention of other parts. The propositions, "William is a man,"—"is wise,"—"is here,"—"studies,"—"is six feet high,"—"is thirty years old,"—"is son of James," are close predications; they set forth simply identity, quality, place, action, quantity, and relation, or at least may be considered to do so. But the propositions, "William is a man from Scotland,"—"is wise concerning business,"—"is here in New York,"—"studies in his counting-room,"—"is six feet

(2) Close and loose predication.

high in his stockings,"—"is thirty years old to-day,"—"is the son of James, a grocer,"—may be regarded as loose predications. Loose, are founded on close, predications, and are formed by additions to the latter. They may always be converted into composite assertions; which is not the case with close predications. The different kinds of close predication naturally made by the mind are enumerated in the categories of Aristotle. Although some of these categories refer to complex assertions, each simply sets forth something *as directly inherent in a subject*. Whether a predication be close or loose cannot always be determined from its language, but will be evident from an analysis of the assertion. The statement "William is thirty years old to-day," may answer the question, "How old is William to-day?" In that case it would be a close predication. In reply to the broader question, "How old is William?" it would be a complex and loose predication.

In the next place, the relation of the predicate, to the constitution of the subject, object of assertion, is set forth by saying that predications are either *essential or accidental*. This distinction has been used by many who suppose it to throw light on the radical nature of judgment and reasoning, and who, in their doctrine of "the predicables," teach that the aim of every predication is either to give the essence or part of the essence of a thing or to add some property or accident to the essence. This view is contracted and unsatisfactory. It presents, as belonging to the very nature of predications, certain forms to which they may be forcibly reduced. When, however, the inquiry *concerns the nature of a thing* and what may, or may not, be included in it, or necessarily connected with it, which is the case with most philosophical discussions, the distinction of predications, as essential and accidental, is useful. An essential predication may be either definitional, giving the whole essence of a thing, or attributional, giving only part. In either case it is explicative or analytic; the predicate is either obtained from an analysis of the subject or such that it may be so obtained. An accidental predication asserts either a property, that is, something necessarily connected with the subject, or an accident in the strict sense of the term, that is, something contingently connected with the subject. As the conception of a metaphysical whole often admits of variations, it is sometimes difficult to say whether a thing be attribute, property, or accident. This, however, may always be settled if we can form and agree upon a definite conception of the subject.

Again, with reference to the mode of inherential conception, predications may be divided into the *identificative*, which might also be styled the *substantial*, and the *ascriptive*, or *ascriptional*. By the former we mean what Aristotle calls the predication of substance; by the latter, all other predications than this. In identificative propo-

(3) Essential and accidental.

(4) Substantial and ascriptional.

sitions, the predicate is expressed by a substantial name, and is really the identity of the substantum mentioned in the predicate-term with that given in the subject. Yet, in this mode of thought and speech, identity is not used for its own sake, but for a characterization which immediately follows from its use. Were it asserted for its own sake, the predication would fall under Aristotle's category of relation, rather than of substance, and would be ascriptional, rather than substantial. For this reason the term *identificative* here is not altogether satisfactory.

Every predication can be made to assume the form of substantial predication. When we say, "The Esquimaux follow the business of fishing," and "The Esquimaux are fishermen," we mean just the same thing; and so when we say, "Grass is green," and "Grass is a green thing." Ascriptional predication becomes substantial whenever, instead of ascribing some predicate entity to a subject, we make it the attribute of a substantum, and then identify this substantum with the subject. This mode of statement is especially adopted when some general nature, or system of attributes, may be predicated of an object as permanently belonging to it. We say, "The horse is an animal," "The sycamore is a tree," because the collections of attributes constituting *animal* and *tree*, are found to exist in permanent union, and lead us to conceive of objects as characterized by them. But we do not say, "The horse is animal," using the adjective; and, in the other case, it would be ridiculous to say, "The sycamore is of an arboreous nature." When we *dwell* upon any predicate, there is a tendency to substantialize it, if we may so speak,—to make it, not a mere attribute or adjunct, but a thing having the predicate as an attribute. And this is possible, though not natural, in the case of every predication.

Substantial predication is founded on the self-evident principle that when one thing is the same with another—that is, with itself under a different aspect—whatever is true of the one is true of the other. When we say, "A horse is an animal," we affirm that an individual having the character denoted by horse is the same as an individual having the character denoted by *animal*; "Horses are animals," is a similar statement of identity, for the same purpose, viz., characterization. In these statements the identity is not between *every* horse and *every* animal, or *all* horses and *all* animals, but is only such as the design of the predication calls for. It is an identity between every horse and an individual animal, indefinitely conceived of, and between all horses and individuals that are animals; but in this particular instance we know that there are animals which are not horses. Again, should we say, "Men are cultivators of the ground," we characterize by identification; yet the identity is not between all men and all cultivators, but only between some men and all cultivators. But should we say, "A triangle is a regular surface bounded by three sides," or give any other definition, the implication would be that every such surface is a triangle; that there is unrestricted iden-

tity between the classes of objects mentioned. In short, while substantial predication always identifies, the predicate is generally conceived indefinitely, and sometimes the subject also; for which reason, we have, as a rule, to study the *matter* of the statement in order to ascertain whether the assertion applies to the whole or only to a part of one class of objects, and whether that whole or part should be identified with the whole, or with a part only, of some other class.

Most logicians treat all predication as if it were substantial; some have gone so far as to say that every predication is the affirmation or denial of an identity. These views are wrong deductions from the fact that ascriptional and substantial predications are equipollent, and from the further fact that the "conversion" of predications, which is assumed to be immediately possible with respect to all assertions, can take place only after predications have assumed the substantial form. We cannot convert, "Men are mortal," but only, "Men are mortals;" nor, "The diamond shines," but only, "The diamond is a thing that shines."

Finally, we come to that division of predication which regards the distribution of the terms of propositions. A term is said to be *distributed* when it is understood to refer to every member of the logical class named by it, and is *undistributed* when it refers only to a portion of the class considered indefinitely. Singular terms are also said to be distributed because their application is fixed, being confined to definite individual objects. For the distribution of a term, or notion, might be defined as the fixedness of its application. A proposition, the subject of which is distributed, is called an *universal* proposition; one with undistributed subject is called particular. This use of language leads to the apparent absurdity that a proposition with a singular subject is universal. This paradox arises from an ambiguity which attaches itself to the term *universal*. As applied to propositions it indicates that their terms are distributed; but as applied to a notion—or to the object of a general notion—it indicates the rejection of individual difference. As only those notions can be distributed or undistributed which are affected by individual difference, the general, or universal, notion, of itself and in its own nature, is unquantified, that is, it is neither distributed nor undistributed. Ordinarily, however, when general conceptions are used in propositions, the nature of the fact asserted enables us to obtain from the proposition an equivalent one with quantified terms, and, because of this, the terms of the original proposition themselves are often said to have a distributional character. When we say, "The lion is carnivorous," we mean, "The lion is necessarily carnivorous," which being so, "All lions are carnivorous." Even in the first proposition, therefore, the term *lion* is, if we may so speak, impliedly distributed. But when we say, "Electricity conveys messages," we do not mean that electricity always does

(5) Universal and particular.

so, but only sometimes. In this case the term is impliedly undistributed. Properly and strictly, a general notion, when thought distributively, ceases to be a general, and becomes a class, notion, and, when thought undistributively, becomes an indefinite notion. In the former case we use such signs as *every*, *all*, *always*; in the latter such as *a*, *some*, *many*.

The quantification of the predicate discussed. Occurs not ordinarily, but in special cases.

§ 203. The twofold division which we have mentioned, into universal and particular, refers only to the distribution of the subject of predication, and is the only important division of propositions which relates to the quantification of terms. But the predicate, as well as the subject of assertion, may be quantified in thought; and, if this be taken into consideration, a fourfold division will result. First, we shall have the toto-total, or universal-universal predication, in which both subject and predicate are distributed, every A being every B. Then, we shall have toto-partial, or universal-particular predication, the subject being distributed and the predicate undistributed; all A is some B. Then the parti-total, or particular-universal; some A are all B. And, finally, the parti-partial, or particular-particular; some A are some B. If we consider that each of these four forms of assertion may be used both affirmatively and negatively, eight forms of predication appear, four affirmative and four negative. Sir Wm. Hamilton treats largely of these eight forms of statement, and considers them, severally, and in their combinations, as of great importance in logic. His doctrine may be accepted so far as to allow that the quantification of the predicate is not only a possible form of thought, but also one sometimes employed. But the importance of modes of thought depends on what use the reason can and does make of them; and, if we view the matter in this light, the quantification of the predicate, as compared with that of the subject, must occupy a very subordinate place, in the philosophy of logic. For the quantification of the predicate is special and occasional, while that of the subject belongs to the most common mode of propositional thought.

Here we include that quantification which is made by implication, as well as that which is expressly stated. We allow that when we say, "Man is mortal," the subject is distributed, though only by implication; because to assert anything as necessary to a nature is equivalent to asserting that it belongs to whatever has that nature. So, when we say, "Only Hindoos are serpent-charmers," the predicate is impliedly distributed, and sometimes at least, we thus assert, in thought, that "All serpent-charmers are Hindoos." But the importance of the quantification of the predicate depends on the extent and character of the uses which this quantification, whether express or implied, may serve in the economy of rational thought. So far as modes of thinking are mere possibilities, for which the mind finds no use—which it could, but does not, employ—they must be regarded as quite unimportant. Now it is clear that, ordinarily at least, the pred-

icate is not quantified in those assertions which we have termed *ascriptional*. When we say, "The elephant is wise," or "The elephant has a trunk," we make no reference to any predicate class. Before the predicate of any such statement can be quantified, the statement must be transformed into a substantial predication. Only individuals can be distributed or undistributed in thought; and only substantial predicatives set forth individuals. To say that ascriptional assertions always quantify their predicates even impliedly, would involve that they are always changed by the mind into substantial predications. No one could maintain this. Yet the most of our assertions are ascriptional. But even in *substantial* predication, the ordinary aim of reason is simply a characterization of the subject, whether it be quantified or unquantified, distributed or undistributed: the quantification of the predicate is something special and occasional. Some teach that the predicate of all ordinary affirmatives is undistributed in thought; that, when we say, "All mammals are vertebrates," "Some plants are edible things," we mean *some* vertebrates,—*some* edible things. In like manner we are told that the predicate of all ordinary negative statements is distributed; that, when we say, "No men are perfect beings," "Some men are not wise," we think of the whole class *perfect*, or *wise*. But, as a matter of fact, in such predications, even while we conceive of predicate individuals, we do not think of classes at all, and of the wholes and parts of classes; our aim is simply to assert or to deny characteristics of objects. The predicates in question can be quantified, but, as a matter of fact, only their subjects are.

Three cases in which the predicate is quantified, in spontaneous thought.

The quantification of the predicate occurs only in the following instances. First, in *exclusive* statements, which assert that the thing spoken of is the *only* thing characterized in some given way. For example, "The elephant is the only animal with a trunk," "Man alone is the laughing animal," "There is nothing great but mind," "Only Hindoos charm serpents." In such propositions the predicate may be said to be distributed, the subject being either distributed or undistributed. The distribution of the predicate, however, is by implication. We expressly assert only that the subject has a character, and that it has it exclusively; that the predicate sets forth all the objects having that character is something which can be,—and which often is,—immediately inferred from these things.

Again, the predicate is distributed when some *enumeration* is set forth as complete. Thus, "James, John, Peter, Andrew, and eight others, were the apostles," "Mammals, birds, reptiles, and fishes, are the vertebrates." The same thing takes place when a genus is divided by a series of propositions. Thus, "Some quadrupeds are horses, some are dogs, some are swine," etc. Moreover, when we illustrate the nature of some generic class, by giving its species, the predicates are conceived as undis-

tributed. Thus, "Horses are quadrupeds, cattle are quadrupeds, swine are quadrupeds," etc.

But the most frequent, as well as the most important, case of the quantification of the predicate occurs, when, for any reason, we are led to "convert" a proposition. In this process, the predicate is first substantialized, if necessary, then quantified, and then transposed. "All men are mortal," first becomes, "All men are mortals," then, "All men are some mortals," and then, "Some mortals are men." Here *mortal*, as a predicate, is momentarily quantified in thought, and, thereupon, as subject of the converse, retains this quantification; while *man*, the former subject, becomes unquantified. Particular affirmatives are similarly converted; for example, "Some men are wise,"—"Some men are wise beings,"—"Some men are some wise beings,"—"Some wise beings are men." In the case of both the above propositions, "All men are mortal," and "Some men are wise," conversion produces particular affirmatives, the predicates, *mortal* and *wise*, showing themselves to be undistributed when quantified; and the conversion of most affirmatives terminates in a similar way. This, however, is not necessarily connected with the nature of affirmative statements, but arises from the circumstances attending our use of them. The conversion of an affirmative proceeds, not from any knowledge included in the statement itself, but from a knowledge with which it is commonly accompanied. It is generally the case—and known to be the case—that the predicate class includes more members than are mentioned in the subject. Yet in some cases it does not do so, and is known not to do so; then the converse becomes an universal proposition. The predications, "All men are rational animals, and some men are civilized beings," may be converted into, "All rational animals, and all civilized beings, are men." The distribution of the predicate in exclusive statements may also be regarded as a special case of that conversion of which we now speak; but, in this case, the ground for the universality of the converse is expressly given in the convertend.

If one were ignorant whether the class *man* included all rational animals and all civilized beings, then he might say, "Some rational animals, at least, and some civilized beings, at least, are men," that is, "Some, or perhaps all"; and this would be a true, though dubious, quantification.

The universal negative is converted thus, "No men are perfect,"—"No men are perfect beings,"—"No men are any perfect beings,"—"No perfect beings are men." This conversion is frequently employed. The particular negative, "Some men are not wise," when converted, yields only, "Some wise beings are not some men"; and this, though correct as a possible judgment, is never used; because it is of no use. It fails as to the essential work of predication, which is to characterize the subject either as distributed or as undistributed, or as viewed indefinitely. The denial that some wise beings are not *some* men,

leaves it possible that they may be some *other* men; and so does not deprive them of the character of men. On the contrary, the converted affirmation that some wise beings are some men, assigns the human character to some wise beings at least. Therefore, negative assertions, whose predicates do not admit of distribution, are never used.

If the foregoing be a full account of the use made by the mind of the quantified predicate, it is clear that this subject is connected, not with the general, but with a special, employment of propositional thought; and that it belongs chiefly to that doctrine which discusses the nature and uses of logical conversion; which is a very limited part of the general doctrine of inference. On the other hand, the quantification of the subject constantly takes place, and is a matter of wide logical importance. When the mortality of men is under consideration, it is desirable to know whether all, or only some, are mortal, and to have this said. Moreover, universal and particular propositions are secondary and concrete forms in which necessary and contingent propositions are commonly embodied; and, for this reason, they occupy an important place in the general doctrine of inference, or reasoning (§§ 214 and 217).

§ 204. The present discussion may be concluded with an attempt to solve some difficulties which present themselves to the thoughtful logician, and of which we have not been able to find any satisfactory explanation. *First*, we shall make some remarks with a view of showing how the verb *to be* came to have its copulative use, and, in connection with this, to signify the existence, not of the subject, but of the predicate, object. *Next*, we may ask, what is the exact force of the particle *not*, in assertions, and, along with this, what rule governs the place of this particle in our predications? *Then*, we may inquire, to what part of predication does the quantification of the subject properly belong? Is it included in the subject, or in the predicate, or is it to be distinguished from both? And, *finally*, we may account for the peculiar mode in which universal negative predication is made both in our own and in other languages. For we do not, as one might expect, say, "All men are not perfect," but, "No men are perfect,"—"Nulli homines perfecti sunt." To some these topics may appear insignificant; we think that they are at least connected with matters of importance.

By the *copula* we mean the *express sign of inherential connection*, that is, of the existential relatedness of the predicate, to the subject, object of an assertion. The precise meaning of the copula is that the predicate exists, in its own proper relation, whatever that may happen to be, to the subject. The existential verb is the only word which simply expresses this meaning; it is the only copula. But all other personal verbs, in addition to their own proper signification, have a copulative force, and

Four logical questions discussed.

The verb *to be* in logic.
The copula; always indicates existence.

might be called copulatives. When we say, "John shouts," the verb *shouts* sets forth, not only the shouting, but also the existence of the shouting, as an action of John; while, in the statement, "John is shouting," this related or inherent existence is expressly indicated by the verb *is*.

No predication can be stated without a copulative word; but sometimes assertions are made indirectly and without their own appropriate expression. Answering the question, "Who shouts?" the true copula is not employed, if we say, "A sailor shouts"; and, in telling what language he speaks, the true copula is withheld, if we say, "He speaks English"; for the copulative and assertive force of the verbs *speaks* and *shouts*, in the foregoing sentence, replies to the question, "What is he doing," or "What is a sailor doing," and not to the questions given above. But the copula is expressed when we say, "He who shouts is a sailor,"—"That which he speaks is English." All assertions may be thus directly made by means of the verb *to be*; and substantial predications are not made directly in any other way.

This copulative use and sense of the existential verb may be conjecturally accounted for, if we refer to the first employment of human speech. We may suppose that, in primeval language, general abstract terms were wanting, and that there was no verb by which the existence of anything could be separately asserted. In order to express this idea, we may suppose that verbs were employed of such significations that one's mind, while viewing some ascript or predicate of an object, would be specially directed to the existence of the object. Verbs signifying *to begin, to grow, to live, to come, to go, to move, to stand, to remain, to be made*, are adapted for this purpose. Hence "*existere*" in Latin, meaning originally *to emerge*, and *γενέσθαι* in Greek, meaning properly *to be begotten or born*, came to indicate *existence*. Hence the various irregular parts of the verb *to be*, in different languages, may be accounted for by reference to the metonymical use of verbal roots. The English *am*, the Latin *sum*, and the Greek *εἰμι*, with derivatives from the same root, in French and other tongues, are traceable to the stem-word "εἶω," which is also the root of *εἶμι, to go*. Thus advantage was taken of the fact that whatever is moving, or going on, is obtrusively existent. In like manner, the German *bin* and *bist*, the English *be* and *been*, and the Latin *fui* and *futurus*, have the same etymology with the Greek *φύεσθαι*, which properly signifies *to grow, or spring up*. For whatever has grown where formerly there was nothing, exists in a noticeable way. Finally, the German *war* and *gewesen*, and the English *was* and *were* are derivations from *was*, an old Sanskrit word, which signifies *to dwell or stay*; because what abides, and does not depart or vanish, is assuredly existent.

The primary force of these suggestive verbs, before they had at all parted with their proper meanings, was like that of other

verbs, and, in the fullest sense, they predicated something of something. In the statements, "The man was born,"—"The man dwells,"—"The man shall live," birth, residence, and life were asserted of man. But, after these thoughts had been used, not as having an importance of their own, but simply to direct attention to man, as existent, and to assert that he did, or does, or shall, exist, the verbs, losing their proper predicative meaning, came to indicate existence only. Thus, the very forms which now constitute the parts of the existential verb, and which when used without addition set forth the existence of a subject, originally had no such meaning, but set forth different predicate objects or characteristics as existing in connection with the subject. Now this fact—if we may so regard it—leads to an explanation of the peculiar force of the copula as setting forth the existence, or the non-existence, of the predicate object. Undoubtedly in early times, no less than at the present day, men desired far oftener to assert the inherent, than the independent, existence of things, or, expressing ourselves more exactly, they had far more use for inherential, than for presentential, statements. And it is evident that in every case of inherential statement the suggestive verbs of which we have spoken might be employed, and that *they would then naturally indicate the existence of the predicate, or inherent, object, only*. Suppose one knew that a tree existed and wished to make assertions about it. He says, "The tree *stands* strong, the tree *grows* high, the tree *remains* green." Is it not plain that these verbs assert by implication the existence of that strength, height, and greenness, which are attached to them after the manner of grammatical "limitation"? And is it not clear that the verbs *stand, grow, remain* (*existere, φυέσθαι, was*), if they should at length lose their own proper meaning, and retain only a copulative force, would continue to set forth the existence of the predicate, and not that of the subject? Certainly, this conjecture is agreeable with fact. The force of the copula in negative assertions, as setting forth the non-existence of the predicate object, may be explained in a similar manner. In the affirmatives, "He lives righteous, he goes happy," the connective verbs which assert *living* and *going*, assert, also, *righteous* and *happy*, as limiting conceptions; in the same way, in the negative statement, "He goes not happy, he lives not righteous," the connective verbs deny the righteousness and the happiness. In either case the thing originally asserted or denied was, "lives righteous," or "goes happy"; but afterwards this came to signify merely, "is righteous," and "is happy."

Not indicates non-existence.
Pres. Porter.

The proper force of the particle *not* may be perceived in its ordinary use. This is to supplant a positive statement with a negative one, and so to assert the non-existence instead of the existence of a thing. *Not*, expresses the statement or assertion of non-existence. Neither the notion of non-existence nor that of existence can be analyzed;

nor is either a derivative of the other. But they are intimately related. They may be likened to Eng and Chang, the famous Siamese, connected, yet separate, and having each his own character. Or, better still, they resemble the man and woman in the little weather-house, who are always near one another, yet never both come out at once. When the man comes out, the woman goes in; and, when the woman comes out, the man goes in. Each of these conceptions, in its assertive use, is incompatible with, and contradictory to, the other. Moreover, the importance of non-existence lies solely in its involving the absence of existence; it has no importance of its own; therefore, in our thought, we constantly connect this absence with non-existence as its distinguishing property. Hence, the conception and expression of non-existence follow those of existence; and the forms of negative, follow those of positive, statements. In the natural order of conception, the proposition, "There is money," is prior to the proposition, "There is not money"; and the assertion, "The man walks," is prior to the assertion, "The man walks not." Yet in these negations we do not say that the money exists, or that the man walks, in some peculiar way, but we deny the existence of the man and of the walking altogether. The force of the particle *not* is to displace the conception of existence, and to substitute that of non-existence in its place. Strictly speaking, this adverb may be said, not to qualify, but to destroy and reverse, the assertion to which it is attached.

Some philosophers teach that the thought expressed by *not*, and by negation generally, is that of diversity or difference (Porter's "Human Intellect," § 547). If the foregoing views be correct, this doctrine cannot be accepted. According to what we have said, not difference, but non-existence, is set forth in negation. The origin of Pres. Porter's misapprehension is to be found in the fact that every negative predication may be reduced to the identificative, or substantial, form, and that predications thus constructed may be considered to affirm difference, inasmuch as they deny identity. When we say, "The man is not a wise being," we deny identity, and thereby impliedly affirm diversity, between *man* and *wise being*. The negative proposition expressed implies the affirmative proposition, "The man is different from a wise being." This, however, arises simply because identity and diversity are contradictory of one another, and is not necessarily connected with negative predication in general. When we say, "The man is not wise," "The wood will not burn," "The winter has not been severe," using ascriptional predication, we do not at all assert that one thing is different from another, but we deny the existence of one thing as inherently related to another. Even in negative substantial predication, what we really wish to assert is the non-existence of some characteristic; the thought of difference between substanta is something subordinate and incidental.

With the doctrine that *not* expresses non-existence the use of negative terms entirely agrees. Such words as *not-merciful* and *not-wise*—or *unmerciful* and *unwise*—primarily indicate the non-existence of the characteristics of mercy and wisdom, in the persons to whom they are applicable; though they may come also to have a more positive force.

The *place* of the particle *not*, in regularly expressed predication, is in immediate connection with the verb, that is, with the copula, or the copulative word. This is as it should be; for the verb asserts, and the *not* changes the character of the assertion. The rule in ancient languages is to place the particle immediately before the verb; modern languages place it immediately after. In Latin we say, "Non dixit"; in English, "He spoke not," or "He did not speak." An exception to the modern custom occurs when the verb has a pronominal object; for instance, "She loves him not." Here the pronoun intervenes between verb and particle. Such expressions arise when the auxiliary *do* is avoided for the sake of brevity. Because, to say, "She loves not him," would be ambiguous, as it might not deny "She loves," but only, "It is he whom she loves." This leads to the observation that, *when predication is indirectly and irregularly expressed, the negative particle immediately precedes the word indicating the true predicate; and does not necessarily join itself to any verb.* In the assertion, "Not many wise, not many mighty, are chosen," the true predicate is indicated by *many*; the point of the assertion is, not that persons are chosen, or are not chosen, but that the persons chosen are not many. In like manner, "He conquered by policy, not by force," contains no denial of the fact of conquest, but only asserts that the conquest was not by force. "Not all men are wise," "Not every coin is genuine," are statements which have *all* and *every* for their predicates. They mean, "The men who are wise are not all,"—"The coin which is genuine is not every one." For that formula by which the true predicate can commonly be found, gives, "*It is not all men that are wise,*"—" *It is not every coin that is genuine.*"

This law, which *places the negative particle before the true predicate or the word principally indicative of it*, is wider and deeper than the rule which makes the particle accompany the verb in regularly expressed predications, and we may look to it as the source from which the solution of difficulties may be obtained. It is the principle universally regulating the place of the particle, and to which modern languages present only a partial exception. For though we say, "The man spoke not," it would be unnatural to say, "The man spoke three sentences not": we say, "The man spoke not three sentences"; and we prefer even to this the more unequivocal form, "The man did not speak three sentences," in which the whole predicate, excepting the auxiliary verb, follows the particle.

Distributional signs have a predicative force; yet to be distinguished from the predicate proper.

Our discussion respecting negative forms of statement has proved somewhat preparatory for our next task, which is to determine *the true logical character and force of the quantification of the subject of propositions*. For, as we have seen, in the statements "Not all—not every—man is wise," the distributional terms express the true predicates. We believe that the quantification of the subject, whether in the universal or in the particular, should be regarded as generally an act of predication. This fact has been overlooked by logicians, who commonly speak of quantity, as if it simply belonged to the subject and were without predicational character. Sometimes, indeed, when we ascribe some characteristic to a whole class or to some members of it, we have no intention of asserting that it is the whole class, or that it is only some of the class, who have the characteristic. One might say, with reference to certain individuals that he knew, "Some merchants are rich," the only point of the assertion being the wealthiness of those merchants, and it being a matter of no consequence, and unthought of, whether some or all merchants are rich.

But our ordinary predications, in which the whole, or a part, of a logical class is spoken of, are not of this character, and this is especially true of those assertions which are commonly discussed as having distributed and undistributed subjects. For the logical importance of universal and particular propositions arises entirely from the use we make of them in reasoning; which use implies that the quantity of the propositions is a matter of assertion. Certainly, if a predicate be that which is affirmed or denied of something, the signs quantifying the subjects of propositions have ordinarily a predicative force. One might learn that A is B,—that serpents are venomous, without knowing whether to proceed on the assumption that all serpents, or that only some serpents, have this character. When, therefore, in answer to his inquiries, we say either, "All serpents are venomous," or, "Some serpents are venomous," we predicate not merely *venomous* of *serpents*, but also that "the serpents which are venomous are all serpents," or that "they are only some." Frequently, this is the main point of our assertion; in which case we particularly emphasize the quantificative sign. The quantification of the subject, therefore, may be regarded as a kind of indirect and concomitant predication, and as giving to the whole statement a composite character (§ 202).

This concomitant assertion differs from the more direct part of the predication to which it belongs in that it does not set forth, or illustrate, any part of the nature of the subject. It only gives the quantitative character pertaining to the subject, and, in this way, imparts to the predication a specific logical value. The quantification of the subject resembles that assertion of necessity, possibility, or contingency, which enters into *modal* propositions and determines their logical value. Therefore, it is

right that each of these two forms of statement should have its own chapter in the discussions of logic (§ 218).

§ 205. We have now, finally, to account for the form which universal negative predication assumes, both in our own and in other languages; and this task is twofold. We must show both why the direct form, "All—or every—A is not B," is rejected, and also why the form, "No A is B," has been actually employed. The reason for the rejection of the direct form may have been that the signs *all* and *every* somehow take upon themselves a collective as well as a distributive sense, in the predications which employ them. As *all*, which is naturally collective, can be used distributively, so *every*, which is naturally distributive, can be used collectively. In saying, "All serpents are venomous,"—"Every serpent is venomous," or "Serpents are universally venomous," we frequently think and assert, not merely that each individual, but that the class, as a collective whole, is venomous. For this latter thought is necessarily implied in the distributive statement respecting "each and every" serpent. Hence, when we say, "All serpents are not venomous," or "Every serpent is not venomous," we are commonly considered to mean that serpents are not venomous as a *whole class*,—that they are not universally venomous. This form of predication denies nothing of the class considered distributively, nor does it directly deny anything of any members of the class; yet it implies that those serpents which may be known to be venomous constitute only a part of the collective body. Accordingly, it is sometimes used to express particular affirmatives.

The foregoing remarks assume that two stages of thought naturally follow one another. First, *the universal affirmative adds a collective to its distributive sense*. This arises in connection with the predicative force of the signs of distribution, and because the mind prefers the predication of a unity to the predication of a plurality, when the truth may be expressed in either way. And, secondly, *in negative predication, the signs of universality lose their distributive and retain only their collective force*. For these two senses, which are necessarily concomitant in affirmative, cannot be rightly associated in negative, assertions. The collective and the distributive sense of the proposition, "All serpents are venomous," involve each other; but the collective and distributive sense of "All serpents are (every serpent is) *not* venomous," do not involve each other. For, though the whole class of serpents are not venomous, some serpents are. One of these meanings, therefore, must be rejected: the collective signification, having the ascendancy, retains it, and yields a secondary form in which particular affirmative predications may be expressed.

Another reason for the rejection of the direct form of statement lies in *that peculiar process of particularized thought through which the universal negative judgment is ordinarily reached*. Here,

The ordinary form of universal negative predication accounted for. The result of a peculiar process of thought.

also, we find the suggestion of that form of statement which is actually employed. A process of particularizing investigation, in which one member after another in a class is found to possess some characteristic, may culminate in an universal affirmative, though such judgments are not commonly formed in this way. But the universal negative judgment ordinarily takes place after the noticeable, perhaps conspicuous, absence of some characteristic, excites the inquiry whether it be possessed by any member of the class at all. In this inquiry the mind forsakes the immediate contemplation of the class as a whole, and considers separately, and in succession, every case in which an exception to the negative rule may appear possible. And then, finally, when no possible exception can be found, we judge that "not any—or no—A is B." Logicians teach that, when we use this formula, we think of the whole class A and deny B of it. But, while this may be true, it is clear that the formula itself does not mention the whole class, and that it is universal only by implication. It is universal because whatever is true of any one, or more, individuals of a class, considered indifferently, must be true of every member of the class. The term *any* is distributive only by implication.

Another point may complete our theory of the formula for universal negation. We must show why we say, "Not any—or no—A is B," instead of saying, "Any A is not B." This last might be regarded as the simple and proper expression of our conviction. The statement, "Not any (no) men are perfect," has *any* for its true predicate, and is an abbreviation of the assertion, "There are not any (or there are no) men, who are perfect;" this, strictly speaking, is not an inherential, but a presentential, proposition. It asserts, "Men who are perfect, or perfect men, do not exist." In reaching this form of thought, the mind fashions the conception, "Any perfect men," from the repeated inquiry, "Are any men perfect?" and then asserts the non-existence of such men. It does this probably from its love of unity—of simplicity. The presentential is simpler than the inherential proposition. This unification of conception explains how the initial negative particle or pronoun qualifies the whole sentence. The non-existence asserted by it is that, not simply of "any men," but of "any men who are perfect."

From all which it appears that the ordinary form of universal negative predication, so far from immediately denying something of a class of things, does not even set forth the class as existing. But, of course, it is generally understood that there is a class, of which, on the supposition of its existence, the predicate may be universally denied.

CHAPTER XLIV.

RATIOCINATION.

Reasoning or ratiocination defined. Syllogism defined. Hamilton and Kant differ. Aristotle quoted.

§ 206. The name *reasoning*, or *ratiocination*, might be applied to every exercise of the discursive faculty, and is sometimes so employed. But, more commonly, it is restricted to *conscious and intentional inference*; and we shall use the term with this meaning. This inference may consist of one act of reasoning, or of many. In the latter case we have a course or train of reasoning. As the understanding of the single step renders the explanation of a succession of inferences a matter of little difficulty, the philosophy of ratiocination is chiefly concerned with the single step.

A step or act of reasoning, when fully stated or expressed, may be called a *syllogism*. Aristotle says, "A syllogism is a sentence, in which certain things being laid down, something else, different from the premises, necessarily results, in consequence of their existence" ("Prior Analytics," i. 1; "Topics," i. 1). Here, the essential point is that, something being laid down, or assumed as true, something else follows, or may be inferred as true.

Aristotle, indeed, does not speak of a thing, but of things, being laid down, as if inference were always grounded on a plural something. This is to be accounted for by the fact that he formally recognized only those inferences which proceed from two premises. Such has been the influence of Aristotle, that almost all logicians have followed his example in this respect. Of late years, however, particular attention has been given to certain "immediate inferences," in which one fact or truth is inferred from *one* other; and it seems best that these, and all inferences, when fully stated, in thought or in language, should be called syllogisms. The common doctrine has been that all reasoning is syllogizing,—that, as Hamilton says, "The compass of the syllogistic system is the compass of the reasoning faculty in man." If, then, the immediate inference be admitted, we must either reject this assertion, and say that there is reasoning which the syllogism does not express; or else, following Kant, and others, we must call every fully expressed inference a syllogism, whether it be grounded on a plural premise or not. The latter course is preferable, because it furnishes a general term for a class of things which are essentially of the same nature and should be covered by the same name.

A necessary consequence may not involve a necessary consequent.

But here let us note one point in Aristotle's definition which applies equally to all forms of inference whatever. He says that the conclusion *necessarily follows* from the things laid down. This is true of every correctly formed syllogism, whether the conclu-

sion be in itself true or not, and whether it set forth something as certainly or necessarily fact, or as being only doubtfully, or probably, or possibly, true. In every case the conclusion follows necessarily from the premises, and must do so, as long as the nature of things, and the nature of mind, remain what they are. In order to justify this statement, and to free the doctrine of inference from confusion, a distinction is necessary between what may be termed a *convictional*, and an *objectual*, necessity of consequence. In every correct inference, whether of something necessary, of something contingent, or of something probable, there is a convictional necessity of consequence. The antecedent, or premise, being certainly, or possibly, or probably, true, the consequent, or conclusion, must be true, also, in a corresponding sense. But an inference may be correct without any objectual necessity of consequence. This belongs only to that demonstrative inference which arises from the known or assumed existence of some antecedent of necessity. It does not belong to the inference of the contingent and the probable. The distinction, now made, may be stated somewhat inadequately by saying that *a necessary consequence does not always involve a necessary consequent*. The former of these things belongs to the essential character of every syllogism; the latter to demonstrative reasoning only. Should we say, in contingency,

Every middle-aged woman may be a married woman;
This woman is middle-aged; therefore
She may be married,

the conclusion would necessarily follow, though it would not be objectually necessary. But, should we say,

Every widow has been married;
This woman is a widow;

stating these things for certain, there would not only be a necessary consequence, but also a necessary consequent,

This woman has been married.

In entire consistency with the doctrine that the conclusion of every syllogism necessarily follows from the premises, we sometimes speak of false, or incorrect, syllogisms. In this, by a secondary use of language, that is called a syllogism which has some appearance of being one, while it really is not. Our language is like that of those who call a mere military display a battle—that is, a sham battle—because of its outward resemblance to a fight; although the essential features of a conflict are wanting. In false syllogisms, or inferences, the conclusion does not necessarily follow from the premises.

False or incorrect syllogisms.

A threefold division of inferences:
Demonstrative,
Contingent,
Probable.

§. 207. We shall commence our discussion of ratiocination by making a *division of inferences with reference to the mode of logical connection between antecedent and consequent*. A thing is necessarily existent when a logical necessitant of it exists and is

included in an antecedent; it is a thing contingent or possible

when some or many of the elements of that necessitant exist, while none are known to be non-existent; and it is probable when a proportion of all the chances, or individual possibilities, to which the antecedent gives rise, favor the existence of the necessitant. Inferences, therefore, are those of necessity, of contingency, and of probability; and, in each of these modes, they may be syllogistically, or formally, expressed. We may say,

“Triangle A is equal to triangle B; and
Triangle B is equal to triangle C; therefore
Triangle A is equal to triangle C.”

This would be reasoning in necessity. Or we might say,

“This figure is a triangle, therefore
It may be equiangular.”

This would be reasoning in contingency. Or we might say,

This is one of three individual triangles, of which one is scalene,
one isosceles, and one equilateral; therefore, with the
probability of one in three,
This triangle is equilateral.

The style of reasoning exhibited in inferences of necessity is commonly called Demonstrative or Apodeictic, while the other two modes have been classed together as Contingent or Probable reasoning. Of these last two terms, the former is the more ancient, and the latter the more modern, designation, for all inference arising from the conception of possibilities. With Aristotle the contingent syllogism is what logicians now call the probable. Neither he nor they distinguish, from each other, the modes of reasoning which we have designated by these terms. The conception of contingencies being a constant and prominent element of probable inference, was thought of only as included in the latter; and the more easily so because the conjecture of contingency seldom takes place without being developed into the conjecture of probability. It is not to be wondered at that one of these inferences was subordinated to the other, and that both were included under one generic name. At the same time, the philosophy of thought requires that the contingent and the probable inference should sometimes be distinguished from each other, specifically; and, should some generic designation be desired which should leave each of these names to its own proper application, both contingent and probable inference might be included under the title, Problematic or Conjectural.

In every case of problematic inference a part of an antecedent of necessity is employed, not of choice, but because the case does not yield a whole antecedent. Therefore, in a certain sense, contingent and probable reasoning may be regarded as imperfect modes of inference, and demonstrative as the perfect mode. But, as the incomplete or imperfect is more easily understood after we have obtained a correct conception of the perfect, our attention, in the first instance, must be principally directed to demonstrative reasoning. Nevertheless, all these modes of inference can, to some extent, be studied together. Since it is the nature of all syllogisms whatever to present an antecedent with which, in some way, the existence of a sup-

posed consequent is naturally connected, we may expect some common relations to pertain to things which are thus generically one. The most important of these relations may be brought to view, if we now consider two distinctions which are of an absolutely universal application.

The first of these pertains to the subjective aspect of syllogisms, and sets forth two modes of belief, or forms of assertion, either of which every inference may assume, without any change in the thoughts composing it. Using this distinction, we divide syllogisms into the *ostensive* and the *suppositive*. The former have truth, or what is taken for truth, as their ground of inference; the latter are expressly based on hypothesis.

This division may be traced to Aristotle, or, at least, may be supported from his writings. He teaches that "Every demonstration and every syllogism must show something to be inherent or non-inherent, and this. . . . either ostensively, or by hypothesis." He describes the ostensive syllogism as one "which commences from confessed theses," and "in which the premises are laid down according to truth"; and he says, "Let us first speak of the ostensive syllogisms, and, when these are explained, the truth will be clear also in reference to those leading to the impossible, and concerning those by hypothesis generally" ("Prior Analytics," i. 23, 29, and ii. 14). He also shows that the "syllogism ad impossibile" or the "reductio ad absurdum," though suppositive, has essentially the same form, or thought-structure, with the ostensive syllogism. It is to be regretted that the writings of Aristotle nowhere fulfill his promise "to show hereafter what are the distinctive marks of the hypothetical syllogism, and in how many ways it is produced" ("Prior Analytics," i. 44). Therefore we cannot tell whether he included all syllogisms founded on an hypothesis among the hypothetical, or whether he characterized as hypothetical those only which have something additional to their suppositive character. Certainly, the "reductio ad absurdum," which he frequently mentions as hypothetical, is not simply a suppositive syllogism, but a suppositive syllogism with an ostensive addition. We reason,

Any passing animal would leave tracks on the sand;
 A camel (*let us suppose*) has passed here; therefore
 (*We must suppose*)
 The camel has left tracks.

So far, the ratiocination is purely suppositive. But we add,
 There are no tracks; therefore
 No camel has passed.

This is an ostensive addition, and, by reason of it, the argument as a whole is not really suppositive—it is ostensive. But, whether Aristotle did, or did not, regard such additions as essential parts of his "hypothetical syllogisms," his followers have done so; therefore the suppositive syllogism of which we now speak is to be distinguished from that which is ordinarily styled *hypothetical*.

Ostensive or categorical, and suppositive, inference. Aristotle.

For the suppositive differs from the ostensive simply as resting on an antecedent which is not asserted, but only supposed, to be true.

Ostensive inferences are such as these:

Air is a substance; therefore
 It occupies space.—
 Trees spring from seeds; therefore
 These trees have done so.—
 All gases are elastic;
 Oxygen is a gas; therefore
 It is elastic.—
 Men wounded in battle often die;
 My friend is wounded; therefore
 He may die.—
 Triangle A is equal to triangle B; and
 Triangle B is equal to triangle C; therefore
 Triangle A is equal to triangle C.

These same reasonings become suppositive if we say,

If air is a substance, then
 It occupies space.—
 If trees spring from seeds, then
 These trees have done so.—

and so on with the rest.

Though closely allied, the ostensive and the suppositive modes of reasoning may take place independently. Each infers from its own mode of propositional thought, and produces its own kind of conviction. But the whole logical value of the suppositive lies in the possibility of its being converted, either directly or indirectly, into the ostensive syllogism, by means of an ostensive addition. Only ostensive inference produces expectation of reality.

The distinction between ostensive and suppositive reasoning corresponds closely with that between real and hypothetical knowledge, and real and hypothetical belief; yet it is not exactly parallel. An ostensive syllogism is one whose premises are assumed to be true, and accepted without question, whether they be really true or not; while a suppositive syllogism is one whose antecedent is conceived merely as an hypothesis, whether the truth or falsity of the hypothesis be known or not.

The nature of suppositive inference being understood, there need be no difficulty regarding that hypothetical syllogism which logicians discuss. This simply accepts the suppositive inference as correct, and then, upon the ostensive assertion of the antecedent, or denial of the consequent, infers the actual truth of the consequent or falsity of the antecedent. In so doing it proceeds immediately from a knowledge of the logical connection between any two things related to each other as antecedent and consequent.

The ostensive syllogism is that which the successors of Aristotle have called *categorical*, because the propositions of which it is composed are categorical. Without objecting to this term, we prefer the ancient name, principally because this is more easily contrasted in meaning with the term *suppositive*.

Orthological and homological inference. Defined and illustrated. Locke quoted.

§ 208. The second distinction of which we spoke as relating to all syllogisms whatever, concerns an objective difference between the antecedents which inferences employ, and takes note of two ultimate modes, or forms, of ratiocination, in one or other of which every inference takes place. For, either what is inferred to exist, is so inferred simply because of its logical connection with some known fact, and without any reference to any previously perceived case of logical connection; or it is inferred because the antecedent laid down is similar to some other antecedent previously found to have a consequent similar to that now offering itself for our acceptance and belief. In this latter case, the previously perceived connection between one thing and another, may have been the object of immediate cognition and observation, or may have been perceived inferentially. But the fact that it existed, and the further fact that the antecedent now presented is similar to that previously perceived, together constitute a new antecedent for a new consequent. Because, it appears to be an ultimate and necessary law of existence that similar logical antecedents should be accompanied by similar consequents.

In the absence of better terms we shall style all inferences whose validity depends upon their conformity to this law of being, and of belief, *homological*; while those inferences whose force is independent of any comparison of present with previously perceived cases of consequence, we shall call *orthological*. In illustrating these modes of inference we shall, for the present, refer chiefly, though not exclusively, to demonstrative reasoning. Homological inference takes place whenever one reasons from experience, or from any knowledge of some similar case or cases. If a little child but once put its finger into the flame of a candle, it will avoid doing so thereafter. In this it is guided by a conclusion from a past experience. An adult person, who avoids touching fire on the general principle that "fire burns," likewise reasons homologically, even though he may not directly refer to a past experience. For the general principle, from which he reasons, is derived from the past experience of himself and others. So also the student, who, by a series of immediate judgments, has perceived that the three angles of some particular plane triangle are equal to two right angles, feels warranted to assume this to be true respecting any other plane triangle. Moreover, he can obtain a general principle from his immediate perception of truth, and can employ this as a rule of inference.

Orthological reasoning takes place in the more intuitional steps of mathematical and geometrical demonstration, and in what have been called immediate inferences, generally. It is such as Locke mentions in the following passage. "I ask," he says, "is it not possible for a young lad to know that his whole body is bigger than his little finger, but by virtue of this maxim, that the whole is bigger than a part, nor to be assured of it till

he has learned that maxim? Or cannot a country wench know, that, having received a shilling from one that owes her three, and a shilling also from another that owes her three, the remaining debts in each of their hands are equal? Cannot she know this, I say, without she fetch the certainty of it from this maxim that, if you take equals from equals, the remainders will be equals, a maxim which possibly she never heard or thought of? I desire any one to consider . . . which is known first and clearest, by most people, the particular instance or the general rule; and which it is that gives birth and life to the other" (bk. iv. 12).

In these inferences described by Locke, two things are observable. In the first place, *the force of the reasoning is not derived either from, or through, any general principle.* This is the point which Locke enforces. If one were to cut an apple into pieces and think only of that apple and those pieces, he could immediately reason, and say respecting any one piece, that it was less than the whole apple, and this with as much certainty as if he should say,

Wherever there are whole and parts, each
part is less than the whole;
In this case there is a whole with its parts; therefore
Each of these parts is less than the whole.

And no strength would be added to the reasoning of the country-woman by saying,

When equals are taken from equals, the remainders are equal;
In this case equals have been taken from
equals; therefore
The remainders are equal.

The maxim, or general principle, in such cases, may serve to test the reasoning, but is not the source of its validity, that is, of its power to produce correct conviction. Secondly, we must notice that orthologous inference takes place, not only without reference to any general principle, but also *without reference to any previously perceived particular case of necessary connection or consequence.* Locke did not fully apprehend this point. His zeal is directed against the doctrine "That all knowledge (or reasoning) depends on certain *præcognita*, or general maxims, called principles." He nowhere denies that all inference may derive its force from remembered instances of a similar nature. But it is clear that we often reason without any reference either to general principles or to any similar case of necessary connection previously perceived. We note a certain fact, simple or complex, and thereupon immediately infer another fact. This is the most striking peculiarity of those inferences mentioned in the above quotation from Locke. If one event precedes another, we can immediately—or without reference to any other case—affirm that the other follows it; and if a first event precedes a second, which precedes a third, we can assert, with equal directness, that the first is prior to the third, as well as to the second. There may be ground

for question whether, without any presentational knowledge of things as connected in necessary ontological relations, the mind could originate the conception of unseen consequents to be inferred from perceived antecedents. We may even allow that the relational conceptions which orthological inference employs, are first obtained by the mind in its immediate cognitions of fact. But there can be no question that many inferential convictions give no indication of being dependent on any knowledge of similar cases of connection. On the contrary, that same mental power which immediately recognizes the necessary connection between two things presentationally perceived, also immediately asserts the necessary connection between two things, of which one is known, and the other only conceived, to exist; and thereby directly infers the existence of the other thing. Moreover, in both cases alike, that is, both in presentational and in inferential perception, we recognize an objectual necessity; we are not merely conscious of inability to think or believe otherwise than we do; we form a most positive conviction that the fact cannot be otherwise than as we apprehend it—a conviction which has no reference to any established order of things that might be changed, but affirms, that, under no circumstances whatever, could the antecedent of the orthological inference exist without being accompanied by its own proper consequent.

Here the question occurs, "In what way can we determine whether any particular inference be orthological or homological?" To which we reply that this is to be determined by asking, "On what does the force of this inference essentially depend?" If it arise simply from consideration of the nature of the antecedent, and is independent of reference to any other similar fact known to be logically necessitant, the inference is orthological; if it arise in connection with such reference, it is homological. Such being the case, it is clear that *all reasoning from general principles is homological*. A general principle has no force originally belonging to itself. It is derived from the perception of a particular case of consequence, or of a number of such cases, and has its validity according to the law that whatever is necessary in any individual instance is necessary likewise in every other instance in which there is an antecedent containing the same necessitative conditions (§ 136). When we reason from a general principle, we do, in effect, reason from the similar to the similar.

All inference may be given a homological form.
All inference based on ontological relations.

In all cases of inference we may be said to reason *in accordance with general principles*. Therefore, also, *a homological form may be given to all reasoning*. But, so long as the inference is in no way dependent on the general principle, it should not be regarded as homological. For this reason we distinguish between that apparent and formal reasoning from principles, when mathematical, geometrical, and metaphysical axioms are employed, and that real use of principles and general theorems which takes place

in the development of any form of ontological science. After we have made some progress, orthologically, through a consideration of individual constructions of figure, or of particular concatenations of fact, through numerical, or other necessary, relations, we generalize the truths thus obtained; and thereupon, neglecting and forgetting the methods by which such truths were reached, we use these as general rules or principles in our further reasonings. Thus, without remembering how we first came to adopt the rules, we ascertain the comparative solidity of cones by multiplying the area of their bases by one third of their altitudes, and we extract the cube root of numbers by a more complicated process. In such cases we are guided by general principles, and reason homologically.

Comparing the two modes of inference with reference to our use of them, we find that the most noticeable part of human reasoning is homological, while, at the same time, the ultimate principles of inference are mostly orthological. Homological reasoning has only one ultimate principle, while orthological has many. Here, by ultimate principles, we mean such as are immediately subordinate to the universal principle of reason and consequent (§ 59). It will be noticed that orthological inference is more evidently, though not more truly, illustrative of this fundamental law than the homological. When we collect at random a number of diverse orthological inferences, we find that they can be co-ordinated under no one general law, except that of reason and consequent. But, when we collect homological inferences, we are distracted by the duality of the principle according to which they are constructed, and by its wonderful universality of application. Hence, the homologic principle has been mistaken for the fundamental principle of all reasoning. This error has been facilitated by the circumstance that, in every train of connected inferences, the successive steps, though sometimes orthological and sometimes homological, can all be given that form of expression which is properly necessary only for the explicit statement of our reasonings from general principles. Because all reasoning may take a homologic form, we wrongly infer that all reasoning is based on the homologic principle. This has been the almost universal mistake of logicians from Aristotle down.

Again, considering both kinds of inference as setting forth things as logically connected with one another, the *ontological* character of both becomes apparent. By this we mean that the radical relations of connection and consequence which the mind uses in these forms of ratiocination are such as must belong to any system of things and form a basis for one's reasoning with respect to it. Collecting and analyzing orthological inferences, we find them to arise from consideration of the necessary relations of times, spaces, quantities, substances, powers, actions, changes,—in short, of such relations as must pertain to things, provided they exist at all, and which could be an-

nihilated only by the annihilation of being; while the homologic principle that similar consequents attend similar antecedents—that what is necessary in any case, by reason of the nature of the case, is necessary again upon the recurrence of that case—is also ontological.

It may be asked, “Can homological inference be based on ontological necessity, when it produces belief in things that are not ontologically necessary, as, for example, when it predicts the freezing of water, at a certain temperature?” For we may suppose that almighty power could change the nature of water in this one respect, so that, on the sea-level, it would remain liquid, or would boil, at the temperature of 32° Fahrenheit.

We reply that not only that prediction of natural events which is characterized by the highest moral certainty, but also our merely probable expectations—and, in short, all inferences whatever,—are based on the recognition of the necessary character of ontological relations. Demonstrative reasoning assumes a perfect and complete antecedent of necessity; contingent reasoning assumes an imperfect and incomplete antecedent of necessity; but in both the force of the inference depends on a perception of the necessary, ontological, relations of entity. The truth of this doctrine will become more evident after we shall have specially considered the nature of probable reasoning. At present we content ourselves with saying that the radical principles of probable inference are as ontological as those of demonstrative, and would, as a matter of course, be employed, by minds like ours, in any universe, or constitution of things, whatever.

Having now taken a general survey of the process of ratiocination, we may both justify the views which we have expressed, and enlarge our theoretic knowledge of this topic, by a more specific consideration of the modes of reasoning. This task may be best accomplished if we consider first different modes of demonstrative, and then different modes of probable, inference. But, in adopting this plan, we shall not follow those who class reasoning in possibility—or what we may term *pure contingency*—only with probable inference. We shall pursue a middle course, and shall claim that reasoning in possibility is equally allied to necessary and to probable inference, and that while, in one aspect, it should be considered in connection with the latter, in another aspect, it may be advantageously classified with the former. For the inference of possibility is allied to demonstrative reasoning in two important respects; first, as to *the simplicity of its sequence*, and, secondly, as to *the singleness of its grade of conviction*. In pure contingency, just as in necessity, the consequent is connected with the antecedent without the intervention of *possible* consequents, or chances; and the contingency, like the certainty, of the consequent admits of no degrees. But probable reasoning first inquires concerning the number and character of the chances, and then asserts its consequent as being supported by

A course of discussion proposed. Contingent reasoning.

more or less of the chances. Therefore, also, inferences in possibility, when regarded by themselves, are not ordinarily distinguished from the demonstrative; of which we have a notable instance in mathematics, wherein postulates, as well as axioms, are included among the principles of geometrical demonstration. In short, inferences in possibility may properly enough be classified with those in necessity, when the nature of the inferential sequence is not in question; and in this way both may be sometimes included under an enlarged conception of apodeictic reasoning. Moreover, the view thus presented has the advantage of opposing both necessary and contingent inference to probable, which last is, in truth, a combination of both the others.

In analyzing the leading forms of demonstrative inference, we shall consider, first those which are orthologic, and then those which are homologic.

CHAPTER XLV.

ORTHOLOGICAL DEMONSTRATION.

§ 209. The force of orthologic reasoning never depends on the use of a general principle. We reason orthologically always according to general principles, but never from them as such. Therefore every mode of this kind of inference may be illustrated by some case in which one individual fact involves another. Moreover, when any orthologic inference is expressed in general language, —as when we say, “If equals be added to equals the sums will be equal,” the reasoning is orthologic, because its proper assertive force is derived from our perceptions in individual cases, although it receives a general form from a use of the homologic principle.

Orthologic inference does not depend on general principles.

Proceeds both from simpler and from more complex antecedents than homologic.

Another mark of orthologic inference is the freedom which it has with respect to the simplicity or complexity of its ground of inference. Homologic argument has always a double antecedent. The major premise sets forth B, a consequent, as existing (or non-existent) in connection with A, as its antecedent; the minor asserts that C agrees with, or is similar to, A; thereupon the conclusion follows that B exists with C. Thus the homologic antecedent is constituted of two propositions. The orthologic syllogism may have an antecedent of one, or of two, or of three, or more, propositions. It may be single-grounded, double-grounded, or many-grounded. An assertion is single when it sets forth the existence of one or more things under one logical relation or aspect. The proposition, “Horses are quadrupeds,” is single, though it asserts many facts; and so is

the statement, "John, James, and Thomas, are married men." The singleness pertains to unity of predicational conception, and not to any external unity. An assertion is double, or multiplex, when it is composed of two or more single assertions and sets forth the existence (or non-existence) of things in more than one logical relation. "Hindoos are men, and men are rational beings," "Nine is less than twelve, and twelve is less than fifteen," are double; while "Hindoos are men, men are rational beings, and rational beings are accountable," and "Nine is less than twelve, which is less than fifteen, which is less than twenty," are multiplex statements.

Those orthological syllogisms which are single-grounded may be divided into two classes. For the premise may either assert the simple existence (or non-existence) of something, or it may assert the inherence or non-inherence of something in something else. In other words, *it may be either a presentential or an inherential statement.* In the former case we can infer whatever belongs to the "nominal essence" of the thing, that is, to the nature of the thing as conceived of by us, and also whatever is connected by ontological necessity with a thing of that nature. We say,

There is a horse; therefore
There is a quadruped,

and this immediately—orthologically. We have no need to say,

Every horse is a quadruped;
This is a horse; therefore
It is a quadruped.

Such orthological inferences spring directly from an analysis of the thing spoken of. We can also say, synthetically,

This is a body; therefore
It occupies space.—
This is an action; therefore
There is an agent.—

or, respecting some specifically characterized body, or action,

This is an animal; therefore
It occupies space.—
I am touched; therefore
Something touches me.

For the very existence of *animal* or of *touching* logically necessitates that of *space* or of *agent*. So, likewise, in possibility, we can say,

Here is a room; therefore
There may be something in it.

These inferences from simple existential statements are easily made, and ordinarily escape our attention; yet they deserve a place in any philosophical system.

Single-grounded inferences from *inherential assertions* are more frequent and noticeable than those from presentential statements; they too, may be both analytic and synthetic. The following are essentially analytic.

Robert is older than Peter; therefore
Peter is younger than Robert.—

Robert is the father of Samuel; therefore
 Samuel is the son of Robert.—
 A is equal to B; therefore
 B is equal to A.—
 Some horses are quadrupeds; therefore
 Some quadrupeds are horses.

Synthetic single-grounded syllogisms with an inherential premise, may be illustrated from conflictive opposition; for example,

All horses are quadrupeds; therefore
 It is false that some horses are not quadrupeds,—

and from certain geometrical judgments; for example,

This line is straight; therefore
 It is the shortest possible between its terminal points.—
 These straight lines are parallel; therefore,
 However prolonged, they will never meet.

Also from certain metaphysical judgments; for example,

A is the cause of B; therefore
 A existed before B.—
 A is part of B; therefore
 A is less than B.

Double-grounded. Double-grounded orthological syllogisms take place when we reason from a succession of ontological relations. Thus,

A is the cause of B; and
 B is the cause of C; therefore
 A is the cause of C.—
 A is part of B; and
 B is part of C; therefore
 A is part of C.—
 A is like B; and
 B is like C; therefore
 A is like C.—
 A is greater than B; and
 B is greater than C; therefore
 A is greater than C.—
 A is equal to B; and
 B is equal to C; therefore
 A is equal to C.—
 A is before B; and
 B is before C; therefore
 A is before C.

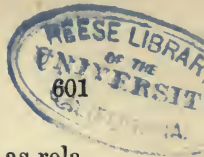
In like manner we use the relations of literal identity and difference, as follows,

A is the same as B; and
 B is the same as C; therefore
 A is the same as C.—
 A is the same as B; and
 B is different from C; therefore
 A is different from C.—

And, combining the assertion of identity with that of any given relation, we reason thus,

A is part of B; but
 B is C; therefore
 A is part of C.—
 A is like B; but
 B is C; therefore
 A is like C,

and so on. These double-grounded orthological syllogisms illus-



trate a style of reasoning which might be distinguished as relational. Because it brings logical relations (§ 63) into an especial prominence.

The ordinary hypothetical syllogism, in which we convert a suppositive into a categorical or ostensive inference, may also be reckoned double-grounded and orthological. But it is distinguished from all other orthological inferences by its peculiar relationship to reasoning in general. The singularity of the hypothetical syllogism is that it is founded on a subjective reference. Recognizing the difference between suppositive and ostensive, or actualistic, conviction, it employs the former as a basis for the latter. We say,

If the man has taken poison, he will die;
The man has taken poison; therefore
He will die.

The first premise sets forth the statement, "The man will die," as being correct and true on the supposition that "he has taken poison"; the second *asserts the reality of the thing supposed*; thereupon we conclude, categorically, "The man will die."

Many-grounded. Many-grounded orthological inference takes place when the premises assume either a complex or a serial form. The following are syllogisms with complex premises.

A is equal to B; and C is equal to D;
A is added to C; and B is added to D; therefore
The sum, A+C, is equal to the sum, B+D.—
A is like B; C is like D; and B is like D; therefore
A is like C.

The multiple premises of these inferences may be made to assume the dual form, if we use some such mode of speech as the following,

A and C are respectively equal to C and D; and
A and B are respectively added to C and D; therefore
The sum, A+C, is equal to the sum, B+D.

And again,

A and C are respectively like B and D;
B is similar to D; therefore
A is like C.

Or this last may be divided into two syllogisms thus,

A is like B; and
B is like D; therefore
A is like D;—and then,
A is like D; and
C is like D; therefore
A is like C;

which is the same conclusion as before. But we question whether the mind need reduce the antecedents to this doubleness before forming an inference. Serial syllogisms are such as these,

A is B; and
B is C; and
C is D; and
D is (or is not) E; therefore
A is (or is not) E.—

A is like B; and
 B is like C; and
 C is like D; and
 D is like (or unlike) E; therefore
 A is like (or unlike) E. —
 Nine is less than twelve; and
 Twelve is less than fifteen; and
 Fifteen is less than twenty; therefore
 Nine is less than twenty.

These can be easily reduced to a series of double-grounded inferences. But probably the mind does not always find this necessary, but can use the serial statement itself as the ground of an immediate conclusion.

These remarks apply to the sorites of which logicians speak, so far as concerns that form of thought in which this mode of argument is embodied. The antecedent of the sorites is a series of substantial identifications, terminating generally in an ascriptive statement. We say,

Caius is a man;
 A man is a finite being;
 A finite being is sentient;
 A sentient being seeks happiness; therefore
 Caius seeks happiness.

The principle of this inference is, that whatever can be identified, either immediately or mediately, with any individual thing, has all the attributes of that thing; this principle is orthological. But the first identification is used to indicate that Caius has a certain common character; and each of the others indicates that any being having a certain given character has a certain other character, also. These thoughts arise from, and express, homologic reasoning; and, as the force of the argument really depends on them, this sorites is orthologic in form only.

Since orthological inference admits either a unital, dual, or plural, antecedent, we may conjecture that *the question of the simplicity or complexity of the ground of inference is not closely connected with the essential nature of this mode of ratiocination.* Such is the case. This topic is instructive chiefly as showing that orthological inference may take place on the perception either of a single fact or of a combination of facts.

§ 210. A more satisfying view of this mode of thought may be obtained if we classify orthologic inferences with reference to their objective character, and consider the principles according to which they are formed. Because orthological reasonings, though independent of general principles, take place according to them; and the clearest way of setting forth the nature of these reasonings is to abstract them from all non-essential matter and to regard their necessary elements. This is done only by generalization.

The supreme law of orthological reasoning is that *what is connected by an absolute and ontological necessity with something else may be immediately inferred to exist whenever that something else is known to exist;* and the first principles of orthologic inference are subor-

Orthological inference divided into two classes; the universal and the specific.
 Axioms defined.
 Reid.

dinate to this law, just as this law is subordinate to the universal principle of reason and consequent. Philosophers have given the name *axiom* to the first principles of orthologic inference, or rather to *such of these principles as are found of importance in ratiocination*. By axiom, we mean, not merely a self-evident truth, but one which may be usefully employed as a law of correct thinking, and which has that dignity and authority which we usually ascribe to a first principle. Dr. Reid thinks that "there are innumerable self-evident propositions which have neither dignity, nor utility, and, therefore, deserve not the name of axioms." But, although certain applications of axiomatic truth are useless, and resemble the employment of a lamp to see that which is evident in the light of day, we question whether the human mind has any ultimate convictions which it cannot in some way put to an important use. Nor is there any ground to believe that the first principles of inference are extremely numerous.

The axioms, or rules of orthologic inference, may be divided into two classes; *first*, those which are continually employed in our consideration of things and universally affect our reasonings, and, *secondly*, those which regulate inferences respecting special aspects, or specific modes, of entity.

Three comprehensive laws, which have been the subject of great discussion among philosophers, may illustrate the first of these classes. They have been called the principles of identity, of contradiction, and of excluded middle, and have been regarded, with reason, as the fundamental tests of consistency in thinking. As we have not found any very satisfactory explanation of these principles, we shall attempt a statement of them, which, without following any particular authority—and perhaps differing from most authorities—may yet embrace what is true in the teachings of all.

According to the principle of identity, any assertion which is really identical with a true assertion, is also true, and must be believed, and any assertion which is identical with a false assertion, is also false, and must be rejected. According to the principle of contradiction, any proposition which is the contradictory of a true statement, is false, and must be rejected, while any proposition, which is the contradictory of a false proposition, is true, and must be believed. According to the principle of excluded middle, one at least of two contradictory statements must be true, and one at least must be false.

Mr. Locke, in his chapter on trifling propositions, declares that purely identical assertions, "wherein the same thing is affirmed of itself," are entirely useless; as, when we should say, "Whatever is, is; whatever is a soul, is a soul; whatever is a man, is a man"; and Lord Macaulay, referring to this principle of identity, writes, "If a philosopher were always to state facts in the following form, 'There is a shower; but whatever

The laws of identity, contradiction, and excluded middle discussed. Locke, Macaulay.

is, is; therefore there is a shower'; his reasoning would be perfectly correct, but we do not apprehend that it would materially enlarge the compass of human knowledge." We admit that such inferences are useless, unless it be to emphasize a truth, and make us realize it more perfectly. The poet did not throw words away when he said, "A man's a man, for a' that." But it is an unjust view of the principle of identity to suppose that its only or chief use is to support those assertions which Locke ridicules. While these conclusions are valueless, there are inferences which the mind constantly forms, and which either wholly, or in part, follow the principle of identity. We often desire to assure ourselves that some assertion, which has taken upon itself a new form, is yet essentially the same with another already considered. Therefore, although it may give no information to say, "Whatever is, is, and whatever is not, is not" (which is the primary and objective form of the principle of identity), and equally unprofitable to say, "Whatever is true, is true, and whatever is not true, is not true" (which is the secondary and subjective form of it), it is often important to inquire, and to ascertain, whether our statements do, or do not, agree with this self-evident principle.

For example, the right to substitute a definition of a name, or notion, for the name or notion itself, depends on the conformity of our thought to this law. Let one's conception of common salt be that it is chloride of sodium. Then instead of saying, "Good health involves the use of salt," he can say, "Good health involves the use of chloride of sodium"; because the second statement sets forth the same truth as the first, though more explicitly. "The judge is just; therefore he will give every one his due," is not necessarily a reasoning from some general principle, but may be an ortho-logical inference by definitional substitution.

Again, that immediate reasoning which logicians call *conversion*, is simply a re-statement of the converted proposition, with certain variations in the order and emphasis of thought. For, the predicate having been previously quantified, conversion asserts that, since all men are some animals, therefore some animals are all men. The consequent here is the same fact of substantial identity which the antecedent asserts, set forth from a different point of view. The conversion of relational predications in general is of the same nature with that of the substantial predication. The syllogisms,

William is the husband of Mary; therefore
 Mary is the wife of William;—
 A is equal to B; therefore
 B is equal to A,

proceed on the principle of identity.

The principle of identity justifies definition.

Is used in conversion.

In the combination of propositions. This principle is employed, also, when we combine two statements respecting the same subject, or unite equivalent modifications to the extremes of a proposition, or combine one statement with another of a congruous nature.

Gold is a metal;
Gold is valuable; therefore
Gold is a valuable metal:—

here we combine two statements respecting the same subject. That transformation of thought, which we call *the substantialization of the predicate*, is another instance of this combination. For we say,

Gold is a valuable thing,

by uniting the propositions,

Gold is a thing; and
Gold is valuable.—

Again,

A negro is a fellow-creature; therefore
A negro in suffering is a fellow-creature in suffering.—
Oxygen is an element; therefore
The decomposition of oxygen is the decomposition of an element.

these inferences result from the addition of equivalent modifications to both terms of a proposition. Finally, the union of congruous statements yields such inferences as the following,

Industry deserves reward; and
A negro is a fellow-creature; therefore
An industrious negro is a fellow-creature deserving of reward.

Any synthetic statement may be justified when it is compounded of assertions which are individually correct. Facts viewed in conjunction, are the same facts, and as worthy of our belief, as when they may be considered separately.

In analytic judgments. Another application of the law of identity is specially connected with the metaphysical whole and parts, and supports what are termed *analytic judgments*. These inferences predicate of a thing only a part of its essence, and may, in this way, be distinguished from definitional substitutions and converse statements; which are also, in a sense, analytic. As the inferences of which we now speak involve a special modification of the principle of identity, they might be regarded as judgments respecting a whole and its parts rather than judgments respecting identity. Yet they come under this general head because the relation of whole and parts is a particular case of identity. There is entire and absolute sameness between a whole and all of its parts; there is partial and qualified sameness between a whole and any of its parts. When, therefore, we select some particular attributive part of something, and say, for example, "Gold is metallic," our assertion follows the principle of identity, and is, in a peculiar and special sense, a statement identical with the larger statement that "Gold is gold." It sets forth a partial identity.

In subordinate assertions.

Lastly, let us notice that modification of the law of identity according to which inferences of subordination are made, and which enables us to say,

All men are mortal; therefore
Some men—or these men—are mortal:—
No men are perfect; therefore
Some men—or these men—are not perfect.

Analytic inferences are true because propositions, which predicate an attributal part of a metaphysical whole, are included in, and partially the same with, propositions which identify the metaphysical whole with itself. Subordinative inferences are true because propositions which distributively ascribe any predicate to some portion of a class, or logical whole, are included in, and partially the same with, propositions which assert that predicate of the class universally. The inference,

All men are mortal; therefore
Some men are mortal,

gives no new information, but only a part of that which has been given. The *all* implies the *some* as a kind of correlative—the logical whole implies the logical part—and implies it, too, as having the same predicates. The principle of identity is not so directly and manifestly employed in the subordinative as in the analytic judgment; yet it is present in both. Such being the case, the doctrine of some that the “*Dictum de omni et nullo*” is a specific modification of the law of identity, is well founded. This formula assumes that whatever is true of a class universally is true of any portion of the class, and states that “whatever may be affirmed or denied of a class universally, may be asserted in like manner of anything contained in the class.” This law, in itself, is just the principle of the subordinative inference, and a specific form of the principle of identity.

The *Dictum* of Aristotle. Not the fundamental law of all reasoning. Its nature and office.

In this connection let us notice the common and erroneous doctrine that the *Dictum* of Aristotle is the fundamental principle of all reasoning. This misconception arose because the dictum is the basis of a form of statement in which every inference may be expressed. Every act of reasoning may be formulated if we first make an universal assertion, and then apply this assertion through the partial identification of some object or objects, with the class of things considered. Ordinarily, however, the force of our reasonings is only incidentally connected with the dictum. In saying,

All men are mortal;
Hindoos are men; therefore
Hindoos are mortal,

the inference does not really arise from the universality of the first statement, but from an observed necessity which admits of generalization, and, therefore, authorizes universality. “All men are mortal,” only because “man must die.” As a rule, universality is a secondary form of thought employed to express a generalized necessity. For a general statement is not

of itself universal, but indeterminate (§ 96). When we assert that Hindoos are men—or belong to the class men—our object is to show that they are like men in that nature which necessitates mortality: their class membership is only an accompaniment and expression of this fact. Logicians over-estimated the office of the dictum, because they supposed that the ultimate form of inference was reached when it became evident that all inference can be reduced to a specific form of statement. We should ever seek the true source of conviction, not in what *might* be, under some circumstances, the real ground of belief, but in those reasons which actually originate conviction. The dictum has an universality as a mode of stating inference, but in itself, and as an original ground of inference, is of comparatively limited use.

Before leaving the principle of identity, we must A needed dis-
function. remark that *it directly concerns the identity of facts or of predications, and not facts or predications of identity.* That is, it no more concerns these than any other predications. Predications are identical when they set forth essentially the same fact or truth; they are predications of identity when they set forth one thing as identical with another. “Gold is valuable,”—“Gold is a valuable,” are assertions essentially identical, though only the latter indicates identity. “Gold is a metal,”—“The rose is a flower,” are assertions of identity, but they are not identical assertions.

§ 211. The principle of identity, which requires us to assert what we have asserted and to deny what we have denied, is employed by the mind more frequently than any other specific law of orthologic inference. For the most part this is done with easy and rapid intuition, and eludes our observation and, in a sense, our consciousness. This is not true to the same extent with respect to the other two laws of inference which we have mentioned; hence, though neither of them have that universality of use which characterizes the principle of identity, they have much more engaged the discussions of philosophers.

Both the law of contradiction and that of excluded middle are contrasted with the principle of identity, and allied with each other, because, while this last enables us to infer the same from the same, the other two enable us to infer one thing from another. Moreover, both these laws refer to what are called contradictory cases or statements. The first asserts that, *if one contradictory be true, the other is false, and that if one be false, the other is true*; the second asserts that, *of two contradictories, one or other is false, and one or other is true.* The principle of the excluded middle, or, better, the principle of the excluded third (*principium exclusi medii vel tertii*), limits our belief—and our disbelief—in a case of contradiction, to two propositions, asserting that one of these is false, and that one of them is true. But the principle of con-

The laws of contradiction and excluded middle allied to each other.

tradiction asserts that, whichever proposition is true, the other is false, and, whichever is false, the other is true.

Two statements are the contradictories of each other when one sets forth something as existing and the other sets forth that very same something as non-existent. "A exists," and "A does not exist," are contradictories; and so are "A is B," and "A is not B." But statements are not mutually contradictory if they do not each conceive of the same thing as in the same relations. According to the law of the excluded third, one of the two propositions "A is," and "A is not," is true, and one is false. But this principle does not assert that the one is true and *the other* false; it does not say whether one or both propositions may not be both true and false at the same time. It says, "It is true either that A is or that A is not;" it does not deny that both may be true. It says, "It is false either that A is or that A is not;" it does not deny that both may be false. The law of contradiction takes up the contradictory statements at this point, and says, that, "If either contradictory be true, the other is false, and, if either be false, the other is true," and that, therefore, only one is true and only the other false.

The common statement of these laws defective.

If the foregoing be a correct analysis of our judgments concerning contradictories, the formulas ordinarily used to express the laws of contradiction and excluded middle, are not perfect presentations of these principles. The law of excluded middle is commonly stated thus, "A thing must either be or not be,"—"A either is or is not,"—"A either is, or is not, B." These expressions are ambiguous. They may mean *simply*, "A thing must either be or not be," that is, "One of two contradictories must be fact," or they may mean, "A thing must either be or not be, and whichever of these is fact, the other is not fact, and, whichever is not fact, the other is fact." In other words, it may mean, "Of two contradictories, one must be true and the other false." It is only in its *simple* use that the maxim expresses the law of excluded middle. Employed, as it commonly is, in cases of contradictory opposition, it expresses *both laws in combination*; in which combination the law of contradiction is generally a more prominent element in our thought than the law of the excluded third. Again, the law of contradiction is given in the maxim, "It is impossible for the same thing to be and not to be." This enunciation is defective. It gives only the principle of contradictory denial, and not that of contradictory assertion. It expresses one half of the law of contradiction. It states that, if an alleged fact, whether positive or negative, be fact, its contradictory is not fact; it does not state that if an alleged fact, positive or negative, be *not* fact, its contradictory *is* fact. Yet this latter reasoning as plainly employs contradictory thought for the purpose of inference as the other, and should be co-ordinated with the other, under the general law of contradiction. This positive, or assertive, phase of the law of contradiction is presented to

us more prominently than the negative, in the complex formula, "A thing must either be or not be," when this formula is taken in its strongest sense. For this reason some have confounded this phase with the law of excluded third, which is expressed by the same formula in its most restricted sense. But we should no more identify the law of contradictory assertion with that of excluded middle than the law of contradictory denial. The law of excluded middle, no less than the law of contradiction, has a double application. It asserts respecting two contradictories, both that one is false, and that one is true. But it does not say that if, or because, one is true, the other is false, nor that if, or because, one is false, the other is true. These are the phases of contradiction.

These two laws really form one law which may go by either name. The law of contradiction.

Though these laws of excluded third and contradiction are distinguishable by metaphysical analysis, they never operate apart in ordinary thought. We never, in contrasting two contradictories, think that one of them must be false without thinking that, in that case, the other must be true, or that one must be true without thinking that, in that case, the other must be false. For this reason many philosophers have included both principles in one, namely, that "of contradictories, one alone is true, and the other alone is false;" and they have styled this *the law of contradiction*. This is the method of Aristotle ("Met." bk. iii.) He does not distinguish the law of excluded middle, as later thinkers have done, but first lays down that two contradictories cannot both be true; so that, if one be asserted, the other must be denied; and then teaches that "there is a necessity either of asserting or denying" any proposition; in other words, of accepting either it or its contradictory as true; all of which teachings fall under the head of the principle of contradiction; which Aristotle declares to be the "most firm of all first principles." For the purposes of logical praxis there is no need to separate the principles of excluded middle and contradiction; and, in our further discussion, we shall regard them as in combination, and as constituting the one complete law of contradiction, or of disjunctive inference.

Negative facts and statements explained.

It will be noticed that, in connection with this law of contradiction, we have recognized *negative, as well as positive, facts*. We say, "If either contradictory be true, or be a fact, then the other is not a fact; and, if either be untrue, or not a fact, then the other is a fact"; but (since one of the contradictories always sets forth the non-existence of something) this is to say, "If the non-existence of something be a fact, then its existence is not a fact; and, if its non-existence be not a fact, then its existence is a fact." Thus, the non-existence of a thing is recognized as being sometimes a fact and sometimes not a fact. And this is to say that the non-existence of a thing is sometimes a reality, and is always a reality whenever it is truly asserted. From this unavoidable use of

thought and language, we conclude, not that non-existence and existence are the same—not that the non-existent as such ever can exist—but that non-existence and existence are two modes of objectuality, and that, when we speak of a fact of non-existence, we do not mean to say that the non-existent exists, but that *the non-existent is non-existent*—that it has its own peculiar objectuality. The words *fact, reality, being*, are, in such cases, used in a peculiar generic sense. For, originally and properly, these terms belong to facts of existence only.

That statements of non-existence should thus borrow the terms of statements of existence, arises from the circumstance that the whole importance of any case of non-existence comes from the absence of the existence of something and from the existing environment of this absence. A statement of non-existence resembles a hole in the bottom of a bucket, or rather that want of material which is the principal element in the constitution of the hole. This has all its importance from its relation to that which might exist instead of it, and from its relation to those things which do exist around it. If there were no solid edge about the vacancy to which a possible filling might be attached, we would pay no attention to the vacancy at all. Even in philosophy we never notice non-existence for its own sake.

A very frequent use of contradictory inference is that according to which we avoid saying or believing what conflicts with that which, on some sufficient ground, we have already said, or believed. On this account Sir Wm. Hamilton styles the law of this inference, the principle—not of contradiction—but of non-contradiction. This innovation is not justifiable. It names the law from a secondary use of it. The principle of contradiction should be designated from its primary effect and use; which is, not to prevent contradiction, but to contradict. This use alone directly illustrates its nature. Why should it be named from any other use, especially when various common modes of inference are based on that application of it which is primary and immediate?

Hamilton's name, non-contradiction, discussed.

This law governs—
(.) Contradictory
opposition, and
contrary opposi-
tion.

Of these modes we may mention, first, that *contradictory opposition*, which has been already noticed. This occurs whenever we find it useful to substitute belief in one contradictory for disbelief in the other, or disbelief in one for belief in the other. In this place we use the word *contradictory*, as we have hitherto done, to signify an *immediate* contradictory; which is the sense in which it is commonly employed in logic. But contradictory propositions may be either *mediate* or *immediate*. Mediate contradiction arises when two different things, being related as the logical, or necessitant, conditions of one another, one proposition sets forth the existence of one of these things, and the other the non-existence of the other. Let "true religion," and "the love of God," mutually involve one another. Then it would be a

contradiction to say that there is true religion where there is no love for God, or love for God where there is no true religion, or that there is no true religion where there is love for God, or no love for God where there is true religion. Immediate contradiction occurs when one proposition sets forth the existence and another the non-existence of *the very same thing*. "The interest of money should be regulated by law," and "the interest of money should not be regulated by law," are contradictory propositions; and so are the two sides of any question of debate when rightly stated. Such, too, is that confliction which logicians note between predications having the same subject and predicate, but differing "both in quantity and in quality." For example, "All men are mortal," asserts that the men who are mortal are all men; while, "Some men are not mortal," contradicts this, because it is equivalent to "Not all men are mortal." In like manner, "No men are perfect," and "Some men are perfect," are mutually contradictory; because the first in effect asserts, "There *are not* any perfect men," and the second, "*There are* some perfect men."

Contrary opposition, also, results from the law of contradiction, though not so directly as the contradictory. When one of two contradictories is found in combination with several accidental adjuncts, so that there are several specific moods in which that contradictory may exist, these moods are said to be *contrary* to the other contradictory. To "All men are perfect," we may oppose, "No men are perfect." This latter statement *includes* the simple contradictory, "Some men are not perfect." Hence, when we assert that no men are perfect, we deny that all men are so. But as the universal negative, in asserting that not merely some, but all men, are not perfect, makes an addition to the simple contradictory, the denial of it does not necessitate the assertion of the universal affirmative. For there is another contrary statement, namely, "Some men are not perfect"; and this may be true, even though the universal negative were false. Therefore, because contradictory assertion is necessary only when every possible modification of one of the contradictory propositions is false, a contrary statement is effective only for contradictory denial.

Again, those immediate inferences which result
 (2) *Contraposition.* *from adopting conceptions contradictory to those in given predications*, employ the principle of contradiction. They take place when two negatives are used so as to destroy one another's force, or when the negative is transferred from the copula to the predicate; or when either of these operations is reversed. Thus we say,

Every righteous man is happy; therefore
 No righteous man is unhappy.

and,

Some possible cases are not probable; therefore
 Some possible cases are improbable.

Such syllogisms follow the rule that, when two predicates are mutually contradictory, we may affirm one and deny the other of the same subject. In the first inference we affirm *happy* of all the righteous, and then deny *unhappy* of them. In the second, we deny *probable* of some possible cases, and then affirm *improbable*. These syllogisms oppose a negative predicate in the conclusion, to a positive predicate in the premise, or a positive to a negative; on this account, the inference has been called *contra-position*.

(3) "Reductio ad absurdum, vel ad impossibile." Another method of argument dependent on the principle of contradiction, is that known as the "reductio ad absurdum," or "ad impossibile." This assumes as true the contradictory of the assertion to be maintained, and thereupon, by some regular course of reasoning, shows that this assumption leads to a conclusion which is impossible, as being the contradictory of known fact. Then, according to the general law of reason and consequent, this conclusion being false, the assumption, on which it is founded, is asserted to be false. And, finally, this assumption being the contradictory of the main assertion, the truth of the latter follows immediately, by the principle of contradiction. Many geometrical theorems have been demonstrated in this way. The proposition that "A straight line cannot meet the circumference of a circle in more than two points," is proved as follows: "For, if it could meet it in three, those three points would be equally distant from the center; and hence there would be three equal straight lines drawn from the same point to the same straight line; which is impossible."

(4) Disjunctive inference. How related to the law of contradiction. Finally, the disjunctive syllogism uses the principle of contradiction. Sir Wm. Hamilton teaches that this syllogism is "A reasoning whose form is determined by the law of excluded middle"; which

law, in this connection, we identify with that complete law in which the more abstract principles of contradiction and of excluded middle are combined. This doctrine of Hamilton may, and probably does, mean that the law of contradiction is the only one employed in disjunctive reasoning. If this be his doctrine, we cannot accept it as correct. Although some disjunctive inferences may be determined simply by the principle of contradiction, most are not. This principle, is not, of itself, an adequate explanation of this sort of syllogism. Should we say, "Sempronius is either honest or dishonest," meaning by dishonesty mere want of honesty, this statement, simply on the principle of contradiction, would be self-evident, and would include four inferences; first, if Sempronius is honest, he is not dishonest; second, if Sempronius is not honest, he is dishonest; third, if he is dishonest, he is not honest; and fourth, if he is not dishonest, he is honest. In these inferences the contradictions are, "Sempronius is honest," and "Sempronius is dishonest"; they differ from each other just as *yes* differs from *no*.

But should we say, "That quadruped is either male or female," the four inferences included in this statement, though similar in form to those just enumerated, would not be founded solely on the principle of contradiction; because the contradictories which they employ, are not related to each other simply as *yes* and *no*. "That animal is male," and "That animal is female," are contradictories, not because one sets forth the existence, and the other the non-existence, of the self-same thing, but because each sets forth the existence of that *which logically involves the contradictory of the other*. Not to be a male quadruped is not the same thing as to be a female quadruped, and not to be a female is not the same thing as to be a male; but these things are the logical conditions, or necessitants, of each other. Therefore, not immediately, but through a specific operation of the law of reason and consequent, and in a secondary sense, they are contradictories. Yet more evidently disjunctive inference from *contrary* statements, does not rest simply, or mainly, on the law of contradiction. "This triangle is either equiangular, right-angled, or scalene," sets forth three propositions, some one of which must be true and the others false; so that, if we assert any one, we deny the other two, or, if we deny both the others, we assert that one; or, by denying one, we may assert one of the other two indeterminately. But these inferences refer specially and principally to geometrical necessities consequent upon the structure of the plane triangle; they are no more inferences of simple contradiction than the "reductio ad absurdum" is. Therefore, disjunctive reasoning in general depends more on the universal principle of reason and consequent—or, rather, on the law of exact logical necessitants—than on the specific law of contradiction.

The ordinary disjunctive syllogism. The law of logical transfer.

The syllogism of which we have now spoken is *essentially a suppositive mode of reasoning, and is entirely expressed by the disjunctive proposition*. It constitutes the principal part of the ordinary "disjunctive syllogism," but unites in this with that peculiar inference whereby a suppositive, is converted into an ostensive, or actualistic, conclusion. For both disjunctive and hypothetical syllogisms, as ordinarily defined, *transfer* the belief of the mind (if we may so speak) from *supposed* to *real* cases of consequence; and the law according to which this is done, which might be called *the law of logical transfer*, is something additional to the principles of pure suppositive and disjunctive inference. This law, though of an orthologic nature, has an extent and peculiarity of application which make it *sui generis*; for which reason,—because of its relatedness to reasoning in general,—it should have a place of its own in logic. It may be regarded as a kind of attachment to the universal principle of reason and consequent.

Other orthologic principles of general application.

Besides the law of identity, and that complete law of contradiction which embraces the principles both of contradiction and of excluded middle, there are other orthological principles which pertain to entities in general.

For example, it is true that every entity may be regarded as a metaphysical whole and parts—that every entity is the same with itself and is diverse from other things (with which statements we must not confound the laws of identity and contradiction),—that every entity has quantity—that every entity has individual form or character—that every entity may be regarded abstractly and as a member of some logical class—and that every logical class may be regarded as whole and parts. But such principles as these, which may be said to pertain to the general nature of entities, rather than to their existence and non-existence, are interwoven with the very structure of our thought, and are seldom used independently as tests of correct thinking. They co-operate with, and modify, other principles which are more consciously employed. For this reason we only mention them as subsidiary laws of belief.

§ 212. We turn to those principles of orthologic inference which support *specific reasonings* respecting different aspects and modes of entity. These may be divided into two classes, one specially exemplified in our abstract reasonings concerning the most generic kinds of entity, and which we may name the metaphysical; the other specially employed in abstract reasonings concerning the quantitative and spatial relations of things, and which may be called *the mathematical*. Both classes of principles are expressed by *axioms*; and, in each case, these axioms are either simple or complex, according as the inferences explained by them have sometimes a single, and sometimes a plural, ground.

Simple metaphysical axioms are such as the following:—

Metaphysical axioms.

Space and time exist; and all other things exist in space and in time.

Space and time, though the conditions of production and destruction, cannot themselves be produced or destroyed.

Every body—and we think, also, every substance—occupies space.

Two bodies cannot occupy the same space at the same time.

No body can be in two places at once.

No body can successively occupy two separate locations without passing through the intermediate space.

All powers reside in substances, and are exercised by substances only.

Every beginning or change is the result of the exercise of some power.

Power acts only on or in substance, and cannot act without a substantial object.

Power never acts without conditions, and the exercise of a power together with its necessary conditions constitutes a cause.

A cause and its effect—that is, the change consequent upon the cause—are inseparably united, so that neither can be present or absent without the presence or absence of the other.

Every change corresponds in its nature to the cause producing it.

Where there is no cause for a change, things remain as they are.

Complex metaphysical principles employ a combination or concatenation of relations, and are such as the following:—

The cause of a cause is the cause of the effect.

A part of a part is part of the whole.

What resembles a likeness resembles the original.

What excludes, or contains, a container, excludes, or contains, its contents.

If a first thing be identical with a second, which is identical with a third, the first is identical with the third.

If a first thing be identical with a second, which is different from a third, the first is different from the third.

If one individual thing be the same as another—that is, the same with itself viewed under another aspect—it has all the attributes and ascripts of that other.

If a first thing be in some sense, before a second, which in the same sense is before a third, the first is before the third in that sense.

Simple mathematical axioms are such as these:—

Mathematical axioms.

Space admits geometrical figures and relations.

Quantity admits of measurement and its relations.

A whole is equal to the sum of its parts.

A whole is greater than any of its parts.

A straight line is the shortest possible between two points.

Through a given point one, and only one, straight line can be drawn parallel to a given straight line.

A straight line may meet another straight line so as to make two, and only two, equal adjacent angles, and all angles so made—that is, all right angles—are equal to one another.

Angles, and other magnitudes which can be made to coincide with one another, are equal.

Solids of similar shape are equal if their boundaries are equal.

Some of the foregoing statements set forth the possibility, rather than the necessity, of the existence of mathematical entities; so far as they do so, they are postulates rather than axioms. The following mathematical principles are complex:—

If a first thing be equal to a second, which is equal to a third, the first is equal to the third.

This is more briefly expressed by saying,

Things which are equal to the same thing are equal to one another.

Again,

If a first thing be greater than a second, which is equal to, or greater than, a third, the first is greater than the third.

Magnitudes of the same kind must be related to each other as equals, or as the greater and the less.

If A equal B, and C equal D, and if A be added to C, and B be added to D, the sum of A and C will equal the sum of B and D;

in other words,

If equals be added to equals the sums will be equal.

Similar axioms relate to the subtraction, multiplication, and division, of equals.

The following, also, are self-evident propositions:—

If two straight lines are parallel to a third line, they are parallel to each other,

and,

Two straight lines, which are parallel, or equidistant, throughout any part of their course, will continue parallel however they may be prolonged.

Although these two last propositions may be proved by the use of geometrical figures and axioms, they are as evident before the proof as after it. For things which are self-evident may sometimes be proved from other things which are self-evident.

The use of mathematical principles in orthological reasoning may be illustrated from the successive steps in some of the simpler demonstrations of geometry, or, better still, from the solution of some algebraic equation. Let one scrutinize the process of his mind in the clearing of fractions; in the elimination of unknown quantities; in the completion of the square, and in the extraction of roots, in quadratics; in the transposition of terms; in the division of both sides by the co-efficient of x ; and in every other device subservient to the solution of an equation; he will find that he can, and often does, proceed intuitively, and with no reference to rules or previous similar cases.

CHAPTER XLVI.

HOMOLOGICAL DEMONSTRATION.

Three different modes of homological reasoning. § 213. Homological differs from orthological reasoning in having one principle instead of many, and in that, according to this principle, we do not infer simply from observed or ascertained fact, but from a necessity which has been ascertained to have connected one fact with another. The greater portion of our homological reasoning results only in probable conclusions. But this circumstance has no necessary connection with the homologic principle; and, for the present, we shall discuss homologic inference only so far as it may be demonstrative. Although this style of reasoning has but one principle, to which all its force of objective assertion is attached, this principle operates in connection with three different modes of thought; accordingly, three different modifications of homologic inference claim consideration. For we may either

infer *one individual truth or fact from another, or general principles from individual facts, or individual facts from general principles.*

Paradigmatic inference. Aristotle, Locke, Whately, and J. S. Mill quoted and criticised.

The first of these modes of reasoning illustrates the fundamental law of homologic sequence more clearly than either of the others, yet, up to the present time, few philosophers have given it any recognition, and fewer still have given any satisfactory account of it. The weight of authority is in favor of the doctrine that all reasoning from observed particulars, takes place through the intervention of general laws or principles. Logicians almost universally follow Aristotle, who teaches that we first infer the general principle from one or more individual instances, and then, in turn, from that infer the individual or particular truth. In explaining reasoning from example (*παράδειγμα*), Aristotle says, "If, then, we wish to show that it is bad to war against the Thebans, we must assume that it is bad to war against neighbors. But the demonstration of this is from similar cases, as that the war by the Thebans against the Phocians was bad. Since, then, the war against neighbors is bad, but that against the Thebans is against neighbors, it is evidently bad to war against the Thebans" ("Prior Analytics," ii. 24). The form of this Peripatetic doctrine, as held by modern writers, may be given in the words of Archbishop Whately, who teaches that "Aristotle's *dictum* is a generalized and abstract statement of all demonstration whatever," and that the scholastic *sylogism*, which follows the dictum, "is not a certain distinct kind of argument, but any argument whatever stated in a regular form" ("Logic," bk. i. 4). It is plain that syllogisms which conform to the dictum employ universal statements as the expression of laws or principles, and that, when employing such syllogisms, we do not reason immediately from one individual fact to another.

In opposition to the foregoing, we quote the following rather indefinite passage from Locke. "It is fit," he says, "before I leave this subject, to take notice of one manifest mistake in the rules of syllogism, viz., that no syllogistical reasoning can be right and conclusive, but what has at least one general proposition in it. As if we could not *reason* and have knowledge *about particulars*; whereas, in truth, the matter rightly considered, the immediate object of all our reasoning and knowledge is nothing but particulars" (bk. iv. 17). To somewhat the same effect Mr. J. S. Mill says, "Archbishop Whately has contended that syllogizing, or reasoning from generals to particulars, is not, agreeably to the vulgar idea, a peculiar *mode* of reasoning, but the philosophical analysis of *the mode* in which all men reason, and must do so, if they reason at all. With the deference due to so high an authority, I cannot help thinking that the vulgar notion, is, in this case, the more correct. If from our experience of John, Thomas, et cetera, who once were living, but are now dead, we are entitled to conclude that all human beings are mortal, we might surely, without any logical

inconsequence, have concluded at once from those instances that the Duke of Wellington is mortal. The mortality of John, Thomas, and company, is, after all, the whole evidence we have for the mortality of the Duke of Wellington. Not one iota is added to the proof by interpolating a general proposition. . . . I am unable to see why we should be forbidden to take the shortest cut from these sufficient premises to the conclusion, and constrained to travel the *high priori* road by the arbitrary fiat of logicians. I cannot perceive why it should be impossible to journey from one place to another unless we march up a hill and then march down again. . . . The child, who, having burnt his fingers, avoids to thrust them again into the fire, has reasoned or inferred, though he has never thought of the general maxim, 'Fire burns.' He knows, from memory, that he has been burnt, and, on this evidence, believes, when he sees a candle, that, if he puts his finger into the flame of it, he will be burnt again. . . . I believe that, in point of fact, when drawing inferences from our personal experience, and not from maxims handed down to us by books or tradition, we much oftener conclude from particulars to particulars directly, than through the intermediate agency of any general proposition. . . . It is not only the village matron who, when called to a consultation upon the case of a neighbor's child, pronounces on the evil and its remedy simply on the recollection and authority of what she accounts the similar case of her Lucy. We all, where we have no definite maxims to steer by, guide ourselves in the same way." These views of Locke and Mill are substantially correct; we have little doubt that they would have been generally accepted long before the present time, had not the statement of them been accompanied, in the case of Locke, with errors of confusion, and in the case of Mill, with yet more serious misconceptions.

The ultimate analysis of paradigmatic reasoning.

When we reason directly from one instance of necessary consequence to another similar instance, the mind acts on the principle that a similar cause will produce a similar effect, or on the more general principle that an antecedent essentially similar to one which has necessitated a given consequent, will necessitate a similar consequent. This is expressed in common language by saying that the same antecedent is followed by the same consequent. If this be admitted, as a widely operative law of conviction, then, certainly, the direct inference of particulars from particulars cannot be denied. At the same time, Mr. Locke's statement, that "the immediate object of all our reasoning and knowledge is nothing but particulars," is inconsistent with other statements made by him, and would not be deliberately accepted even by himself. And Mill's doctrine, that all reasoning originates simply from the associations of past experience, is to be utterly rejected. "If reasoning be from particulars to particulars," says Mr. Mill, "and if it consist in recognizing one fact as a mark of another, or a mark of a mark of another, nothing is required to render

reasoning possible except senses and association; senses, to perceive that two facts are conjoined; association, as the law by which one of those two facts raises up the idea of the other" ("Logic," bk. iv. chap. iii.).

Mr. Mill here mentions two facts, "one of which raises up the idea of the other," as if only two facts were considered in any inference "of particulars from particulars," that is, of what is individual from what is individual. But it is evident that the two facts first seen in conjunction are not literally the same two facts, "one of which suggests the other." On the contrary, in every such case, there are two pairs of facts, one of which consists of two different things immediately seen as existing in necessary union, and the other of which consists of a first something immediately seen, and of a second something inferred as in connection with the first. The two facts of the second pair are exactly similar to those of the first pair; but a close analysis, and a literal statement, require the recognition of four facts, and not of two only. To illustrate this, let us suppose some one to pick up a piece of coal, and to say, reasoning from past experience, "This will burn." To explain this inference, Mr. Mill assumes, what is certainly necessary to assume, that two facts have heretofore been perceived conjointly, viz., the existence of pieces of coal, and, secondly, their combustibility. He then teaches that, in consequence of these previous perceptions, though without any logical reference to them, and simply through the force of an association engendered in the previous perceptions, the fact of the existence of a piece of coal is taken as evidence of the fact that it will burn. In other words, our belief that the fact of coal is accompanied by the fact of combustibility, is not founded on any reference to, or remembrance of, a previous perception of similar concomitance, but arises simply through the force of the association of ideas. The isolated fact that this piece of coal, having its own perceptible individual character, exists, is the proof of its combustibility. Such is Mill's doctrine, if we understand it. Now it is true that the sight of a piece of coal might suggest the thought of its combustibility, without reference to any previous perceptions, and simply through the force of the association of ideas. We also allow that such suggestion is the condition of any reference to the past. But the remembrance of something past, and a reference to it as fact, is something additional to the reproduction of ideas by association (§ 176); and we deny that the sight of a piece of coal would evidence its combustibility without such remembrance and reference. Rather than accept Mill's inference of one particular fact from another, we would say that, in such reasoning from known particulars, *one fact is inferred from four*. Let a large black lump of mineral be broken into pieces, and let the problem be whether this piece, which I hold in my hand, be combustible or not. Setting fire to the other pieces, we perceive that they are combustible; for they burn. Whereupon we reason, "That coal burns; therefore this will burn." Here, on ulti-

mate analysis, we find *five* facts; *first*, the existence of *those* pieces of coal, each with its own individual nature; *second*, their perceived combustibility; *third*, the existence of *this* piece of coal with its individual nature; *fourth*, the sameness, or exact similarity, of the nature of this coal with that; and, *fifth*, the inferred fact of the combustibility of this coal. Employing a less searching analysis the first and the third of these facts may be conceived as being implied rather than expressed, and as united with the second and the fourth, respectively. Thereupon, only three facts remain, two of which in combination, and as a kind of double fact, constitute an antecedent, while the third fact is the consequent. The duplex antecedent states, (a) that those pieces of coal are combustible, and (b) that this piece is precisely similar to those; the conclusion is that (c) this piece will burn. To such a theory of inferring particulars from particulars, there can be no serious objection. But it is not that of Mill. It assumes not merely an association of ideas, but a *homological reference*—a reference to a necessary connection previously perceived in a case similar to that under our immediate consideration.

The inference which we have now described is equally possible whether the case previously perceived be one of absolute and ontological, or of instituted and cosmical, necessity. Our primary inferences concerning things as ontologically necessary, are orthologal. They do not involve a reference to a knowledge of the past; in this respect, they are contrasted with our first inferences concerning things as connected by cosmical necessities, or the laws of the natural creation. But this is not the case with our more advanced reasonings from the perception of ontological connection and sequence. Homological inference of the particular from the particular is always possible *when there is an essential similarity of necessitating antecedents*. Hence, having demonstrated orthologally—or from the immediate perception of certain ontological necessities—that the angles at the base of the triangle A, which is isosceles, are equal, we thereupon infer, homologically, that the angles at the base of the triangle B, which is isosceles, are also equal. Thus, the homologic principle is largely employed in those demonstrative sciences whose radical and initial principles are orthologic.

So far as we know, this inference of the particular from the particular—or of the singular from the singular,—has no distinctive title. This want of a name is both a consequence and a cause of the general failure of logicians to recognize this mode of ratiocination; and it should be supplied. As the inference in question is really that from *example*, of which Aristotle speaks, it might be called *paradigmatic reasoning*, or *paradigmatization*.

§ 214. We have next to notice the inference of the general from the particular. This is commonly discussed by logicians under the general head of *induction*; it is said that induction is of two kinds, first, formal, pure, or abstract, and, secondly, material, common, or applied.

Principative reasoning.
Mill quoted and criticised.

By this distinction our attention is directed to two modes of mental action, one of which contains, and is essentially founded on, the other. Formal, or pure, induction is the simple inference of the general, from the individual, truth. It is founded on the principle that what is true, either necessarily or contingently, in the singular, is true, in the same sense, in the general. It is of a *pure*, or abstract, nature, because it is not limited to any special sphere of thought or existence; and it is apodeictic in the sense that it does not affect the degree of our belief, but simply educes one belief from another. Applied induction, on the other hand, embraces that whole process wherein we form general judgments respecting the operation of natural causes, and ascertain what are called *the laws of nature*. In this process, we do not merely generalize truth, but we prepare for that generalization by the collection, comparison, and analysis, of instances, and also determine with what degree of confidence we should receive any alleged natural law. This kind of induction arises in connection with a specific observation of the actual operation of causes; and the strength of its conclusions varies from that of mere presumption to that of the highest moral certainty. *Ordinarily this is the process meant when we speak of induction*; so that the term *induction* naturally suggests the collection and examination of instances, and the formation of conclusions, for the most part probable, and always ontologically contingent. Such being the case, a word is needed for the distinctive designation of what we have called pure induction,—that is, the simple illation of the general from the particular, or the individual. This process has been called *the generalization of truth*. But the term *generalization* commonly signifies the formation of general notions, and, when applied to the formation of propositions, sets them forth as generalizations rather of thought than of belief. We need a term to indicate that generalization which produces and presents a proposition as a true inference from our perception of some individual case of necessary consequence. As the desired word must signify the formation of principles, we can think of no better term than *principiation*, or *principiative inference*; for both the probable or certain induction of cosmical laws, and the generalization of absolute ontological conclusions, are alike the formation of principles.

The foregoing account of induction, considered simply as principiation, or the formation of general principles from singular beliefs, is similar to that of Mr. Mill. "Induction," he says, "may be summarily defined as generalization from experience. It consists in inferring from some individual instances, in which a phenomenon is observed to occur, that it occurs in all instances of a certain class, namely, in all which *resemble* the former in what are regarded as the material circumstances." These statements avoid the recognition of necessity. They call our original perception and knowledge of cases of sequence *experience*, and every such case a *phenomenon*. This was to be expected; the associationalist system does not admit the existence

of any necessity, whether ontological or cosmical. But, should we remedy this defect, Mr. Mill's doctrine may be accepted as true and satisfactory. And the following remarks, respecting the nature of induction, exhibit a yet nearer approach to the recognition of that truth, which, alone, justifies the inductive inference. "We must observe," he says, "that there is a principle implied in the very statement of what induction is, . . . namely, that there are such things in nature as parallel cases; that what happens once, will, under a sufficient degree of similarity of circumstances happen again, and not only again, but always. . . . The universe, we find, is so constituted that whatever is true in any one case, is true in all cases of a certain description." If this last sentence could be taken to signify that the ultimate nature of things is such that whatever is necessary in any one case, is necessary in any other case similar to the former in containing an exactly similar necessitant, or collection of necessitative conditions, it would exactly express the homologic principle.

Hamilton quoted
and criticised.

Those writers who regard Aristotle's dictum as the fundamental law of ratiocination, and who, accordingly, hold that every inference must start with an universal proposition, naturally find difficulty with the inductive inference. Most of them teach that formal, or demonstrative, induction follows the principle that whatever is true, separately, of every individual in a class, may be asserted of the class collectively. Thus Hamilton writes, "An inductive categorical syllogism is a reasoning in which we argue from the notion of all the constituent parts discretively, to the notion of the constituent whole collectively." In this he reproduces Aristotle, who, in his brief and imperfect account of this mode of reasoning, says that the set of instances produced must be considered "as composed of all the singulars; for induction has its inference through all." According to this doctrine, the inductive syllogism has the following form:—

$a, b, c, \dots x, y, z$, have the characteristic B; but
 $a, b, c, \dots x, y, z$, are the class A; therefore
 The class A has the characteristic B.

This syllogism does not follow the "dictum de omni et nullo." Its principle, which we have already given, resembles that dictum in pertaining to the parts and the whole of a class, yet is entirely distinct from it. It is a perfectly conclusive syllogism. We object to it, not as having an illogical character, but as an explanation of induction. Instead of meeting, it avoids, the thing to be explained. The true question is not, "How can we infer about all from all?" but, "How can we infer about all from some?" When this latter inference is declared to be *extra-logical*, and cast out from the science of demonstrative reasoning, all induction whatever is dismissed from logic. The induction which Hamilton described is no induction at all. It is a grand mistake to say that the inference

about all from only some, has no fundamental place in the philosophy of necessary reasoning; for every general truth, that we hold with certainty, is thus obtained. Moreover, as we may see more perfectly hereafter, the principle of principiative reasoning is, in itself, demonstrative, and is distinct from that principle of probability with which it is frequently combined.

Whately's theory of induction differs from that of Hamilton. He holds that we reason from an understood, or suppressed major premise, which premise asserts that *whatever is true of some members of a class is true of all the members*. Thus,

Whately's theory of induction.

Whatever is true of John, Hugh, William and some others of whom we have knowledge, is true of all men; but John, Hugh, William and those others, are mortal; therefore All men are mortal.

If this suppressed premise of Whately's be taken as a simple statement of fact, we must ask for the proof of it. Do we know that what is true of several members of a class is true of all? Do we not know that very often what may be true of many, or of most members, is not true of all? But the premise may mean that what is necessarily true of John, Hugh, and the rest, simply as and because they are men, is necessarily true of all men. In that case a true principle is expressed. But it is the homologic principle itself, and it is clear that we do not reason from this principle but only according to it. The reference of like consequents to like antecedents takes place in every form of homological reasoning without any thought of grounding this reference on any general principle. Whately's teaching respecting the principle of deduction may be applied to the principle of induction:—"It is not a distinct demonstration brought to confirm another demonstration, but is merely a generalized and abstract statement of all demonstration," which takes place according to it. The archbishop's erroneous explanation of the principiative inference illustrates the way in which all reasoning can be expressed according to the form of the dictum, whether it involve the principle of the dictum or not.

Principiation may take place in contingent and probable inference, and may then be expressed by the universal proposition.

The homologic principle is of such a fundamental character that it applies to sequences of possibility and of probability as well as to those of necessity. If any consequent be possibly or probably existent under given conditions, a similar consequent may possibly or probably exist in all cases presenting the same conditions. Every individual judgment of possibility and of probability, as well as every judgment of necessity, may be the premise of a principiative inference, or the origin of a general truth.

Every proposition which immediately expresses the principiation of a modal judgment is, of course, a general modal proposition. In other words, it is a predication, or inherential statement, having for its subject a logical antecedent, and for its predicate a logical consequent. For the chief use and value of

the inherential, as distinguished from the presentential, proposition, lies in its fitness to express the logical connection of one thing with another. In necessity we infer, "Man must die," because individual men, by reason of their condition as men, have been necessarily mortal. In possibility we infer, "Man may be sick," because the state of this or that man, considered so far as he is man and subject to like conditions with other men, renders sickness a contingency for him. And in probability we infer, "Man, when poisoned, will probably die," because a considerable proportion of men, who have been poisoned, have died.

In each case, the homologic principle authorizes the signs of universality, so that we can say, "All men must die,"—"Any man may be sick,"—"Every poisoned man may, or will probably, die." Aristotle, in discussing his *contingent* syllogisms, frequently speaks of those in which universal contingent propositions occur. He also speaks of particular contingent propositions, meaning, probably, by these, propositions whose universality is limited by our definite knowledge. For logical contingency has reference to our ignorance; and a thing is not contingent to every member of a class, if we know that it is not, or cannot be, true, respecting some given—or specified—members.

One mode of universality is frequently employed to express demonstrative principiation.

While every generalized proposition may assume universality, *one mode of universality forms a peculiar connection with statements of necessity only.* We mean the universality of simple being, or of what Aristotle calls the proposition "de inesse" (*τὸν ὑπάρχειν*).

For the assertion, "Man must die," implies that "all men are mortal," or that mortality—*inesse*—exists in, all men. But the assertion, "Man may be sick," does not imply, "All men are sick." Hence, *universal propositions "de inesse," that is, universal pure categoricals, are often used to express generalizations of necessity, being understood to originate from such generalizations; while particular propositions "de inesse" are often used to express a contingency which they imply.* In discussing the syllogism, Aristotle and his immediate disciples distinguished between those universal statements which are necessary, and those which are pure. But scholastic and modern logicians, having discarded the modal syllogism, have employed the universal—that is, the pure universal, for they use no other,—as equivalent to the general, or universal, *necessary* proposition.

An essential characteristic of all reasoning.

While paradigmatic inference clearly illustrates that essential characteristic of homological reasoning, according to which the like is inferred from the like, principiative inference illustrates a point in the nature of all reasoning whatever, namely, that *inference is essentially of an analytic character, and that reason draws her conclusions, not from all the facts and circumstances in any case, but only from those which are seen to be necessitative.* This principial generalization discards from thought all circumstances which we may find non-essential to the antecedent. And therein lies its

usefulness. The individual antecedent having been carefully ascertained, the general principle sets forth the constitution of this antecedent in its simplicity; so that we can easily recognize such an antecedent again. In what way our conception of the individual antecedent is first obtained, is a question belonging to the topic of immediate perception, and not to that of homological reasoning. But, that determination having taken place, there is a great advantage in forming a general rule by means of which the true antecedent may be more accurately conceived of, more distinctly remembered, and more easily applied.

The value of the
pricipiative in-
ference.
Mill quoted.

The general character and value of the principiative inference has been noticed by Mr. Mill. "Generalization," he says, "is not a process of mere naming; it is also a process of inference. From instances which we have observed we feel warranted in concluding that what we found true in those instances holds in all similar ones, past, present, and future, however numerous they may be. We, then, by that valuable contrivance of language which enables us to speak of many as if they were one, record all that we have observed, together with all that we infer from our observations, in one concise expression; and have thus only one proposition, instead of an endless number, to remember or to communicate." This statement is affected with the nominalism of Mr. Mill; it speaks of general names as if there were no general ideas; and contains the absurdity that, in generalization, we think of many things as one, the truth being that we have one indeterminate conception which we can refer to many things. It also fails to state that the chief advantage of principiation is—not the substitution of one statement for many—but the elimination from thought of non-essential circumstances. Because perfect principiation may take place from the observation of only one individual case of consequence. Yet the words of Mill are a closer approximation to the truth than could be expected from any adherent of associationalism. For, in referring to the remembrance of similars, he unwittingly introduces that essential character of the inductive process which his psychological theory ignores.

It is to be allowed that general principles do not of themselves include direct reference to the past knowledge of a similar case of consequence. When we say, "The area of a triangle is as its base multiplied by its altitude," or "Silver is a white mineral," we do not recall the individual cases in connection with which these truths were originally discovered. Nevertheless, the first formation of such conclusions must be ascribed to a judgment that what was found true in some one or more individual cases, was to be held true in every similar case. The general truth can be retained when the origin of it has been forgotten. But when we ask why a thing is true in the general, we justify our belief only by reference to singular cases similar to the case presented in the general rule.

CHAPTER XLVII.

THE ARISTOTELIAN SYLLOGISM.

§ 215. The only remaining mode of homologic demonstration to be discussed, is that according to which we infer *the particular from the general*. This is commonly called *deduction*, and is especially indicated by this name when we oppose deduction to induction. For, in a wide use of the term, *deduction* sometimes signifies inference in general. A principle, or general truth, is a sort of formula which we often use as a kind of half-way position in the process of inferring particulars from particulars,—a stage of thought at which we may rest until we have become ready to make further progress. Mr. Mill asserts that inference is only from particulars to particulars, or from particulars to the general, and “is finished when we have asserted that all men are mortal. What remains to be performed afterwards, is merely the deciphering our own notes.” This is an extreme statement, and is inconsistent with other teachings of Mr. Mill himself, as, for example, that “deduction is the great scientific work of the present and of the future ages.” Probably, in this statement, Mr. Mill merely designed to emphasize two important truths; first, that the application of general principles to instances which manifestly fall under them, is something simple and easy, and secondly, that the value of deduction chiefly depends on the correct derivation of principles from individual facts. For deduction may be regarded as the second, and, in some respects, less important, half, of a complete process. General principles are frequently difficult to ascertain, but commonly easy to apply; while deduction from unverified principles is an unfailing source of fallacy and error.

The homological theory of deduction dispels difficulties otherwise irremovable.
Pres. Porter quoted.

The theory that deductive reasoning,—or inference from the general to the particular,—is based on the homologic principle, is necessary for the removal of difficulty respecting the usefulness and value of such reasoning. According to the common doctrine, the fundamental law of deduction, and, indeed, of all reasoning, is the “dictum de omni et nullo,” viz., that “whatever is predicated universally of any class of things, may be predicated in like manner of anything comprehended in that class.” In other words, deduction takes place on the principle that what is true of *all* must be true of *some*. It is impossible to accept this principle as an ultimate explanation of the nature of deductive reasoning. We do not say that the dictum does not sustain a true inference. The objection that the illation of what is true of a part from what is true of a whole is mere *petitio principii*, and simply a repetition of what is already known, has been adequately met. In the

first place, even if the conclusion were only an identical inference from a single premise, it would yet be a true inference. To say,

All men are mortal; therefore
Some men are mortal, or
This man is mortal,

is a correct, though a very simple, act of reasoning. But, secondly, when we say,

All men are mortal;
Hindoos are men; therefore
Hindoos are mortal,

we form a correct double-grounded inference, even on the supposition that we are reasoning simply from a consideration of class relations. We say that a whole class are mortal, and then,—not merely that a part of the class are so—but, first of all, that Hindoos are a part of the class, and, thereupon, that *they* are mortal. This is a true orthological inference (§ 212). Yet, though such reasoning is conclusive, we remain unsatisfied. We feel that, in the great majority of cases in which we follow the dictum, the force of our reasoning does not come from it, but from another principle,—that is, from the principle, whatever it may be, which *authorizes universal statements respecting logical classes*. The universal premise in deductive reasoning never expresses direct and immediate knowledge of fact. It refers to that peculiar kind of class which includes not only all things of some certain kind that we may have seen, but all that ever have existed, that ever shall exist, or that can, in any way, be supposed to exist. What it asserts respecting this class cannot be a thing observed, it must be an inference from what is necessarily true in some cases to what is necessarily true in all. Therefore, we employ the universal statement, not for its own sake, but because, as an inference from the necessary to the necessary, it expresses a law of logical sequence, applicable to any one of a class of similar antecedents—in other words, because it describes a general homological inference. Moreover, the assertion of the minor premise, that such and such objects belong to such a class, simply shows that they possess those respects in which similarity to known antecedents brings them under the law.

We may even express deductive reasoning without any conformity to the dictum, or reference to a class. We can say,

Man is necessarily mortal;
The Hindoo is a man (or human); therefore
He is mortal.

So speaking, we employ general, but not universal, terms. The vital force of ordinary deduction does not rise from the principle of the dictum, but from the deeper principle that a similar reason is necessarily accompanied by a similar consequent.

This doctrine of deductive reasoning, at least on its negative side, has been well presented by President Porter. He says, "The real error or defect (of the common theory), consists in making the essence or import of both induction and deduction to consist in classification and the apprehension of class rela-

tions. The relation which is characteristic of the deductive process is that of a reason to its consequent, or of a ground to its inference. This relation is suggested to the mind in many cases of reasoning—always in the syllogism—by the relation of a *whole to a part*, or of a general to a particular, but it is not, therefore, resolvable into this relation, nor should it be confounded with it. When we say, ‘All magnets attract iron; this is a magnet; therefore it attracts iron.’; the word *all* suggests, or indicates, that there is some reason, founded on the nature or properties of the magnet, which forces us to believe that this particular magnet will do the same. The relation of whole to a part is stated as a fact; but the fact indicates a reason; and it is upon this last relation that the necessity and convincing force of the deduction always turns” (“Human Intellect,” § 445).

The dictum of Aristotle furnishes an orthologic form in which homologic inference may be expressed. An analysis of those forms of inference which are treated in the scholastic logic.

§ 216. If the theory, which we have now advocated, be correct, that dictum, according to which we reason from the whole to a part of the logical class, is an instrument which derives its significance and force from the homologic principle, and which is employed to formulate the operation of this principle. It is chosen as offering a mode of thought less abstract and more easily expressed,

than can be obtained from naked homological reasoning. Such being the case, it will be instructive to inquire how far those syllogistic forms, which are commonly discussed in the scholastic logic, are governed by the principle of the dictum. So far as they involve this principle, they may be accounted homological, and so far as they combine any other principles with this, they are of a mixed nature. In order to the accomplishment of this inquiry we have only to accept and to analyze those forms of argument which the scholastic logicians have distinguished as correct. The aim of these Aristotelian thinkers was to describe all necessary inferences resulting from the combination of two propositions, in each of which some assertion is made respecting the whole or a part of some logical class. At least they have admirably discussed such inference so far as it naturally takes shape in ordinary thought and language. They have demonstrated that all such reasoning, when fully expressed, is found in some one of the nineteen or twenty moods of the four different figures of the Aristotelian syllogism; and they have thoroughly described these moods and determined their principal relations. To refresh the memory, let us recall those lines whose famous cabalistic names embody the principles and rules of the ancient logic.

“Barbara, Celarent, Darii, Ferioque, prioris;
Cesare, Camestres, Festino, Fakoro, secundæ;
Tertia, Darapti, Disamis, Datisi, Felapton
Bokardo, Feriso, habet: Quarta insuper addit
Bramantip, Camenes, Dimaris, Fesapo, Fresison.”

In regard to the forms of argument thus enumerated, it is allowed, on all hands, that the "dictum de omni et nullo" applies immediately to all the moods of the first figure. In each of these, the major premise is an universal statement, while the minor asserts that some objects are members of the class respecting which the statement is made. Such inferences are plainly homological. It is also agreed that every argument in every mood of the three last figures, can be replaced by a valid argument in the first figure, in which the same terms may be employed, and the same, or an equivalent, conclusion, obtained. The mnemonic names of the moods are themselves so constructed as to be rules for the explicit effectuation of this *reduction*; and the detailed application of these rules is perhaps the most interesting chapter of the scholastic logic.

But there is a difference among logicians as to whether arguments in the last three figures do, or do not, depend for their validity and convincing power on our mental reduction of them to arguments in the first figure, and whether, therefore, the scholastic syllogism in general is, or is not, based on the dictum of Aristotle. For, beyond doubt, the three last figures can derive their force from the dictum only through some connection—or substantial identity—with the first figure, which the mind may be supposed to recognize.

The view of most logicians is expressed by Hamilton, whose words, according to his usual manner, are clear and decided. He says (Lect. XXII.), "The three last (that is, second, third, and fourth) figures are merely hybrid or mixed reasonings in which the steps of the process are only partially expressed. . . . They do not, in virtue of their own expressed premises, accomplish their own inference; this is done by the mental interpolation of certain complementary steps without which no conclusion in these figures could be drawn. They are thus in fact reasonings apparently simple, but in reality complex; and, when the whole mental process is expressed, they are found to be all only syllogisms in the first figure with certain corollaries of the different propositions intermingled." In the remainder of the lecture, Hamilton shows, in detail, how by the transposition of premises, and the interpolation of converse and contrapositive inferences, syllogisms in the inferior moods may be replaced by equivalent reasonings in the first. Beyond question, these reductions can be successfully accomplished.

At the same time, while following the process of change and interpolation, especially in those moods whose reduction is somewhat difficult, we receive an impression at variance with that intended by Sir William. We ask, "Is it really so that the mind must take all these steps? May not these conclusions, from these premises, be reached more easily? Are there not some self-evident principles which justify a less complicated mode of inference?"

The first figure only, based on the dictum; the others on laws of their own.
Lambert's doctrine. Hamilton criticised.

Scholastic "reduction" illustrated.

Take, for instance, the reduction of Camestres in the second figure to Celarent in the first. The example is,

All colors are visible;
No sound is visible; therefore
No sound is a color.

This argument seems simple and immediate enough. But, in reduction, we first transpose the premises, and then convert the first of the transposed premises. This gives, in Celarent,

Nothing visible is a sound;
All colors are visible; therefore
No color is a sound.

Even so, we have not the original conclusion. This is obtained by converting, "No color is a sound," which Hamilton calls the proximate or real conclusion.

Or let us reduce Fakoro to Ferio. The example is,

All birds are oviparous:
Some animals are not oviparous; therefore
Some animals are not birds.

Here we must first take the contrapositive of the major premise—that is, the equipollent proposition obtained by *infitation*, and say,

No birds are non-oviparous.

Converting this, we have,

"No non-oviparous animals are birds.

Then, taking the contrapositive of the minor, we have,

Some animals are non-oviparous.

Combining these last two propositions, we obtain a syllogism in Ferio, which produces the original conclusion.

Again, Disamis of the third figure is reduced to Darii. The example is,

Some acts of homicide are laudable;
All acts of homicide are cruel; therefore
Some cruel acts are laudable.

First the premises are transposed, so that we have,

All acts of homicide are cruel;
Some acts of homicide are laudable.

Then, for this last we substitute its converse,

Some laudable acts are acts of homicide.

Thereupon a conclusion follows in Darii, namely,

Some laudable acts are cruel.

Finally, by converting this we obtain the original conclusion,

Some cruel acts are laudable.

Bocardo of the third figure is also reduced to Darii. The example is,

Some syllogisms are not regular;
All syllogisms are important; therefore
Some important things are not regular.

First, by transposition of premises, we obtain,

All syllogisms are important;
Some syllogisms are not regular.

Then, by contraposition and conversion, this second premise becomes,

Some things not-regular are syllogisms.

Then we have a conclusion in Darii, namely,

Some things not-regular are important.

Then, by conversion, this becomes,

Some important things are not-regular.

And, finally, by contraposition, we reach the original conclusion,

Some things important are not regular.

Such ratiocinations as these are undoubtedly correct, but we question whether they are commonly employed. We are not conscious of such changes and interpolations; and it is noticeable that every inserted proposition, obtained from an expressed proposition by conversion or contraposition, is less easy and familiar to the mind than the proposition from which it is derived. That would not be so, if the interpolation were of constant or regular occurrence.

Such being the case, we are prepared to consider a doctrine which has been held by several eminent thinkers, but which was especially advocated, more than a century ago, by Lambert, a German logician, in his "Neues Organon." He held that *the three inferior figures, as forms of inference, can be explained on principles peculiarly their own*, and that this is the only natural interpretation of them. The correctness of this opinion can be shown from an analysis of the inferior figures.

§ 217. In the second figure *one premise always affirms some predicate of a subject, while the other denies the same predicate of another subject. Thereupon, in the conclusion, one subject is made a predicate and is denied of the other.* In the mood Cesare, we say,

we say,

Nothing material has free will;

(This denies free will of everything material,)

All spirits have free will; therefore

No spirit is material.

Or, transposing the premises, we produce the mood Camestres, and obtain the converse conclusion,

Nothing material is a spirit.

Again, in Festino, we say,

No vice is praiseworthy;

Some actions are praiseworthy; therefore

Some actions are not vices.

We could, in the same way, obtain a converse conclusion from the premises of this argument; we could deny vices of *some* actions, that is, of as many actions as are praiseworthy. We cannot, however, say, simply,

Some vices are not actions;

this would mean "not any actions"; and, as only this latter kind of negation is useful and enters into ordinary thought, we confine ourselves to the one conclusion,

Some actions are not vices.

The principle of the second figure illustrated and shown to be orthodox, and not that of deduction from the general to the particular.

The law governing the form of such reasoning is plain. It is the orthological principle that, when one thing is identical with, and another diverse from, a third, the first and second are diverse from each other. In the scholastic syllogism this principle is not applied to single things, but to classes, and is modified by reason of this circumstance. With reference to this use, it may be expressed specifically by saying, "When a first class is identical with, and a second diverse from, a third, the first and second are diverse from each other"; to which we must add, for the explanation of particular conclusions, "When a first class is wholly identical with, and a second partially diverse from, a third, or when a first class is wholly diverse from, and a second partially identical with, a third, the first and second are partially diverse from one another." This principle is quite different from the "dictum de omni et nullo"; it relates to logical classes, in a way distinctively its own; and it is perfectly self-evident. Moreover, we shall see that this principle, though, like the dictum, essentially orthological, in being applied to the logical class, becomes subservient to homological reasoning. For the logical genus is a kind of mental creation for the aid of homologic inference; and those principles which assume, and reason from, its existence, partake in its instrumental character.

The law of the third figure also orthological.

The law of the third figure is twofold, and may be thus stated. *If the same thing, or set of things, belong to two different classes, these classes partially include one another, but if the same thing, or set of things, belong to one class, and not to another, then these classes partially exclude one another.* The first part of this principle supports affirmative, the second, negative, conclusions. The affirmative inference may be illustrated by the following syllogism, which is in the mood Darapti.

All gilding is metallic;
All gilding shines; therefore
Some things that shine are metallic.

The mood Feriso yields a negative conclusion, thus;

No man is perfect;
Some men are lovable; therefore
Some lovable beings are not perfect.

In this mood the major premise implicitly includes the subordinate statement, "Some men are not perfect"; in this way, the two premises assert that the same "some men" belong to one class, and not to another. The principle of the third figure, as given above, is self-evident and orthological, and is applicable to classes of any kind. But, when applied to the logical class, it becomes subservient to homological reasoning.

The fourth figure is allied to the first more closely than any other of the three inferior figures, and, because its conclusions can be easily obtained through reductions to the first figure, it has been regarded by most as simply an awkward form of the first. This was probably the view of Aristotle, who does not speak of the fourth

And also that of the fourth figure.

figure at all. The first three moods of this figure yield syllogisms in the first figure on the mere transposition of their premises; and the conclusions thus obtained, though not the original conclusions, yield these by simple conversion. The other two moods fall into the first figure if we convert both premises. Those have some show of reason on their side, who neglect the fourth figure, or identify it with the first. When, however, we carefully study syllogisms in this figure, we find that they really follow an independent principle.

This principle is twofold. It justifies affirmative conclusions by saying, that, *if a first thing is identical with a second which is identical with a third, then the third is identical with the first*; and it supports negative inference by saying, that, *if one thing is identical with a second, which is diverse from a third, or diverse from a second, which is identical with a third, then the third is diverse from the first*. Thus it proves either the identity, or the diversity, of a third thing as related, through a second, to a first. This law of the fourth figure, in the same manner as the laws of the other figures, is used as applicable to genera, or logical classes, of things. We say, in the mood Dimaris,

Some practical men are profound thinkers;
All profound thinkers are philosophers; therefore
Some philosophers are practical men.

Here the *some practical* is identified with *some profound thinkers*, and then, through the *all*, these are identified with *some philosophers*; thereupon we identify *some philosophers* with *some practical men*.

The following, in Camenes, gives a negative conclusion.

All ruminating animals have four stomachs;
No animal with four stomachs is carnivorous; therefore,
No carnivorous animal ruminates.

It will be perceived that this fourth figure involves the substantialization of the predicates of the major and of the minor premises so as to provide subjects for the minor premise and for the conclusion, that is, in cases in which each or either predicate may not be already a substantial term; in this respect it differs from the first figure as interpreted by the dictum of Aristotle.

It is also noticeable that we might naturally conclude, from the premises, of any syllogism in the fourth figure, that a first thing is identical with, or diverse from, a third. Let us take the syllogism in the mood Bramantip,

All greyhounds are dogs;
All dogs are quadrupeds; therefore
Some quadrupeds are greyhounds.

With the premises of this syllogism, as they stand, the most natural and easy inference is,

All greyhounds are quadrupeds.

Clearly, too, the argument producing this conclusion is in the first figure, though it does not follow the principle which ordinarily governs this figure, that is, the Aristotelian dictum. Then, after this inference, we might say further, "Since all greyhounds

are quadrupeds, some quadrupeds are greyhounds," and in this manner reach the conclusion which is directly produced by the fourth figure. Thus it is a natural peculiarity of the fourth figure to assert a reciprocation of identity or diversity.

The principles of the four figures characterized and named.

The foregoing examination of the three inferior figures sustains the doctrine that *each figure has a principle of its own, by means of which it accomplishes a specific mental result.* The first figure has the "dictum de omni et nullo." This, at least, is the law which ordinarily governs this figure, and which renders it expressive of homologic reasoning. When, as mentioned above, the first figure is used to prove the relation of identity or diversity of a first thing, through a second, with a third, the law of inference is not the Aristotelian dictum, but what might be called the principle of mediate identity or diversity. This law appears frequently to govern this figure when, the terms of the conclusion retaining their places, the minor premise is uttered first, thus,

Hindoos are men;
Men are mortals; therefore
Hindoos are mortals.

It is a principle closely related to that of the fourth figure, and, like the latter, requires a substantialization of the predicate of the major: for this is needful before we can identify *Hindoos* with *mortals*. The great prominence and value of the first figure, however, depend, not on this principle, but on the dictum, and on that fitness to express homologic reasoning which conformity to the dictum imparts. Moreover, as the leading aim of the mind in following the dictum is to ascribe something to something, the first figure may be distinctively characterized as *ascriptive*. In the second figure we always deny something of something; it might be called the *separative* figure. In the third figure we support or weaken some general statement, by establishing instances of it, or exceptions to it; so that this figure may be styled the *specificative* or *exemplificative*. And, since the fourth figure proves a reciprocal identity or diversity, it may be named the *reciprocativ* figure. A specific conclusion naturally sought by one of these figures, may often be obtained through another; but the formative principle of each figure renders it specially suitable for its own work.

Only the first figure expresses deductive reasoning properly so called. But in every figure we reason respecting logical classes.

We have now to consider the fact that each of the four figures deals with the logical class, and is, in this way, made subservient to homological reasoning. A right comprehension of this topic will reveal the fundamental nature and ultimate scope of the scholastic syllogism. In order to this understanding, let us recall the doctrine already taught respecting the ratiocinative use of pure propositions, or assertions "de inesse." Pure universal predications are used to express what is necessarily true respecting a given kind of thing; while pure particular propositions are used to express what is contingently or proba-

bly true respecting a given kind of thing. When we say, "All men are mortal," we mean, "Man is necessarily mortal"; and, when we say, "Some men are unfortunate," we mean, "Man may be unfortunate"; and so are prepared for necessary or contingent conclusions respecting this or that man. The universal proposition expresses a homological principiation in view of some necessary consequence, and announces a form or law justifying further homological inference. As, in principiation, we reason from the agreement of the general with the particular antecedent, so, in deduction, we reason from the agreement of the particular with the general. It is clear that the subject of the universal sets forth the antecedent, and the predicate of the universal, the consequent, of the necessary sequence. For the principiation, on which the universal is founded, is an inference in which the antecedent and consequent of some individual necessity have been generalized together and in their mutual connection. In pure universal statements, therefore, subject and predicate really set forth antecedent and consequent. In like manner, the pure particular predication indirectly expresses a law of contingent homologic inference, with its antecedent and consequent. When we say, "Some minerals, or most minerals, are valuable," we really mean that *any* mineral or metallic possession is possibly, or probably, of value, and thus we suggest the rule of sequence, that, "If there be any mineral or metallic possession, it is possibly or probably valuable." And evidently, in forming and applying such rules, we exercise homologic reasoning.

The relations of the scholastic syllogism to homologic inference.

Such being the case, we say that the scholastic syllogism is an instrument of homologic inference in the following ways: *first*, by reason of the nature of its premises, since both the universal and the particular propositions which it employs express *laws* of sequence; *secondly*, in the fact that every syllogism, whatever be its figure or mood, produces a general conclusion either of necessity or of contingency; and, *thirdly*, because a singular conclusion from any scholastic syllogism involves the homologic principle. For singular and definite, as distinguished from particular and indefinite, conclusions, are best regarded as no proper part of the syllogism, but as addenda which can be attached to any syllogism when desired, after the fashion of a deduction in the first figure.

In every figure we reason in the general, employing and enlarging the results of principiation. But in the first figure only we reason homologically.

In the first figure the major premise sets forth, in the general, *a necessitant antecedent and its consequent*, and the minor sets forth, also in the general, *either a necessitant or a contingent antecedent which has the antecedent of the major for its consequent*. Thereupon we conclude, also in the general, that the *antecedent of the minor is, necessarily or contingently, as the case may require, followed by the consequent of the major*. From which general conclusion any corresponding singular conclusion can be immediately inferred.

Thus understood, the first figure reasons in necessity, as follows,

If anything is composite, it is dissoluble;
 If anything be material, it is composite; therefore,
 If anything be material, it is dissoluble.

In contingency, it reasons thus;

If one be honest he is worthy of respect;
 Though one be a poor man, he may be honest; therefore,
 Though one be poor, he may be worthy of respect.

The second figure sets forth *the same general consequent as necessarily inherent in one general antecedent, and necessarily non-inherent in another, or as bearing one of these relations necessarily and the other contingently*. Thereupon we conclude, in the general, that *the one antecedent is, as the case may require, necessarily or contingently, non-inherent in the other*—in other words, that, necessarily or contingently, the existence of the one is not involved in the existence of the other. From which, of course, a singular conclusion may be homologically inferred. Thus interpreted, this figure reasons in necessity, thus (Cesare),

If anything is material, it has not free-will;
 If anything be spiritual it has free-will; therefore,
 If anything be spiritual, it cannot be material.

In contingency it reasons thus (Festino),

If an animal be a horse, it is not carnivorous;
 If it be a quadruped, it may be carnivorous; therefore,
 If (or though) an animal be a quadruped, it may not be a horse.

In the third figure, *two different general consequents are affirmed of the same antecedent, or one is affirmed and the other denied, the consequents being either both necessary, or one necessary, and the other contingent*. Thereupon *one consequent is contingently affirmed, or contingently denied, of the other, as the case may require*: and this conclusion, also, may be the ground of an immediate singular inference. Thus explained the third figure argues after this fashion (Darapti),

Music has necessarily a refining influence;
 Music is necessarily a sensuous pleasure; therefore
 A sensuous pleasure may have a refining influence.

Or thus (Disamis),

If one kill another, he *may* do so rightly;
 If one kill another, he does a cruel act; therefore,
 If one does a cruel act, he *may* yet be acting rightly.

In the fourth figure, *the latter of two consecutive consequents is asserted to be, either in necessity or in contingency, an antecedent of the antecedent of the prior consequent*. When both consequents are necessary, the conclusion is one of necessity; when one is necessary and the other contingent, the conclusion is one of contingency. According to this analysis this figure reasons thus (Bramantip),

If a greyhound be a dog; and
 If a dog be a quadruped; then
 A quadruped may be a greyhound.

Or thus (Camenes),

If an animal ruminates, it has four stomachs;
 If an animal has four stomachs, it is not carnivorous; therefore,
 If an animal be carnivorous, it does not ruminate.

Such is the ultimate analysis of the scholastic syllogism. It has been presented, not for practical, but for philosophical, uses. We have desired to show how the logic of the Schools is related to the radical principles of reasoning. The first figure, as explained by Aristotle, originates entirely from the homologic principle. This law of inference not only gives force to the different propositions in an argument of the first figure, but is used in the construction of the figure itself. The other figures subserve homological reasoning only because their syllogisms are constructed from general propositions and infer about the general. The principles according to which these figures themselves are constructed are orthologic. In the arguments of the first figure one application of the homologic principle (that is, the dictum) combines its force with that of other applications or employments of the same principle (that is, the premises). In each of the other figures general homological conclusions (the premises) are combined so as to produce a new law of homologic inference (the conclusion) by the operation of a principle that is not homologic. In the first figure, alone, we reason from the general to the particular. This figure, only, expresses deductive reasoning, properly so called. The unapproachable superiority of the first figure, arises from the fact that we consciously use the deductive inference more than all other styles of reasoning put together, and because all reasoning whatever may assume a deductive form of thought and expression.

This analysis shows, also, that the consideration of contingency cannot easily be excluded from any searching account of the operations of the reasoning faculty, even though the account be partial and one-sided.

CHAPTER XLVIII.

PROBABLE REASONING.

§ 218. It is remarkable that those writers of the present age who profess most respect for the authority of Aristotle, avoid the discussion of probable reasoning, and, so far as they can, exclude this topic from logic. Aristotle himself, in his book "De Interpretatione," and in the "Prior Analytics," treats of propositions and syllogisms as affected by contingency. He evidently regards the inference and belief of what is contingently true, as important, and as different from the inference and belief of what is necessarily true. The chapters in his "Organon" which discuss *modal* reasonings are twice as numerous as those devoted to the pure syllogism. The early Greek expositors of the Peripatetic logic gave the name *modal*

The modal syllogism treated at great length by Aristotle. Cannot be excluded from logic. Hamilton quoted and criticised. Dr. Thomas Reid.

to propositions and syllogisms as affected by contingency and necessity; Aristotle had left them unnamed; and both they, and subsequent logicians, greatly exercised themselves over these forms of thought. Reid, in his account of the Aristotelian logic, tells how the scholastic doctors tortured their wits regarding the modal syllogism. Then, having mentioned various eminent authors who declined the discussion of it, he says, "All the writers of logic for two hundred years back, that have fallen into my hands, have passed over the rules of modal syllogism with as little ceremony; so that this great branch of the doctrine of syllogism, so diligently handled by Aristotle, fell into neglect, if not contempt, even while the doctrine of pure syllogism continued in the highest esteem." To these remarks Hamilton subjoins, that modals "ought, on principle, to be wholly excluded from logic," and that they have, at last, "been formally expelled from the science." In his "Lectures," Sir William justifies, at some length, this dismissal of modality. "The discrimination of propositions," he says, "into pure and modal, and the discrimination of modal propositions into necessary, impossible, contingent, and possible, and the recognition of these as logical distinctions, rendered it imperative on the logician, as logician, to know what matter was necessary, impossible, contingent, and possible. . . . All this proceeds on a radical mistake of the nature and domain of logic. Logic is a purely formal science. It knows nothing of, it establishes nothing upon, the circumstances of the matter to which its form may chance to be applied." The consideration of modality is "impossible, first, inasmuch as logic would thus presuppose a knowledge of the whole cycle of human science; and it is impossible, secondly, because it is not now, and never will be, determined what things are of necessary or contingent, of possible or impossible, existence" (Lect. XIV.). This reasoning is poor. Logic may consider the necessary, the contingent, the possible, and the impossible, as *posited*, without involving any knowledge of things specifically considered. In pure syllogisms we assume things as simply true; we need not know whether they are true or not. In modal syllogisms we assume things as necessarily or as contingently true; we need not know whether they are so or not.

We do not object to the statement that logic pertains only to the necessary forms of thought, and that, in this sense, it is a formal science. But we ask, "What *are* the necessary forms of thought?"

That is, what are the necessary forms of inferential thought? For logic concerns this only. Are no forms of thought necessary save those which relate to the inference of that which is necessary, of that, which, as a consequent, must certainly exist, if the antecedent certainly exist? Such a limitation is gratuitous. In one sense all those modes of thought are necessary, which the nature and surroundings of the human mind require it to adopt. But, in the most absolute and abstract

What are "the necessary forms of thought?"
Contingency a
thing necessary.

sense, which is that now in question, those forms of inference are necessary which the mind must employ in gaining a knowledge of any system of things, which might exist and offer itself for our consideration.

Logic—the pure or formal logic, of which we now speak—deals only with things ontologically necessary, that is, with certain relations which must exist in any system of being. But this does not exclude the consideration of contingency. Contingency, no less than necessity, is a thing ontologically necessary, and must pertain to any system of things. The contingent is that which, under given circumstances, may be and may not be for aught that there is in those circumstances to prevent; and the conditions productive of it must exist under any state of things. Ontological contingency is a specific form of general, or logical, contingency. It is the character of that which is consistent, not with the circumstances of some specific case, but with the ultimate laws of being. It belongs to everything which infinite power could cause to be or not to be. Both this contingency, and logical contingency in general, are ontologically necessary. The ontologically contingent, of course, is not ontologically necessary; but ontological contingency itself—like logical contingency in general—is a necessary feature in any universe. If, then, contingency is a thing ontologically necessary, the laws according to which a rational intellect perceives or infers things as contingent, should certainly be determined by the science of “formal thought.” We hold that all inference, whether necessary or probable, is the subject of one ontological science, and should be explained with reference to one fundamental philosophy, which may be called the *philosophy of conditions and the conditioned*, or of *logical relations*. In this we follow Prof. De Morgan, who, rejecting the too limited conceptions of his contemporaries, entitles his work, “Formal Logic, or the Calculus of *Inference, Necessary and Probable*.”

But, in this connection, let us note a specific A fallacy exposed. theory, by which, in an indirect way, logicians endeavor to exclude *modality* from their science. They say that the necessity or contingency of propositions really belongs to the predicate, and not to the copula of the proposition; and that, therefore, there is no logical difference between purity and modality. Undoubtedly, the necessity, or the contingency, attaches itself to the predicate. That is, it has a predicational character somewhat similar to that of those signs of quantity which apparently qualify the subject of the proposition (§ 204). But, as these latter have an office of their own distinct from that of the subject, properly so called, so the former have an office of their own distinct from that of the predicate proper. They indicate the logical connection of the predicate with the subject; *they show in what sense, and how far, the latter may be the logical antecedent of the former*; and this is a most important office, because it determines the char-

acter of our inference, and the degree of our belief. When we reason thus,

Wholesale dealers are often (or probably) wealthy;
Any merchant may be a wholesale dealer; therefore
One who is a merchant is, perhaps, wealthy,

the contingencies denoted by *often* in the first proposition, by *may* in the second, and by *perhaps* in the third, affect the character of our conclusion, and are intended to do so. They are not used to qualify the predicate object. The contingency in each premise, though no part of the copula, is used simply with reference to its effect on the copula, or on our belief in that assertion which the copula expresses. Though of a predicative character they are no part of the predicate proper. No one can dispute that the major premise and the conclusion of the above syllogism have the same predicate; but the contingency of the major is not the same contingency with that of the conclusion. The former is a strong, the latter a weak, probability. And the contingency affecting *wholesale dealer* in the minor premise, does not affect this term in the major at all. In short, the reduction of the modal to the pure proposition cannot be carried out when we come to modal syllogisms: and thus it fails with respect to the only important end to be attained by it. It leaves the doctrine of reasoning as much burdened with modality as ever.

Aristotle's treatment of modality unsatisfactory. Illustrated.

But, while Aristotle is right in considering modality of inference, and his disciples wrong in rejecting it, we do not say that Aristotle's presentation of modality is sufficient and satisfactory. On the contrary, two circumstances render his discussion imperfect. *First* of all, we find no clear recognition of the true nature and purport of modal propositions. Aristotle dwells upon propositions and syllogisms which set forth the necessary and the contingent, as if the assertion and ascertainment of necessity or contingency were the ultimate aim of the mind in the employment of these modes of thought. He never mentions certainty and probability in connection with modal inference. But the essential aim of modal reasoning is to determine the grade of confidence with which a conclusion must be received. The consideration of premises as necessary or contingent, is wholly instrumental to this end. Viewing the matter in this light, it is of no consequence whether a premise or a conclusion be a necessary statement or a pure universal, or whether it be a pure particular statement, or contingent and modal. Therefore, the syllogistic forms of the "Organon" are needlessly multiplied and complicated.

Secondly, the mistaken view that all reasoning depends essentially on a perception of the relations between the wholes and parts of logical classes, led Aristotle to discuss necessity and contingency rather as modifying that perception than as to their effect on inference in general. Influenced by this main idea, he traces the

operation of pure, of necessary, and of contingent, premises, throughout all their combinations in every mood and figure. To follow these analytic labors, step by step, is a strengthening intellectual exercise, but it contributes little to one's knowledge of logic as either a theoretical or a practical science.

The syllogism given above (respecting wholesale merchants), is in the first figure, with both premises contingent. Should further illustration be desired, we might take a syllogism in the third figure ("Prior Analytics," chap. xx.).

Gilding may be costly;
Gilding may be tasteful; therefore
What is tasteful may be costly.

Here, again, both premises are contingent, but the minor premise might be either necessary or pure, and still we would have a contingent conclusion. Thus,

Gilding may be costly;
{ Gilding is necessarily tasteful; or
{ Gilding is sometimes tasteful; or
{ All gilding is tasteful; therefore
What is tasteful may be costly.

Moreover, says Aristotle, if we make the major a necessary, or on universal, negative, we can have a negative conclusion "de inesse," or of simple negation. Thus,

No slave can be well circumstanced;
A slave may be happy; therefore
Some happy people are not well circumstanced.

So much for the Aristotelian modals. Though correct forms of reasoning, they are complicated and far removed from the ultimate laws of inference. Their abandonment was justifiable, not because of their difficulty, but because of their unprofitableness. That field of discussion, however, which is presented by modal reasoning, should not, by any means, be neglected by the logician. On the contrary, since it has heretofore been only superficially developed, it should now be entered upon afresh, as if it had never been labored in before. Indeed, a true understanding of this subject is philosophically more important than the doctrine of the "pure syllogism"; it involves a deeper and clearer knowledge of the nature of all reasoning whatever.

An enlarged conception of the law of antecedent and consequent.

§ 219. Having considered *the specific forms of necessary inference* (Chaps. XLV.-VII.), it remains that we should discuss somewhat those of contingent and probable inference. The universal principle of

logical sequence is that of *the sufficient or adequate reason*, or, as it is also termed, of *antecedent and consequent*. Generally, in speaking of this law, we refer to necessary consequence, and to demonstrative reasoning. But, because rational belief in the contingent or the probable is always grounded on some sufficient or adequate reason, our conception of the law may be enlarged so as to be applicable to the sequences of contingency and of probability. We may speak of the antecedents and consequents of such sequences.

The relations of contingency and probability to necessity. Every antecedent of contingency or of probability may be regarded as part of that, which, if it were known to entirely exist, would be, in relation to the given consequent, an antecedent of necessity.

The antecedent of contingency—that is, of pure contingency—is easily conceived and defined. It is the same as an antecedent of possibility, save only that it indicates a nearer relation to reality than possibility is generally allowed to have. It arises when a number of the elements of an antecedent of necessity are known to exist, while the remaining elements, though not known, may be naturally supposed, to exist. Hearing that a friend is sick, we might conjecture him to have typhoid fever, without any special reason to give probability to this conjecture of the contingent. But, if we were informed, not only of the sickness, but also of its causes and symptoms, we might conclude, probably or certainly, that he has that disease. Contingency easily passes into, and often is identified with, a low grade of probability.

The antecedent of probability is always itself an antecedent of necessity *which admits of becoming a more determinate antecedent of necessity, in a limited number of ways*. With reference to each of these ways it is a partial antecedent of necessity to a possible consequent. Therefore, it is a partial antecedent of necessity to its own consequent of probability, which agrees with, and is supported by, one or more of the individual possible consequents, or chances. Let us suppose ten soldiers to be subjected to the sentence that three of them, to be selected by lot, shall suffer death. On the supposition that this sentence will be certainly executed, the case, with respect to each man, presents an antecedent of necessity, the consequent of which may be fulfilled in any one of ten ways. Every man is subjected to a fate—to a determination of his future; and this may happen in any one of ten ways; for any one of ten lots may fall upon him, seven being for life, and three for death. With respect to life, the case presents a consequent with the probability of seven tenths, and with respect to death, a consequent with the probability of three tenths.

Two meanings of contingency and the contingent. Aristotle's contingency.

Contingency and the contingent may be understood in two significations. First, they may indicate a form of *possibility* closely related to the probable, and which is the basis of a wholly indeterminate judgment, that is, indeterminate as regards the assertion of fact. Secondly, they may denote that form of *probability* which is asserted by a judgment more or less indeterminate, the ratio of the chances not being exactly estimated. Contingency in this latter sense may be regarded as a modification of the contingency first mentioned. For all things probable, as such, are things contingent, because the conditions of their probability render them possible either to be or not to be. These two senses are closely related also, because, as a matter of fact, we seldom dwell upon anything as purely con-

tingent, but add to this judgment the further belief that there are chances of its occurrence—that it has the contingency of probability.

Hitherto we have considered contingency chiefly in its first signification, and as a form of possibility. The inference of the contingent, viewed in this light, resembles that of the necessary, and need not farther engage our present attention, although certain interesting questions might be discussed in connection with it. Hereafter we shall chiefly consider contingency as a form of probability. We shall mean by contingent inferences, those whose premises and conclusions exhibit probability, but *a probability the degree of which is not determinately fixed*. This is the ordinary sense of terms when logicians speak of our inferring things as contingent; this is especially the meaning which underlies Aristotle's employment of the conception of the contingent. "Let us next," he says, "speak of the contingent; when, and how, and through what, there will be a syllogism. To be contingent and the contingent (*το ἐνδεχόμενον*), I define to be that, which, not being necessary, but being assumed to exist, nothing impossible will, on this account, arise" ("Prior Analytics," bk. i. 13). From these words we might suppose Aristotle to mean the contingent to be that which exists, but which does not exist necessarily. This, however, is not what he says; nor is it his meaning. For, a little farther on, we read, "The contingent is non-necessary, and the non-necessary may happen not to exist." So far, he describes that pure contingency of which we have already spoken. For, though things contingent may, and continually do, exist, this is no part of their contingency. A thing is contingent in that, if it exist, it is possible for it not to exist, and, if it do not exist, it is possible for it to exist. Pure contingency simply takes away all impossibility and renders a thing credible. Because, when one cannot deny that, for all he knows, a thing may be so, he cannot assert positively that it is not so.

But Aristotle adds to this conception, when he says, "To be contingent is predicated in two ways, one, that which happens for the most part and yet falls short of the necessary; for instance, for a man to become hoary, or to grow stout, or to fail, or, in short, whatever may naturally be. For this has no constant necessity. . . . The other way is the indefinite, and is that which may possibly be thus, and not thus; as for an animal to be walking, or, while it is walking, for an earthquake to happen, or, in short, whatever occurs *casually*; for a thing does not take place thus more naturally than its opposite." Then Aristotle adds that arguments and speculations generally concern the contingent which happens *naturally*, that is, according to such a natural tendency that we can form a probable judgment about it. Concerning those contingencies which are casual, and wholly indeterminate—in other words, pure contingencies—Aristotle says that we may make a syllogism, "But it is not generally inves-

tigated." Then, under the head of Contingency, he goes on to discuss syllogisms of probability: and the only probable syllogism of which Aristotle speaks is this syllogism of contingency.

Our ordinary judgments of probability do not closely determine the ratio of the chances. They only assert that the chances, that is, the majority of the chances, in some case, favor a given supposition. They are judgments of contingency in the sense principally contemplated by Aristotle. These inferences are less exact than those in which the ratio of the chances is ascertained mathematically, and, therefore, they are uncertain and doubtful, not only in the sense of falling short of absolute conviction, but also in the sense of leaving the degree of conviction indeterminate. By means of them we know that a thing is probable, but not just *how* probable. Yet such reasonings are often the best which circumstances admit; and they are of greater practical importance than those in which the chances can be accurately calculated. So far, however, as they positively exercise judgment and belief, they are of the same nature, and obey the same general laws, as our more exact judgments of probability.

The two styles of inference, which we have named *orthological* and *homological*, are employed in this contingent or probable ratiocination, as well as in that which is demonstrative. Sometimes a case presents a sufficient reason for a probable inference without reference to any other case in which a similar ground for such a judgment may have been perceived; and, at other times, an antecedent is held to render an event probable, because it is like some other antecedent which has been found to have that effect. The reason, on account of which the homologic principle may be applied in probable, as well as in demonstrative, inference, is that the necessary condition, which makes a thing possible, and the necessitant condition, which makes it certain, are subject to the same law, viz., that similar antecedents have similar consequents. This common property is connected with that necessitative character which is common to necessary and necessitant conditions (§ 84). But, since the necessitant is always composed of necessary conditions, we may suppose the homologic principle to attach primarily to the latter, if it belong primarily to either.

Orthological contingent reasoning may be illustrated from any immediate calculation or determination of the chances. If an urn contain ten white and five black balls, or any number of black and white balls in the proportion of five to ten, we can immediately say that the likelihood of drawing a white ball is as two to one, and that of drawing a black ball as one to two. If a man live in one of ten houses, we know not which, we need no rule to say that the probability of his living in some one of them taken at random is indicated by one tenth. If three fourths of the voters in some election precinct are illiterate, it is self-evident, respecting any one of them, that there are three chances

The probable contingent.

Orthological and homological probability. The former illustrated.

to one of his being illiterate. If the statistics of ten thousand individuals who lived till they were forty years of age, show that nine tenths of them lived on till they were sixty years old, then there is an immediate probability of nine tenths, respecting any one of those ten thousand, that he attained the age of sixty.

Homologic probability. Illustrated. Two possible orders of thought.

§ 220. From any conclusion of orthologic probability we might reason homologically as to any case presenting a similar antecedent. But, when the case, considered simply in itself, and without reference to any previous case, presents an antecedent of probability, it is commonly easier and better to make a direct or original inference. The homological inference of probability may be looked for in cases where the chances can be ascertained only through the aid of the homologic principle. For frequently we cannot immediately determine the ratio of the chances, but must obtain this by questioning a past experience. Let the question be, "What is the expectation of life for a man forty years of age and in good health, *who is now living?*" Consulting extensive statistics, we find that, in the whole number of recorded cases, nine tenths of those who have reached forty, live at least twenty years longer. From this we infer, orthologically (as has been said above), respecting any of those individuals whose cases have been recorded, that, at forty years, he had an expectation of twenty years, with a probability of nine to one. Then, assuming that the lives of other men are subject to similar tendencies and conditions, we say, homologically, that any, or every, man forty years old, has the probability already mentioned of reaching the age of sixty. In the foregoing statement, the following succession of thought is supposed; *first*, the statistical information that nine tenths of that large number of men observed lived till they were sixty years old; *secondly*, the inference respecting some one of them that, at forty years, his chances of living twenty years more, were nine to one; and, *thirdly*, the homological conclusion that this expectation of life belongs to any one, or to all, of that large number of men who are forty years old, and who are now living. The succession of thought, however, might be, and generally is, different from the foregoing. We might have, *first*, the statistical information as before; *secondly*, the paradigmatic or principiative inference that nine tenths of *any* large number—or of all—men, who reach forty, live till sixty; and *then*, the inference of probability that any man of forty has the given expectation of life. In the first order of procedure, the homologic principle furnishes the last step, and may be said to act on the principle of probability, which operates in the middle of the process; in the second order the principle of probability governs the third step, and may be said to act on the homologic principle, which justifies the principiation. In both cases alike, these principles combine their operation, and produce homologic reasoning in probability. Moreover, by either process, a general rule of probability may

be formed which can be employed afterwards without reference to its origin.

The tychologic principle of inference, combines with others but is distinct from them.

Here let us note that these laws of inference, which thus combine their operation, are distinguishable from each other. The homologic principle of itself does not affect the grade of one's belief; like the principle of possibility, or pure contingency, it is, in a sense, apodeictic. The law of probability, alone, requires our confidence to vary according to the ratio of the chances. In order to indicate the nature of this law, and to give it a convenient name, it might be called the *tychologic* principle. For some distinctive designation is needed when we would speak of the radical principle of all probable inference.

Probable inference has a form of thought appropriate to itself. A false doctrine exposed.

In this connection, we must notice a theory which Hamilton and other Kantian logicians teach by means of their conception of *pure or formal logic*. They make this logic to concern "the absolutely necessary forms of thought without which no use whatever of the understanding is possible," and then they identify these absolutely necessary forms with those of demonstrative reasoning, or, at least, with certain general and comprehensive demonstrative forms. And thus, since probable reasoning is a use of the understanding, they teach that it employs the same forms of thought as demonstrative, that, in short, *the probable syllogism is made up of the same propositions as the demonstrative, but differs only in the weakness of its premises and in the consequent weakness of its conclusion*. We regard this view as erroneous. Demonstrative, contingent, and probable, reasoning have each a form of thought peculiar to itself. All conform to the general law of reason and consequent; in every case we can say, "A exists; therefore B exists." But, in necessity, A is conceived as embracing a logical or necessitating condition of B; in contingency, as including merely necessary conditions of B; and, in probability, as the foundation of chances for B. When, therefore, the premises of any syllogism in necessity give a probable conclusion, this is not because the probable syllogism is necessarily based on the demonstrative, but because probable may be combined with necessary inference. When we say,

A may be equal to B;
B is equal to C; therefore
A may be equal to C,

the contingency of the conclusion comes properly *from the contingent premise*. It is only accidentally connected with the structure of the syllogism, which is purely apodeictic. But, should we say,

A is one of a number of quantities, some of which are severally equal to B;
Therefore A (contingently or probably) may be equal to B;

this syllogism would express that form of thought which is essential or peculiar to probable inference. When a syllogism of a demonstrative form has a probable conclusion, this results sim-

ply because the apodeictic reasoning conveys to the conclusion a probability previously inferred, and not because probable and necessary inference have the same form of thought.

Homologic probable inference chiefly takes place in reasonings respecting the laws and events of nature.

What we have now said, taken in connection with former discussions (§ 86), may suffice for the orthologic inference of probability. A great field of investigation remains untouched regarding homological probability. For, although the homologic principle itself operates with the same simplicity, in probable reasoning, that it does in demonstrative, considerable difficulty has been experienced in regard to the fundamental ground on which our ordinary inferences of homological probability are based. These inferences take place *when we determine, with more or less confidence, the law of some natural, or cosmical, sequence.* The inquiry after causes or consequences, which may exist in any part of the actual universe, necessarily involves the homologic principle; and the conclusions of this inquiry, so far as they are affected by probability, are the only probable conclusions to which homological reasoning is an indispensable condition. Let us investigate the grounds on which our convictions, respecting the laws or operations of nature, rest for their truth or probability.

We may open this discussion with the remark that, *for present purposes, parallel, or paradigmatic, reasoning may be classed with deductive.* These modes of inference are alike in this respect, that they immediately depend on the perception, or assumption, of likeness between some known and some alleged antecedent. In both we say,

A is the antecedent of B;
C is similar to A; therefore
C has a consequent similar to B.

The only difference is that deduction employs the abstract and general premise, which is derived by principiation from the individual, or particular, case of sequence, while paradigmaticization proceeds immediately from one individual, or particular, case to another. If we neglect the question whether the first premise involve principiation, and regard that premise simply as the statement of a sequence, paradigmatic and deductive inference may be classed together as of the same nature, and as being both, equally and essentially, dependent on the similarity of C to A. In both cases, this similarity must be *perfect* as regards those elements which make up a logical antecedent; it is what we often mean by *sameness*, and what we may call *logical identity*. Reasoning from a general principle, we say,

Man is mortal;
The Duke of Wellington is a man;

(that is, is identical with a man),

Therefore, he is mortal.

Reasoning from a parallel case, we say,

John, Thomas, and others, have died by reason of their physical constitutions;
The Duke of Wellington is the same as John, Thomas and company, in his physical constitution; therefore
He is mortal.

As the paradigmatic and deductive processes both assume the prior sequence from which the inference proceeds,—viz., that A is the antecedent of B,—it is plain that any probability *which may be specially connected with either of these modes of inference*, must arise in connection with the assertion that C is identical with A.

Only two modes of probable homological reasoning ordinarily recognized.

Such being the case, it is not surprising that only two radical modes of probable homological inference are recognized, one of which is essentially principiative, and is called *induction*, or, more properly, *probable induction*, and the other of which is either paradigmatic or deductive, and is called *reasoning by analogy*. The terms *induction* and *analogy*, which are frequently to be met with in discussions respecting inference, do not, of themselves, necessarily imply a probable conclusion. They primarily indicate two modes of procedure, in each of which we reason respecting natural causes and effects. Inductive and analogical reasonings are called probable, not because the conclusions of them are necessarily affected with probability, but only because this happens generally, or for the most part.

The term *induction* defined. Introduced by Cicero. Induction illustrated and analyzed.

§ 221. Induction takes place when some natural law is inferred to exist whether as a rule of necessary and universal, or of contingent and probable, application. The term *induction* was first used by Cicero in translating *ἐπαγωγή*, a word which Socrates employed to signify the bringing of a number of instances so as to justify a general statement. This conception was naturally enlarged so as to include, not merely the collecting of similar cases of sequence, but also that *whole procedure* of comparison, analysis, abstraction, and principiation, which the collection of such facts is designed to facilitate. Finally, because logical discussions dwelt chiefly on the final result, the formation of the general truth, induction came to signify the act of principiation,—the inference of general principles from particular cases. Thereupon, logicians, for the most part, spoke no longer of the induction of facts, but of the induction of principles.

The essential nature of induction may be illustrated from the generalization of any causal sequence. Salt, thrown into pure water, is seen to be dissolved; from this we conclude that water dissolves salt. Ardent spirits are found to make men drunk; therefore we say that wine or whiskey produces intoxication. A lucifer match, when struck, gives forth flame and light; from this we infer that all such matches will do the same. Induction, as distinguished from analogical inference, involves a complete and fixed conception of the antecedent of the consequent to be inferred. It presupposes a knowledge of what the mingling of salt with water is—of what the drinking of ardent spirits is—of what the striking of the lucifer match is; and it asserts that a specific consequent follows each of these antecedents. Without a complete and fixed conception of the indi-

vidual or particular antecedent, no reliable conception of the general antecedent could be formed. But *complete*, here, means only that which includes all the necessary conditions for a sequence; any circumstance found to be unnecessary to the sequence, may be dropped from the conception.

The inductive inference is certain, provided we are certain as to the original sequence; *it becomes probable when the operation of causes is such that a given consequent follows a given antecedent, not always, but only sometimes, or for the most part.* This happens when some power, adequate to produce a result, is occasionally counteracted, or hindered from its regular operation, or when some tendency, which needs advantageous circumstances to render it effectual, is only sometimes attended by such circumstances. Ordinarily, a wound produces pain; but mental excitement, or bodily stupor, or rapidity of infliction, may prevent this. Therefore we can only say that a wound is likely to produce pain. We reason in this wise: first, in necessity, we say,

Most wounds, which have been observed, have caused pain;

then, by principiation,

Most wounds produce pain;

and, finally, by the tychologic principle,

A wound is likely to produce pain.

Because any wound *may* be one of those which cause pain.

Analogical, as distinguished from inductive, reasoning includes both paradigmatic and deductive inference respecting natural sequences. The term *ἀναλογία* was first employed by arithmeticians to signify that equality of ratios which constitutes a proportion. In the statement, $3 : 6 :: 9 : 18$, the two pairs of numbers present an analogy, or equality of ratios. The ratios of any proportion present an instance of the similarity of relations; for, being equal, they are perfectly alike in numerical value. Moreover, if three terms of a proportion be given, the remaining term can be ascertained. In solving any problem in proportion, we think of four terms, two of which are called antecedents, and two consequents; of the two antecedents each is related to its own consequent in the same way as the other is related to its consequent; and, if three terms—an antecedent and its consequent and another antecedent,—be given, the remaining consequent can be found. In these particulars, the arithmetical inference—though really orthologous, and not homological—bears an external resemblance to those modes of reasoning which we have called paradigmatic and deductive, in both of which we infer some consequent similar to a known consequent, because we have found an antecedent similar to a known antecedent. The resemblance is merely superficial; for the existence of the arithmetical antecedent does not necessitate or imply the existence of its consequent, whereas it is the essence of a logical antecedent to involve the existence of its consequent; and all homological reasoning is dependent on

The history of the term *analogy*.

this principle. Speaking logically, the whole fact $a : b :: c : x$, is the antecedent, and the answer to the problem, viz., $x = \frac{bc}{a}$, is the consequent. Some writers, not perceiving the radical difference between arithmetical and logical analogy, have defined the latter as a resemblance of relations, and have supposed the similarity of arithmetical ratios to be a proper illustration of it. Logical analogy is the similarity of *necessitant* or *necessitative*, that is, of *logical*, relations; and is very different from mathematical proportion. It received the name *analogy*, which it has now wholly appropriated, only because of that superficial resemblance of which we have spoken.

Analogy and analogical reasoning defined.

This analogy was anciently defined as the *ἰσότης τῶν λογῶν*, that is, the parity of reason, or parallelism of inference, which exists between two or more cases which exhibit similar logical antecedents. In this broad sense, *analogy* might signify the ground of homological reasoning in general. But the expression *reasoning from analogy* would especially describe that paradigmatic or deductive inference in which the similarity of the alleged to the known antecedent is formally considered and relied upon. Commonly, however, this phrase signifies reasoning from, or according to, the *analogy of nature*; it does not set forth parallel reasoning in general, but only a specific case of it. For, ordinarily, in analogical reasoning, we assume that a certain kind of causation can be, and is, distinctly perceived in many natural sequences, and may, therefore, be inferred in other cases which present antecedents more or less similar to those in which it has been already perceived. We, therefore, define analogical inference as *that reasoning which turns upon the assertion that an alleged natural antecedent is similar to a known natural antecedent; and in which we assume that whatever in the natural universe resembles a known reason, is, certainly or probably, a true and sufficient reason.*

Bishop quoted.

Butler

This style of argument is employed by Bishop Butler, in his "Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature"; and is, somewhat inadequately, described by him in the introduction to that famous book. He says, "Probable evidence is essentially distinguished from demonstrative by this, that it admits of degrees; and of all variety of them, from the highest moral certainty, to the very lowest presumption. When we determine a thing to be probably true, suppose that an event has or will come to pass, it is from the mind's remarking in it a likeness to some other event, which we have observed has come to pass. And this observation forms, in numberless daily instances, a presumption, opinion, or full conviction, that such event has or will come to pass; according as the observation is, that the like event has sometimes, most commonly, or always, so far as our observation reaches, come to pass at like distances of time or place, or upon like occasions. Hence arises the belief that a child, if it lives twenty years, will grow up to the stature

and strength of a man; that food will contribute to the preservation of its life, and the want of it for such a number of days be its certain destruction. It is not my design to inquire further into the nature, the foundation, and measure, of probability; or whence it proceeds that likeness should beget that presumption, opinion, and full conviction, which the human mind is formed to receive from it, and which it does not necessarily produce in every one; or to guard against the errors to which reasoning from analogy is liable. This belongs to the subject of logic, and is a part of that subject which has not yet been thoroughly considered. It is enough to the present purpose to observe, that this general way of arguing is evidently natural, just, and conclusive. For there is no man can make a question but that the sun will rise to-morrow, and be seen, where it is seen at all, in the figure of a circle, and not in that of a square." These remarks of Butler do not distinguish between the inductive and the analogical inference, but they apply throughout to the latter as we have described it.

Ontological contingency and philosophical probability. Dugald Stewart quoted.

They may introduce two statements explanatory of the doctrine that analogical and inductive inferences are modes of probable reasoning. *First*, although these inferences sometimes, and even often, produce perfect or demonstrative conviction, there is a sense in which they concern only the contingent, and result only in probable conclusions. Although the generic relation of cause and effect is a thing ontologically necessary, those specific modes of operation which inductive and analogical reasonings contemplate, are ontologically contingent. A state of things might exist in which those connections of cause and effect which we are accustomed to see, might no longer exist, and in which other causes and effects, entirely new to us, might take their place. Therefore, inferences respecting specific natural laws and operations are of things which might be otherwise; with reference to this, they may be called *conclusions in contingency*. Though such inferences may be perfectly certain, they are termed probable, because they concern sequences which are not necessary and certain by reason of the very nature of things, but which are *provable* (probabilia), and which require to be proved by observation. Philosophers have noticed the two meanings of the word *probable* thus produced; yet have scarcely distinguished them sufficiently. "The word *probable*," says Mr. Stewart, "does not imply any deficiency in the proof, but only marks the particular manner of that proof, as contradistinguished from another species of evidence. It is opposed, not to what is certain, but to *what admits of being demonstrated after the manner of the mathematicians*. This differs widely from the meaning of the word in popular discourse. But, although, in philosophical language, the epithet *probable* be applied to events which are acknowledged to be *certain*, it is also applied to events which are called probable by the vulgar. The philosophical mean-

ing of the word, therefore, is more comprehensive than the popular; the former denoting that species of evidence which contingent truths admit, the latter being confined to such degrees of this evidence as fall short of the highest" ("Elements," part ii. chap. ii.). This philosophical employment of the term *probable*, evidently arose because a common name was desired for all inferences based on laws or principles ontologically contingent. But many such inferences take place not merely certainly, but without any reference to the tychologic principle; while orthologic inferences in probability, such as the pure calculations of chance, follow principles which are not ontologically contingent, but which must be laws of logical sequence in any universe. Therefore, that philosophical probability, of which Stewart speaks, differs, not in degree merely, but in its nature, and in its sphere, from that probability which logic ordinarily discusses. The generalizations of natural law, and our deductions from them, are often made with absolute certainty. In such cases, our inferences, though philosophically, or metaphysically, probable, do not really differ from ordinary homologic demonstration. Many of the teachings of science may illustrate this statement. How positive are the leading statements of chemistry and natural history, of mechanics and of astronomy! Many absolute convictions also regulate our daily life. One knows certainly from experiment that fire produces heat, and that if he put his hand into the fire, it will be burned; and we form and employ such beliefs without any reference to the ratio of the chances. There are, therefore, two styles of probability; but, at present, we are principally concerned with *vulgar*, or logical, probability.

The term *analogical* commonly, though not necessarily, restricted to probable inferences.

Our *second* statement refers to this ordinary, or logical, probability, and to a contrast which exists, between the inductive and the analogical inference, with respect to it. *It is commonly held that analogical reasonings always result in presumptive or probable conclusions, whereas it is allowed that the conclusions of induction may be either certain or probable.* The reason for this seems to be that, in absolute or demonstrative, no less than in probable, induction, there is evidently a process of principiation, in which some general law is ascertained from the individual instances of its operation; but, in the case of analogical reasoning, absolute conclusions, though no less dependent on the comparison and perceived resemblance of antecedents than those which are probable, are not apparently so dependent. They arise when there is that perfect and entire similarity which we have called *identity*, and this, being perceived by us easily and instantaneously, is as instantaneously dismissed from thought. For this reason we pass from the original sequence to the conclusion, without dwelling on the parallelism between them, and call our reasoning *deductive*, and not *analogical*. We find that a solid body, let fall from any attainable height, approaches the earth with a force proportional to its quantity of matter. Ontologically this might

be otherwise; cosmologically, it is a necessary law. From this law we reason, demonstratively, that any given piece of solid matter, disengaged from a height, will descend earthwards with a force similarly proportioned. And we style such reasoning *deductive*, though it follows the analogy of nature. But, when the similarity of the antecedents falls short of complete identity, and produces an inference that is only probable, we call the inference *analogical*. For the points of resemblance between an alleged and a known antecedent, necessarily arrest the attention when we are judging how far a partial, may indicate a complete, identity. Thus frequently, indeed generally, the conception of analogical reasoning is *limited by combining it with the notion of probable inference*.

§ 222. This probable analogical inference may be illustrated from the conjecture of Sir Isaac Newton regarding the gravitation of the moon; which occurred to him in the year 1666, while he was yet a young man, only twenty-four years of age. The following particulars of it are given in the preface to Pemberton's account of Newton's philosophy. "As he sat alone in a garden, he fell into a speculation on the power of gravity; that, as this power is not found sensibly diminished at the remotest distance from the center of the earth to which we can rise, neither at the tops of the loftiest buildings, nor even on the summits of the highest mountains, it appeared to him reasonable to conclude, that this power must extend much further than was usually thought. 'Why not as high as the moon?' said he to himself; 'and, if so, her motion must be influenced by it; perhaps she is retained in her orbit thereby.'" Evidently, the supposition of the moon's gravitation arose in Newton's mind, because he regarded that satellite as a solid sphere, and because he saw that her constant deflection from a tangent to her orbit was similar to the motion of a falling body. A falling moon, being an antecedent similar in some respects to a falling stone, suggested, as a consequent, gravity in the moon operating in the same way as the gravity of the stone. Yet this analogy did not produce strong conviction. So long as Newton was ignorant whether the motion of the moon *exactly* corresponded with those of falling bodies, he only said, "Perhaps she is retained in her orbit by gravity." After his first calculations, made on incorrect data, indicated that the moon did not obey the law of gravitation, he laid aside his conjecture as valueless. But, after some years, more perfect data established the exact correspondence between the moon's motion and that of a falling body, and turned his analogical conjecture into a satisfactory paradigmatic, or deductive, inference. By a similar course of reasoning he found that the movements of some of the planets conform to the law of gravitation; and, thereupon, he felt justified in the wide induction that all planetary bodies are governed by this law.

Newton's reasonings respecting gravitation are a fair example

of wise speculation, and may illustrate the way in which analogical inference often prepares for, and terminates in, some far-reaching and satisfactory induction. In the simple inductions, either of science or of daily life, the identity of antecedents and their connection with their consequents, are things easily recognized. Such inductions exhibit little or no dependence on previous analogical conjecture. But the more fundamental laws of nature are not open to such easy and immediate discovery. Most of the deeper doctrines of science have originated from the analogical inference of causes or laws, which subsequent observation and experiment have shown to be real causes or laws, and adequate for the explanation of the facts investigated.

Distinguished from inductive inferences.

Pres. Porter's view of induction.

Analogical may be distinguished from inductive inference because the former, properly and of itself, is not principiative, while the latter always is. Induction simply asserts a sequence in general terms; but analogical inference, assuming the truth of a sequence, asserts something essentially similar to the known consequent because of the existence of something similar to the known antecedent. It partakes more of the nature of deduction, than of induction. The term *induction*, however, is not always confined to the principiation of observed sequences; it is sometimes employed to indicate *that whole process of investigation and reasoning* whereby we ascertain the existence and character of some natural law. In this sense the analogical and the inductive inference, as we have described them, are only *specific methods of inductive reasoning*. The term *analogical*, likewise, admits of a wide application; it may characterize every form of homological inference respecting natural sequences. This comprehensive use of terms, together with a rather exclusive attention to the more recondite investigations of science, has led some writers to describe the inductive process as consisting chiefly of analogical reasoning ("The Human Intellect," §§ 465-499). There is a sense in which analogical reasoning is inductive, and there is a sense in which inductive reasoning is analogical; but such language should not be allowed to produce confusion. For, as we have seen, there is another sense, according to which analogical and inductive reasonings, though closely related to each other in nature and in use, may yet be contrasted with one another.

The principle of inductive and analogical inference rests on the law of causal necessity. Yet is not purely ontological.

The ultimate principle which justifies both these forms of inference is ontological, and may be called *the law of causal necessity*. Every inductive or analogical inference is, in some way, an application of the requirements of this law. We do not always infer from cause to effect; we infer from effect to cause, or from one effect to another connected with it through being related to the same cause. We also reason from the non-existence of the cause to the non-existence of the effect; and conversely. Any mode of logical sequence which is con-

nected with causational necessity may be a ground of inductive inference.

Inductive, and yet more evidently, analogical inference, founded on the analogic principle.

§ 223. But here it is important to remark that our ordinary reasonings respecting natural events are not confined to the direct and immediate employment of ontological principles, but *are based, quite as much, on a peculiar law of causational sequence, of the knowledge of which the human mind in some way becomes possessed.* The recognition and use of this principle (which might be called the *analogic*) *is traceable even in our simple inductions.* When we certainly infer and expect the melting of salt from its mixture with pure water, or the intoxication of the brain from the use of alcoholic stimulants, or the blaze of light from the striking of the lucifer match, we say truly that we expect the same effect from the same cause, and that this is the law of our inference. But the question arises, "How do we know that, in each case, the cause *is* the same?" Might not the apparent antecedent be really different from that previously observed? Our observation, in any case of sequence, may not take in the whole cause, but only a part of the cause, or something connected with the cause; and so, when a subsequent case presents an antecedent apparently identical with that already seen, this may not show assuredly that the first antecedent has been repeated. Some other substance might have the sensible qualities of salt or of water, of wine or spirits, or of the lucifer match, without being the thing itself, and without having the properties which we make the subject of our inquiry. We might, without absurdity, suppose a system of things in which something having all the sensible qualities of salt or alcohol, would not have any other qualities of the substance, and would not, for instance, dissolve in water, or produce intoxication, the reason being that it was not really and fully of the nature of salt or of alcohol. There might be a universe in which like causes would always produce like effects, but in which, nevertheless, we could have no assurance that any cause, which seemed to us identical with another, was really so. Clearly, induction assumes that the causal conditions of nature are permanently combined in wholes, or systems, which can be distinguished from each other by marks or characters—that is, by noticeable parts indicative of the wholes to which they belong. It is by reason of this constitution of things that a knowledge of general causes and of laws, and therefore, also, the employment of natural agencies, become possible for rational beings. In short, induction assumes that the universe, or at least that portion of the universe wherein we dwell, is, by reason of certain characteristics in its formation, adapted for the comprehension of creatures having an intelligence like ours.

Such adaptation *is yet more manifestly assumed in the probable inferences of analogy.* These assert the existence of a consequent, because of the partial existence of an antecedent. Sir Isaac

Newton inferred that the moon is governed by gravitation, because some power continually draws her from a straight course—that is, from a tangent to her orbit—in the direction of the earth, though he could not tell whether her earthward movement was identical in its law with that of falling bodies or not. Lavoisier conjectured that rust was produced by oxygenation, because the rusting of metal resembles the wasting of wood produced by burning, in which oxygen combines with the fuel. In such cases there is an expectation that the partial and insufficient, may, upon further inquiry, be replaced by a complete and sufficient antecedent, either identical with that originally observed, or at least containing all its necessitative elements. The partial antecedent suggesting the moon's gravity, was replaced by a complete antecedent identical with that which indicates the gravity of any falling body; and the partial antecedent which suggested the oxygenation of the metal, was replaced by a complete one when experiment proved that a certain kind of change, whether produced by burning or by rust, is indicative of oxygenation.

The question, then, arises, "Why do we expect a complete, because we have found a partial, antecedent?" The existence of some of the elements of the known antecedent, in itself merely supports the possibility of a like necessitant; it does not support a probability. There must be some adequate ground for believing that a partial antecedent in causal necessity, renders the existence of a complete antecedent more or less probable. Such a belief is certainly wise and rational. Let us endeavor to discover the ground of it.

The essential nature and various modes of the analogic principle explained.

If we knew that three lines were drawn on a slate by a child incapable of mathematical design, we could say that those lines might form a triangle, that they present an antecedent of possibility. Drawn by some one gifted with mathematical knowledge, but whose purpose is entirely concealed, they might be called an antecedent of contingency. Drawn by a mathematician, in the prosecution of his studies, they would be an antecedent of probability. For, in the majority of cases, in which only three lines are used in mathematical demonstration, they are employed to form a triangle. In like manner, an assemblage of conditions, considered abstractly as a possible part of some antecedent of causal necessity, produces only the inference of possibility, but, *as a part of the operations of nature*, it supports the probability of a complete and sufficient antecedent. We cannot but suppose that the workings of nature—or of that Supreme Cause which nature manifests—are conducted according to fixed rules or analogies. When, therefore, one natural fact even partially resembles another, we expect that its causal relations will be similar to those of the other. In short, ordinary inductive and analogical reasonings assume that *nature has an orderly constitution, in which permanent and permanently recurring combinations of causal conditions form distinguishable antecedents.*

The doctrine of the intellectuality of nature includes that—

1. Her uniformity,
2. Her parcimony,
3. Her analogies,
4. Her final causes.

This truth might be stated by saying that *nature has an intellectual constitution*, meaning by this a constitution such as rational purpose would naturally originate, and such as rational thought can understand and approve. We shall not now discuss whether this structure of the universe could come from any other than an intelligent source, and whether the existence of an intelligent First Cause may not be inferred from principles which thoughtful scientific investigations assume as fundamental. But, beyond question, the human mind is constantly guided by the conviction that order, wisdom, and design, rule in the visible creation.

This belief, that the constitution and workings of nature conform to rational order and exhibit intentional methods, has long been recognized by philosophers as a sufficient basis of probable conjecture, and even of confident inference. Certain rules of judgment rest on this belief alone. Such is the maxim that *the course of nature is fixed—or regular—or uniform*. This is not a law of ontological necessity; it is a statement of the truth that the course of nature exhibits principles or methods such as result only from rational control. The law of *parcimony*, which is, that a plurality of laws or agencies is not to be assumed when a phenomenon can be explained by one law or agency, and that, in general, the simpler explanation, if sufficient, is to be preferred, is another and more specific recognition of rational ordering. Reason always prefers the simpler method, if it be equally adequate with the more complex. Again, when philosophers found arguments on *the analogy of nature*, they do not mean simply that they reason from one case of causation to another which has a similar antecedent. They express the expectation that nature will be found to have employed similar methods in similar circumstances, even though different methods might have proved equally effective. This presumption rests on the belief that the workings of nature not only follow intelligent direction, but have also been rendered suitable for the comprehension of such intellects as ours. Scientific speculation, also, avails itself directly of the conception of *final cause*, or *purpose*; and assumes that wisdom operates in nature so as to adapt means to ends. Aristotle's division of causes into the material, the formal, the efficient, and the final, came from analyzing the natural judgments of men in the explanation—and in the interpretation—of the phenomena of nature. For we cannot but ascribe these partly to design. In analogical reasoning the conception of final cause is employed in two ways. We may either infer the operation of such a cause from effectuated adaptation, or we may infer the existence of adaptation from that of a final cause. The probable operation of *design* is inferred as follows. First, some wise combination of agencies is seen to produce a given result; then we discover elsewhere the existence of some parts of a similar combination; thereupon we conclude that a whole combination, with the power of accomplishing a similar work, exists, or has existed.

The finding of a few fossil bones convinces the geologist that some huge animal has lived with a body capable of motion and of vital functions generally. But we infer *adaptation* from design, when something, whose use is not manifest, is plainly a part of an organized system. When, for instance, many parts of the human body serve various ends—the use of eyes, ears, hands, feet, and so forth, being obvious—we expect to find every other part fitted for some useful purpose; and we endeavor to discover the design of it. The science of physiology originated in the belief concerning final causes, and has continually employed the maxim that there is no organ without its function.

It is true that the conjecture of the operation of a final cause in nature, on the ground of some partial or possible adaptation, and without corroborative investigation and experiment, remains a mere conjecture, a feeble hypothesis. Many noted theories, which subsequent discoveries have disproved, have been constituted in this way. Referring to such insufficient ratiocinations, Bacon declared the inquiry into final causes to be sterile. Mere theorizing is worse than sterile, if it be arbitrary, and careless of the analogy of nature, and fitted chiefly to show how some imaginative thinker can construct a consistent system. But conjecture, founded on a true knowledge of the similar, and followed by investigation into the actual sequences of some department of created existence, often proves a valuable aid to scientific progress. Sometimes, when supported by a close analogy, it even produces strong conviction, as in the inference above mentioned respecting animal life in geologic periods. The principle of final cause, also, sustains a decided negative conclusion. We reject, as absurd, any statement which ascribes to nature a palpable want of wisdom. It would take powerful evidence to convince any sensible person that there is a race of men whose countenances face backwards and not forwards, or who have eyes in their heels instead of in their heads.

This doctrine, of the intellectuality of nature, is held alike by the profoundest thinkers and by mankind at large. Aristotle recognizes it in asserting, "God and nature do nothing without reason,"—"ὁ θεὸς καὶ ἡ φύσις οὐδὲν μᾶτην ποιοῦσιν" ("De Cælo," i. 4). Kepler expresses the same sentiment when he exclaims, "O God, I think Thy thoughts after Thee!" These sayings of eminent men simply give utterance to the common conviction of mankind, that order, adaptation, and design, exist, and are to be expected, in every department and operation of the universe.

Since, then, this principle of final cause—of the intellectuality of nature—is confidently used, as a rule of inference, by all who investigate the works and laws of the actual creation, the question arises, "In what way have thinking men come to accept, and rest upon, this principle?" On this point two theories contend for our approbation. One of these was advo-

The inference from final causes. Its value. Bacon, Aristotle. Kepler.

The origin of our conviction respecting the intellectuality of nature. Two theories. Reid, Porter, Mill.

cated by that greatest of Scotch philosophers, Dr. Thomas Reid. He places the doctrine that "design and intelligence in the cause may be inferred with certainty from marks or signs of it in the effect," among "the first principles of necessary truth"; and argues, at considerable length, that "we can not learn this truth from experience." In this Reid follows Descartes and Leibnitz, and has been followed by very eminent men. President Porter, in his chapter on final cause, asserts that "the relation of means and end is assumed *à priori* to be true of every event and being in the universe, and that the mind directs its inquiries by, and rests its knowledge upon, this, as an intuitive principle" ("Human Intellect," § 608).

To this doctrine we prefer an opinion somewhat similar to that which Mr. J. S. Mill expresses respecting our confidence in the uniformity of nature; for this belief, as we have said, may be regarded as one specific form of the belief in final causes. Mr. Mill teaches that our conviction of the regularity of the constitution of nature is an induction, of a very general character, which is presupposed in our more specific inductions of natural laws, and enters into them, as a common element. The discussion, in which he advocates this view, makes no distinction between the simple law of causation, which is ontological, and the law of the uniformity of nature, which is cosmical. According to the first of these principles, there can be no effect without a cause, and the same cause must have the same effect; but the second only asserts that nature maintains the same methods in her operations and continues to seek similar ends by similar instrumentalities. No system of things could exist in which events would be free from the law of causation; but we can conceive of a universe in which the operation of causes would be without adjustment or design, and would only contribute to the perpetuation of chaos. This confusion of things different greatly lessens the force of Mr. Mill's argument; but it could not have been avoided under a system which reduces all reasonings to mere associations of ideas, which makes the inductive judgment only a mental association, and the axioms of mathematics only strong inductions. At the same time we approve of the position that *man's belief in the uniformity of nature is a generalization from experience*; for we believe it to be part of that deeper and broader induction whereby we discover rationality in nature.

The foundation for this conviction is laid *when man first perceives that no exercise of his own power is adequate to adapt means to ends, unless it be guided by intelligence*. He discovers such an adaptation in one of the productions of nature, then in another natural arrangement, and another, till, finally, he concludes that rational methods pervade every part of the creation. This being the case, he looks for, and finds, the workings of a wise intelligence, and is guided by this expectation in his subsequent investigations and reasonings. Such, we think, is a true and suf-

A homological inference from the formation and use of instrumentalities by man himself.

ficient account of that belief in the intellectuality of nature, which every thinking man entertains, more or less consciously.

Were a suitable name desired for this law of inference, it might be distinguished, by the name already given, as *the analogic principle*; and, although it is not an expression of pure ontological necessity, it is a most fundamental law.

The probability of analogical conclusions traced to the tychologic principle, which combines with the analogic.

The rules of analogical, broader than those of inductive, probability.

The degree of our conviction in the case of a probable conclusion from analogical reasoning is not so easily traced to an application of the tychologic principle as it is in the case of a probable induction. The induction is based on a perception of the course of nature in connection with some one defined cause or antecedent. Let us suppose that, in fruit-culture, the apple crop has been found to be a failure one year in three; upon this basis, in the absence of

further information, we estimate the prospect for a profitable crop from any particular orchard as having the probability of two thirds. Here the apple tree, year after year, furnishes the same definite antecedent. But analogical conjectures take place in cases in which no such antecedent presents itself; and in which we must fall back on more general considerations. When Sir Isaac Newton, from a partial resemblance between the motions of the moon and those of falling bodies, conjectured that the same law might account for both, the probability of his hypothesis, so far as it had any, arose from the general conviction that in some, though not in all, instances in which natural phenomena resemble each other, they are due to the same causal antecedent. In other words, Newton employed a rule of indeterminate probability, which assumed the uniformity of the methods of nature, and which was, in fact, a judgment, founded on experience, respecting the value of indications of that uniformity. He had no doubt that nature follows analogies, and that the same causal antecedent would have the same consequent; but he was in doubt whether the antecedent presented by the motion of the moon was the same as that presented by a falling body. The probability of his conjecture arose in connection with this latter point.

In like manner every probable conclusion from analogy employs a *rule of judgment based on a wide experience, and not on the observation of cases specifically similar to that in hand*. A mineralogist, who has tested a kind of ore with results generally approximating a certain average quantity of metal, may, from a probable induction, form a deductive judgment regarding the value of any piece of that kind of ore. But, if a sample of mineral were brought to him, such as he had never previously observed, and resembling that ore only in some particulars, say in color and weight, he might hope that it would yield a similar proportion of metal, yet with less probability than would belong to the deduction we have mentioned. And this probability, more than that of the deduction, would depend on the general conviction

that the similarity of some alleged to some known natural antecedent may indicate a consequent similar to the known consequent. For such is the course of nature, and such our means of discovery, that the more an alleged, may resemble a known, antecedent in those respects which either are known, or may be supposed, to be essential to the sequence, the more frequently the alleged antecedent is found to be a true one.

§ 224. We have now considered those two styles of homologic reasoning which naturally and frequently result in probable conclusions. A more searching and satisfactory discussion of analogical, and of inductive, inference, and of that comprehensive process of induction in which they are employed, would lead us beyond the scope of our present undertaking. But we may add, that *induction*, in the broad Baconian sense, employs a greater variety of inferential methods than the careless thinker might suppose. In addition to the reasonings already explained, *it embraces certain intuitional inferences connected with the observation of facts, which, though immediately subservient to homologic ratiocination, are in themselves orthological.* These inferences are based upon the radical, or ontological, conception of the law of cause and effect, and are instrumental in determining what may be a true necessitating antecedent in any case of causal sequence. The principles on which these inferences proceed, are discussed by Bacon under the title of "Prerogatives of Instances"; later writers have styled them *the canons of experimental inquiry.* They might be defined as the laws of scientific elimination and determination. All of them alike lead to the rejection of what is non-essential to a causal antecedent, and to the retention of that which properly belongs to it. Their nature may be exhibited in connection with Mr. Mill's account of the four methods of experimental inquiry, for each of these is founded on a principle of its own. Mr. Mill names these methods respectively, the Method of Agreement, the Method of Difference, the Method of Residues, and the Method of Concomitant Variations.

The method of agreement assumes that *when two or more cases of causal sequence, which have the same consequent, have only some circumstances in common, the antecedent of the consequent is to be found in their common part.* It is plain that this must be so. Because if the common part did not include or constitute the antecedent, then it would not be true that the same cause and the same effect are always conjoined in nature. For example, says Mr. Mill, no bodies exhibit the crystalline structure save those which are solidified from a liquid state either of fusion or of solution; therefore the circumstances of this solidification in some way include the cause of the crystallization. Thus we may determine a cause; in the same way we may determine our knowledge of an effect. For instance, we may desire to know

Induction, in the Baconian sense, includes inductive, analogical, and yet other modes of inference. The prerogatives of instances.

The four methods of inquiry are modes of orthological inference. Method of agreement. Mill quoted.

what will result from the mixture of an alkaline substance with an oil. "This combination, being tried under several varieties of circumstance resembling each other in nothing else, the results agree in the production of a greasy and detergent or saponaceous substance; it is, therefore, concluded that the combination of an oil and an alkali causes the production of soap." On this same principle we ascertain the cause of a disease or the sanitary effect of the surroundings of one's dwelling-place. If a certain type of fever prevail, in very diverse localities, in all of which, however, the air is tainted with the effluvia of decaying vegetation, we may safely pronounce it a malarial fever.

Method of difference.
Crucial instances.

The method of difference assumes that, *when a case in which some sequence occurs, and a case in which it does not occur, differ only in the fact that the former includes circumstances not to be found in the latter, these circumstances must yield, either wholly or partly, a causal antecedent.* This is evident, because, in the case supposed, if some conditions, at least, of the sequence, were not among the added circumstances, there would be a causation without a cause. "When a man is shot through the heart," says Mill, "it is by the method of difference we know that it was the gunshot which killed him: for he was in the fullness of life immediately before, all the circumstances being the same except the wound." So, when we put sugar into one cup of tea and find it sweet, while another cup without the sugar lacks this taste, we ascribe the sweetness to the sugar. This method applies to those instances which Bacon calls *crucial*, comparing them to a cross or guide-post erected at a point where roads diverge. Such a sign enables the traveler to choose the right way to his destination and to reject all others. "Crucial instances," he says, "are of this kind. When, in inquiry into any nature, the intellect is put into a sort of equilibrium, so that it is uncertain to which of two, or sometimes more, natures, the cause of the nature inquired into ought to be attributed or assigned, on account of the frequent and ordinary concurrence of more natures than one, the instances of the cross show that the union of the one nature with the nature sought for is faithful and indissoluble, while that of the other is varied and separable; whence the question is limited, and that first nature received as the cause and the other sent off and rejected" ("Novum Organum," ii. 36).

Crucial instances seldom present themselves in nature, but they may often be brought about by the ingenuity of the investigator. Franklin, by means of his kite and copper wire, placed one end of an electrical conductor in a thunder cloud, to see what new effect, if any, would result. "The wire instantly brought down electricity, emitted sparks, and gave galvanic shocks. This had not occurred when the sky was clear, or when the kite was on the ground. Plainly, therefore, the thunder-cloud was the source of the electricity." For the only element added to produce the electrical phenomena was the contact of the

conductor with the cloud. After this the identity of lightning with electricity was easily perceived; since both came at the same time, from the same source, presented the same appearance, and obeyed the same laws. Most chemical experiments belong to this crucial order of instances, as they immediately exhibit the effect of some added element or elements.

The method of difference, as above described, is more effective than any other of the four methods, for the elimination of non-essential circumstances and the determination of the true cause. But, beside the direct use of this method, it may be employed indirectly, and in connection with the method of agreement. *If we can show, by this latter method, first that a certain consequent always follows some circumstance, either simple or complex, and then that the absence of this consequent always follows the absence of this circumstance—the other features of each case being essentially the same—we may conclude that the circumstance of difference is, either wholly or partly, the antecedent of that consequent.* Thus, says Mill, “If it be true that all animals, which have a well-developed respiratory system, and therefore aerate the blood perfectly, agree in being warm-blooded, while those whose respiratory system is imperfect, do not maintain a temperature much exceeding that of the surrounding medium, we may argue, from this twofold experience, that the change which takes place in the blood by respiration, is the cause of animal heat.”

The method of residues assumes that a composite effect follows a composition of causes, and that, in such a case, if part of the effect can be traced to part of the cause, the rest of the effect may be ascribed to the rest of the cause—that is, to the rest of the composite antecedent. If, therefore, in some natural sequence, part, but only part, of the total consequent is accounted for by known causes, the residual part may prove indicative of causes yet to be discovered. This method goes on the principle that every effect has a cause, and its own cause; and guides inquiry by distinguishing the effects of known, from those of unknown, causes. This rule of investigation is especially serviceable when one scrutinizes facts within some sphere of causation, with the laws of which he is already somewhat familiar. Because, then, if he find something for which he cannot account, he begins to search for a new cause. Many important discoveries have been made after this fashion. The following illustration of this method is quoted by Mill from Sir John Herschel. “The return of the comet predicted by Prof. Encke, a great many times in succession, and the general good agreement of its calculated with its observed place during any one of its periods of visibility, would lead us to say that its gravitation towards the sun and planets is the sole and sufficient cause of all the phenomena of its orbital motion: but, when the effect of this cause is strictly calculated and subducted from the observed motion, there is found to remain a residual

The indirect method of difference.

Method of residues.

phenomenon, which would never have been otherwise ascertained to exist, which is a small anticipation of the time of its reappearance, or a diminution of its periodic time, which cannot be accounted for by gravity, and whose cause is, therefore, to be inquired into. Such an anticipation would be caused by the resistance of a medium disseminated through the celestial regions; and, as there are other good reasons for believing this to be a *vera causa* (an actually existing antecedent), it has, therefore, been ascribed to such a resistance." It will be observed that the method of residues does not of itself discover a cause, but only leads to the discovery of it by the method of agreement or that of difference. It may, therefore, be regarded as having a secondary character.

Method of concomitant variations.

A somewhat similar remark may be made in regard to the last of the four experimental methods—that of concomitant variations. This assumes that *when one natural occurrence, which is either continuous or complex, varies in a manner to correspond with the variations of another, the two must be connected through some law of causal sequence.* Either of them, therefore, may be taken as the antecedent, that is, the logical antecedent, of the other. Whether the correspondent phenomena are related to each other directly as cause and effect, or by some indirect causal connection, and what the specific relation between them may be, is not indicated by the mere fact of concomitant variation, but generally may be inferred from the nature of the case, and according to either or both the primary methods. If we should find that a certain fever prevailed in certain localities in proportion to the prevalence of malaria in each locality, we would naturally regard the malaria as the cause of the fever; which conclusion would be further strengthened, if the fever was found to decrease, in any locality, in proportion as the drainage and cultivation of lands resulted in the abatement of malaria.

In the case of variable causes and effects, each increment of the antecedent may be regarded as an antecedent followed by a consequent of its own, *so that the agreement in variation is a specific result of the law that every cause and its effect correspond with each other.* The complex, or continued, correspondence, having been tested by the primary methods, is recognized as a regular and recurrent conjunction of phenomena, and is, therefore, ascribed to some law of nature, and not to chance. An interesting application of the rule of concomitant variation leads to the discovery of causes which are never seen in their simple, or single, operation. In this way we conclude that a body in motion, if not retarded or deflected by some new force, will keep on moving in a right line, and at a uniform rate of speed. No example of such motion can be found. But observation shows that, exactly in proportion to the removal of retarding or deflecting causes, bodies approach the perfect exemplification of it. Hence, we adopt the first law of motion, and ascribe the actual movements

of projected bodies to a combination of other forces with that of the steady *vis inertiae*.

All reasoning founded on the perception of ontological relations. These modes of inference, which we have now briefly illustrated, are methods naturally adopted by the mind in its endeavors to understand the phenomena of nature. They are styled *inductive*, because, from a consideration of facts, they help to determine our conceptions of causal sequences. But they are not of themselves *pricipiative*; they only prepare conceptions, and convictions, for principiation. We cannot now consider how the employment of these methods often results in only probable conviction, and is frequently beset by complications not easily overcome. We have mentioned them, and the "canons" to which they appeal, chiefly to direct attention to their ontological character. *They are evidently different aspects of that universal law of causation, which must be recognized as a necessary element in any system of being.* This fact, in connection with others already considered, justifies the statement that even analogical and inductive reasonings are based on the perception of ontological, or absolutely necessary, relations. For all things which exist are connected in such relations. But, if this be so, it is clear that all ratiocination whatever employs, and is radically founded on the employment of, ontological forms of thought and conviction. We have now completed our survey of the normal operations of the reasoning faculty. It was our intention to follow this with some account of the nature, sources, and varieties of error or fallacy. But this task must be postponed till some other time.

CHAPTER XLIX.

EXPERIENCE AND INTUITION.

Intuitionism defined. § 225. That doctrine, which distinguishes between experience and intuition, and which explains the nature of each of these modes of mental action, may be named Intuitionism. Those who hold this doctrine maintain, in opposition to others, that the mind is capable of a certain kind of perception or judgment which they call *intuition*. No department of philosophy requires greater care in the definition of terms than that which discusses this doctrine. This is true partly because of the inherent abstruseness and complexity of the subject, and yet more because of the ambiguity and inadequateness of the words which must be employed. The case is such as to necessitate a somewhat arbitrary use of language, for which reason one who may have no wish to force his definitions on the acceptance of others, must yet exercise care that the mean-

ings which he employs may be understood. Without such precaution no attempt at a last analysis of the laws of conviction and belief can be hopefully made; and the effort to solve this, the most fundamental, problem of mental science, will result only in perplexity and confusion. But, in defining and distinguishing terms, we shall, at the same time, define and distinguish things that differ, and shall present what we consider correct views regarding a most important topic.

Primarily a doctrine concerning convictions or beliefs.

The doctrine of intuitionism pertains primarily to our convictions or beliefs, and divides them into the experiential and the intuitional. After that it deals with our conceptions or thoughts, and finds in them what is intuitional and what is experiential. These distinctions are not parallel to each other, yet the latter grows out of, and depends upon, the former. In discriminating experiential belief from experiential thought, and intuitional belief from intuitional thought, the terms *thought* and *belief* are employed in contrasted senses. In this use *belief* and *conviction* signify thoughts or conceptions as accompanied with intellectual conviction, or belief; while the term *thought* signifies conceptions or ideas regarded simply in their own nature and aside from their combination with conviction.

Experience and intuition are two radical modes of judgment.

We shall first consider our experiential and our intuitional *convictions or beliefs*. These may be characterized as two radical modes of judgment. For judgment is the initial act of forming a belief, and, in a wide philosophic sense, is the initial act of forming any belief whatever. Moreover, as judgment may signify the power or faculty of performing this act, so experience and intuition may signify the mental powers by which we form those judgments which we call experiential and intuitional.

That form of judgment which is the initial act of knowledge is properly named *cognition*. It is distinguished from other judgments in that the belief which it originates is absolute and well-founded. Our more important and noticeable experiential and intuitional judgments are cognitions—or perceptions, as they are also sometimes called, the *per*, in this case, denoting completeness or thoroughness. Most of the discussion concerning intuition and experience might take place regarding these cognitions, or perceptions. But these terms, if used exclusively, might indicate that experience and intuition result only in the absolute cognition of truth, and never in judgments respecting things possible or probable. This would be an error. We prefer, therefore, to describe the radical nature of these modes of mental action as being that of judgment, and not that of cognition, or perception, simply. All experiential judgment is a perception of the certainly existent, but this is not true in regard to all intuitional judgment, or in cases in which experiential and intuitional judgments combine.

The purposes of mental science require that we use the terms

experience and *intuition*—and their more express equivalents, *experiential* and *intuitive* judgment—in technical and defined significations. Each term has a variety of meanings, but, in the present discussion, each must be employed in a way different from any of its more common significations, and in that way exclusively. For the distinction between experience and intuition, in this department of speculation, is wholly removed from ordinary thought and language. It is purely philosophical, and so subtle and abstruse that it will be lost in misconceptions, if any possibility of misconception be allowed.

Three common meanings of the term *experience*. *Experience*, in common language, has three principal meanings. First, it is a name for *all of man's psychical life*, all he does or suffers, *so far as he is distinctly conscious of it*. According to this we say, "One's experience, during such or such a period, was monotonous or varied, happy or full of sorrow. Secondly, it may denote all of those *cognitions, or perceptions, of present objects and relations*, which take place immediately on the occasion of one's psychical life, whether the objects be included in this life, or only in some way connected with it. In this sense *experience* is a comprehensive term, including every form of sense-perception, concomitant perception, and consciousness. Hence memory is the record of experience, and is referred to as giving the testimony of experience. This mode of cognition is nothing else than presentative perception. Its principal element is the cognition of simple fact; but it does not exclude, as an accessory to this, a perception of necessary relations. Thus, one may experience, or know from experience, the length of a certain road, the necessity of passing over that road to reach a certain mountain, the height of the mountain, the necessity of exertion to surmount the summit, the beauty of the prospect obtained there, the resemblance of this prospect to some other seen elsewhere, and the dependence of the beauty or the resemblance on some particular features of the prospect. Whatever of fact or of necessity may be observed with attention and interest, is an object of this experience. Finally, experience may signify *our immediate knowledge of fact considered as accompanied by an inductive process*, and as resulting in general conclusions. With reference to this meaning we often speak of the dictates of experience, and say that a wise man is governed by experience, and that it is possible to learn from experience—that is, from inductive observation—many useful and important lessons. At present, we employ a sense more restricted than any of these, but more closely related to the second than to either of the others. We mean by experience, *the perception or observation of mere fact*, as distinguished from the perception of the necessary, or logical, relations of fact, or of fact as having these relations. If one sees a man on the street, the sentence "The man stands on the street, not in the house," may express his experience, or experiential perception, in regard to the man. In this he sees and believes simply that

the man is in the one place and not in the other, but does not think of the necessity of his being somewhere, if he exist at all, of the impossibility of his being both on the street and in the house at the same time, or of the possibility of his being in either place. These last-mentioned perceptions are intimately united with those of mere fact, and are frequently included with them in one act of cognition; yet they may be distinguished from the latter, and may be called necessary, or logical, or intuitional, perceptions.

A peculiar technical application of the term. Defined and illustrated.

Often an experiential judgment signifies a lesson or general truth learnt from our observation of fact; and this use of language is natural and proper. But, in the present discussion, we shall mean, by experience, only the simple perception of fact, that is, of fact so far as it does not involve logical relations; for these relations, of course, may also be things actual. So, also, by empirical cognition, judgment, or perception, and by empirical knowledge, we shall mean the cognition of simple fact, and not the knowledge of any law, gained from observation, although the phrase might have this latter signification.

Experiential or empirical judgments, or perceptions, are expressed by pure categorical statements, or what the Aristotelians called propositions "de inesse." They use the indicative mood of verbs, and this in its simplest and most literal significance. Sometimes this mood is used to express a necessary law, as when we say, "A straight line is the shortest possible between two points,"—"Ice, when exposed to the fire, will melt." But it expresses experiential perception, when it is used merely historically. Hence, experiential, or empirical, knowledge might be called historical; as it was by Aristotle. Philosophical history, which accounts for facts and traces them to their causes, is not purely empirical; but history, as a mere chronicle of facts, is a formal record of experience.

Experiential knowledge admits of generalization, or rather of the use of general notions. One can say, "All the trees in that forest are oaks." This does not express any law of necessity, but simply sums up the result of an exhaustive observation. A general fact must be distinguished from a general law.

In causal sequence, experience, or empirical perception, may be said to observe the agent and its power, the operation of the power and the result as produced by this, but not that absolute necessity of connection which exists between these things; just as it may perceive a body occupying space, but not as doing so necessarily. In other words, historical fact and logical necessity may be distinguished, and the perception of each assigned to a different power, or to a different modification of the same power.

Intuition defined. McCosh.

The term *intuition* signifies literally a looking upon, and is naturally applied to *any style of conviction in which something is immediately seen*, and not inferred, or believed on testimony, to exist. "By intuition," says Pres.

McCosh, "I mean that power which the mind has of perceiving objects and truths at once, and without a process." This is the primary and generic meaning of the term.

But, according to this signification, that act of mind which we have distinguished as experience, or empirical perception, is a leading kind of intuition: all presentative cognition, whether of sense, or consciousness, or concomitant perception, is intuitive. For all such cognition is immediate and without a process. In a previous part of the present treatise (§ 156) the term *intuition* was used to signify presentational cognition, and not in the peculiar and technical sense now to be employed. The intuition of which we are about to speak, is not, indeed, to be distinguished from all presentative cognition, but it is to be distinguished from what we have called *experiential*, or *empirical*, perception. According to the sense at present before us, it is not intuition simply to be conscious of having a toothache, and to know that it is on one side of your face and not on the other, or to realize that you have five digits on one hand, and that with these you are touching the fingers on the other hand, or other objects within reach. These perceptions would be experiences, in the special sense already defined.

Again, intuition sometimes signifies an action of the intellect in which things are perceived, not really without a process, but so quickly and with so great natural or acquired facility, that the steps of the process elude our observation. According to this sense *intuitive* reason is opposed to *discursive*, though these are both radically of the same nature (§ 187). In like manner the process of inference in our acquired sense-perceptions is called *intuitive*. This is that intuition exhibited by great mathematicians who sometimes understand and solve problems at once, which others master only by slow and methodical calculation.

The intuition, of which we now treat, agrees with experience in being a perception of truths without a process; but it differs from experience in that it takes place quite as well in the absence as in the presence

of the objects asserted to exist. It manifests itself in the fact that a large class of propositions need only to be presented to the mind in order to be fully believed. No objects need be actually present; the conception of them is sufficient. For this reason the truths thus perceived may, more emphatically, be styled *intuitional* than those gained by experiential cognition. Experience does not lead to the belief of propositions apart from the evidence of observation, and simply on our consideration of them; in this sense experiential convictions are not intuitive. Because logic and mental science immediately examine reproduced or elaborated ideas, and not the perceptions in which these originate, it was natural that, in many discussions, those beliefs alone should be called intuitive which are evident in themselves, or simply as forms of thought, while propositions expressive of our perceptions of simple fact should be regarded as immediately

The meaning of the term *intuition* as opposed to the term *experience*.

evidenced by the presented object, rather than as immediately evident in themselves. Thus the terms *intuitive* and *intuitional*, though naturally referring to all perceptions which are immediate or without a process, are often opposed to the terms *experiential* and *empirical*, and are then employed to distinguish a class of cognitions which are not those of simple fact.

With respect to their objective character, intuitions are necessary, or necessitudinal, judgments.

The objective peculiarity common to intuitive or self-evident convictions is that *they pertain to the necessary relations of things and set forth things as in necessary relations*. For this reason they have been called our *necessary judgments or beliefs*. This designation refers to the necessary nature of the truths which these judgments set forth, and not to their own nature as modes of mental conviction. Although the constitution of the mind renders them necessary in this light also, they are no more subjectively necessary than our experiential convictions. What our cognitive powers apprehend to be fact, we cannot help firmly believing, whether we apprehend it as necessary fact or not.

Moreover, it is to be remarked that, although our intuitions set forth what is necessarily true, they do not always set forth what is necessarily existent. They may present the merely possible, or, through a combination of the possible with the necessary, what is only probable. The distinction between intuitive and experiential convictions is not such that certainty belongs to the former and probability to the latter. On the contrary, pure intuitional reasoning, in which only ontological principles are employed, may have probable conclusions, while both experiential knowledge and the inferences from it may be perfect and absolute. No one will dispute that, when I see an object, for example, my inkstand, I am just as certain experientially, that it is where it is, that is, on my table, as I am, intuitively, that, being a real inkstand, it must exist somewhere. But the doctrine has been taught that intuitive perception, being the cognition of things necessary, is always productive of absolute certainty. This is incorrect. Our ontological convictions set forth always what is necessarily true, but not always what is necessarily existent. Possibility, or contingency, and probability, no less than necessity and certainty, belong to the very nature of things, and are intuitively perceived. Our inferences in possibility and in probability, no less than those which are necessary and certain, involve ontological judgment. All pure mathematical reasonings are intuitional, but among the purest of them we must reckon calculations of chance and probability. We allow that our more important intuitions concern the necessarily existent, rather than the possible and the probable. But we maintain that the radical principles of contingent reasoning are intuitive convictions. Let it be remembered that *necessary judgments* are not simply those which set forth things as existing necessarily under given conditions, but those which set forth things as necessarily true.

In styling all intuitional judgment *necessary* we recognize a community of nature which subsists between logical necessity and logical possibility. Both are modes of the state of the conditioned. Possibility may be regarded as a partial or imperfectly developed necessity, and it partakes so much of the nature of necessity that it cannot be destroyed so long as the antecedent on which it depends exists. An effect is *necessarily* possible when some parts of its cause, at least, exist, nor can it cease to have this possibility till these conditions are removed. As intuitive judgments assert necessity and contingency, they are naturally expressed in modal and hypothetical propositions, just as empirical judgments are naturally expressed by categorical statements.

Our original perceptions of possibility and of contingency are intuitive, and, in a certain wide sense, necessitudinal.

Some distinguish *intuition* as the immediate perception of that which is necessary as such, and make *experience* the perception of that which is contingent as such. This contrast of judgments may be made, but it is not that called for in this department of philosophy. Both the perceptions

above mentioned are intuitive. Empirical perception is the simple cognition of fact, as fact, without reference to its logical relations. When we see a man walking along the street, we perceive, experientially, that he is moving in space. This is a thing necessary if he move at all, for no motion is possible save in space; and it is a thing possible, for the actual is always possible, and the existence of space renders the motion of any body possible. Moreover, we may say that this necessity and this possibility are presentationally perceived. But they are not *experientially* perceived. So far as anything is perceived as logically necessary or possible, it is the object of intuitional cognition; but mere fact, to the exclusion of logical relations, is the object of experiential cognition. It is true that empirical knowledge does not recognize things as necessary; but neither does it recognize them as contingent.

Some intuitions are presentational. Three modes of intuition; one of experience.

Here let us avoid that extreme doctrine which makes all presentational thought experiential, and, in this way, denies that any intuitive thought can be so. There is no absurdity in saying that some

things immediately perceived as fact, are also, and in the same act of intellect, perceived as things necessary or possible. It is even reasonable to suppose that our first intuitions take place in connection with experiential cognition, and that they are not properly inferences, but presentational perceptions of things as in logical relations. Or we may say that, in complete presentational perception, intuition and experience unite. Thus, in the very act of perceiving some event as resulting from some cause, we also perceive it to result necessarily. We see that it could not take place without the cause, and that, with the cause, it could not fail to take place. In such a cognition, we would not infer the event from the cause, but perceive it as in necessary relation to the cause. In like manner, mathematical intuitions

may be presentational. We may see three equal bodies and their equality, and at the same time perceive the necessity that two of them, being respectively equal to the third, must be equal to one another. But it is true that the great use and value of intuitive judgment are realized in connection with inference. As the vital element in inference, intuition enables one to perceive and know things which he does not know already, and which he cannot know in any other way. The fitness of intuition for this use, more than any other characteristic, is the ground of its philosophical importance and of its distinction from experience.

While this latter mode of perception is wholly presentational, *the intuitive judgment may assume three forms*. First, it, also, may be presentational, the perception of necessary relations between things visibly present. Secondly, it may be an actualistic inference, in which, from some seen antecedent, we infer a real consequent as necessarily connected with it. And, thirdly, it may be a hypothetical inference in which we merely suppose an antecedent, and thereupon infer a consequent as hypothetically necessary. In these two latter modes of judgment, intuition exhibits that peculiar power whereby it produces conviction on the mere presentation of a proposition, and in the absence of the object asserted to exist.

§ 226. When we examine any spontaneous intuition or self-evident belief,—as, for example, that some individual change which we observe must proceed from a cause, or that some particular change similar to another must proceed from a cause similar to that of the other—or that two individual things, bodies, weights, forces, lines, surfaces, solids, or any kind of quantities, being equal to a third, are equal to each other, we find that the judgment *does not depend on the whole nature* of the things observed and judged about, *but only on certain elements of their nature*, which we perceive as the fundamenta of the necessary relations. We ground our judgment on the perception that certain objects are quantities and have relations and relata pertaining to them as such; or on the perception that they are events and have the relations and relata belonging to them as such; or that they are substances, or powers, or spaces, or times, or relations of some kind, as identity or diversity, or similarity or dissimilarity, and have the relations and relata connected with them as such. Our conclusion is logically independent of any more specific features which may accompany these radical characteristics. Such being the case, it is both possible and natural for thinking men to withdraw their attention from those elements in objects which are not necessary conditions of their judgment, and to concentrate their thought upon those which are. In this way *abstract singular judgments* are formed, presenting that which is self-evident simply as having the nature which makes it self-evident; and from these, by an

Singular or individual and general or principiated intuitions distinguished.

application of the homologic principle, *general judgments* are derived, which express fundamental laws, and may be used as radical rules of inference. For example, perceiving or thinking about any individual event simply as such, we can immediately say that it must have a cause, and that, too, a cause corresponding to its own nature, and which, if repeated, will produce a similar effect. Or, should we add together three equal amounts of some particular substance, as sugar, or salt, or water, or wine, on two or more occasions, we might, thinking of them only as quantities, say that the sum, in each instance, is equal to that in each of the other instances. Then, immediately consequent upon such judgments, we have the general "principles," that there is no effect without a cause, that like effects have like causes, and that, if equals be added to equals, the sums will be equal.

How far and in what sense intuitive and intuitional judgments are ontological.

Every such general judgment sets forth that which is necessarily true in any particular instance whatever, in which the antecedent of the judgment may exist. Such a judgment, therefore, may be regarded as expressing a universal law of being. *It states what absolutely must be true of some subject provided that subject exist.* It asserts that anywhere, or at any time, or in any system of being, in which that subject may be found, that law must prevail. Because these generalized intuitions would be true under any possible system, they may be distinguished as ontological judgments, and may be said to express ontological laws. This character may be given to them on the further ground, which may become more evident as we proceed, that they would be necessarily employed by rational beings, under any system of existence, as *really applicable* to the forms of entity composing it. In other words, our abstract intuitive judgments are not only such as would be true, if applicable, under any system of being, but are such, also, as must be applicable. For this reason, therefore,—as connected with the very existence of things, in case things exist at all,—we may call them *ontological* judgments, and say that they indicate ontological laws. Those concrete intuitions in which objects are regarded in their whole nature, and without rejection of those elements on which the necessary perception does not depend, might also be called *ontological*, as containing and embodying the necessary judgment; and they sometimes do receive this name. They are ontological, however, not as to their whole nature, but only in an inferior and secondary sense, and as including judgments which more properly deserve the designation.

Cosmological judgments defined, as being concrete intuitions or inferences. How related to ontological judgments.

As contrasted with the abstract or general judgment, the concrete intuition might be distinguished as *cosmological*; and so our intuitive convictions might be divided into two kinds, the *ontological* and the *cosmological*; these latter having, in addition to the thought and perception which ontological judgments employ, and which they also employ, modes

of conception and of conviction peculiar to themselves. Our most noted cosmological judgments relate to the specific operation of natural causes. Let us, for example, take our intuitions respecting the explosion of a percussion cap by the blow of a hammer. Presentationally we say that that particular blow (with its attending circumstances) was necessarily followed by that particular flash and report. Inferentially we say that another cap, just like that one, would be exploded by a similar blow. These judgments pertain, not to cause and effect in the abstract, but to the hammering and explosion of certain percussion caps. Evidently, too, the propositions expressing them, *when understood as the utterances of intuitional or necessary truth*, are self-evident in the sense that they need only to be conceived or stated in order to be believed. Our conviction, in each case, assumes or starts from our observation and analysis of the actual phenomena. But, at the same time, these judgments, as setting forth necessary relations, include, and are founded on, modes of perception which do not depend on our knowledge of any instituted order of things, but which employ principles of absolute necessity, and are emphatically ontological. They include the judgments that a change demands a cause—that the true cause, or an essential element of it, is discoverable by the method of difference (for the explosion takes place only when the blow is given),—and that like causes are conjoined with like effects. These principles are ontological; and not only does the cosmological judgment involve the assertion of them, as a part of itself, but *its whole force as an inference depends on, and flows from, this assertion*. The only part which presentation necessarily performs, in connection with inferences respecting the actual operations of nature, is to give a knowledge of fact simply as such, and without reference to the logical relations of fact. Thereupon inferential perception, according to intuitional or ontological principles, taking hold of the facts, and retaining the specific forms of thought furnished by experience, yet without any further aid from presentative perception, produces the conclusion proper in the case. The judgment, that the explosion necessarily follows the blow, is something so independently intellectual that it takes place as well on the supposition or remembrance, as on the perception, of the facts; while the judgment, that a similar cap will be exploded by a similar blow, is a homological—and, therefore, an ontological—inference, from the particular intuition already made. So that, although cosmological judgments find the specific form of their data, and of their conceptions, in experience, or the observation of fact, their whole force comes from the apprehension of truths which are evident merely on being stated and independently of our cognition of the actual. Therefore, as opposed to experiential perception, and as being a mode of necessary or inferential perception, the cosmological judgment is essentially intuitional.

While our reasonings respecting the operations of specific

causes are pre-eminently cosmological, all other inferences, which employ any mode of conception not essential to the ontological principle which they follow, have the same character. Such are judgments and inferences in which mathematical, or other intuitional convictions, are employed about natural objects, considered as such and as having their observed peculiarities. The assertion that a pound of feathers is of the same weight as a pound of lead, because they are each equal in weight to a pound of iron, is cosmological. Such judgments, yet more evidently than those regarding causational sequence, derive their force from the abstract principles which they embody and to which they are conformed.

An ambiguity
avoided.
Kant quoted.

The foregoing remarks may illustrate the relation between those modes of judgment which we have distinguished as ontological and cosmological; and they show how both are essentially intuitive. We have named our concrete intuitions *cosmological* in order to avoid an ambiguity. Some, perhaps most, who observe that these judgments are connected with experience and take their start from specific experiential cognitions, have distinguished them as experiential or empirical. While the use of such language is not without reason, it is fitted to produce perplexity. It tends to confound cosmological judgments with those which are purely experiential; and it obscures that relation of affinity, or community of nature, which exists between cosmological judgments and those which are purely ontological. In the statements of Kant, the *experiential* judgment is distinguished from the *empirical*, this latter being the simple perception of concrete fact, and the former being what we have called the cosmological judgment. He says,—in his “Prolegomena to Future Metaphysics,” § 18,—“Although all judgments of experience are empirical, that is, have their ground in the immediate perceptions of the senses, yet, conversely, it is not true that all empirical judgments are, for this reason, judgments of experience; but, in addition to the empirical element, and, in general, in addition to that given to sense-intuition, particular concepts must be furnished, whose origin is *à priori* in the pure understanding, under which every percept must be subsumed and so changed into true *experiential*, as distinguished from *empirical*, knowledge.” The terms *experiential* and *empirical* are the exact Latin and Greek equivalents of each other. We prefer to use them as mere synonyms, and have, therefore, distinguished the *experiential* perceptions of which Kant speaks, by the term *cosmological*.

The distinction between ontological and cosmological intuition applies to all necessary or inferential judgments whatever and, therefore, to conclusions of contingency and probability as well as to those of necessity and certainty. In every case the illative force depends on the recognition of ontological laws. This truth has been illustrated in previous discussions (§ 218). We shall not dwell upon it now, but shall assume that the

relation between ontological and cosmological judgments has been sufficiently considered.

§ 227. The next point calling for attention concerns the modes in which experience, or the cognition of simple fact, may and does affect intuition in its abstract, and in its concrete, form. These modes are two in number. One of them relates to the *nature*, and the other to the *matter*, of our intuitive convictions. In the first place, *every logical judgment, whether ontological or cosmological, is either actualistic or hypothetical, according as it is, or is not, founded on experiential perception.* This will be evident in regard to abstract intuitions, if we attend to the operation of our minds in the use of any mathematical or metaphysical axiom. If we say respecting some straight line which we know to be actually existent, that it is the shortest possible between its terminal points, this is an actualistic judgment; but, if the line be only a supposed or imaginary one, our judgment is hypothetical. In just the same way a cosmological inference is actualistic if the antecedent be known, or believed, to exist, and hypothetical, if the antecedent be only supposed to be. But it is to be remarked that the two kinds of judgment do not assume the hypothetical character with equal ease and completeness. Axioms, or general ontological judgments, are essentially hypothetical, and may be entertained without any reference to existing realities; while cosmological judgments, even when hypothetical, are seldom purely so. For example, hypothetical statements concerning specific causational sequences almost always refer to a law of nature, as *known*. In the axiom, *every effect must have a cause*, our conviction is free from the remotest dependence on experience; this is not the case with even our most general statements respecting the operations of nature. These involve an experiential reference. We say, "All vegetable growth must have moisture," in other words, "If there be vegetable growth, there must be moisture;" this is hypothetical as regards the existence of vegetable growth and of moisture. But, behind this hypothetical reasoning, there is an actualistic conviction concerning the stability of the course of nature, and the reality of that law which connects moisture with vegetable growth. Therefore, our belief in the necessary connection of this consequent with that antecedent, though hypothetical, is not purely so; it is partly founded on our observation of the course of nature in regard to such growth. For the hypothetical judgment would have no force unless we believed that the course of nature is really uniform, and that we have discovered one of its uniformities.

We might conceive of a judgment in which these principles, also, were hypothetically assumed, but ordinarily we have no use for such judgments, and do not use them. Considered with reference to their *ultimate* grounds, our ordinary cosmological judgments, even when general or hypothetical, are partly founded

The action of intuition is modified by that of experience in two ways. First, as to the nature or mode of our belief.

on experience, and, to that extent, are not hypothetical. A purely hypothetical cosmological judgment would be such as would predict the operations of some imaginary law in an ideal world. The conviction attending it would be wholly independent of experience, though it might employ what we may call *experiential elements of conception* (§ 231). Such a judgment has merely theoretical importance. It might be distinguished as the poetical or supposititious cosmological inference.

Secondly, as to the matter of our conviction. Matter of conviction defined.

In the second place, ontological and cosmological intuitions are differently related to experience with respect to the *matter* asserted by them. The matter of the ontological judgment may be supposed to originate with the judgment itself; it does not logically involve any antecedent experience. But that of a cosmological conclusion, *so far as it includes more than that of the ontological principle on which it is founded*, is drawn from experience. By *matter*, here, we mean the matter of conviction and assertion, in other words, *that which is believed and asserted*. In the abstract intuitions, "Like effects must have like causes," and "Things which are equal to the same thing are equal to each other," the conception of what we assert and believe is not originally obtained in experiential cognition; but in order to conceive and say, "A struck percussion cap will explode," we must start from, and refer to, a past experience of causal sequence. So, when we say that a lump of butter which balances a given weight equals another lump which balances the same weight, the peculiarity of the conclusion, that it is a lump of butter which is equal to a lump of butter, is to be traced to experiential perception. In poetical cosmological judgment, which is purely hypothetical, imagination takes the place of experience, in supplying the additional matter.

Experience and intuition are found in every phase of mental life. But intuition more prominent in the rational phase.

Both the radical modes of cognition which we have now explained, that is, both empirical and intuitional judgment, manifest themselves under every phase of mental life. In the perceptive phase experiential cognition is the prominent element. But intuition, uniting itself with experience, is manifestly present in our concomitant and in our acquired perceptions. These are actualistic judgments in which we perceive things in necessary relations, and in which, according to ontological principles, we infer the actual from the actual. In the reproductive phase, experience, though not immediately employed, appears in simple memory, which is reproduced experience, and is referred to as the basis of most of those hypothetical concrete judgments which are employed in the constructive work of the imagination. These judgments, being cosmological, involve also intuitive convictions. Moreover, in avoiding absurdities, imagination employs perceptions of possibility and of probability; and these are modes of intuition.

In the rational, or discursive, phase of intellect the exercise

of intuition is more prominent than in either the presentative or the reproductive phase. This is a consequence of the distinguishing characteristics of reason, which are a clear and full comprehension of things and their relations, and a special development of the powers of analysis and judgment. These properties pertain equally to what is called the *intuitive* or *instinctive*, and to the *discursive*, mode of reason, but they are more observable in this latter because of its deliberate and articulate movement. Such is the force of rational perception that it never perceives things simply as existent, but always, also, in their necessary or ontological relations; and such is its power of analysis and abstraction, that it can think of things simply so far as they condition, and are conditioned by, such relations. All pure, or abstract, ontological judgments are the product of rational thought.

Because intuitional principles are more distinctly, more prominently, and more efficiently, employed by reason than by any other form of intellect, some have ascribed the origination of these principles to the reason, and have called this power the faculty, or place, of "principles," meaning by these the general laws of intuitive conviction. We prefer to say that intuition is a radical power which appears in every mode of apprehension, but which becomes especially prominent in our rational perceptions. But we cannot object much to the terminology of those who, referring to abstract ontological judgments, distinguish the faculty whereby we make these, as the pure or fundamental reason. This is the *reine vernunft* of various German philosophers. There is danger, however, of considering such a faculty as the ultimate source of these radical convictions, and not simply as the power by which they are brought out into distinct and separate consideration. The original capability of forming necessary judgments, whether ontological or cosmological, should be called *intuition*.

The relation of intuition to ratiocination. Locke's teachings quoted, with comments.

The ordinary exercise of this power is more perfectly seen in that mode of rational perception which we call *reasoning* or *ratiocination*, than in any other employment of the mind. Comparing the philosophy of intuition with that of reasoning, we perceive that the latter is but a development of the former. *A course of ratiocination is a succession of intuitions.* Pure hypothetical reasonings, such as those of logic and mathematics, consist of ontological intuitions, while our ordinary reasonings are a connected series of cosmological judgments. Every step of reasoning is intuitive; and every process of reasoning is intuitional.

This view of the affinity of ratiocination with intuition is the development and completion of a doctrine which Mr. Locke teaches in the fourth book of his "Essay." He there asserts, first, that demonstration is not intuition, and, secondly, that demonstration is made up of intuitions. He says, "We cannot have an *intuitive* knowledge that shall extend itself to all our

ideas, and all that we would know about them; because we cannot examine and perceive all the relations they have to one another by juxtaposition, or an immediate comparison one with another: Thus, having the ideas of an obtuse and an acute angled triangle, both drawn from equal bases, and between parallels, I can, by intuitive knowledge, perceive the one not to be the other, but cannot that way know whether they be equal or no; because their agreement or disagreement in equality can never be perceived by an immediate comparing them; the difference of figure makes their parts incapable of an exact immediate application; and, therefore, there is need of some intervening qualities to measure them by, which is demonstration, or rational knowledge." But that this *rational knowledge* is the product of intuition, Locke teaches in these words, "In every step reason makes in demonstrative knowledge, there is an intuitive knowledge of that agreement or disagreement it seeks with the next intermediate idea which it uses as a proof. For, if it were not so, that yet would need a proof; since, without the perception of such agreement or disagreement, there is no knowledge produced. If it be perceived by itself, it is intuitive knowledge; if it cannot be perceived by itself, there is need of some intervening idea as a common measure to show their agreement or disagreement. By which it is plain that every step in reasoning that produces knowledge, has intuitive certainty; which when the mind perceives, there is no more required but to remember it, to make the agreement or disagreement of the ideas, concerning which we inquire, visible and certain. So that to make anything a demonstration, it is necessary to perceive the immediate agreement of the intervening ideas, whereby the agreement or disagreement of the two ideas under examination (whereof the one is always the first, and the other the last in the account), is found. This intuitive perception of the agreement or disagreement of the intermediate ideas, in each step and progression of the demonstration, must also be carried exactly in the mind, and a man must be sure that no part is left out: which because, in long deductions and the use of many proofs, the memory does not always so readily and exactly retain; therefore, it comes to pass that this is more imperfect than intuitive knowledge, and men embrace often falsehood for demonstrations."

Locke's doctrine of intuition, though scant and imperfect, is valuable as being a partial apprehension of the truth by an able and earnest intellect. Let us dwell upon it a little longer. He says, "If we will reflect on our own ways of thinking, we shall find that sometimes the mind perceives the agreement or disagreement of two ideas immediately by themselves, without the intervention of any other: and this, I think, we may call *intuitive knowledge*. For in this the mind is at no pains of proving or examining, but perceives the truth, as the eye doth light, only by being directed towards it. Thus the mind perceives that

white is not *black*, that a *circle* is not a *triangle*, that *three* are more than *two*, and equal to *one* and *two*. Such kind of truths the mind perceives at *the first sight of the ideas together*, by bare intuition, without the intervention of any other idea; and this kind of knowledge is the clearest and most certain that human frailty is capable of. This part of knowledge is irresistible, and, like bright sunshine, forces itself immediately to be perceived as soon as ever the mind turns its view that way; and leaves no room for hesitation, doubt, or examination, but the mind is presently filled with the clear light of it. . . . He that demands a greater certainty than this, demands he knows not what, and shows only that he has a mind to be a skeptic without being able to be so. Certainty so wholly depends on this intuition that, in the next degree of knowledge, which I call *demonstrative*, this intuition is necessary in all the connections of the intermediate ideas, without which we cannot attain knowledge and certainty. . . . In this case, then, when the mind cannot so bring its ideas together, as by their immediate comparison, and, as it were juxtaposition or application one to another, to perceive their agreement or disagreement, it is fain, by the intervention of other ideas, one or more, as it happens, to discover the agreement or disagreement which it searches. Thus the mind, being willing to know the agreement or disagreement in bigness between the three angles of a triangle and two right ones, cannot by an immediate view and comparing them do it: because the three angles of a triangle cannot be brought at once and be compared with any one or two angles; and so of this the mind has no immediate, no intuitive, knowledge. In this case the mind is fain to find out some other angles to which the three angles of a triangle have an equality; and, finding those equal to two right angles, comes to know their equality to two right ones" (book iv. chaps. ii. and iii. *passim*).

These statements of Locke will become more intelligible if we understand by ideas *ideal objects*, or *things contemplated in idea*. Any one who studies the "Essay" will find that the term is constantly used in this signification. With this meaning Locke's *intuition* is clearly identical with that of which we have spoken, and which takes place on the mere comprehension of the terms of the proposition setting it forth. Moreover, what Locke calls *the agreement and disagreement of ideas* is really the inherence or non-inherence of the predicate in the subject of the proposition, that is, the existence or non-existence of the predicate-object as in relation to the subject-object. Thus identity-with-black is non-inherent in white, and identity-with-a-triangle is non-inherent in a circle, while more-than-two, and equal-to-one-and-two inhere in three. In the case of our intuitions the inherence or non-inherence of the predicate is perceived as logically necessary, but, in the case of our experiential judgments, as simple fact. Locke's description of the self-evident agreement or disagreement of ideas applies very well to intuition, but he does not dis-

tinguish this mode of perception from experience. We can only say that his doctrine is more properly that of *intuition*, as we understand it, than of *experience*. For the former takes place on the mere inspection of ideal objects, while the latter does not. The illustrations of Locke, also, seem to refer to principles of ontological necessity. In saying black is not white, a circle is not a square, we may employ the law that things which are different cannot in the same sense and at the same time be the same, and so mean that black *cannot* be white, nor a circle a square; and the inferences of inequality and equality which Locke mentions are clearly intuitional.

§ 228. When pure or ontological intuitions are generalized, and form axioms, they have always, as we have seen, a hypothetical character. The abstract axiom may be said to lie at the opposite pole of conviction from the experiential judgment. This latter is always both actualistic and devoid of the thought of necessary consequence; the former is both necessary and hypothetical. Cosmological statements occupy an intermediate place. To this rule, that all axioms are hypothetical, the convictions that *space is boundless* and that *time has been without beginning and shall be without end*, may seem to be exceptions. These beliefs are so simple that they appear to be immediate intuitions, and so universally related that they might be taken for general principles. But close examination will show that they are neither general principles, nor even, strictly speaking, immediate intuitions. They do not, like axioms, set forth any law of being which can be realized in particular cases; they are actualistic convictions regarding singular facts of a most unlimited relatedness. They assert the real and necessary existence of that infinitely extended space and that infinitely lengthened time, which never have, and never will, come under the immediate perception of any finite being. Hypothetical judgments, indeed, are possible respecting space and time. We might say that, because any thing or system of things, must exist in space and during time, therefore, if any thing exist, these entities must do so. But we do not commonly reason in this way. We perceive that the space and time around us are things necessary and actual, whether other things exist or not, and then, along with this immediate actualistic intuition, we form the further judgments, that space is boundless and time without beginning and without end. President McCosh, recognizing the peculiarity of these convictions, has distinguished them from other necessary judgments under the title of Intuitive Beliefs.

We are inclined to consider them, not immediate intuitions, but *conclusions reached by a simple process of reasoning*. They certainly are *ontological*, that is, they contain no element of thought which is not immediately given in the action of intuition. But they do not seem absolutely immediate. We

Our convictions respecting the infinitude of space and the endlessness of time accounted for. They are not simple intuitions.
Pres. McCosh quoted.

take them to be a kind of constructive conclusion, formed somewhat after the fashion of a geometrical demonstration. For, noticing two bodies to exist beside one another, we intuitively recognize that the nature of space is such that another body could exist beside them in like manner, and another, and another, and so on, indefinitely. In this way, by a mental construction, we perceive that boundless space is necessary as the correlative of an indefinite possible extension. In like manner, noticing a number of successive events and imagining others both before and after them, we perceive that the nature of time is such that no limit can be assigned to the number of events which may precede and which may succeed one another—that time, therefore, is endless. In this process our conception of space and time as infinite, is formed just in the same way as the algebraic conception of any infinite quantity, that is, by combining the thought of an increasing series with the negation of limit.

The actualistic character of our convictions respecting these infinitudes has its root in the perceived reality of that space and time in which our own existence is passed. Beginning with the consideration of this, the possibility of indefinite extension and succession is perceived as a *real* possibility (§ 76), and therefore, also, as being accompanied with the reality of its conditions, which are space and time.

If this account of our cognition of the infinite in space and time be adequate, it should be preferred to the theory of an immediate intuition. It involves less assumption; and it harmonizes with the doctrines that all intuitions primarily exhibit themselves as presentational perceptions, and that actualistic intuitions and reasonings take their start from experience.

Our convictions respecting the unlimited character of space and time, guarantee the possibility of an infinite Substance extending throughout all space and enduring throughout all time. Some have even supposed that the being of such a substance is necessarily involved in that of these conditions. On this assumption what has been called the *à priori* argument for the existence of God has been constructed. This, however, involves the misconception, now no longer entertained by any one, that space and time are the attributes, or properties, and not merely the necessary conditions, of an infinite substance. A more satisfactory demonstration of the Divine existence is that which employs the principles of causal inference.

§ 229. It is a frequent teaching of Aristotle that "the principle (or beginning) of demonstration is not demonstration" ("Met." iii. 6), that "first truths are such as are believed, not through aught else, but through themselves alone," and that "we should not, in respect to the principles of rational knowledge, demand the reason why (*το δια τι*), but each principle should be a belief in and of itself" ("Topics," i. 1). Reid

The *à priori* argument for the existence of God.

The reliability of our original convictions. Aristotle and Reid quoted. First principles, defined and distinguished.



repeats this doctrine when he says, "I hold it to be certain, and even demonstrable, that all knowledge got by reasoning must be built upon first principles. This is as certain as that every house must have a foundation. When we examine, in the way of analysis, the evidence of any proposition, either we find it self-evident, or it rests upon one or more propositions that support it. The same thing may be said of the propositions that support it, and of those that support them, as far back as we can go. But we cannot go back in this track to infinity. Where, then, must this analysis stop? It is evident that it must stop only when we come to propositions which support all that are built upon them, but are themselves supported by none—that is, to self-evident propositions" ("Essay," vi. 4). Such remarks as these are frequently to be met with in philosophical writings; they simply recognize the fact of inferential knowledge and analyze its nature. But it is to be observed that this doctrine as to first principles, when examined critically, has a double application; first, to *experiential* perception, or our simple knowledge of fact, and then to *intuitional* conviction, or our perception of necessary relations. For, if we use the word *principle*, here, according to its original signification, to indicate that in which belief *first originates*, it is plain that the knowledge of mere fact or existence, no less than that of the necessary relations of entity, furnishes principles of conviction. Because every perfect inference is actualistic, and consists, first, in a simple belief or knowledge of fact, and then in the assertion of some other fact as necessarily connected with the known fact through the medium of necessary relations. A course of reasoning may be likened to a chain, hanging from a hook. The links of the chain may represent intuitional principles, but the hook is the experiential knowledge from which the reasoning starts. In hypothetical reasoning this knowledge does not really exist, but is imagined to exist; and so we infer hypothetically what we *would* infer actualistically, if we knew the antecedent to be fact. If our language followed nature simply, this perception of fact would receive the name *principle* quite as frequently as the intuitive convictions which employ it as the basis of proof. The discussions of philosophy, however, have chiefly concerned the intuitive convictions, and, therefore, these, especially in their generalized forms, have very much appropriated to themselves the term *principle*. Yet experience, no less than intuition, has the character of an original or fontal belief.

While, from the nature of the case, some convictions must be self-evident, so as to have no need of logical proof, it does not follow that there are any convictions incapable of logical proof. One thing which is self-evident may be proved from something else which is self-evident. Such is the case sometimes with experiential perceptions as connected by logical relations (§ 156). But our intuitions seem related only as logically harmonious; they do not directly prove one another.

It is irrational to demand proof for a self-evident principle, but reasonable to inquire whether a principle be self-evident or not.

When a conviction is original, or a truth self-evident, it is not reasonable to demand proof of it; sometimes, however, *it is not unreasonable to inquire whether a conviction be self-evident or not.* In the practical affairs of life our powers of immediate cognition never exhibit doubt or hesitation, but, in abstract speculations, men have been led into perplexity even regarding the fundamental grounds of belief. Persons troubled with such skeptical difficulties should first satisfy themselves that there are some things which are self-evident, and should then inquire regarding any particular belief whether it be self-evident or not. For there are certain characters by which such truths may be tried and known. Three such marks are noticeable.

Three marks of self-evidence—

1. Subjective necessity.

Hamilton quoted.

Of these we may mention first, that every self-evident truth is *necessarily believed* by the mind. Such is our mental constitution, that we cannot reject it. In order to use this test properly, we must remember that *our immediate cognitions, whether experiential or intuitive, are never of the general or abstract, but of the singular and concrete.* We must receive or reject, correct or modify, general statements, according to our perceptions in individual cases. This direction is especially important with reference to our intuitive convictions; for these are of a more subtle and delicate nature than those of experience. Care is necessary in the determination of ontological principles from our immediate judgments. In the first place, we must be sure that the singular perception is really intuitive and self-evident—a point not to be hastily assumed, but ascertained by the critical scrutiny of the action of one's own mind; and in the second place, the abstraction of the general principle must be so performed as to retain every essential element and to exclude all others. This is not always an easy task. Hamilton says, "Common sense is like common law. Each may be laid down as the general rule of decision; but in the one case it must be left to the jurist, in the other to the philosopher, to ascertain what are the contents of the rule; and, though in both instances the common man may be cited as a witness, for the custom or the fact, in neither can he be allowed to officiate as advocate or as judge." These words contain a truth; yet, perhaps, it is too strongly expressed. One unaccustomed to intellectual analysis, may not be able to formulate doctrines; he cannot be a safe interpreter and expounder of truth; and, in this sense, cannot be accepted as a judge. But persons of sound understanding have no difficulty in comprehending fundamental principles after they have been correctly formulated, or in perceiving their self-evident truth. To this extent the common man may be a judge of common sense.

We need scarcely remark that the test derived from necessity of conviction operates somewhat differently in the case of experiential and in that of intuitive convictions. In the former we have to ask ourselves whether or not what we perceive and know

as immediately present to us exists—whether, for example, we can doubt the reality of our own minds, or thoughts, or desires, or actions, or of our bodies and their parts and affections, or of the material substances with which we come into immediate contact. But intuition is tested by attempting to believe that something necessary might not be, as that a body might exist without space, or an event take place without any relation to time, or to a cause. In either case we find that we cannot but believe in a certain way.

2. Logical consistency. Hamilton.

A second test of our original judgments is to be found in their *logical consistency*. This of itself does not go to show that our original convictions must be believed, but only that we have never any reason to disbelieve them. It takes for granted one intuitive principle, viz., *the law of contradiction*, that a proposition cannot be both true and false at the same time. For, if the truth of one of our convictions involved the falsity of another, then that other would be asserted as both true and false at the same time. Thus the skeptic, in arguing from the alleged inconsistency of first principles, employs one first principle at least. But all truth, when fairly examined, is ever found consistent with itself. Often, proceeding from observed fact on intuitive principles, we infer fact which subsequent observation witnesses, and thus experiential perceptions confirm each other and the intuitions connecting them. Moreover our intuitive convictions, though independent of one another, always work in perfect harmony.

Such being the case, those who have not fogged themselves in sophistical subtleties, have not even theoretical doubts as to their primary beliefs. They realize that *presumption*, mentioned by Hamilton, who says, "There is a presumption in favor of the veracity of the primary data of consciousness. This can only be rebutted by showing that these facts are contradictory. Skepticism attempts to show this on the principles which dogmatism postulates." The presumption here is an antecedent certainty, which certainty is only confirmed by every accurate analysis and comparison of our beliefs.

3. The common agreement of mankind. Philosophical sense." "common sense."

Finally, the reliability of our original cognitions is often illustrated by what is called *the argument from common sense*. In this expression, the term *sense*, derived from the Latin *sentio*, signifies, not feeling, but perception, and indicates that there is a cognition, which, like the feeling which it commonly follows or accompanies, is immediate and without a process. The principles of common sense are the generalizations of those perceptions, whether experiential or intuitive, which are common to mankind. Of the first class are such statements as the following—that *those things exist of which we are conscious*, such as our thoughts and feelings, our souls and their powers—that *those things really exist which we perceive by our senses, and are what we perceive them to be*, for example, our bodies and the things with which we come

into bodily contact—that *we can and do exert a control over our bodies, and are, also, to some extent, ourselves controlled by external forces*—and that *those things really happened which we distinctly remember*. Such principles are simply generalizations of our perceptions of fact; they cannot be used, as laws of inference, for the enlargement of our knowledge. In a wide sense the existence of all things, external and internal, so far as they may be commonly and directly perceived by men, is the object of experiential common sense. The principles of intuitional common sense are our ontological convictions, and they set forth fundamental laws of existence and of ratiocination. Such are the laws of causality, of substance and attribute, of the necessary relations of things in space and in time and as having quantity, and the laws of identity and of contradiction. Such, also, are the radical principles according to which all men reason in matters of possibility and of probability.

Owing to the fact that the discussions of philosophers have chiefly concerned ontological convictions, there has been a tendency to restrict the term *common sense* to the agreement of mankind with respect to assertions of necessary consequence. But the expression, as thus used to designate exclusively, the rational intuition of the race, has this serious objection, that it applies, just as naturally, to their rational experience, that is, to their generalized cognitions of simple fact. For this reason the restriction of the name to intuitional judgment cannot be maintained in the absence of any justifying necessity. Even the restriction of the name to the power of immediate cognition is technical and philosophical; because, in ordinary language, common sense is not subject to this limitation, but indicates rather that entire development of judgment and reason which men commonly exercise about their affairs.

Common sense both experiential and intuitional. Hamilton and Reid quoted. A peculiar application of the term *contingent*.

Both Reid and Hamilton recognize the experiential as well as the intuitional phase of Common Sense. Hamilton goes so far as to say that “the argument from Common Sense is of principal importance in reference to the class of *contingent truths*; the others, from their converse being absolutely incogitable, sufficiently guard themselves”; and Reid enumerates certain “first principles of *contingent truths*” among the principles of Common Sense. Here, let us note, what is properly related to a point already mentioned, that the term *contingent*, as applied by these and other philosophers to experiential convictions, simply denotes truths or beliefs *which do not set forth things as necessarily true*. In this sense contingent truth is that of simple fact, and excludes alike judgments of necessity and judgments of contingency, properly so called. For every such judgment, whether of necessity or of contingency, is logically necessary, and, in a certain sense, sets forth a necessary truth. The ultimate principles of inference in possibility and in probability are as intuitional and as necessary, as are those of demonstrative rea-

soning. When, therefore, the adjective *contingent* is applied—not to one kind of logical judgment as distinguished from another—but to experiential as contrasted with intuitive conviction, the term *contingent* assumes a secondary signification different from its original and proper meaning. It does not indicate the perception of what is contingent, but only the perception of fact aside from any consideration of its necessity or contingency. This use of language arose partly from the circumstance that, in a certain wide sense, all logical judgments are objectively necessary, perceptions of simple fact being devoid of this element of assertion; and partly, also, because in our ordinary thinkings, those perceptions of the simple *esse* or *inesse* which specially call for our attention, are related to things contingent. Neither Reid nor Hamilton defines his use of terms, but the former, with his customary good sense and sagacity, makes statements which justify our interpretation of his language. He says, "One of the most important distinctions of our judgments is, that some of them are intuitive, others grounded on argument. . . . In propositions that are submitted to our judgment, there is this great difference—some are of such a nature that a man of ripe understanding may apprehend them distinctly and perfectly understand their meaning, without finding himself under any necessity of believing them to be true or false, probable or improbable. . . . But there are other propositions which are no sooner understood than they are believed. The judgment follows the apprehension of them necessarily, and both are equally the work of nature and the result of our original powers. There is no searching for evidence, no weighing of arguments; the proposition is not deduced or inferred from another; it has the light of truth in itself, and has no occasion to borrow it from another. Propositions of the last kind, when they are used in matters of science, have commonly been called *axioms*; and on whatever occasion they are used, are called *first principles*, *principles of common sense*, *common notions*, *self-evident truths*. Cicero calls them *naturæ judicia*, *judicia communibus hominum sensibus infixæ*. Lord Shaftesbury expresses them by the words, *natural knowledge*, *fundamental reason*, and *common sense*."

This passage is wanting in clearness because it does not distinguish intuition from experience, but only immediate from ratiocinative conviction. It does, however, state that there are propositions which are no sooner understood than they are believed, which have the light of truth in themselves, and which a man of ripe understanding, who apprehends them distinctly, finds himself under a necessity of believing "to be true or false, probable or improbable." Thus we are taught that necessary convictions, or those which we have distinguished as intuitive, comprise judgments of probability and contingency as well as those of necessity.

Again, Reid teaches that "the principle, *whatever begins to exist must have a cause which produced it*, is not a contingent, but

a necessary proposition. It is not that things which begin to exist commonly have a cause, or even that they always in fact have a cause; but that they must have a cause, and cannot begin to exist without a cause." Here the statement, that things which begin to exist *have in fact a cause*, is represented as a contingent proposition. But, evidently, it is contingent only in the sense that it is an experiential assertion—that is, one of fact simply; for, as Reid constantly maintains, experience is a knowledge of what is or has been, but never of what must or might be. The statement in question is *not* contingent in the sense of asserting what might be otherwise. In the case to which it relates, the connection experientially perceived is allowed to be a necessary one.

Returning from our digression, we must say in conclusion, respecting the "argument from common sense," that the usefulness of this appeal lies chiefly in the assurance, which it excites, that one has correctly interpreted the judgments of his own nature. First principles, as expressed in language, are necessarily abstract and general; *if, therefore, many persons find themselves independently using the same formulæ to express their convictions, they conclude that they not only have judged correctly, but also have correctly expressed their judgments.* The concurrence of a large number of people respecting matters immediately subject to their observation renders assurance doubly sure. Aristotle denounces as "idle talk" the doctrine of some who denied that the pleasurable is a good. "For," he says, "what appears to all, that we affirm to be; and he who would subvert this belief, will himself assuredly advance nothing more worthy of credit" ("Ethics," x. 2). But the caution is not to be forgotten that the appeal to common sense concerns only those truths and facts *which are the objects of our immediate cognitions.* The agreement of men, or of classes of men, in regard to matters of inquiry and deduction, should have more or less weight according to the means of information enjoyed by the judges, and their qualification to act with skill and care and impartiality. But no concurrence of opinion has the infallibility of philosophical common sense. To contradict this is to be guilty of absurdity, and is even given by Melancthon as his definition of the absurd. He says, "Absurdum in philosophia vocatur opinio pugnans cum Sensu Communi, id est, vel cum principiis naturæ notis, vel cum universali experientia" (vide Hamilton's Note A).

Intuitionism compared with other theories § 230. The doctrine of intuitionism, which we have now endeavored to expound, is the only theory of immediate cognition which at once recognizes all the facts presented by consciousness, and explains these on principles derived from a careful comparison and analysis of the facts. On this account we believe that this doctrine will remain as the final statement of philosophy regarding man's primary beliefs. The excellence of the Intuitionist view may be illustrated by the incompetency of all other theories which

The foundation of the appeal to common sense. Aristotle, Melancthon.

have sought the approval of studious minds. These may be rudely classified under four heads as the Skeptical, the Dogmatic, the Kantian or Idealist, and the Associationalist, theories of our primary convictions.

Philosophic skepticism.
Pyrrho, Hume.

In ancient times philosophical skepticism nourished itself on the sophistical refinements of Pyrrho regarding our acknowledged cognitions; in modern times, under the leadership of David Hume, it has triumphed in overthrowing inadequate accounts of our perceptions of fact and truth. But it never has been a common doctrine even among philosophers. For no man, however he may be puzzled by subtle difficulties, can really doubt the testimony of his senses and of his consciousness, or the intuitive perceptions of his intellect.

Dogmatism.
Ueberweg, Locke,
and Aristotle
quoted.

That school in philosophy which maintains that the mind "has the power of *immediately perceiving fundamental truth in the form of general abstract principles*, has been called the dogmatic. "Dogmatism," says Ueberweg, has an immediate faith in the power of human thought to transcend, by the aid of perfect clearness and distinctness in its ideas, the limits of experience, and attain to truth." This doctrine is an improvement on skepticism, but it sets out from a wrong starting-point and tends to the acceptance of abstractions whose truth may be questioned and whose authority may be denied. Locke attacks dogmatism when he denies that maxims, or axioms, are "the principles and foundations of all our knowledge." "Many a one," says he, "knows that one and two are equal to three, without having heard or thought of any axiom by which it might be proved, and knows it as certainly as any other man knows that the whole is equal to all its parts, and all from the same reason of self-evidence" (bk. iv. chap. vii.). But this doctrine, that all cognition is primarily a perception of the singular, has been struggling for recognition from the earliest beginnings of philosophy. That famous saying which Aristotle borrowed from the Stoics, "In intellectu nihil est quod non prius fuerit in sensu," is no obscure anticipation of Locke's assertion that all knowledge originates in *experience*. For in this statement *αἰσθησις* is to be taken broadly to signify every kind of immediate or presentative perception. Aristotle did not sufficiently emphasize this doctrine and deliver it intact to his disciples, yet he expressly teaches that general truths are formed by induction, or principiation (as we would prefer to say), and that this process is based on our knowledge of particulars. "Demonstration," he says, "is from universals, but induction from particulars. But it is impossible to investigate universals *except through induction*. For abstract statements will be known through induction."

Kantianism. Idealism.

The doctrine of Kant *was an attempt to explain and defend the truth which dogmatism inaccurately taught and imperfectly upheld*. Kant failed to see that experience is as intellectual as intuition, and that intuition,

is not a mere power of forming conceptions, but a cognition of things as they truly exist. His *à priori* ideas are far more fanciful things than the general principles assumed by dogmatism. Kantianism has this only in its favor, that it contains more of truth than any of those systems of pure idealism to which it gave rise, and which agree with it in substituting conceptions for cognitions.

Associationalism,
materialism, sen-
sationalism.

Finally, associationalism presents *the weakest and most unsatisfactory account possible of our original perceptions and beliefs*. This form of error is plausible and captivating, especially when divorced from the grosser schemes with which it is commonly united. Materialism, which confounds molecular with psychical activity, and sensationalism, which confounds all thought and feeling with bodily impressions and their reproduction, inevitably ally themselves with associationalism, which confounds the objective laws of inference with the subjective laws of the succession of our ideas. The weakness of all these modes of philosophy is nowhere more apparent than in their attempt to account for the radical conceptions and convictions of the mind. The harder one tries to form such notions as those of space and time, and substance, and power, from the association of "feelings, or impressions, or states of consciousness," the more he will realize the impossibility of doing so. And the more one endeavors to identify our conviction of logical necessity with that of an acquired psychical necessity governing the sequence of our thoughts, the more he will find that logical necessity pertains to objects, and is truly perceived by the mind viewing them. The convictions that all things must exist in space and time, that power must reside in substance, that action comes only from power, and change only from action, that nothing can be existent and non-existent at the same time, and that a thing must be either existent or non-existent, that the nature of space admits geometrical figures and relations, and necessitates certain connections between them, and that quantity, in like manner, admits and necessitates arithmetical relations—these, and many other principles, irresistibly assert themselves as simple, ultimate, objective, verities.

CHAPTER L.

THE ELEMENTS OF ENTITY.

§ 231. The doctrine of intuitionism would not be fully illustrated if we did not consider two distinctions, not absolutely essential to it, yet naturally and necessarily connected with it.

Two distinctions dividing both elements of thought and elements of entity.

The first of these may be expressed by saying that *some portions or elements of our thought, and the objects corresponding to them, are intuitional or ontological, while others, and the objects corresponding to them, are empirical or experiential.* The second may be expressed by saying that *some portions or elements of entity, and our conceptions of them, are ontologically necessary, while others, with our conceptions of them, are ontologically contingent.* The first of these statements and the terms employed in it relate, primarily, to our modes of conception, and, secondarily, to the objects corresponding with these; the second statement and its terms relate, primarily, to the objects of our thought, and, secondarily, to conceptions corresponding to them. When, therefore, in the first statement, we speak of intuitional and experiential things or elements, we do not mean things which are the products of experience and intuition, but only things specially related to each of these modes of cognition, and when, in the second, we speak of necessary and contingent conceptions, we mean only conceptions corresponding to things necessary and contingent. Moreover, as in each case, the division of thought and the division of things exactly correspond to each other, we may sometimes, for the sake of simplicity, omit mention of one of these classes of things. That is, we may speak of a difference in objects, leaving it to be understood that there is a corresponding difference in our conceptions, or, conversely, of the difference in thought, making the difference in objects a matter of reference. For conceptions, considered as to their objective nature (§ 30), are distinguished by the distinction of their objects.

The logical origin of Kantianism.

The discussion of these different modes of conception and of the different elements of entity corresponding to them, is desirable, not only as illustrating the action of the mind in its primary cognitions, but also as exhibiting *the truth which gives vitality to the error of Kantianism.* The doctrine, that the perception of the actual essentially consists in the union of two diverse modes of mental activity, is a fundamental mistake, yet we must allow that two different modes of conception do unite in every perception of the actual. The error of Kant possibly was suggested by the Aristotelian teaching that existence or fact lies in the connection or composition of things. For we might naturally infer from this that the perception of truth lies in the composition or union of our ideas (§ 45). A person conversant with Aristotle's doctrine, who should find that two peculiar modes of conception really did combine in every perception of the actual, might naturally suppose that he had discovered the ultimate nature of our cognitions. But we need not repeat that the perception of fact is a thing simple and *sui generis*, and not to be resolved into any synthesis of conceptions or other mental states.

Ontological or intuitional elements, defined and contrasted with the experiential.

Beginning, then, with the first distinction, we say that some elements of thought are intuitional while others are experiential. The objects of the modes of conception thus distinguished, are two forms of entity which are most intimately united in actual existence, and which are not ordinarily discriminated. Indeed, experiential elements are never ordinarily conceived of by themselves, and they may be best pointed out if we first explain what we mean by the ontological elements and then say that those elements are experiential which are *not* ontological or intuitional. By ontological elements, we mean those which enter into our most abstract or general statements of intuitional truth, that is, into those judgments which are distinctively ontological or axiomatic. In the statement, "Power must reside in substance," power, substance, the peculiar relation between them, the existence of that relation, and the necessity of this existence, are ontological elements. On the other hand, those elements of thought are experiential which never enter into and condition a pure ontological judgment, but which, as added to, or combined with, ontological conceptions, compose our ordinary ideas of things. The idea of a tree, or that of any common object, contains both ontological and experiential elements. It includes the conceptions of substance, quantity, size, place, shape, power, and of such relations as that of whole and parts (which makes the tree one body), of cause and effect (which accounts for its existence), of similarity (which gives it a common nature), and of individual difference (which separates it from all other trees). These are the ontological elements; but the experiential are those peculiarities of the properties of the tree of which our senses are cognizant, and which, by their relations to the different other elements of the tree, color its whole nature. In like manner, the peculiarities of one's disposition as lively or dull, amiable or morose, intelligent or stupid, may be regarded as experiential elements in the facts of psychical life. For such things are originally perceived only in experience, and are not of themselves the bases of any logical necessity.

We call the conceptual and objectual elements on which intuitive judgments are conditioned *ontological*, simply because of their relation to these judgments. For *our convictions of necessary truth do not depend on all the elements perceived in objects, but only on certain elements which are the fundamenta of logical relations.* The judgments which depend on these elements are of such absolute necessity, that they would hold under any system of things in which their subjects or antecedents might be found. Therefore, they, and the conceptions which condition them, may be styled *ontological*. On the other hand, elements of thought and being which do not enter into the laws of necessary conviction, may be called *experiential*, not because they alone are used in experience, nor yet because they are used in experience only (neither of these things would be true), but because they are the additions, ob-

tained in experience, whereby ontological judgments or conceptions become cosmological, and because they can be employed in argument, as representations of reality, only on the ground of an actual or assumed experience. For these experiential elements of conception are fitted of themselves to represent fact, but not principle or law.

The distinction which we have now made refers to A confusion avoided. certain *elements* of thought and being, and should not be confounded with another related to it and founded upon it. By ontological conceptions we might mean, not merely such elementary forms of thought as set forth, or connect, subjects and predicates in our ultimate abstract intuitions, but also any combinations or constructions formed from these. In this sense not only the simple and radical, but also the complex and even complicated, conceptions of the "pure sciences," and especially of mathematics, are ontological; while all such additions to these conceptions as are not fitted to furnish logical relations, are experiential or empirical. We might, for example, take some peculiar geometrical shape, as a pyramid, or a sphere, which is a combination of simple geometrical elements, and which, on that account, has certain necessary properties peculiar to itself. Our judgments respecting these properties might be called *ontological*, as being of an absolute and universal necessity, and the shapes themselves might be called *ontological*, as the bases of these judgments. Or, because an attractive force, operating on bodies inversely as the square of the distance, and directly as the quantity of matter, would produce certain effects in any universe, we might call that force and our conception of it *ontological*. But, at present, we consider *elements, and not compounded objects*, or our conceptions of them, and, in particular, we mean by ontological elements such ideas (and objects) as are *the necessary factors in axiomatic judgments or simple abstract intuitions*.

The distinction between experiential and intuitional elements not parallel with that between experience and intuition.

In the next place, let us note that the distinction between experiential and intuitional conception, though growing out of that between experiential and intuitive conviction, is not so connected with the latter that experiential thought only is used in experiential conviction, and intuitional only in intuitive. On the contrary *both modes of conception are used in each mode of belief*. The distinctions, therefore, though related, are not parallel to each other. For cosmological intuitions employ experiential conceptions along with those on which their peculiar force depends, and our experiential cognition of things includes—and sometimes mainly consists in—the perception of elements which may be the fundamenta of necessary or logical relations. When one sees a man walking along the road, his body and its parts, his place, his size, his motion, and his rate of speed, are all perceived as matters of fact. But these things involve such radical entities as space, time, substance, power, action, change, quantity, and relation; which are ontological

elements. Plainly, experience perceives such elements, and objects compounded from them, as well as the non-ontological peculiarities which may be found in such objects.

Because of this want of correspondence between the division of our conceptions and that of our convictions, when each are distinguished into the *ontological* and the *experiential*, it may be questioned whether these terms should not be used exclusively with reference to convictions, and some other designations provided for the elements of conception. But, so far, no better terms have presented themselves.

The ontologically necessary, and the ontologically contingent, elements of thought and being.

The second distinction between the elements of conception and entity, though closely related to the first, distinction, is not based on so simple and evident a ground. Each distinction is related to what might be called an ontological necessity, and, therefore, also, to necessitating conditions; yet, in a certain sense, the first refers to a conditioned, and the second to an unconditioned, or absolute, necessity. In the division already considered, conceptions are ontological as representing natures which exist in *various simple necessary correlations with each other*. The intuitive propositions in which these elementary conceptions are found, state what must be true, provided certain specific antecedents exist. But, using the second distinction, we call conceptions ontologically necessary, when they set forth *what must in any case exist in any developed system of being*. Philosophers employ this rule of discrimination, when they speak of the necessary elements of conception or thought, and of being or entity. They refer to what must exist *in case any system of being exists*. The single antecedent thus described is of so general and comprehensive a character that the necessity resulting from it, as compared with the other already described, may well be called *absolute*. But it is absolute, not as being wholly unconditioned, but only as being free from any specific condition; and, like the other necessity, it is of a hypothetical nature.

Refer to a system of being.

To understand the character of this necessity, we must note that the antecedent to which it refers is not the mere existence of entity but *the development or construction of a system of entity*. A necessary element of being is not such as cannot be supposed to be non-existent, but only such as must exist provided that, and so far as, any universe or system of things exist. Excepting only space and time, it is possible to conceive—that is, we can conceive as abstractly possible—the non-existence of all things. There is no contradiction in the idea of an infinite void in which not even one substance abides in solitude; so, also, an endless duration is conceivable in which no events transpire, and an unbroken silence reigns. But, on assuming the existence of any system of being, we cannot but attribute to it a certain constitution. First of all, it must contain one or more substances; without substance nothing can exist in time save empty space. Then this substance

must be endued with power, or a capability of action; else we shall have a world of stillness and death. Further, this power must exhibit itself in action, or exertion; and this action must be productive of change; otherwise phenomena will not really take place, but be mere possibilities. Moreover, the different substances, powers, actions, and changes, of the universe, must all be affected by quantity; for whatever exists cannot but be a something; and they must be subject to various relations, those, for example, of numerical difference, of similarity and diversity, of space and of time, of causation, of number and of quantity. In short, there must be various general modes of entity, if there be any universe or system of being, and, in this aspect of the case, such things may be called the *necessary* or *fundamental* elements of entity. This power of the mind to judge regarding the necessary conditions of universal being is something wonderful; but it is not inexplicable. For what we immediately perceive to be the necessary conditions of any system of being in that sphere of space and that period of time, to which our own personal existence is united, may be inferred, on the homologous principle, to be necessary in any space and at any time. We know that which is distant, because we know that which is present.

Two modes of ontological necessity. Both hypothetical. One conditioned, the other absolute.

We have seen that each of the distinctions now discussed relates, in its own sense, to an ontological necessity, and divides the elements of things according as they are or are not conditioned by such a necessity. In each case we may be said to distinguish the ontologically necessary and the ontologically contingent. But these names have been *specially given to the elements divided by the second distinction*, because the necessity to which it refers is, as we have said, most absolute.

The determination of the character of elements according to the first distinction, though not always easy, has the advantage of having definite starting-points in our specific and ultimate intuitions. An analysis of the fundamental laws of necessary or inferential judgment, yields the ontological elements of thought; and an analysis of the additions obtained in experience, the experiential. Thus we are led directly to a division of elements by a consideration of definite intuitions respecting specific forms of entity. There is not the same simplicity in applying the second distinction. According to it, those elements of thought and of being are ontologically necessary without which no developed system of being could exist, while all elements additional to these, are ontologically contingent. For what is not necessary either to be or not to be is contingent.

The antecedent of this necessity is noticeably indefinite, and even somewhat variable. The notion of a system of things or entities is a very general one; and such a system may be more or less developed. We might conceive of substances which were powerless, of powers which never

were exerted, and of exertions which, through mutual opposition or counteraction, produced no change; but we cannot think of a change save as the effect of the exertion, or of exertion save as the action of power, or of power save as the property of substance. And, with reference to these modes of dependence, we say that, next after space and time, if anything exist, it must be substance, and next after substance, if anything exist, it must be power, and so after power we put action or exertion, and after action, change. Moreover, quantity and relation, though existing with each of these other forms of entity, are existent or non-existent so far as each is existent or non-existent; they live or perish with that to which they belong. Hence, it seems that *collective entity forms a sort of system in which, though every part is essential to the system, some parts are built on others, and are, in a sense, less fundamental.* Each element is necessary to the system in its own way, and has, for an immediate antecedent, a greater or less development of the system. That each element is necessary to the system as a whole, is the ultimate conclusion of such judgments as we have given above respecting the logical succession of the elements. For, as every part of a process is necessary to the process, so every fundamental form of entity is an essential element of being.

The two divisions of elements compared and identified.

The question now arises, "In what way are the two divisions of the elements of being, which we have now described, related to one another?" To which we reply, that they seem to be coincident, and that the elements respectively ontological and experiential, according to the first division, are also respectively ontologically necessary, and ontologically contingent, according to the second. This statement refers to the *elements* in question, and not to *objects compounded from them.* In particular, we do not say that objects composed of certain elements, as, for example, the complex forms of geometry, are ontologically necessary, but only that certain elements of which these objects are composed are so, and that if objects be fully analyzed into their elements, ontological and experiential, we shall find on examination, that the former are ontologically necessary and the latter ontologically contingent, in the specific sense already explained. This position will be established if we can show that ontological and ontologically necessary elements are the same; for, beside the ontological, there are only the experiential, and, beside the ontologically necessary, only the ontologically contingent.

It is very apparent that any simple nature which may be ontologically necessary, according to the second distinction, is an ontological element, according to the first. We not only find that such natures are the foundation of intuitive judgments, but those very judgments about them, on account of which we pronounce them ontologically necessary, are intuitive and ontological. *Is, then, the converse proposition true, that any element, ontological, according to the first distinction, is ontologically necessary, according*

to the second? To answer this question in the fullest and most satisfactory manner, all our simple, or axiomatic, intuitions should be distinctly formulated, and then we should inquire whether and how far each factor entering into the composition of every such intuition, must be present in a developed system of being. This would involve the collection and analysis of all the different axioms, postulates, and primary conceptions employed by *pure* reason. Without entering on this task we must express the opinion that it would result in exhibiting the coincidence of the two divisions of elements. The fundamental principles of the *ontological* sciences appear, on examination, to be simply statements expressive of certain necessary relations pertaining to space, or time, or causation, or quantity, or to substance, its powers and its actions, or to things as having numerical difference and sameness, or as logically identical or diverse, or as existent or non-existent; and these relations, in any developed system, cannot be things merely hypothetical, but must be really operative laws, such as involve the reality of their elements. We think, too, that any intuitive principles other than those employed in the sciences commonly distinguished as ontological, may be shown to relate to things ontologically necessary. We refer to certain principles of mental and of moral science which seem self-evident and incapable of analysis into any simpler beliefs.

The identity of the divisions not a fundamental, yet an important, doctrine.

That identity of elements which we have now described, and which is a bond of union between two different principles of distinction, can scarcely be regarded as a matter of fundamental importance; yet, if we accept it as true, a new light is thrown on the nature of our intuitive convictions. We perceive that the necessary convictions of the mind set forth what, in a very absolute sense, is the necessary nature of things. The practical advantage also follows that we may reason from either distinction of the elements to a correct application of the other. For, the divisions being coincident, whatever elements are ontologically necessary, are such as specific intuition considers, and whatever are involved in specific intuition, are ontologically necessary. But ordinarily we have no need of such criteria.

The *summa genera* of entity. The eight categories of being.

§ 232. We shall now enumerate and define certain elements whose ontological necessity and whose intuitional character are both very apparent. The consideration of these will illustrate the nature of ontological elements, and will prepare us to understand more easily the nature of the experiential, or contingent, elements of being. The things to which we refer may be called the *summa genera*, or fundamental forms, of entity, and of the relations of entity. They are the ultimate generalizations to which we naturally come from the analysis of all classes of objects. For, the end of generalization *being to facilitate the logical consideration of things*, our highest natural generalizations set forth those radical

forms of entity, which are the simplest, and, therefore, the most general, fundamenta of logical relations.

So far as we can see, there are in all seven ultimate categories of being, and, beside these, several radical kinds of relation which exist between them, and which constitute another comprehensive category. These seven elements may be enumerated as Space, Time, Quantity, Substance, Power, Action, and Change. They are in every case to be regarded as simple ultimate elements, and as exclusive of one another.

Space, for example, is simply *room*, without reference to its extent; for this involves quantity. Moreover, the conception of space as immense or infinite is not simple and primary. In like manner the idea of time is merely that of duration, without reference to its capability of measurement, or to its being without beginning or end. Stewart says truly that "space is neither substance, nor an accident, nor a relation; but it does not follow from this that it is nothing objective." The same may be said of *time*. Both are entities *sui generis*. Nothing could be more erroneous than the opinion of Leibnitz, "Je tenois l'espace pour quelque de purement relatif, comme le temps—pour un ordre de co-existence, comme le temps est un ordre de succession." Space and time are the conditions of certain relations; they are not themselves relations. In regard to the teaching of "certain mystical divines and philosophers who speak of space and time as having no reality to the Divine mind," Dr. McCosh well remarks, "If they have no reality to the God who knows all truth, they can, properly speaking, have no reality at all. If our convictions testify that they have a reality, it follows, I think, that they have a reality to the Divine mind." The "eternal now," or "punctum stans," of the scholastics, is a pious absurdity, originating in a figure of speech. Space and time are utterly devoid of power; they can produce nothing. But neither can they be affected by power: and they condition all things, even the Divine Being. It is part of the perfection of God to be omnipresent and eternal. He could be neither were there no space and time.

Dimension, or the capability of measurement, belongs to space and to everything which occupies space. Of course, definite measurement is possible only when space is definitely occupied. Measurement is possible in every possible direction from any given point in a space or the substance occupying it. But, inasmuch as the volume or extent of space is proportional to the product of the measurements on three lines crossing each other at right angles, we often speak of the three dimensions of space. Such language does not teach that space is composed of length, breadth, and thickness, as of three elements, but only that it is of such a nature that it admits of lines, surfaces, and solids, and that its volume may be determined by three measurements. Space itself is a simple thing and extends equally in every direction.

Space and time.
Stewart, Leibnitz,
and McCosh
quoted.

The "dimensions"
of space defined.
They are not ele-
ments of space.

Quantity defined
and divided.
Discrete and con-
tinuous.
Mathematics.

Quantity is distinguished by its peculiar inherence in all entity. It is that which makes everything a something. Without importance of its own, it becomes important according to the nature of that in which it inheres. The quantity of entities, considered as having numerical difference, and without reference to their measurement, is called *discrete* quantity, and is the basis of multitude and of number. The quantity of entity as subject to measurement, and without reference to numerical difference, is styled *continuous* quantity, or magnitude. Thus the *many* and the *great* are distinguished. Mathematics is sometimes defined as the science of quantity. Strictly speaking, it considers quantity only as the basis of numbers or of measurement, that is, of definite quantitative relations. Yet, as there is no other science specially devoted to the consideration of quantity, the common definition is not inappropriate. But we cannot agree with Reid that, because mathematics deals only with things as having determinate quantitative relations, quantity should be defined that which may be measured. This, of course, was intended only as an accidental definition; for simple elements cannot be analytically defined. But it is of too limited an application. We prefer the more general statement that quantity is that on which the relations of the more and the less depend. Both continuous and discrete quantity belong to every element of entity, but *relations* are commonly conceived of only as having discrete quantity. Yet continuous quantity may be ascribed to relations. For example, we might say that a greater quantity of similarity exists between two pieces of blue cloth, each ten yards long, than between two which are only one yard in length, respectively. But this quantity of relations is so connected with the continuous quantity of the things related, that we seldom think of it independently, but regard it as an attribute of the things.

Substance defined
and divided.
Aristotle's doc-
trine.

Substance is the central category. It is that element which is most easily and frequently taken as the basis of the unity of our conceptions. We can think of spaces, times, powers, actions, changes, and relations, as things, but substances, pre-eminently and emphatically, are called *things*. The reason for this is, that this element is perceived constantly, and as a stable factor, amid our successive cognitions of other elements. Many places, times, powers, actions, changes, and relations, may be perceived separately from each other, yet all in connection with the same substance. Like the other elements, *substance*, though of a simple nature, has distinctive properties. It occupies or pervades space; and it is the sole repository of power. We cannot conceive of a substance which should occupy no space whatever; nor of a power which should exist in separation, and not as the attribute of some substantial entity. Those use an unintelligible language who say that the different forms of matter are only different modes of force.

We know only two kinds of substance, the material and the spiritual; these are distinguished by the diverse characters of their powers. Aristotle's doctrine of substance, which occupies a large place in his philosophy, is wonderfully confused. This arose principally because he did not distinguish the logical from the metaphysical substance (§ 126). The former of these is not a specific kind of entity, but is entity considered as the subject of attributes. At present we speak of the latter only.

The remaining genera of entity—power, action, and change—are intimately related to one another. Power is the principal condition of action; and action of change. These three are generally perceived at once, the *action*, or operation, of *power*, being recognized as the cause of *change*.

Power defined and divided.
Locke quoted. *Power* not only resides in, and can be exercised by, substance only, but also operates only on substance. By this we mean that the changes produced by power are all changes in the affections and relations of substance. Moreover, whether the agent act on itself or on some other substance, there is need of a capacity to receive, as well as of power to effect, the change. This capacity has been named, by philosophers, *passive power*—*δύναμις παθητική*. Locke says, "Fire has a power to melt gold, that is, to destroy the consistency of its sensible parts, and consequently its hardness, and make it fluid, and gold has a power to be melted. The sun has a power to blanch wax, and wax a power to be blanched by the sun, whereby the yellowness is destroyed and whiteness made to exist in its place. . . . Power, thus considered, is twofold, viz., as able to make, or able to receive, any change. The one may be called *active*, the other *passive power*" ("Essay," bk. ii. chap. xxi.). The Greek language indicates this distinction by two kinds of potential adjectives, one terminating in *τικός*—such as *ποιητικός*, *κινητικός*—signifying active power, and another terminating in *τος*—such as *ποιητός*, *κινητός*,—signifying passive power. A somewhat similar use is made of English adjectives with the endings *ive* and *able* (or *ible*)—for example, constructive and constructible, motive and movable.

Action or exertion, and passion or suffering. *Action*, as we have said, is seen in the production of change, and is so closely connected with this that the conception of an action often includes that of the change produced by it. Action is distinguished from power, because the latter without the former does not produce any result; change follows only when power acts. And action may be distinguished from change, because change of itself has no efficiency. Moreover, action does not always produce change, but only always tends to do so; if one exercise of power counteract another, there is no result. On this account the essential part of action might be called *exertion*; while action as producing change is *operation*. To the general rule that change is conditioned on action there is this exception, that the beginning and ending of action itself is not produced by the exertion of power, but is a concomitant of this exertion. For this reason one might take

action for a kind of change. But exertion is to be distinguished even from that change which may immediately affect itself. Passive action corresponds to passive power, but is not commonly called action, but *passion* or *suffering*.

The element of *change* exhibits two parts or modes, the one the ending, and the other the beginning, of existence. Using the term in a wide sense, both annihilation and creation are changes. But commonly, when we speak of a change, we mean that one thing, or state of things, ceases to exist, and that another, fitted to occupy its place, begins to do so. Change ordinarily follows the exercise of power, and is commonly conceived of as effect or result. It takes place when the substance or substances possessing the power may become subject to the proper circumstances or conditions for its exercise. Then the power, or its exercise, as accompanied by these conditions, is called a cause, the change being the effect. So far as we can see, change may affect all things save space and time. As affecting quantity, it is increase or diminution. As affecting substance, it is creation or annihilation. As affecting power, it is invigoration or enfeeblement. As regards action, it is cessation or commencement. But this element is especially noticed as affecting relation, and, in this aspect especially, it bears the name of change. We find, by experience, that no human or finite power known to us can create or annihilate substance; yet intuition does not teach that such changes are absolutely impossible. The uneducated can believe that a cloud appearing in a clear sky is made out of nothing, or that the very matter of fuel is destroyed in the fire. Nor is it irrational to believe that finite substances can be called into existence, or can be rendered non-existent, by the exercise of a peculiar and divine power.

The changes ordinarily perceived and conceived of by us may be divided into the psychical and the physical. The former include exercises of spiritual powers and the alterations of the state or condition of one's conscious life, consequent upon these. For the relations of the elements of our inward activity are constantly varying. The exercise of psychical power naturally follows its proper conditions—one set of activities being conditioned on those preceding,—without, in the strict sense, being an effect. Thus knowledge is rather the condition than the cause of desire or emotion; and a desire is rather the condition than the cause of our effort to obtain its object. This psychical sequence is often called *causation*, and may be allowed the name, if the word *cause* be taken to signify any antecedent condition of a beginning of existence.

Only one substance is essentially necessary for the sequence of psychical changes, although sensation involves two substances; but matter never acts save when it is acted on. As acted on by spirit it seems passive, not contributing to its own changes, but, when one portion of matter acts on another, both contribute to the efficiency producing

Change, its modes
and relations.

Psychical and
physical changes
contrasted.

the entire result. Material changes mostly consist in, or arise from, the destruction of old relations and the institution of new. The simplest is motion, which is a change of place, or of the relations of a body to some part of space. That exertion of power which produces motion is called *force*. Alterations in the size, shape, consistency, mechanical properties, and sensible qualities of bodies, seem dependent on changes in the adjustment of their particles one to another. By this we mean that the powers of the ultimate particles, probably, are not changed, but only the conditions of adjustment under which the powers act. Such views, however, are merely conjectures, not intuitions. Changes, like the powers producing them, cannot exist apart from substances, *yet they may be the objects of analytic and independent conception*. Some, building on this circumstance, deny that we perceive aught save changes or "phenomena." But no one ever saw, or even distinctly conceived of, a change existing by itself; we only see things changing. In connection with change we may define the thought of a state—or of a condition, as it is sometimes called. This is the existence of a thing considered as related to the non-existence of change. It is not a specific element, but only the existence of a thing as abiding and unchanged.

Relation is not an intermediate entity.—Implies two relationships.
A duality of elements.

§ 233. We come now to that element by which all the others are united in various systems of being, and which, more than any other, is the object of rational attention; that is, *relation*. The existence of this entity always involves the existence of two others. Hence, some have called it *the intermediate entity*. But nothing really exists *between* objects related. The truth would be better expressed by saying that there is a correspondence, part of which exists in the one object and part in the other, and that so every relation consists of two relationships. If this be so, a kind of duality may be traced throughout the radical elements of entity. Space and time may be classed together as independent of all the rest and conditioning them all. Quantity is twofold, discrete, and continuous. Substance is either spirit or matter. Power is active or passive; and is manifested by doing and suffering. Change, whether psychical or physical, includes both the beginning and the ending of existence. And, finally, relation is composed of two relationships or corresponding parts.

Numerical difference and identity.
Why so called.

The most general of all relations is *difference*, using this term in its most literal and absolute sense. It is often distinguished as *numerical* difference, having received this name, not because it always involves the conception of number, but because it is always involved in that conception. We may, and constantly do, think of it without reference to number. It is that property by reason of which any one individual thing is not any other thing. Numerical—or literal—identity is often defined as the relation between any object and itself, but this can be allowed only in part, and in con-

nection with a distinction. Speaking objectively, this identity is only the absence or non-existence of the relation of difference; but speaking subjectively—or regarding the object as viewed by two different acts of the mind, it is a kind of relation. It is that between an object and itself, as twice viewed by the mind. The relation of whole and parts is a combination of the relations of identity and of difference. It is a particular case of identity in which an entity is perceived to be the same with a collection of lesser entities which are perceived to be different from each other.

Numerical identity and difference, though involving quantity, are to be distinguished from what we ordinarily term *relations of quantity*. These latter are the relations of the *how much* and the *how many*. Quantity, as affected by them, may be called *definite* or *mathematical*. Numerical difference and identity involve only the indefinite quantity which belongs to something or anything.

A second mode of ontological relation is that of *similarity*. Next to numerical difference it is more employed than any other relation in the operations of rational thought. Its great importance arises from its connection with the homologic principle, which declares that all being is governed by logical necessity and that all logical necessity follows the forms of law. As thus subservient to rational conception and conviction, similarity becomes logical identity, which, unlike literal identity, is a real objectual relation. *Dis-similarity*—from which we obtain logical difference or diversity—is the relatedness which arises between two or more objects from the absence of mutual similarity. It becomes an object of interest only when objects have a considerable degree of likeness, and, therefore, present a noticeable contrast as to their points of unlikeness. Literal and logical identity and difference are more constantly used in thought than any other relations.

Besides these, five other fundamental classes of relations may be mentioned, as having an ontological character. These are those of space, of time, of causation, of substance and attribute, and of quantity. *Spatial relations*, of causation, of substance and attribute, and of quantity. Spatial relations are mentioned when we speak of an object as being in space, or as occupying space, or as related to other objects in space, and to the spaces occupied by them. Relations of place are spatial relations founded on spatial relations. For relations may be founded on, and may exist between, relations, and things as related.

Temporal relations. Objects are temporally related as enduring for a time, or occurring in time, or at some time, or as related to other objects which are past, future, or contemporaneous.

Causational relations. The relations of causation subsist between change on the one hand and power, together with its operation, and the conditions of its operation, on the other. We have already spoken of these; they are the different elements and modes of the relation of cause and effect.

The relation of substance and its properties or attributes.

The connection of substance and attribute is a relation between two specific elements of entity, and is to be distinguished from that between the logical substance and its attributes. The latter is the relation between a metaphysical whole and its parts (§ 122), and exists between any entity whatever and its distinguishing characteristics. The former exists between real, or metaphysical, substances and the powers inherent in them.

Quantitative relations.

The relations of quantity are either those of numbers, according to which units and collections of units, without reference to the size of the units, are added, subtracted, multiplied, and divided, and in other ways made the subject of intuitive judgment; or those of magnitude, in view of which similar operations may be performed, the quantity of each unit being considered, and compared with some unit adopted as a standard. Magnitude is sometimes distinguished from multitude as involving absolute continuity of substance, or operation, or being; but whatever admits *continuity of measurement* may be regarded as a magnitude, whether it be continuous in other respects or not. A ton of pebbles is as much a magnitude as a ton of water.

The transcendental elements of thought and entity.
Existence, non-existence.

§ 234. We have now illustrated the ontologically necessary by briefly enumerating the seven radical forms of entity, and the seven principal modes of relation by which they are united, in fact and in conception. Certain other thoughts and things, which can scarcely be styled modes of entity, are also ontological. Such are existence and non-existence. In every conceivable universe, some things must exist and others be non-existent. The thought of non-existence, as well as that of existence, combines with our conceptions of the elements of entity, and thus doubles the possible number of our conceptions. We can say that there is no room, or no time, for something, or no quantity of it; that nothing (that is, no substance) of a certain kind exists; that a given substance is powerless for a certain work; that some agency is inactive; that there is no longer motion or change, but a state of rest, or a condition of things; and that in a given case no relation of a specified character exists.

Entity or being.

This leads to the remark that the conception of being, or entity—signifying, not existence, but that which does or may exist, is ontological, as, likewise, that of non-entity, or nothing. In this last the conception of non-existence combines with that of entity. When we speak of the elements of entity, the term *entity* is used as a collective noun; but, when the term has simply the general meaning now given to it, every element is itself an entity.

Logical necessity and possibility.

Finally, logical necessity and possibility, however we may define them, are things which must exist in any universe. We omit impossibility and contingency, because these are included under necessity and possibil-

ity. A thing is necessary to be when it exists, and no power can make it not to exist; impossible, or necessary not to be, when it does not exist, and no power can make it to exist. A thing is possible to be when one or more of the conditions of its existence are compatible with given circumstances, possible not to be when one or more of the conditions of its non-existence are compatible with given circumstances; contingent when it is possible either to be or not to be. Necessity is a kind of absolute connection of the existence or of the non-existence of a thing with given fact; possibility the compatibility of its existence or non-existence with given fact. They are a sort of relations, but are separated from other relations because they are ordinarily used simply as instruments of conviction, and are not often the direct objects of our consideration and inquiry.

§ 235. The elements which we have now considered are clearly ontologically necessary. The question now arises, whether any other things of a less simple and incomplex nature may be granted this character. We have seen that substance is a necessary element. Is mind, also, or spirit, such an element, or might there be a purely material universe? Or, on the other hand, might there be a system of existence entirely spiritual, without any material addition? Or might there be a universe of some third substance, neither spirit nor matter? We incline to answer this last query negatively. If mind be the thinking sentient substance, and matter the unthinking insensate substance, then whatever substance is not mind, must be matter. If, therefore, any system of being exist without mind, it must be material. But, in further answer to the above queries, we would not deny the abstract possibility of a purely material world, but must say that if such a world existed, it could scarcely deserve the name of a universe or system. It would be, at the best, a chaotic commingling of blind forces without order, purpose, or desirable result. A developed system must contain intellect, or soul. Might, then, such a universe exist, without material addition—a universe composed of spirits and their life? We think so; but, if the system were further developed by the creation of any new kind of substance, that substance must be material. In this view, therefore, we say, that first mind, and then matter, is ontologically necessary.

This judgment will appear the more reasonable if we take the essential constitution of our minds to be a correlate of the necessary constitution of being, and hold that our simple and primary intuitions exhibit the structural laws of any possible universe. In that case those objects which serve as the subjects or predicates of any such intuitions may be regarded as ontologically necessary.

Our intuitions respecting matter are very few; they seem to be these only, that, if it exist, it must occupy space and must be

May any things capable of analysis be regarded as necessary elements of entity? e. g., mind and matter?

The subjects and predicates of our simple and primary intuitions may be regarded as elements of the ontologically necessary. Intuitions respecting psychological life.

subject to forces operating in space. Regarding spirit, there is a more noticeable variety of primitive judgments. For example, we perceive necessary relations to exist between subjectual or propositional truths, as well as between objectual truths, or facts. But the former are psychological things; they are the mental apprehensions of facts. We say equally that the same thing cannot both be and not be at once, and that it is impossible to perceive or believe that the same thing both is and is not, at the same time. Some writers, dwelling too exclusively on the ontological character of the laws of inferential conviction, *have divorced these from those necessary modes of being to which they refer* and by which they must be understood. In this way one-sided systems of logic and metaphysics have been produced. But it cannot be disputed that we do regard certain modes of conviction as ontologically necessary, and assert that no beings could exercise a belief contrary to them. Again, it seems intuitively true that every sentient being is bound in reason to desire happiness and avoid misery, so far as he understands the nature of these things. Hence, Aristotle, arguing from common sense, ridicules those who deny that pleasure, considered *per se*, is not a good, holding that it must necessarily be esteemed a good by all intelligent beings. Hence, also, we say that every rational being, as rational, necessarily approves and desires the greatest good, and necessarily recognizes the excellence and obligation of right ends, meaning by rationality a sufficient degree of intelligence to understand the good and the right. We cannot conceive it possible that beings of sufficient intelligence to make such judgments should make them otherwise than according to certain radical principles. It is true that these judgments concern our experience—our mental, motive, and moral, life—and take place in view of it. But they are not experiential judgments. They have an intuitional character in asserting that some things cannot, under any circumstances, be disbelieved, that other things must, when considered, be objects of desire or aversion, and that others must, when understood, appeal, to those understanding them, as right and obligatory ends. Nor is it possible to explain these judgments as being deduced, by the aid of experience, from principles less specific and more fundamental than those which they immediately present. If this be so, it agrees with the conviction that sentient, rational, and moral, beings (according to our conception of them), must form a part in any developed universe.

Moral intuitions
and their objects.
Prof. Shedd and
Pres. McCosh
quoted.

The doctrine which we have now stated, so far as it relates to moral life, is that taught by those who hold to "an immutable and eternal morality." Dr. Shedd writes thus, "The law 'Thou shalt love the Lord thy God with all thy heart and thy neighbor as thyself,' is necessary and absolute for all intelligences. We cannot conceive that it might have been different from what it is—that the command might have been thus, 'Thou shalt hate

the Lord thy God, and thy neighbor.' Neither can we conceive of such a modification of it as to allow an equal degree of love toward the Creator and the creature. The golden rule, "Whatsoever ye would that men should do to you, do ye even so to them," is absolutely necessary. Neither the contrary, nor any modification of it, is conceivable. No other rule for the conduct of finite rational beings could have been laid down by the Supreme Reason" ("Presbyterian Review," Jan., 1882). To the same effect Pres. McCosh writes, in his chapter on "Convictions Involved in the Exercise of Conscience." He says, "The mind is led by its very nature and constitution to perceive that there is an indelible distinction between truth and falsehood. It finds that every substance has potency, that the species implies the individual; but it also declares that to give every one his due is good, and must be good, and that it is wrong in children to neglect their parents, and in God's creatures to forget their Creator." These words maintain that we immediately perceive, not only that certain things are right and obligatory, but also that they are necessarily so, and could not, under any circumstances, or in relation to any beings, be otherwise—and this seems to be the case. But our moral perceptions would not have this intuitive character if they simply expressed specific sequences in our actual experience, or were even inductive cosmological judgments, that similar beings, under similar circumstances, must have a similarity of experience. Again, McCosh says, "Moral good is moral good to all intelligences so high in the scale of being as to be able to discern it. I lay down this position in order to guard against the idea that moral excellence is something depending on the peculiar nature of man, and that it is allowable to suppose that there may be intelligent beings in other worlds to whom virtue does not appear as virtue. Such a view seems altogether inconsistent with our intuitive convictions, and would effectually undermine the foundations of morality." In other words, a certain degree of intelligence necessarily perceives the same essential things as morally right and obligatory; and, consequently, in any universe whose development includes that degree of intelligence, the same fundamental rules of morality are recognized. These teachings of philosophic men commend themselves to every healthful mind. They interpret and apply the intuitive convictions of our race. Their connection with these convictions may be illustrated, pleasantly, if we compare them with the following lines written, without any theoretical purpose, by a lady.

"It might have been that the sky was green and the grass serenely blue;
 It might have been that grapes on thorns and figs on thistles grew;
 It might have been that rainbows before the showers came;
 It might have been that lambs were fierce and bears and lions tame;
 It might have been that cold would melt, and summer heat would freeze,
 It might have been that ships at sea would sail against the breeze—
 And there may be worlds unknown, dear, where we would find the change
 From all that we have seen or heard to others, just as strange—

But it never could be wise, dear, in haste to act or speak,
 It never could be noble to harm the poor and weak;
 It never could be kind, dear, to give a needless pain;
 It never could be honest, dear, to sin for greed of gain;
 And there could not be a world, dear, while God is true above,
 Where right and wrong were governed by any law but Love."

—Kate Lawrence.

The relation of immutable morality to the doctrine of intuition.

Here, however, we may remark that an intuitive perception of right is not so indispensable to the theory of an immutable morality, as it is to the belief in any morality at all. For a purely hypothetical necessity or law has an absolute universality whether it employ experiential thought or not, and whether it be at first perceived intuitively or by deduction from intuition; and theories are possible in which a permanent principle of moral rightness may be explained as the application to a specific nature of some principle not distinctively ethical. But all such theories have failed, and, we think, must fail, to satisfy, because of a *simple and ultimate peculiarity, incapable of analytic definition, in the character of moral ends and actions*. To determine the essential subject to which this peculiarity belongs, and, in this way, to determine our conception of this peculiarity itself, are the principal problems of fundamental ethics.

We have now sufficiently illustrated the doctrine that certain elements are ontologically necessary, and the theory that these elements may be identified with the factors of conception which enter into our simple abstract intuitions.

The experiential elements of thought and being.

The experiential elements of entity, and the modes of conception corresponding to them, include all of thought and being which is not intuitional or ontological. But, unlike the ontological elements, they are seldom the objects of special and separate consideration. In all ordinary generalization only experiential thought is dismissed, and, in the highest abstraction, it is wholly eliminated. *Intuitional thought furnishes a frame-work or form which is filled in, and clothed, with the experiential, and with which the latter is always found united*. Our first perception of experiential elements takes place in sense-perception and consciousness; in concomitant cognition we perceive ontological elements only.

When we think directly of space and time, and the relations immediately dependent on them, our conceptions do not receive any experiential coloring. The same may be said of quantity in its two modes of the discrete and the continuous, and of the relations founded on these; and of substance and its two modes, the spiritual and the material, and the relations involved in their essential nature.

The experiential character attaches to the different modes, operations and effects of power.

But power is perceived to exist in a great variety of modes, on account of which we speak, in the plural, of the powers and properties of things; in respect to the great majority of these modes of power, we have no intuitive convictions pertaining to them specifically; and, therefore, *they* are the proper ob-

jects of experiential conception. This remark also applies to the operation of power and the changes and states produced by it. The peculiarities of powers and of their modes of action are revealed only in connection with their effects. Relations receive an experiential addition when they belong to, or follow from, the exercise of some peculiar power, as, for example, the causational relation between action and effect expressed by such verbs as *to blacken, to sweeten, to bruise, and to kill*. So, also, a substance, considered, not abstractly, but as possessed of all its noticeable properties, is affected with an experiential element. Hence, such conceptions as those of *flowers, stones, animals, men, houses, fields*, and of all ordinary objects, contain this kind of thought. The distinguishing peculiarities of the sense-affecting qualities of material bodies, and of the various powers by which matter acts on matter so as to change, or produce, or destroy, these sense-affecting qualities, are experiential elements. So are all those peculiarities of mind and character, of life and experience, of rank and station, by which human beings and classes of beings are distinguished from one another.

As already said, it may be a question whether the terms *intuitional* and *ontological, experiential* and *empirical*, should be employed to characterize conceptions and things, as well as convictions and truths. But that distinction of the elements of thought and being which has been expressed by means of these terms, should in some way be recognized.

We now bring to its close a pleasant task, which has occupied the writer for a number of years. This work has been pursued with the earnest desire to understand thoroughly the operations of the human mind, and to reduce the knowledge of them to an orderly and intelligible system. Those who may be able to appreciate the difficulty of the undertaking, will have some indulgence for the imperfect accomplishment of it. The doctrines which we have specially elaborated, differ, to a considerable extent, from any that have hitherto been taught. But we have confidence in their general correctness, and do not think that they will be easily rejected by those who may examine them patiently, and without prejudice.

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NOTE TO TEACHERS.

It may be found desirable to omit from the ordinary undergraduate course some discussions not essential to a fair knowledge of mental science. In that case, we suggest that the following sections may be wisely passed over, viz.,

§§ 18, 19;	being all of	Chapter VII.
§§ 26, 27;	“ “ “	X.
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§§ 95-106;	“ all of	“ XXIV.
§§ 124-131;	“ “ “	XXVIII.
§§ 138-141;	“ part of	“ XXIX.
§§ 165-167;	“ “ “	XXXIII.
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§ 204;	“ “ “	XLIII.
§§ 216, 217;	“ “ “	XLVII.
§ 224;	“ “ “	XLVIII.
§§ 231-235;	“ all of	“ L.

After the omission of the foregoing sections, the treatise may be studied in fifty lessons of eleven pages each. Should a still shorter course be a necessity, the judicious teacher can find further matter for omission; for example, Chapter XXII., on Logical Possibility, might be passed over; for the principal points concerning this topic are afterwards presented incidentally.



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