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ELEMENTS
OF
INTELLECTUAL PHILOSOPHY;
OR, AN
ANALYSIS
OF THE POWERS
OF THE
HUMAN UNDERSTANDING;
TENDING
TO ASCERTAIN THE PRINCIPLES OF A
RATIONAL LOGIC.

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TO
JAMES GREGORY, M. D.

PROFESSOR OF THE PRACTICE OF PHYSIC
IN THE
UNIVERSITY OF EDINBURGH,
&c. &c.

AS A TESTIMONY OF RESPECT FOR
WORTH AND TALENTS OF NO ORDINARY STANDARD,
THIS WORK

IS INSCRIBED,
BY HIS
MUCH OBLIGED FRIEND,

THE AUTHOR.

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THE original intention of the following Sheets was merely to furnish a Text Book for part of the Author's Academical Course. During the execution of this Plan, he found reason to believe that a short Treatise, which should contain an Analysis of the Powers of the Human Understanding, tending to illustrate the Principles of sound Reasoning, and scientific Investigation, might be a desirable acquisition to Students in general: because the Elementary Systems of Logic which have yet appeared, are almost all founded upon the metaphysical subtleties of the schoolmen; and have little reference to the present advanced state
of

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of Intellectual Philosophy. Actuated by these considerations, the Author presumes to offer to the Public the following attempt to supply a desideratum in Elementary Science; which may prove of some use to the Student, till an abler hand shall undertake the execution of the task.

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ELEMENTS

OF

INTELLECTUAL PHILOSOPHY.

INTRODUCTION.

THE most general division of the objects of human knowledge, is into two classes, the material and intellectual; or the phenomena of body, and those of mind. The distinguishing characteristics of matter or body are, extension, solidity, divisibility, inertia, &c.: the distinguishing characteristics of mind are, to think, to remember, to will, &c.; properties which are of a very different nature from those of body, or material substance. Hence

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the manifest propriety of dividing the objects of human speculation into these two great classes.

The phenomena of the material world are made known to us, in the first instance, by our senses and perceptive powers: the knowledge of mind, according to the above account of it, rests more immediately upon the evidence of our own consciousness. We feel its operations within ourselves; and, at the same time, we have sufficient evidence that it exists in our fellow men, when we see the effects of similar operations. The conduct of brute animals, too, proves that they have a thinking principle, though of a nature very inferior to that of man; inasmuch, that its principal qualities are included in those of the human intellect. The proofs of intelligence and of superintending providence, which a survey of the works of nature amply furnishes, lead to a firm belief in the existence of a Supreme and All-

All-governing mind, of a nature infinitely superior to that of the minds of brutes or of men.

Besides the human mind, the minds of brutes, and the Supreme mind, it does not appear that our faculties are calculated to give us any certain knowledge concerning the great class of intellectual beings. Many speculative men, both ancient and modern, have conjectured that there are, in the universe, various orders of intelligent beings, of different rank and dignity, to whose operation they assign those natural phenomena which cannot easily be explained by mere matter and motion. Others have been inclined to explain these phenomena by the agency of beings that are active without intelligence, so as to perform their destined work without any knowledge or intention. But we may safely say, that, whatever may be the result of future investigations, we have, as yet, no certain evidence with respect to these intermediate intellectual existences.

The science which investigates the laws of the material world, is called Physics, or Natural Philosophy; when we employ this term in its most extensive signification. The science of mind is denoted, perhaps, in its full extent, by the term Metaphysics, or by that of Moral Philosophy; although both are frequently employed in a more limited sense. That particular branch of the science of mind which treats of the Supreme Being, is termed Natural Theology, and does not come within the limits of our present inquiry. This is chiefly circumscribed to an analysis of the laws of human thought, or of that part of the human constitution, which is subservient to speculation and scientific investigation, and which may, perhaps, with sufficient propriety, be denominated Intellectual Philosophy.

The utility of an analysis of the powers of the human understanding, or of the science of Intellectual Philosophy, has been so ably illustrated

trated by some late writers, particularly Dr Reid and Mr Stewart, that it is unnecessary to waste time in an endeavour to establish it. This science evidently furnishes the proper basis upon which all the others rest ; as the human faculties are the instruments by which alone invention in all the sciences can be accomplished. The human mind, too, is the subject upon which all the sciences, as well as the liberal arts, are intended to operate ; so that an intimate acquaintance with its constitution seems to be essential, in order to secure success in the cultivation of every branch of knowledge. Neither is it too much to say, that the business of education can never be properly conducted, without a due regard to the nature and gradual expansion of the intellectual faculties ; and that the most beneficial improvements may be expected in that important concern, when it shall become the object of the rational and enlightened instructor to unfold and bring to maturity the think-

ing and reasoning powers ; to check the irregular exercise of those faculties which threaten to become too luxuriant ; to prevent the influence of false and unnatural associations ; and to guide the affections and moral principle to those objects with which they ought to be connected, by a rational regard to our present comfort, and to our future and eternal welfare.

The most obviously attainable of these advantages, by the due cultivation of intellectual science, is the ascertainment of the natural process of scientific discovery, and the detection of those sources of error, and false reasoning, which have generally pervaded the different branches of human knowledge. To accomplish this, would be to form a system of true and rational logic, of a far nobler nature than that disputatious art which has hitherto borne the name. But it is by no means presumed that the following attempt can effectually supply this great desideratum in science :

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the utmost it pretends to accomplish, is to deduce, from an analysis of the powers of the human understanding, those first principles of belief, which cannot be rejected without the most absurd consequences ; which form the basis of the various fabrics of science that human ingenuity has built upon them ; and which alone seem entitled to admission on their own proper evidence ; and consequently form a test, or touchstone, by which the various pretensions to scientific improvement may be examined.

Such an inquiry, in addition to its usefulness, has this further advantage, which indeed it possesses in common with all the other branches of the philosophy of the human mind,—that it affords a subject of the most rational and liberal curiosity. For what can be more interesting to man, than a display of the structure of the human mind ? of that part of his nature by which alone he has been enabled to claim

a superiority over the numerous tribes of brutes ; and to advance, by slow but certain steps, from the rudeness of the savage state, to all the enjoyments of highly civilized life ? If the anatomy of the human body be an interesting object of study even to the man whose professional views do not prompt him to such inquiries ; surely it is a much more interesting study to analyze the human mind, whose nature and powers are so much more noble and wonderful than those of the body.

It is generally acknowledged, that, notwithstanding the utility and importance of intellectual science, it has been, at least till lately, but in a low and corrupted state. The causes of this seem to have been first clearly pointed out by Dr Reid. The conjectural and hypothetical mode of reasoning, which equally vitiated the physical and intellectual science of the ancients, continued to pervade the metaphysical disquisitions of the moderns, long after

ter the genuine mode of philosophizing in physics had been pointed out by Bacon; and successfully exemplified by Newton. Another very copious source of error, in some measure peculiar to intellectual science, is reasoning by an assumed analogy. Our early notions are so much engrossed and modified by material objects, that when we come, at a more advanced age, to speculate concerning mind, our investigations receive a certain colour and bias, from our previous knowledge of the properties of matter. Hence it is, that the very names of our intellectual faculties, and all the technical terms of intellectual science, such as *Understanding*, *Comprehending*, *Imagining*, &c. are borrowed from material objects. This gives rise to an ambiguity in the language of intellectual science peculiar to itself; and as, perhaps, no two species of beings are more essentially different than body and mind, reasonings from a supposed analogy between their properties must evidently be a very copious source of error.

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The first writer upon Intellectual Science, who has completely avoided both hypothetical and analogical reasoning, is undoubtedly Dr Reid. The same excellent writer has also pointed out the true sources from which the elements of our knowledge in this science ought to be derived, viz. the exercise of Conscientiousness, by which the various operations of our own minds are made known to us ; and a careful examination of the facts exhibited in the conduct of our fellow men, or recorded in the memorials of history, voyages, or the other species of literature. We are also indebted to Dr Reid for a precision of language, of which there was no previous example in metaphysical writing, and which is doubtless of the greatest importance in this and every other science : For many of the contests which have been keenly agitated on various speculative points, are found, upon examination, to resolve themselves into nothing more than a misapprehension, or different application of terms.

The

The example which Dr Reid has set of previously explaining the meaning of every scientific term which is liable to any ambiguity, deserves to be followed in all abstruse speculations, and shall be adopted in this work wherever the case appears to demand it.

In conducting our analysis of the intellectual powers, it is proposed to adopt the following arrangement: 1st, To treat of Consciousness, or that faculty or mode of human thought, by which the various powers of our minds are made known to us. * 2^d, Sensation, or the
faculty

* The terms, *faculty*, *operation*, or *power*, of the mind, have long been employed to denote the various phenomena of human thought. It ought, however, carefully to be remembered, that, by the various *faculties* of the human mind, we do not mean any separate and independent energies, which may be supposed to unite in forming the mind itself, but merely different modes of action of the same thinking principle. ‘By the *mind* of a man,’ says
Dr

faculty by which we experience pleasing or painful effects from various objects through the medium

Dr Reid, ' we understand that in him which thinks, remembers, reasons, wills. By the *operations* of the mind, we understand every mode of thinking of which we are conscious. The *faculties* of the mind, and its *powers*, are often used as synonymous expressions. But as most synonyms have some minute distinction that deserves notice, I apprehend that the word *faculty* is most properly applied to those powers of the mind which are original and natural, and which make a part of the constitution of the mind.' (Essay I. on the Intellectual Powers, ch. 1) It is in this sense that I propose to use the word *faculty* in the following investigations, as well as the word *power*, which may safely be considered, in most cases, as synonymous with it.

The following passage, in the writings of Father Buffier, clearly states the error that is sometimes committed concerning the meaning of the word *faculty*: ' En effet, personnel se trompe-t-il à l'idée de ces facultés différentes? Ne fait-on pas que c'est la même âme, qui produit diverses opérations? Selon que nous trouvons plus ou moins de différence dans ces opérations, nous nous figurons

dium of the senses. *3d*, Perception, the faculty by which we are informed of the properties of external objects, in consequence of the impressions they make on the organs of sense. *4th*, Abstraction, the faculty by which we analyze objects of Consciousness, Sensation, or Perception, &c. and contemplate their various properties apart from each other. *5th*, Association, or Combination, the faculty by which we connect together these objects, according to various relations, essential or accidental, so that they are suggested to us, the one by the other. *6th*, Conception, the faculty by which we represent to our minds the objects of any of our other faculties, variously modified. *7th*, Memory, the faculty by which the mind has a knowledge of what it had formerly perceived, felt,
or

‘ figurons plus ou moins des facultés différentes d’où
‘ elles procedent; bien que ces facultés ne soient au
‘ fond, et réellement, qu’une seule et même substance,
‘ qui est l’âme. ’

or thought ; and, 8th, Reason, the faculty by which we are made acquainted with abstract or necessary truth ; and enabled to discover the essential relations of things.

CHAP.

CHAPTER FIRST.

Of Consciousness.

CONSCIOUSNESS, we have defined the faculty by which the various powers of our own minds are made known to us, and which, therefore, seems to demand the first place in an investigation of the principles of human thought. The power of Consciousness appears to be altogether denied to the lower animals; nor does it shew itself in man till he is advanced towards maturity. The wants and purposes of life require that we should form an intimate acquaintance with those objects of nature with which we are externally connected, and which are the chief sources of our pleasures and pains. Hence, our senses and perceptive powers come first of all to maturity; and those which are purely intellectual, such as Consciousness, are reserved

reserved for the more contemplative period of life.

Consciousness, however, is a faculty which is exercised, not only by the philosopher and man of contemplation, but also by the illiterate and bustling part of mankind, though in different degrees. In the rudest languages there are words appropriated to express various operations of the mind, such as thinking, willing, perceiving, remembering, &c. which is a proof that such things are attended to by all mankind, even the most uneducated, and spoken of as matters of knowledge and belief. In proportion as a people advance in cultivation, their language naturally becomes more copious in words of this description; and as, in forming new terms, men are apt to borrow from those already in use, by a metaphorical analogy, so it has happened, in this instance, that the names which denote the mental faculties have generally been derived from those already appropriated

priated to the phenomena of matter, according to some fancied analogy, which occasions that peculiar ambiguity in the language of the science of mind already mentioned.

It is worthy of remark on this subject, that, in our own language, as well as in most of the languages of Europe, almost all the terms applied to the mental faculties are of Latin origin, as, for example, *judgment, memory, conception, abstraction, imagination, &c.* A very few only, such as would necessarily occur in the language of a rude people, as for example, *thinking, willing, seeing, hearing, &c.* are of Saxon or Gothic original. This illustrates the natural progress of the human mind in what relates to Consciousness; and traces the origin of intellectual philosophy, in the less civilized parts of Europe, to the first introduction of the Latin language.

Mr Locke denotes the faculty of which we

are here treating, by the term *Reflection*, which he defines to be ‘ that power by which the ‘ mind turns its view inward, and observes its ‘ own actions and operations;’ and all the notions which we form of an intellectual nature, such as the notions of time, of number, of cause and effect, as well as our notions of thinking, remembering, willing, and the other laws of human thought, he calls ‘ ideas of reflection,’ and represents them as derived solely from the operation of reflection or consciousness. The ambiguity of the term Reflection, has had a considerable share in keeping out of view the insufficiency of this doctrine; for this term is employed to denote, not only the power of contemplating our mental faculties, but likewise the spontaneous exercise of memory, or voluntary recollection, as well as the act of contemplation or cautious consideration, and the more deliberate efforts of judgement. Hence, it is not wonderful that men should be disposed to acquiesce in the doctrine which comprehends
all

all our intellectual notions under the class of 'ideas of reflection.' But if, instead of reflection, we substitute the term Consciousness, limited as above, we shall find that many of our intellectual conceptions or notions cannot be assigned to it as their origin.

We might ruminate for ever upon our intellectual faculties, without acquiring such a notion as that of time, for example, or of space, or any of those which are commonly called abstract. The origin of such notions will be a matter of future inquiry; and it will appear, that they are to be derived from the exercise, not of one, but of several of our intellectual faculties: at present, it is sufficient to make this general observation upon the insufficiency of that doctrine which derives all intellectual notions, whatever from the exercise of reflection, or Consciousness.

Dr Reid seems to understand by the term

Reflection, the deliberate and sedulous examination of the powers of our own minds ; and in this sense, thinks that it ought to be distinguished from Conscioufness. ‘ All men,’ says he, (*Essays on the Intellectual Powers, Essay I. ch. 5.*) ‘ are conscious of the operations of their own minds, at all times while they are awake ; but there are few who reflect upon them, or make them objects of thought.’ Again, says he, ‘ the difference between conscioufness and reflection, is like to the difference between a superficial view of an object which presents itself to the eye while we are engaged about something else, and that attentive examination which we give to an object when we are wholly employed in surveying it. Attention is a voluntary act ; it requires an active exertion to begin and to continue it, and it may be continued as long as we will ; but conscioufness is involuntary, and of no continuance, changing with every thought.’

It

It would seem from this, and other expressions of the same author, that he conceived a greater difference to exist between consciousness and reflection, than a mere difference of degree. To me it appears, that reflection, taken in Dr Reid's sense of it, is nothing more than the deliberate and mature exercise of consciousness; and the very illustration he employs to point out the difference, viz. that it is like that between a superficial view, and an attentive examination of the same external object, serves to shew that the one is only a more deliberate and careful exercise of the other. Neither does it appear to be true, that we are 'at all times conscious of the operations of our own minds while we are awake.' Consciousness, like memory, abstraction, or any other mental faculty, may for a while lie dormant; or it may be exercised in a very slight degree; or it may engross for a time the whole of our attention: but it is surely the same faculty, whether it receives a slight or a sedulous exercise.

To acquire a habit of reflection upon the powers of our own minds; or of the deliberate exercise of Consciousness, is, as Dr Reid observes, a work of time and labour, even to those who begin it early, and whose natural talents are tolerably fitted for it. Of all the powers of the human mind, he observes, it seems to be the last that unfolds itself; and most men seem incapable of acquiring it in any considerable degree. Like all other powers, however, it is greatly improved by exercise; and it is by the proper employment of this power, that men become fitted to discover the laws by which their own thoughts are regulated, and to make advances in the science of intellectual philosophy.

As in the earlier period of life the faculty of Consciousness lies dormant, so there appear to be many intellectual processes or trains of thought which pass through the mind at that period, but of which, on account of the inactivity

tivity of Conſciouſneſs, no trace afterwards remains, ſo that we are ignorant, in ſo far as relates to ourſelves, of their having ever exiſted. It is upon this account that philoſophers have entered into ſo many keen diſputes concerning the origin of our ideas ; ſome deriving them all from the ſenſes ; ſome tracing a great part of them to reflection, as well as ſenſation ; and ſome conſidering a certain claſs of them as innate, or coexiſtent with the mind itſelf. Did Conſciouſneſs exiſt in full power, at every period of life, ſuch diſputes could never have ariſen, and we ſhould then have been at no loſs to aſcertain at what moment we firſt formed a diſtinct conception or notion of *time*, for example ; when we firſt clearly acquired the notion of *number* ; and ſo forth. But, as we are at preſent conſtituted, it is a difficult problem in intellectual philoſophy to aſcertain theſe points.

Rude and uninſtructed men, being very

much in the situation of children, in as far as relates to the faculty of Consciousness, continue, in a great measure, ignorant of the trains of thought by which their conduct is regulated in many important particulars; and it forms no small part of the business of the philosopher, to ascertain, by cautious investigation, the intellectual processes by which such men have been guided, in a great degree, unknown to themselves. Those who have entered upon the scientific investigations of grammar, of philosophical criticism, of morals, or of politics, will see the full force of this observation. In forming a theory of morals, for instance, it has been found a matter of the greatest difficulty to ascertain the general principles by which men, more particularly in the uncivilized state, are prompted to approve or disapprove of certain actions, as virtuous or vicious; more especially, as different tribes are found materially to disagree in this particular. In like manner, it is the great difficulty of philosophical

philosophical grammar, to ascertain those trains of thinking which led men, in the earlier periods of society, to express their thoughts by those particular classes of words which are found to exist in all languages ; and it is the arduous object of philosophical criticism to trace the secret causes of the mind's approbation or disapprobation of certain productions of nature or of art, and to reduce these to a few general principles. In all these cases, the business of the philosopher is to detect those mental processes, which, from the uncultivated state of the human faculties, had eluded the observation of Consciousness. *

Mr

* ‘ Il semble,’ says the acute D’Alembert, ‘ que tout
 ‘ ce qu’on apprend dans un bon livre de metaphysique,
 ‘ ne soit qu’une espece de reminiscence de ce que nôtre
 ‘ âme a déjà su ; l’obscurité, quand il y en a, vient toujours
 ‘ de la faute de l’auteur, parce que la science qu’il se
 ‘ propose d’enseigner, n’a point d’autre langue que la
 ‘ langue commune,’—‘ Les saines idées metaphysiques
 ‘ sont

Mr Stewart, in his Elements of the Philosophy of the Human Mind, considers intellectual processes of this nature as objects, not of *consciousness* but of *attention*; but to me there appears no necessity for calling in the aid of this new faculty. That ingenious philosopher has given a variety of interesting illustrations relative to trains of thought, which certainly are daily passing through our minds, but which are never recollected; because, on account of their great rapidity, they are not objects of *attention*, or as I should prefer to say, of *consciousness*. Such, for example, is that train of thought by which we are led to judge of the distances of visible objects, and which includes in it a comparison of various particulars, such as the apparent magnitude of
the

‘ font des vérités communes, que chacun saisit, mais que
‘ peu d’hommes ont le talent de développer; tant il est
‘ difficile, dans quelque sujet qui se puisse être, de se
‘ rendre propre ce qui appartient à tout le monde.’——
Mélanges, Vol. IV. Art. 6.

the object, its distinctness or obscurity, the brightness of its colours, the inclination of the axes of the eyes, and change of conformation of the eye itself. In this instance, and in some of the others mentioned by Mr Stewart, it may be remarked, that the inactivity of Consciousness is to be ascribed, not only to the rapidity of the intellectual process, but also to its having been familiarized to the mind in early life, before the faculty of Consciousness came into exercise. In other instances, particularly such as are ascribed to the mechanical agency of habit, as where a musician comes, by long practice, to perform a piece of music with such facility, as to be unconscious of any voluntary effort, the inactivity of Consciousness seems wholly due to the rapidity of the mental exertions; and Mr Stewart appears to have been peculiarly successful in illustrating the true nature of such phenomena, which had been most unphilosophically ascribed to the influence of an undefined and misunderstood principle

principle called Habit. But, for the ingenious remarks of this philosopher, upon these interesting topics, we refer to his own work, chapter second.

To the exercise of Consciousness we are chiefly indebted for the conviction or notion of personal identity. Every man holds himself to be absolutely certain, that whatever changes his body may undergo in this life, his soul or mind always continues one and the same; not liable to that alteration and disunion of parts to which all corporeal beings appear to be subject. Along with Consciousness, however, we must conjoin memory, in order to give a rational explanation of the origin of this conviction. For Consciousness reaches only to the present, while memory alone gives a knowledge of past thoughts; and it is by comparing our past and present mental operations together, that we form the conviction of our personal, or rather intellectual identity. Hence, in this instance,

as

as in various others, the system of Mr Locke, which derives all our intellectual notions from the exercise of consciousness, or reflection alone, is inapplicable. (See Reid's Essays on the Intellectual Powers, Essay III. ch. 4.)

The operation of Consciousness is accompanied with an irresistible belief of the real existence of those objects of which it gives us information. It is upon this evidence alone, that the belief in the existence of our own minds, and of their various faculties, rests ; and it is by means of it that we acquire our most accurate knowledge of the laws by which these faculties are regulated. Nor can the belief accompanying Consciousness be resolved into any process of reasoning, or any other intellectual operation: for, if we are asked why we believe that we have a soul, and that that soul has such faculties as memory, conception, or the like, we shall be unable to give any better reason, than that we *feel* such to be the case ;
that

that is, in more accurate language, that we are *conscious* of it. The fact already mentioned, that in all languages there are found words intended to denote the various intellectual processes, is a sufficient proof that the evidence of Consciousness is felt and admitted by all men, even the most unenlightened.

When Descartes was solicitous to form a new system of philosophy, free from the absurdities and false assumptions of the schoolmen, the principle which struck him, as the most clearly evident of any, and which he seems to have thought alone worthy of being admitted without a proof, was the evidence of Consciousness. ‘*Cogito, ergo sum.*’ ‘I think,’ said he; ‘therefore I exist.’ This celebrated fundamental proposition has been considered by Dr Reid as, after all, nothing but a *petitio principii*; inasmuch, that before we allow that we *think*, we must take it for granted that we *exist*. If, however, we understand the proposition

sition as merely inferring existence from the evidence of Consciousness, it does not appear liable to this objection. Even Mr Hume, the most sceptical of all modern philosophers, appears implicitly to admit the evidence of Consciousness, in so far, at least, as regards the reality of his *impressions* and *ideas*, whose existence he seems entirely to rest upon the supposed fact of our being conscious of them. Thus, we may consider the evidence of Consciousness as one of the most universally admitted intuitive truths. But that this is the only truth which is to be admitted intuitively, or on its own proper authority, according to the Cartesian and Sceptic systems, is what we are by no means inclined to allow, as will sufficiently appear from the following investigations.

CHAPTER SECOND.

Of Sensation.

SECTION I.*General Remarks upon Sensation.*

WE have defined Sensation to be, the faculty by which we experience pleasing or painful effects from various objects through the medium of the senses. This, therefore, is that part of our intellectual constitution which is most intimately affected by corporeal beings; and forms the principal link in that mysterious union which subsists betwixt body and mind. The senses, too, which are the media of sensation, come to maturity even in infancy; so that this faculty, on account of its familiarity, naturally demands

demands to be first considered among the objects of our Consciousness.

Till the writings of Dr Reid, Sensation and Perception seem to have been considered by philosophers as synonymous terms, and used indiscriminately as such ; from which no small confusion has arisen in their systems. To Dr Reid we owe the clear ascertainment of the distinction between these terms, which, in fact, appear to denote different faculties of the mind, which, though generally, are not constantly conjoined. Perception, as limited by Dr Reid, denotes that faculty of the mind, by which we learn the properties of external objects through the medium of the senses ; and he thus draws the distinction betwixt it and Sensation. ‘ Sensation,’ says he, ‘ taken by itself, implies neither the conception, nor belief of any external object. It supposes a sentient being, and a certain manner in which that being is affected ; but it supposes no more. Perception

‘tion implies an immediate conviction and belief of something external; something different both from the mind that perceives, and from the act of perception.’ (Essay II. Ch. 16.)

According to this distinction, the very essence of a sensation consists in its being felt; and, when it is not felt, it ceases to exist, and has no longer any object; while the objects of perception have a permanent existence without us, whether they are perceived or not.

That Sensation and Perception are different faculties, may be inferred from this circumstance in particular, that though generally, they are not constantly conjoined; so that there may be sensation without perception, and perception without sensation. Thus, in many of those sensations, the cause of which exists within our own bodily frames, as in the thrilling sensation which accompanies certain affections of the mind, the painful sensation of hunger and the like, it cannot be said that we have any perception,

ception, or mental notion of the nature of the particular cause of these sensations. And again, in the case of many of the perceptions of sight, as of extension, figure, magnitude, &c. as viewed by the eye, it can scarcely be said that there is any accompanying sensation even of the most indifferent kind. Hence, Sensation and Perception ought to be separately treated of, in an enumeration of the faculties of the human mind.

We may consider the five senses as the media by which all sensation is communicated to the mind, taking the sense of Touch in its most extensive application, as diffused over our whole corporeal frame. But in what manner these organs contribute to excite the various sensations which we are capable of experiencing, or how the communication between material objects and our immaterial thinking principle, is carried on, are questions which, however much they may have excited the curiosity,

have hitherto entirely eluded the ingenuity of inquisitive men. Anatomists have carefully analyzed the various organs of sense, as well as the structure of the nerves and brain; and are able to shew us that, in all the senses, the peculiar impressions seem to be communicated to the nerves; and as all the nerves terminate in the brain, the impressions are probably finally conveyed thither. This is all the real insight they have given us into the matter. But philosophers are by no means satisfied with this; and have endeavoured to inform us of the peculiar manner in which these impressions are conveyed by the nerves to the brain. According to some, this is by means of a fine animal spirit with which the nerves are filled; and this is the most ancient opinion upon the subject. According to others, the nerves are solid filaments, which, by means of various vibrations, dependent upon their length and tension, communicate their impressions to the brain. This last hypothesis seems to have originated with

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Dr Briggs; and it was espoused by Sir Isaac Newton, under the modification, that the impressions on the solid filaments of the nerves were propagated by the undulations of an elastic fluid or æther, which was supposed to pervade all space. (See 23d Query subjoined to his Optics.)

It must be remembered, that such speculations are merely hypothetical; as no anatomist has yet been able to establish, whether the constituent filaments of the nerves are of a tubular, or solid structure. Sir Isaac Newton, indeed, is careful to state the matter merely as a conjecture, or hypothetical query. But Dr Hartley pursued a very different course; and, in his 'Observations on Man,' founds the whole of his system upon the doctrine of these supposed vibrations of the brain and nerves, joined with that of association. Of such a system it may be observed, that not only it is a mere hypothesis, and therefore of no real value

lue as a work of science; but that it is likewise an anatomical, and not an intellectual system; for its object is to trace, a few steps further, those changes which take place in our bodily structure, in consequence of impressions made upon the organs of sense; and, granting that the real existence of vibrations, and vibratiuncles, could be established, we should be as far as ever from comprehending the nature of the action of body upon mind, or of mind upon body. The same remark may be made upon the various hypotheses which have been offered concerning the immediate seat of the intellectual principle, or soul; which some have placed in a particular portion of the brain; some in the heart or præcordia; some have considered as diffused over the whole system; and which, it is well known, Descartes considered as situated in the *pineal gland*; finding that to be the only part of the brain which was not double, or belonging to both lobes. Such hypotheses are, in fact, mere anatomical fancies, and, even if
established,

established, could throw little light upon the constitution of our intellectual principle.

When sensation is excited in the mind, it is generally in consequence of some impression first made upon the corporeal senses. But, in some instances, the cause originates in the mind, and is thence communicated to the bodily organs, while apparently an effect is produced precisely similar to that of the more usual kind of sensation. It is well known, that the mere thought of pain in any particular part of the body, is sufficient to excite the corresponding sensation to a certain degree : Thus, the idea of sore eyes produces a certain degree of pain in those organs ; and the strong imagination of any particular taste or flavour, is accompanied with a slight sensation of that taste or flavour.

Again, many affections of the mind are accompanied with strong sensations, either pleasant

fant or painful. Anger, terror, envy, revenge, and all the train of malevolent passions, have a very powerful effect upon the bodily frame, and excite sensations which are of a very disagreeable kind. Upon the other hand, joy, admiration, love, and all the amiable emotions, produce sensations, which are decidedly pleasurable. Such sensations are, not unusually, in common language, called feelings; a name, however, which more properly belongs to the pleasurable effect of our benevolent affections and moral judgments, as well as to the pleasure accompanying our approbation in matters of taste, as remarked by Dr Reid. These feelings appear to be almost purely of an intellectual nature; while the term Sensation, as we wish to limit it, includes a distinct affection of the body as well as the mind.

According to this view, our sensations may be divided into those which arise from the operation of material objects upon the five senses; those

those which accompany our appetites, as hunger, thirst, and the like; and those which arise from the action of the passions and stronger emotions. Some of the sensations arising from these sources are decidedly pleasant; others are painful; and others indifferent. These last, in the opinion of Dr Reid, are by far the most numerous of the three kinds; but so little attention is paid to them, that they have no names, and are immediately forgot, as if they had never been; so that it requires a considerable degree of attention to the operations of our minds, to be convinced of their existence. Instead of indifferent, it would perhaps be more strictly proper to call them slightly pleasant, or slightly painful; as some degree of pleasure or pain, however small, seems essentially necessary to the very existence of sensation.

SECTION II.

*Of the Primary and Secondary Qualities of
Body.*

SENSATION, as we have observed in the preceding section, is generally conjoined with perception, or that mental faculty by which we form a notion of the properties of external objects, infomuch, that the two acts of the mind have been confounded together, not only by the vulgar, but by philosophers themselves. In scarcely any instance does language afford an appropriate name both for the Sensation and Perception which are so conjoined; both are generally confounded together under one term, which comes to be more strictly appropriated, either to the sensation or the perception, according as the one or the other more strongly occupies the attention of the mind.

If

If it be asked, what I mean by the ‘*smell*’ of a rose, it is evident that, in the general acceptation of the phrase, this denotes a sensation of the mind; as appears from the epithets ‘fragrant, agreeable,’ &c. which are applicable to it, and which alone have meaning when referred to a sentient being. Along, however, with this sensation of an agreeable odour, there is conjoined a perception, by which we form a certain notion of that quality in the rose which is the cause of its odour; which perception is totally distinct from the sensation; for it cannot be said to be agreeable or otherwise, and it has an external object, whose existence does not depend upon the act of the mind as the sensation does. Yet we have no name whereby to distinguish the object of this perception, unless that which more properly belongs to the accompanying sensation, viz. ‘the *smell* of the rose;’ a defect of language, which is no doubt the source of much ambiguity.

Again,

Again, if it be asked, what is the effect produced by applying the hand upon any solid and compact substance, it will be answered, that 'we feel the body to be hard.' The term *hardness*, in its common acceptation, denotes a well known quality of external objects, that is, a mere object of perception; but, if we attend for a moment to what passes in the mind upon the present occasion, we shall be conscious of a very distinct sensation, which is likewise the effect of the application of the hand to the solid body, and for which we have no other name than the same term *hardness*. This sensation may be increased in strength at pleasure, merely by increasing the pressure of the hand; and it may be increased to such a degree as to be very disagreeable. It then arrests the attention forcibly enough, and we give it the name of *Pain*, which is, however, no appropriate term, but the common appellation of all sensations that are disagreeable; and it ought to be remarked, that the sensation excited

cited by hardness, continues to be perfectly the same in kind, though different in degree, although, when slightly excited, it almost entirely eludes our attention.

Thus it appears, that language affords, in general, but a single term whereby to distinguish both the sensation and its accompanying perception; and that this term is chiefly appropriated either to the sensation or perception, according as the attention is most engrossed by the one or the other. Upon this circumstance appears to be founded a distinction of the qualities of body into two kinds, called by Mr Locke, *primary* and *secondary*. The reality of the distinction I would place in this, that the primary qualities are those of which we have a distinct perception, and but a slight sensation; while, of the secondary, our perception is but obscure, and we have a strong sensation, which chiefly arrests our attention. Hence, the names of the primary qualities of body more usually

refer

refer to the perception by which they are made known to us ; while those of the secondary qualities have more properly a reference to the accompanying sensation.

This account of the matter nearly corresponds with Dr Reid's explanation of the distinction between the primary and secondary qualities of body. According to that philosopher, ' they are distinguished by this, that of
' the primary we have, by our senses, a direct
' and distinct notion ; but of the secondary,
' only a relative notion, which must, because
' it is only relative, be obscure : they are con-
' ceived only as the unknown causes or occa-
' sions of certain sensations with which we are
' well acquainted.' (Essay 2. ch. 16.) Hence,
as is afterwards observed by the same writer,
' The distinctness of our notions of primary
' qualities prevents all questions and disputes
' about their nature. They are the object of
' the mathematical sciences ; and the distinct-
' nefs

ness of our notions of them; enables us to reason demonstratively about them to a great extent. It is not so with secondary qualities. Their nature, not being manifest to the sense, may be a subject of dispute. It is a proper subject of philosophical disquisition; and, in this, philosophy has made some progress. It has been discovered, that the sensation of smell is occasioned by the effluvia of bodies; that of sound by their vibration. The disposition of bodies to reflect a particular kind of light, occasions the sensation of colour. Very curious discoveries have been made of the nature of heat; and an ample field of discovery in those subjects remains.' (Ib.)

The distinction which I have been endeavouring to illustrate, has undergone various modifications in the systems of philosophers; and has, at some periods of its history, given rise to various singular doctrines, and erroneous inferences. The distinction is pretty plainly

plainly laid down, so long ago as in the original Atomical philosophy, as taught by Leucippus, Democritus, Epicurus, &c. According to that philosophy, extension, figure, motion, &c. which we now call primary qualities, were inherent in the atoms, or first principles of things; but smell, taste, colour, &c. or the secondary qualities, to which alone the atomists gave the name of *quality*, were not inherent in bodies, but were something resulting from the operation of bodies upon our senses. As fire, said they, which is neither in the flint nor in the steel, is produced by their collision; so those qualities, though not in bodies, are produced by their impulse upon our senses.

The distinction between primary and secondary qualities was discarded in the Peripatetic philosophy, but it was revived by Descartes, who reduced the class of primary qualities to three only, extension, figure, and motion. Mr Locke, however, enlarged this class,

class, so as to comprehend, in addition, such qualities as divisibility, solidity, hardness, softness, fluidity, and the like; and was at great pains to illustrate the distinction between the two kinds of qualities to which he first applied the terms primary and secondary. Subsequent philosophers have either admitted or rejected this distinction, according as it suited the particular views of their systems.

The doctrine concerning the secondary qualities, taught by the Atomists, that they were not inherent in bodies, but resulted from the operation of bodies upon our senses, was more fully illustrated by Descartes: Sound and colour, taste and smell, heat and cold, were, according to that philosopher, sensations in the mind, and could not be modifications of mere extension, figure, and motion. Mr Locke pointed out this distinction betwixt Sensation and the external qualities of body, yet more clearly; but the conclusions to which these

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philosophers

philosophers were led, were such as a complete view of the subject would by no means have warranted. Attending solely to the sensation, in the case of the secondary qualities, and not to the accompanying perception, they were led to assert, that the secondary qualities of body have no existence whatever but in the mind, which perceives; or rather feels them. Heat and cold, smells and tastes, say they, are things which cannot exist in inanimate, unfeeling matter, and are attributes of a sentient being only. So that, according to this doctrine, it is a vulgar error to say, that heat is in the fire, or fragrance in the rose; since heat and fragrance are sensations that can exist only when felt by the mind.

The foundation of this doctrine, which was considered as a brilliant discovery in its day, appears to be nothing more than an ambiguity of language, whereby, as already observed, the same name is generally applied, both to a sensation

sation in the mind, and to the cause of that sensation as it exists in some external object. Thus, the term *heat* denotes the peculiar sensation which fire excites in a sentient being, and also that quality in the fire which is the cause of it. This ambiguity was felt to be so inconvenient in scientific language, as to induce modern chemists to invent a new term, viz. *caloric*, by which they denote the external quality, or cause, of the sensation of heat; so that, in this instance, the ambiguity no longer exists. It was, however, merely in consequence of this ambiguity, that philosophers convinced themselves that there was no heat in the fire, employing the term, *heat*, as denoting a sensation only; and the strength of their reasoning totally disappears, when it is considered, that *heat* is the only term by which the vulgar, at least, denote the external cause of the sensation, as well as the sensation itself. The same reasoning is easily applicable to all the other secondary qualities, as sounds, tastes,

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smells,

smells, &c. In this instance, therefore, the vulgar were better reasoners than the philosophers; for the vulgar by no means confound together the sensation and perception which are excited by external objects, although they have not an appropriate name for each. But the philosophers, in the case of the secondary qualities, entirely overlooked the perception; as, in the case of the primary, they seem to have passed by the sensation: and hence the origin of their scepticism with regard to the permanent existence of the secondary qualities; a scepticism which we shall immediately see was extended by subsequent philosophers to the existence of the primary qualities themselves. *

The

* It ought, however, to be stated, in justice to the sagacity of Mr Locke, that after fully illustrating the difference between the primary and secondary qualities, according to which, the last are stated to have nothing resembling

The three senses of taste, smell, and hearing, appear to give us information of the
secondary

resembling them in the actual texture of material substances, that ingenious philosopher precisely admits, that there is still *something* in body, which is the cause of these secondary qualities.

‘ The qualities,’ says he, (B. H. c. 8. § 23.) ‘ that
‘ are in bodies, rightly considered, are of three sorts.
‘ 1st, The bulk, figure, number, situation, and motion, or
‘ rest, of their solid parts; these are in them, whether we
‘ perceive them or no; and when they are of that size
‘ that we can discover them, we have, by these, an idea
‘ of the thing as it is in itself, as is plain in artificial
‘ things. These I call primary qualities. 2^{dly}, The
‘ power that is in any body, by reason of its *insensible pri-*
‘ *mary qualities*, to operate after a peculiar manner on
‘ any of our senses, and thereby produce in us the dif-
‘ ferent ideas of several colours, sounds, smells, tastes,
‘ &c. These are usually called sensible qualities. 3^{dly},
‘ The power that is in any body, by reason of the parti-
‘ cular constitution of its primary qualities, to make such
‘ a change in the bulk, figure, texture, and motion of

secondary qualities of body alone; the other two senses, of sight and touch, inform us both
of

‘ another body, as to make it operate on our senses
‘ differently from what it did before. Thus, the sun has
‘ a power to make wax white, and fire to make lead
‘ fluid. These are usually called powers.’

This statement appears to be almost entirely conformable to the common notion, and to the doctrine which we have been desirous of establishing; yet, in a few sentences afterwards, Mr Locke recurs to the philosophical distinction, by which the existence of secondary qualities is entirely overthrown. ‘ But,’ says he, ‘ though
‘ these two latter sorts of qualities are powers barely,
‘ and nothing but powers, relating to several other bodies,
‘ and resulting from the different modifications of the
‘ original qualities, yet they are generally otherwise
‘ thought of. For the second sort, viz. the powers to
‘ produce several ideas in us by our senses, are looked
‘ upon as *real qualities* in the things thus affecting us:—
‘ e. g. the idea of heat or light, which we receive by our
‘ eyes or touch, from the sun, are commonly thought
‘ real qualities existing in the sun, and something more
‘ than mere powers in it.’

of primary and secondary qualities. Heat and cold are secondary qualities discernible by touch; and colour is a secondary quality discernible by sight. For colour is a sensation occasioned by the fitness of certain particles of external bodies to reflect some only of the rays of light; and, in this acceptation, it really exists in the sentient being, although early prejudice induces us to refer it to the external body alone; and the term is usually applied only to the external cause of the sensation, and not to the sensation itself, which is not the case with the other secondary qualities. All the primary qualities of body may be discovered by the sense of touch alone; and it is this sense which imparts the most accurate notions concerning them. For the notions of extension and figure, as conveyed by the eye, require the correction of the touch; and even motion, which might be supposed to be the peculiar province of sight, can only certainly be ascertained by the

touch, because the eye often judges motion to be real, when it is but apparent.

In the opinion of Dr Reid, colour is the only perception received by the eye, which is accompanied with a sensation. But this perception and sensation is conjoined with almost every act of the sense of sight, and may, in certain states of the eye, be experienced without the notion of extension or figure. Thus, as we are at present constituted, almost all our perceptions are accompanied by certain sensations, strong or weak, which nature seems to have intended, not only as sources of gratification to the individual, but as impressive signs, whereby the attention or energy of the mind should be properly roused to acquire a knowledge of the properties of external matter.

CHAPTER THIRD.

Of Perception.

SECTION I.

Theories concerning Perception.

WE have already had occasion, sufficiently to explain the sense in which we employ the term Perception, and the distinction betwixt it and Sensation, in treating of this last faculty. According to the common arrangement, Perception should have been first treated of; but I have preferred commencing with Sensation, as being the most corporeal (if I may so express it) of all the intellectual faculties, and as being less incumbered with the fanciful hypotheses of philosophers than the faculty,

faculty, of which I am now to speak. The corporeal organs of sense are subservient to the operation of the faculty of Perception, as well as of Sensation, which generally accompanies it. Yet it is not unreasonable to suppose, that these organs rather limit and circumscribe this intellectual faculty, than that they are essential to its operation ; and that beings of a superior order may enjoy perception in a much more perfect degree than we do, uncircumscribed by bodily organs like ours. A person who had been all his life shut up in a chamber with a single window, would naturally conceive that window to be essential to his sight, instead of being the cause of his very limited view.

We have seen with how little success philosophers have invented theories, in order to throw light upon the process of sensation ; and to trace the particular manner in which material objects convey impressions to our intellectual principle. They have not been less desirous

firous to investigate the mode of action of Perception ; but as this faculty is of a still more intellectual and refined nature, it is not to be supposed that their hypotheses have been attended with very fortunate results. Such hypotheses, however, have been very prevalent from the remotest antiquity ; and, contrary to the general course of such things, have preserved a considerable uniformity, and been implicitly admitted by succeeding philosophers as a rational basis of investigation. The consequence has been, a systematic diffusion of error in this branch of science, unparalleled in any other ; so as at length to be matured into a complete system of scepticism, or disbelief. Those who wish to see the gradual progress of this sceptical philosophy completely developed, are referred to Dr Reid's Second Essay on the Intellectual Powers. Our present plan requires only a brief statement of the leading opinions of philosophers concerning the operation of Perception.

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The first philosopher, in whose writings we find a systematic theory concerning Perception, is Aristotle. According to this theory, Perception, as well as all the other operations of the mind, is carried on by the agency of certain images, forms, or species of material objects there present. The images presented to our senses were called sensible species, or forms; and were supposed to be continually sent off from material objects, in all directions; so that, by entering at the avenue of the senses, they produced perception during the day, and dreaming during the night. These images were supposed to be again presented to the memory, or imagination, in a more refined state, when they were called Species, simply; and when presented to the intellect in their most refined state of all, they were called Phantasms; and it was maintained, that there can be no perception, memory, or intellection, without species, or phantasms.

This

This theory was well adapted to the Peripatetic philosophy, which resolved all the phenomena of the material world into the effects of two principles, called *matter* and *form*. It does not, however, appear to have originated with Aristotle; for the followers of Democritus and Epicurus held a similar doctrine with regard to slender films of subtile matter, which they supposed to come from external objects. It is likewise probable that the Pythagoreans and Platonists taught a similar theory of perception; as may be gathered from the hints which Plato gives in the Seventh Book of his Republic, concerning the manner in which we perceive the objects of sense; which he compares to the situation of persons in a deep and dark cave, who see not external objects themselves, but only their shadows, by a light let into the cave through a small opening.

The principal difference among these sects, was concerning the origin of the objects of the
human

human understanding. According to the Peripatetics, these must all enter originally by the senses, as sensible species, and are merely refined and rendered more spiritual by the intellectual faculties. This doctrine afterwards passed into the maxim, ‘*Nihil est in intellectu quod non fuit prius in sensu.*’ Plato, on the other hand, had a very mean opinion of all the knowledge we get by the senses. All science, according to him, must be employed about what he called *Ideas*, which are the eternal and immutable patterns of things, which existed before the objects of sense themselves, and are not liable to any change. This doctrine nearly coincides with what the Pythagoreans taught concerning their numbers.

The Peripatetic philosophy, as is well known, continued to prevail in the world during a period of several centuries; nor were its metaphysical doctrines successfully opposed till the time of Descartes. The theory of perception,

tion, above detailed, received a considerable modification from this philosopher. He did not, however, totally reject it ; for he held it as certain, that it is only a representative picture, form, or species of an object, that is present in the mind when we perceive, and not the object itself. But he denied that these forms, or species, are sent forth from external bodies ; and shewed the absurdity of this doctrine by solid arguments. He also gave the name of *ideas* to the representative forms which he supposed to be present in the mind ; a term which he seems to have borrowed from the philosophy of Plato. Another peculiarity in the Cartesian system, was the origin which it assigned to certain of our ideas, such as those of time, space, motion, &c. ; which it represented to be innate, or coeval with the mind itself.

The Cartesian theory of Perception was variously modified by Malebranche, and other succeeding metaphysicians : but it is not necessary,

cessary, here, to specify the peculiar notions of each. The writings of Mr Locke are justly entitled to more consideration than those of any philosopher of the period in question. It does not appear that his opinions, concerning perception, differed materially from those of Descartes; except in respect of the origin which he assigned to the representative images, or ideas, as they now were universally named. In this respect he differed both from the Peripatetics and Cartesians; and assigned all our ideas, or notions, to two sources, viz. 1st, Sensation; and, 2d, Reflection or Consciousness; as we have already had occasion to specify.

It is an evident consequence of the doctrine of Perception, as admitted by Descartes and Mr Locke, that we have no direct evidence for the existence of external objects, or of a material world; since all the objects of our perception and consciousness are only ideas, or images, which have no dependence whatever
upon

upon external things. Both philosophers were too acute not to perceive this inference; but neither were inclined to give up the existence of a material world, although we have found them, without reluctance, relinquishing the independent existence of the secondary qualities of body. The arguments, however, by which they endeavoured to establish the real existence of matter, are not very strong, and founded chiefly upon this position, that a benevolent Supreme power would never have given us faculties like the senses, merely in order to deceive us. *

But

* Mr Locke has examined, more fully than Descartes, the arguments which may be adduced in support of the evidence of the senses. 'As to myself,' says he (b. 4. c. 11. § 3.) 'I think God has given me assurance enough of the existence of things without me; since, by their different application, I can produce in myself both pleasure and pain, which is one great concernment of my present state.' He then subjoins four arguments,

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But although we find Descartes and Mr Locke conceiving that the existence of a material world is only supported by probable arguments, we are scarcely prepared for a system so repugnant to common sense, as positively and seriously to deny the existence of any kind of matter whatever. Yet such was the system of the ingenious Bishop Berkeley, who was considered as one of the most philosophical reasoners of his day. The denial of the existence of the secondary qualities of body, but as mere sensations

by which the testimony of the senses may be supported. The first is, Because we cannot have the ideas of sense but by the inlet of the senses. 2d, Because an idea from actual sensation, and another from memory, are very distinct perceptions: 3d, Pleasure, or pain, which accompanies actual sensation, accompanies not the returning of those ideas, without the external objects. And, 4th, Our senses assist one another's testimony of the existence of outward things (§ 4. 5. 6. & 7.) 'This certainty' (he adds in the following sections) 'is as great as our condition needs, but reaches no farther than actual sensation.'

sensations of the mind; which we have seen
 formed a part of the systems of Descartes and
 Locke; no doubt prepared the way for this
 sceptical doctrine; and it was not difficult to
 extend the arguments, by which the non-exist-
 ence of the secondary qualities of body was
 supposed to be proved, to the primary also.
 These, according to the prevailing theory of
 Perception, were mere ideas or images present
 in the mind; and we know nothing of them
 but as ideas existing in the mind; so that of
 the existence of external bodies we have no
 evidence. Berkeley states his system as a
 thing very obvious, and readily to be admitted.
 ‘ Some truths there are,’ says he, ‘ so near and
 ‘ obvious to the mind, that a man need only
 ‘ open his eyes to see them. Such I take this
 ‘ important one to be, that all the choir of
 ‘ heaven, and furniture of earth,—in a word,
 ‘ all those bodies which compose the mighty
 ‘ frame of the world, have not any subsistence
 ‘ without a mind.’

Berkeley, though he denies the existence of a material world, yet, as became his cloth, decidedly espouses the existence of a world of spirits. In order to this, he admits that there are certain objects of human knowledge, which are not ideas, but things which have a permanent existence. These are our own minds, and their various operations, other finite minds, and the Supreme mind. And this he thinks must follow from the very nature of ideas, which, being inert, passive, unthinking beings, cannot be the images of thinking and active beings; of those very beings in which they exist.

It was a large stride in scepticism to deny the existence of a material world: but the tenets soon after advanced by Mr Hume, and grounded upon the same theory of our perceptions, go far beyond this, even to deny the existence of mind, as well as matter. This philosopher distinguishes the images, or pictures,

tures, which were supposed to be the objects of our thoughts, into two classes, which he calls impressions and ideas; and comprehends under the first, all our sensations, passions, and emotions; and, under the last, the fainter copies of these, when we remember, imagine, or reason concerning them. He sets out with this as a principle that needed no proof, (and of which, therefore, he offers none); that all the perceptions of the human mind resolve themselves into these impressions and ideas. This being granted, it was easy to shew, by the same process which Berkeley employed to prove the non-existence of matter, that there is neither matter nor mind in the universe; nothing but impressions and ideas. What we call a body, is only a bundle of sensations; and what we call the mind, is only a bundle of passions, thoughts, and emotions, without any subject: so that Mr Hume does not leave us even a self to claim the property of these impressions and ideas.

The system of Mr Hume is not to be considered as a mere philosophical reverie, concerning the manner in which the operations of the mind are conducted ; but as a highly dangerous and insidious attempt to overturn every principle of belief, and rule of conduct. For it admits no other standard by which our opinions and reasonings are to be guided, than those hypothetical impressions, or ideas, which we are to look for within ourselves. From this singular assumption, the author endeavours logically to deduce, that there is no such thing as power, or intelligence, in the universe ; no active cause, or voluntary agent ; no time or space, matter or mind : In fine, that there is no such thing as evidence, or even probability ; nor any reason why we should believe one thing, more than its contrary.

Philosophical scepticism had now arrived at its utmost limits ; and it became time to assert the privilege of reason, and examine upon
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what foundation doctrines of so preposterous and dangerous a tendency rested. Dr Reid has unquestionably the merit of being the first who successfully executed this task ; and in his various works on the human mind, he has so completely accomplished it, as to leave little more to succeeding writers than to select and illustrate his various arguments.

On examining the ground upon which the modern sceptical system rests, it is found to be nothing more than the hypothesis which represents all our perceptions and thoughts as carried on by means of images or representations of the thing perceived or thought of, present in the mind ; which images, in modern times, have generally been called *Ideas* ; an hypothesis which, we have seen, has descended from a very high antiquity, under various modifications. As this theory was taught by the Peripatetics, however erroneous in its assumptions, it led to no sceptical conclusions ;

because it taught that the images present in the mind were sent forth by material objects ; and, consequently, still left us the evidence of our senses for the existence of matter. But Descartes and his followers, while they retained the supposition of images in the mind, rejected that of their proceeding from the external body. The consequence was, that they began first with doubting the existence of material substances, and at length deliberately denied that there is any such thing in the world as matter, or mind, or any sentient being. ‘ It is pleasant,’ says Dr Reid, ‘ to observe, that while philosophers have so long been labouring, by means of ideas, to explain Perception, and the other operations of the mind ; those ideas have, by degrees, usurped the place of perception, object, and even of the mind itself, and have supplanted those very things they were brought to explain.’

It might be reasonably concluded, that this theory,

theory, which has so long prevailed in the world, and been so implicitly admitted as to sanction conclusions apparently the most absurd, rendered our notion of perception, as well as the other intellectual faculties, very clear and intelligible. This, however, is by no means the case; for if we apply the theory to any other of the senses, except sight, it is altogether incomprehensible. I can indeed understand what is meant by an image or representation of visible forms or colours, because I know that such images are painted on the retina of the eye; and this fact seems to have afforded the origin of the whole hypothesis. But what is meant by the image or idea of a taste, of a smell, a sound, of sourness or sweetness, of loudness or lowness, of hardness or softness, I confess myself perfectly at a loss to determine. Much less can I pretend to understand what is meant by the images of intellectual objects, of truth or falsehood, fitness or unfitness, virtue or vice.

Again,

Again, if we should ask, where are these images exhibited, and of what kind of materials are they formed, it would be difficult to obtain an answer from those who have most strenuously espoused the theory. It would seem, from the writings of Descartes, that he sometimes places the ideas of material objects in the brain, not only when they are perceived, but when they are remembered or imagined; but at other times he says, that we are not to conceive the images or traces in the brain to be perceived, as if there were eyes in the brain; these traces being only occasions on which, by the laws of the union of soul and body, ideas are excited in the mind. Mr Locke also seems to have wavered between these two opinions, sometimes representing the ideas of material things as being in the brain, but more frequently in the mind itself. Other philosophers, among whom we may rank Newton and Dr Clarke, speak of the images of material things as being in that part of the
brain

brain called the *sensorium*, and perceived by the mind, there present: but Newton speaks of this point only incidentally, and, with his usual modesty, in the form of a query. As for Berkeley, his system leaves no brain on which the images could be traced; and the system of Mr Hume leaves neither a brain nor a mind for the reception of his impressions and ideas.

As to the particular nature or substance of the images, philosophers are generally silent. Mr Locke indeed says, that our sensations are ‘ produced in us by different degrees and ‘ modes of motion in our animal spirits, variously agitated by external objects:’ And again, that, by the faculties of memory and imagination, ‘ the mind has an ability, when ‘ it wills, to revive them again, and, as it were, ‘ to paint them anew upon itself, though some ‘ with more, some with less difficulty.’ Dr Robert Hook is almost the only author who

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is explicit on this subject. He informs us, (*Lect. on Light*, sect. 7.) that ideas are completely material substances, and that the brain is furnished with a proper kind of matter for fabricating the ideas of each sense. The ideas of sight, he thinks, are formed of a kind of matter resembling the Bononian stone, or some kind of phosphorus; the ideas of sound, of some matter resembling the chords or glasses which take a sound from the vibration of the air; and so of the rest. Were this doctrine any thing like the truth, we might reasonably expect to obtain a view of these ideas by a careful dissection of the brain; which, however, has not yet been found to be the case.

What then, it may be asked, can be the cause of the very general reception of an hypothesis which is replete with so many inconsistencies and difficulties, insomuch that it rather obscures than enlightens the doctrine which it is brought to explain? This seems
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to be ascribable to a prejudice which is deeply rooted in the human mind, and has even been admitted, from remote antiquity, as a philosophical axiom, or self-evident principle, namely, that ‘ nothing can act, or be acted upon, but ‘ when and where it is present.’ It seems a necessary consequence, from this principle, that when the mind perceives, either the objects of its perception must come into it, or it must go out of the body to these objects. The first of these opinions has generally been adopted as the most rational. ‘ We see,’ says Malebranche, ‘ the sun, the stars, and an infinity ‘ of objects without us; and it is not at all ‘ likely that the soul sallies out of the body, ‘ and, as it were, takes a walk through the ‘ heavens to contemplate all these objects.’ Yet the author of the *Antient Metaphysics* has, among his other singularities, espoused this last opinion. (See *Ant. Met.* Vol. II. p. 306.)

The origin of this prejudice, that all action
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is the effect of contact, it is not difficult to assign. This is the only manner in which we ourselves can act upon external objects; and it is the manner in which all our external senses are acted upon by these objects, either immediately, or by the intervention of some known medium, such as the rays of light, the undulations of the air, or the effluvia of odorous bodies. Yet, after all, when we come to examine the matter a little more nearly, we no more understand how bodies act upon one another when in contact, than when at a distance; and we should never have found out, independently of actual experience, that motion is the effect of contact or impulse. Nay, if the system of Boscovich be true, there is no such thing as real contact in nature, nor is such a thing possible. Again, there are many natural phenomena, such as those of gravitation, magnetism, electricity, &c. which appear to be produced by the mutual action of bodies at a distance from one another. For though we
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have various hypotheses of intervening media, ethers, or effluvia, which are intended to explain these phenomena, all these are mere suppositions, destitute of the least shadow of proof. The inference is, that the maxim above stated is to be ranked among those vulgar prejudices which, though very generally received, are without any real foundation in nature.

If we seek for any other proof of the ideal theory, in the writings of those who have espoused it, than this generally received prejudice, we shall seek in vain. They all appear to assume the existence of ideas as a thing self-evident, and of which, therefore, no proof will be expected. ‘ I presume, ’ says Mr Locke, ‘ it will be granted me that there are such ideas in men’s minds ; every man is conscious of them in himself, and men’s words and actions will satisfy him that they are in others. ’—‘ It is evident, ’ he says again, ‘ the mind knows not things immediately,

‘diately, but only by the intervention of the
‘ideas it has of them.’ Berkeley, indeed,
infers the reality of ideas from this circum-
stance, that magnitude and figure, as perceived
by the eye, and as perceived by the touch, are
things, in appearance, very different; and Mr
Hume employs a similar argument when he
says, ‘The table which we see, seems to di-
‘minish as we remove farther from it; but
‘the real table, which exists independent of
‘us, suffers no alteration. It was, therefore,
‘nothing but its image which was present to
‘the mind.’ But the known laws of optics
are a sufficient answer to such reasonings, and
prove, that tangible magnitude must assume
the precise appearances to the eye which it
is known to assume. There is, in truth, an
image in such cases, but it is not in the mind,
but in the retina of the eye.

I have thought it necessary to be thus
ample in my account of the celebrated theory
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of ideas, because it has not only pervaded almost every system of metaphysics, both ancient and modern, but has even become incorporated with the structure of language itself. This renders it difficult, not occasionally to employ the term idea, which has become completely naturalized in most modern tongues; but I shall use it with this proviso, that I mean by it a mere mental notion or conception, without reference to any image, form, or representation, supposed to be present in the mind. *

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* I have taken no notice of the peculiar theory of Leibnitz concerning Perception, which differs more in appearance than in reality from that of Descartes, or of Locke. According to Leibnitz, Perception is produced, not by any action of body upon mind, or of mind upon body, which he conceives to be inadmissible, but by what he calls the *preestablished harmony*. Our bodies and minds, he conceives, are so constituted, that each may perform its peculiar operations independently of the other,

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SECTION II.

Of the Evidence of Perception, or of the Senses.

HAVING given a pretty ample investigation of the various hypotheses which philosophers have entertained on the subject of perception, and which are only different modifications of the Ideal Theory, it remains to inquire, what we really know concerning this primary operation of the mind. Here, we are obliged to

but with a perfect correspondence or sympathy, so that every change of the one is attended with a corresponding change in the other : just as one clock may be so adjusted as to keep time with another, although guided by a perfectly independent moving power. This system, it is evident, overturns all the authority of our senses ; ‘ and ‘ this one thing,’ says Dr Reid, ‘ as long as men retain ‘ their senses, will always make these systems truly ridiculous.’

to confess, that of the peculiar manner in which this faculty is brought into action, we are entirely ignorant, and must therefore be contented to state it as an ultimate fact, or law, of the human mind; in the same manner as gravitation continues to be stated as an ultimate fact, or law, of nature, by the Newtonian philosophers. We may, however, be able to ascertain the phenomena which accompany the operation of this ultimate principle; and thus make advances in knowledge, which are the more useful and important, that they rest on the basis of observation, and not of fanciful hypothesis:

According to Dr Reid (Essay II. ch. 5.)
 ‘ in every perception of an external object of
 ‘ sense, we find these three things. 1st, Some
 ‘ conception or notion of the object perceived;
 ‘ 2^{dly}, A strong and irresistible belief of its
 ‘ present existence; and, 3^{dly}, That this con-
 ‘ viction and belief are immediate, and not the
 ‘ effect

‘ effect of reasoning. ’ We may have a conception of an object without perceiving it ; but when we perceive, some conception or notion is necessarily implied. Again, when the perception is distinct, we have an irresistible conviction of the existence of its object. A perception may be so faint, as to leave us in doubt of its reality ; as when we observe the first twinkling of a star, or the first appearance of a ship upon the distant horizon : but, when the perception is clear and steady, this doubt, with regard to the reality of its object, vanishes at once.

Further, this conviction which we have of the present existence of the objects of perception is immediate, and not resolvable into reasoning, or any other kind of evidence. The rudest savage is as fully convinced of the reality of what he sees, hears, and feels, as the most expert logician ; but both are alike incapable of giving any better reason for this belief,

belief, than the original constitution of their nature. If, indeed, the knowledge we have of external objects were to be got by reasoning only, the greatest part of men would be destitute of it ; for the greatest part of men hardly ever reason ; and in infancy and childhood no man can reason : ‘ Therefore,’ continues Dr Reid, ‘ as this intelligence of the objects ‘ that surround us, and from which we receive ‘ so much benefit or harm, is equally necessary ‘ to children and to men ; to the ignorant and ‘ to the learned : God, in his wisdom, con- ‘ veys it to us in a way that puts all upon a ‘ level. The information of the senses is as ‘ perfect, and gives as full conviction to the ‘ most ignorant, as to the most learned.’

Upon this account of the phenomena of perception, which is given nearly in Dr Reid’s own words, I have only to remark, that the second and third circumstances in his enumeration may perhaps, with more propriety, be

comprised in one ; and then it may be said, that, in every perception of an external object of sense, we find, *1st*, Some conception or notion of the object perceived ; and, *2^{dly}*, A strong and irresistible belief of its present existence, which is not resolvable into reasoning, or any other kind of evidence.

The most obvious objection to this doctrine, of the immediate and irresistible belief which accompanies perception, arises from the opinion, so often inculcated by philosophers, of the fallacy of the senses. Almost all the antient philosophical sects, Atomists, Academics, Peripatetics, and Sceptics, strenuously espoused this opinion, and illustrated it by many common-place arguments ; such as the crooked appearance of a stick in the water ; objects being magnified, and their distance mistaken in a fog ; the sun and moon appearing but a few inches in diameter, while they are really thousands of miles ; a square tower being taken at a distance

distance for a round one; and so forth. These, and many similar appearances, they thought were sufficiently accounted for, by ascribing them to the fallacy of the senses; which thus served, like the substantial forms, and occult qualities, as a decent cover for their ignorance. Descartes, and most of the modern metaphysicians, have joined in the same complaint of the fallacy of the senses; a doctrine which was very suitable to that system, which represented the perfection of philosophy as consisting in doubt.

When we consider that the active part of mankind, in all ages from the beginning of the world, have rested their most important concerns upon the testimony of sense, it will be very difficult to reconcile their conduct with this so generally received opinion of the fallacy of the senses. It must be acknowledged that our senses are limited and imperfect, liable to injury and misapplication; but this they have

in common with our memory, our judgement, and all our other faculties ; and, in many important objects of knowledge, it will be found that we have no other legitimate sources of information. The fact is, that in many of those instances which are called deceptions of sense, the error is not in the information which the senses give us, but in the judgement or conclusion which we deduce from their evidence. Thus, if I mistake the picture of a cube, or of a sphere, delineated upon a plane surface, for these solid bodies themselves: the error is not in the eye; for it has fulfilled its office, by giving me information of the form, colour, apparent magnitude, &c. of the object perceived : but when I deduce from these perceptions, that the object perceived is a solid, and not a plane, I am guilty of a piece of false reasoning ; so that, in fact, the fallacy, here, is not in the senses, but in the conclusion of reason. But, what places the evidence of the senses in the most convincing light is, that it
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is by their means alone that we are able to detect this fallacy. In the case just mentioned, we might reason for ever, without being able to determine whether we saw a plane or a solid body; but we can at once settle the question, by going so near as to see its appearance more distinctly, or yet more certainly by the help of the sense of touch, whose proper province it is to perceive the dimension of solidity.

The same reasoning may easily be applied to other instances which are ascribed to the fallacy of sense. In fact, therefore, the source of error, in these cases, is in the faculty of reason, which is much more liable to mistake than the senses are. In the most important concerns of mankind, as in trials for life and death, the evidence of sense, that is, of eye and ear witnesses of veracity, is admitted by the judge as the proper ground of his decision. But the *reasonings* of a counsel are fully weighed

ed, and scrutinized, and admitted with much limitation ; and if, as Dr Reid remarks, ‘ a
‘ sceptical counsel should plead that we ought
‘ not to put so much faith in our senses as to
‘ deprive men of life or fortune upon their
‘ testimony,—such an argument would be re-
‘ jected with disdain. ’ The inference is, that
the evidence of sense is perfectly conclusive
and unanswerable. It is therefore stronger
than that of any kind of reasoning, except de-
monstration ; and those sceptical philosophers
who have substituted the conclusions of their
own hypothetical systems in the room of the
evidence of sense, have been guilty of a com-
plete *paralogism*, or an admission of the less
evident in room of the more evident.

It may perhaps be asked, whether there be
an evidence or belief accompanying Sensation,
as we have endeavoured to prove that belief
always accompanies the distinct operation of
Perception, and also of Consciousness. To
this

this I would answer, that our sensations and feelings are, like every other thing that passes in our own minds, the proper objects of consciousness; so that the conviction which we have of their reality, rests upon the evidence of that faculty.

CHAPTER FOURTH.

Of Abstraction.

SECTION I.*General Observations upon Abstraction.*

EVERY object which we contemplate in nature, is an individual distinguished from all other objects by some peculiar characteristic properties of its own. But we are endowed with a faculty, by which we contemplate the various qualities of objects apart from the actual assemblages of nature. Hence we are enabled to ascertain what qualities an object has peculiar to itself, and what are in common to it and other objects of a like nature, which
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will therefore be referred to the same class with it. That faculty by which we analyze the actual assemblages of nature into their constituent parts, we call Abstraction. According to the opinion of various philosophers, the operation by which we refer simple qualities to a variety of objects, must be ascribed to another faculty, which they call Generalization; and they conceive that there might have been abstraction without generalization, though not generalization without abstraction. Granting this to be true, I consider the faculty of generalization as nothing other than that which I have called Combination, or Association, by means of which we connect together the objects of our thoughts, according to various relations, essential or accidental, and which we shall have to consider in the next chapter. In the mean time, it will not lead to any material misapprehension, to speak of the whole process of the formation of general notions as due to the faculty of abstraction alone.

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Had we possessed no such faculty as abstraction, it is evident that all our knowledge would have been limited to an acquaintance with individual beings and individual facts. But the very essence of science consists in generalizing and reducing to a few classes, or general principles, the multitude of individual things which every branch of human knowledge embraces. Hence, without abstraction, science could have had no existence ; and the knowledge of man would have been, like that of the lower animals, in whom no traces of this faculty are discernible, circumscribed to an acquaintance with those objects and events in nature with which he was connected by a regard to his own preservation and well-being.

I do not, indeed, go so far as to say, with some philosophers, that without abstraction, the faculty of reasoning could never have been called into exercise ; for reasoning may no doubt be exercised upon particular facts and circumstances ;

circumstances ; and of this degree of reasoning the lower animals appear to be capable. A curious example of the reasoning powers of the monkey is quoted by Mr Stewart (c. 4. sect. 5.) from the *Lettre sur les Animaux* of M. Bailly, addressed to M. Le Roy : but this faculty, even in the most sagacious animals, is confined within very narrow limits ; of which I have heard a convincing proof from a person of undoubted veracity. Around Gibraltar, a certain species of apes is common ; and these animals are frequently seen in herds in recesses of the rock. They have a particular fondness for the heat of a fire, and never fail to assemble together around the embers which the centinels leave after boiling their kettles, where they seem highly to enjoy themselves. In the neighbourhood of these embers, plenty of chips and fragments of wood are to be found, which serve the centinels for fuel ; but although the apes are not unfrequently seen pelting each other with these chips, they have
never

never been known to apply them to feed the expiring fire, whose loss they evidently appear to regret.

It is in the discovery of general principles, that reason has its noblest exercise. It is generalization alone that makes it possible for us continually to go on in scientific improvement. It is in consequence of this, (as is eloquently observed by M. Condorcet *sur l'instruction publique*) ‘ that at the moment when a multitude of particular solutions, and of insulated facts, begin to distract the attention, and to overcharge the memory, the former gradually lose themselves in one general method, and the latter unite in one general law ; and that these generalizations continually succeeding one to another, like the successive multiplications of a number by itself, have no other limit than that infinity which the human faculties are unable to comprehend.’ (See the whole passage translated by Mr Stewart, c. 4. sect.

fect. 6.) Hence it appears, that abstraction is completely subservient to all the nobler exertions of reason ; to those, in particular, by which man has attained the high distinction of being denominated a rational animal.

In proportion as a man familiarizes himself in the exercise of Abstraction, and accustoms himself to consider what are the distinguishing characteristics of the various objects of his contemplation, and what they have in common with others, does he fit himself for scientific pursuits. But the formation of general principles is not entirely suited to the direction of our conduct in the more ordinary occurrences of life. Hence the origin of that maxim, ‘ which ’ (as Mr Hume remarks) ‘ has been ‘ so industriously propagated by the dunces of ‘ every age, that a man of genius is unfit for ‘ business. ’ ‘ When, ’ says Mr Stewart, ‘ theoretical knowledge and practical skill are ‘ happily combined in the same person, the
G ‘ intellectual

‘ intellectual power of man appears in its full
‘ perfection, and fits him equally to conduct,
‘ with a masterly hand, the details of ordinary
‘ business, and to contend successfully with the
‘ untried difficulties of new and hazardous situ-
‘ ations. ’ (See Elem. of the Phil. of the Hum.
Mind, c. 14. the whole of § 6. & 7.)

If it should be asked at what period of life the faculty of Abstraction shews itself? Dr Reid answers, that as soon as a child can say, with understanding, that he has two brothers, or two sisters, that is, as soon as he can use the plural number, he shews himself to have formed a general conception. (Essay V. c. 3.) Hence it appears, that it is to the faculty of Abstraction alone, that we owe the notion of *number*, one of the most important with which we are acquainted. For if we had not possessed the faculty of generalizing, or of reducing individual things to various classes, we should never have been able to say that there were two, or more things of a sort.

Again,

Again, as all language consists, in a great measure, of general words or expressions which are applicable to more than one individual thing, this valuable prerogative in a great measure depends upon the faculty of Abstraction. If we examine the structure of language, we shall find that all its parts of speech are general terms, or may all be applied to a variety of individuals, with the exception of that class of substantive nouns, called *proper names*. Hence, we see in how great a degree the faculty of abstraction facilitates the communication of our thoughts from one to another. And this principle ought to be decisive of a question, which has not unfrequently been agitated, viz. whether the brutes be capable of acquiring language? Being destitute of abstraction, the only terms in language, whose meaning they are capable of comprehending, are the proper names: and this is perfectly agreeable to experience. A dog, or other animal, may be made to answer to a

particular name ; or he may be made to perform certain individual acts when certain sounds are pronounced to him : but further than this, in respect to the comprehension of words, his intellectual powers appear to be incapable of carrying him.

Few subjects have given rise to more controversy, among metaphysical writers, than the question concerning the particular intellectual process by which the mind forms general notions ; or, in other words, what is the object of our thoughts when we employ an abstract or general term. This question has become very much implicated with the ideal theory which so long prevailed in the world, and according to which, as already stated, (c. 3. sect. 1.) there is some image or sensible representation of every object of thought present in the mind, when any of our faculties are employed about that object. It therefore became a question, what is the nature of the *images*,
or

or *ideas* of abstraction ; and are these mere creatures of the mind, or have they a real and permanent existence in nature ?

It was the doctrine of Plato, as well as of the Pythagorean school, that *universal ideas* were of an eternal and immutable nature, and were the general representations of what the objects of our senses exhibited only as individuals. (See as above.) Hence, it is evident that these philosophers assigned to *abstract ideas*, or *universals*, as they were called, a real and permanent existence ; and indeed considered them as the only objects of true science. Aristotle, who derived ideas from matter, instead of matter from ideas, still admitted that universal ideas were things actually present in the mind ; although he denied them an independent and permanent existence. It is to him we owe the division of universals into five classes, viz. genus, species, specific difference, property, and accident ; which, however, Dr Reid is of

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opinion,

opinion, was borrowed from the Pythagorean school. Thus, we may conclude, that Plato and Aristotle, as well as the Pythagoreans, all concurred in ascribing a real existence to universal ideas, although they differed as to their origin : but a very opposite doctrine appears to have been taught by Zeno and the Stoics, *viz.* that universals have no real existence, but are mere creatures of the human mind.

The obscure statement of this controversy, in Porphyry's Introduction to the Categories of Aristotle, appears to have drawn the attention of the schoolmen to it very early in the middle ages. The prevailing opinion was, the reality of universals, in conformity to the doctrine of Aristotle ; but the system of the Stoics was revived, or rather reinvented, in the eleventh century, by Roscelinus, and found a very able and eloquent defender in his disciple the celebrated Peter Abelard, as well as, afterwards, in the English schoolman William Occam,

a disciple of Duns Scotus. The controversy was agitated with the greatest keenness, and not without blows and bloody affrays. Those who espoused the reality of the existence of universals, were called *Realists*; and those who maintained the opposite doctrine, were called *Nominalists*. A few took a middle course; and asserted that universality was neither in things nor in names, but in our conceptions; whence they were called *Conceptualists*.

Those modern philosophers who have espoused the theory of ideas, have generally given up the opinion of the Realists. Mr Hobbes was a decided Nominalist; as were also Dr Berkeley and Mr Hume. Mr Locke, in the opinion of Dr Reid, was a Conceptualist; although it is not very easy to assign a distinct notion to this doctrine, in conjunction with the ideal theory; for, according to that theory, our conceptions are themselves real beings,

viz. nothing other than ideas themselves; so that it would seem that a Conceptualist, who believed in the ideal theory, must be a Realist, at least in so far as the real existence of universals was taught in the Peripatetic system. The history of the controversy may be seen clearly stated in Dr Reid's *Essays on the Intellectual Powers* (*Essay V. c. 6.*), as well as in Mr Stewart's *Elements of the Philosophy, &c.* (*c. 4. sect. 2. & 3.*); and still more amply in Bruckeri *Hist. Phil.* (*vol. III.*)

If the ideal theory be relinquished, as I think it must, in consequence of the reasonings of Dr Reid, the system of the Realists falls to the ground, or at least becomes identified with that of the Conceptualists; for I do not suppose that any philosopher would now be inclined to revive the system of Plato concerning the eternal and independent existence of universal archetypes, or ideas, after the patterns of which all individual things have been formed.

ed. The only rational controversy, that now remains, appears to be, Whether is the mind capable of attaching distinct notions, or conceptions, to those general and abstract terms which it so frequently employs? or is it incapable of forming such notions, so that, when it employs general terms, these are to be considered rather as signs than accurate expressions of our thoughts, and if any distinct notion is annexed to them, it must be that of an individual of the species which they are employed to express?

This question appears still to divide the opinions of Intellectual philosophers; and on this account, as well as because of its real importance in settling the first principles of knowledge, it deserves a particular examination. We may consider Dr Reid as having maintained the first opinion; and Mr Stewart as one of the ablest advocates for the second. A variety of ingenious arguments for this last doctrine, are likewise

likewise to be found in the writings of the Abbé de Condillac. After all that has been said upon the subject by these able philosophers, perhaps some new lights remain to be thrown upon it by inquirers of far less eminence. With a view to avoid the errors attendant upon theoretical speculation, I shall, in the short investigation of this question, which forms the next section, follow, as much as I am able, the natural order of induction grounded upon the progression of facts.

SECTION II.

Of the Nature and Origin of Abstract and General Terms.

THE most general division of the objects of human thought, or of those things which language is intended to denote, is into *sub-*
stances

stances and *attributes*; for every thing which exists, or of which we can form a notion, must be either an individual being or substance; or else some quality, relation, or mode of operation, that is, some attribute of that substance. In all languages yet discovered among the various tribes of men, the first class of notions is expressed by certain words, which, from their office, have been called substantive nouns. The second class, which is by far the most complicated, and assumes a great variety of forms, is expressed by words which have, in process of time, come to be arranged under different genera; for attributes are expressed by adjective nouns, by verbs, participles, adverbs, and all the indeclinable parts of speech, and also by many substantive nouns.

It has been rendered exceedingly probable, by the philological investigations of Mr Horne Tooke, that language, in its primitive form, consisted almost entirely of nouns and verbs;
since

since he has been able to shew, in the case of the English language, and, occasionally, in particular examples of other languages, that all the indeclinable parts of speech, which have given so much trouble to grammarians, may be reduced to some form or other of the noun or verb, either existing in the language itself, or in those dialects from which it was originally derived. This renders it probable that, in every case whatever, this reduction might be made, were we acquainted with all the roots of the language in question.

Without both the noun and verb, scarce any thought can be intelligibly expressed ; for the noun is necessary to denote the subject of our thoughts, and the verb to denote its particular state, or that which we wish to affirm or express concerning it. The utterance of a name alone, accompanied with some indicative gestures of the body, may be sufficient, on some few occasions, to convey our
meaning

meaning to others : and we find, in certain languages, a few forms of expression, which, by means of the verb alone, contain a complete affirmation ; as in the Latin—*pluit, it rains ; pugnabatur, there was a battle ;* and some others. But, in general, it may be assumed as a manifest truth, that both the noun and verb are necessary for the communication of thought, even in the rudest state of language ; the one to denote the object of our thoughts ; the other, that relation or attribute which we express concerning it.

The verb, as it is found in all languages, includes, in its more usual forms, not only the expression of some particular state or action, but also the notion of time, denoted by its tense, together with other notions which it is not necessary here to specify. Hence, the necessity of another set of words which shall denote the more permanent attributes of substances, without reference to the present, past,
or

or future; or shall include in them nothing more than the simple notion of the attribute itself. These words are the *adjectives*, whose purpose it is, simply to denote the various permanent qualities of substances, such as *white, green, rough, smooth, good, bad, &c.*; and which are necessarily of a very high antiquity in language. It has been ingeniously supposed, that many of the adjectives were at first nothing more than the names of those substances which possessed much of the quality which they were employed to denote. Thus, it would be natural to say, the ‘snow cloth,’ to denote the white cloth; the ‘grass cloth,’ to denote the green cloth; and so forth: a form of expression which we still retain, in such examples as the words *violet, orange, &c.* which are employed both as substantives and adjectives. Others of the adjectives are evidently derived from verbs; as *learned*, from *to learn*; *hot*, from *to beat*; which is more manifest in the instance of *calidus*, from *caleo*; and
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so forth : and, perhaps, some can scarcely be traced to either origin, but must be referred to the original stock of words.

The adjectives are employed with propriety only when conjoined with substantives, as their very name imports. Hence the origin of a set of substantives which have been termed abstracts, intended to denote a quality or attribute, without any relation whatever to a substance. Thus, from *good*, we have *goodness*; from *white*, *whiteness*; and so forth : while, in such instances as *green*, *blue*, &c. one word serves the purpose of both substantive and adjective. Many of these abstracts are derived from verbs ; such as *punishment*, from *punish*, *understanding*, from *understand*, &c. ; while in some instances here, also, one word answers both purposes, as in the words *love*, *walk*, &c. It is an observation of M. de Condillac, (*Sur l'Origine des Con. Hum. part. 2. § 1. c. 9.*) that all the abstract substantives are derived from

‘ from some adjective or verb ; and, in common language, owe their origin merely to the necessity of expressing the thoughts com-
modiously. ’ *

Let us now pause, and ask, Have we distinct conceptions attached to the various classes of words which we have just enumerated ? I think it cannot be doubted that we are capable of forming such conceptions. What it is *to walk, to run, to have walked, or to command to walk* ; what it is *to love or to hate, to be angry or to pity*,—all which are examples of the verb ; surely we as distinctly comprehend, as what is meant by the specific name of any tree, mountain, or river, such as *ash, Snowdon, or Thames*. Certainly, too, we have an equal-
ly

* ‘ Si nous pouvions remonter à tous les noms primitifs, nous reconnoîtrions qu’il n’y a point de substantif abstrait qui ne dérive de quelque adjectif ou de quelque verbe. ’

ly distinct conception, when we say, the ash is *green*, or it is *smooth*, or it is *crooked*; which are examples of the adjective: and I think there is no difficulty in annexing a distinct meaning to the abstracts, *smoothness*, *crookedness*, &c. although we are perfectly aware that these cannot exist, and, therefore, cannot be figured visibly before the eyes, without some substance that should be *smooth* or *crooked*. But, surely, a distinct mental conception is one thing, and an ocular representation, or visible painting, is another.

The doctrine which I have been endeavouring to illustrate, appears to coincide with what is said concerning our notions of attributes by Dr Reid, (Essay V. on the Intellectual Powers, c. 2.) ‘ It appears,’ says he, ‘ from every man’s experience, that he may have as clear and distinct a conception of such attributes as we have named, and of innumerable others, as he can have of any individual

‘vidual to which they belong.’ ‘Indeed,’ adds he, ‘the attributes of individuals is all that we distinctly conceive about them. It is true, we conceive a subject to which the attributes belong; but of this subject, when its attributes are set aside, we have but an obscure and relative conception, whether it be body or mind.’

‘The other class of general terms,’ adds he afterwards, ‘are those that signify *genera* and *species*, into which we divide and subdivide things;’ and of these I come now to treat. ‘If we are able,’ says Dr Reid, ‘to form distinct conceptions of attributes, it cannot surely be denied that we may have distinct conceptions of genera and species, because they are only collections of attributes which we conceive to exist in a subject, and to which we give a general name. If the attributes comprehended under that general name be distinctly conceived, the thing
‘meant

‘ meant by the name must be distinctly conceived: and the name may justly be attributed to every individual which has those attributes.’ ‘ Thus,’ adds he, ‘ I may conceive distinctly what it is to have wings; to be covered with feathers; to lay eggs. Suppose, then, that we give the name of *bird* to every animal that has these three attributes. Here, undoubtedly, my conception of a bird is as distinct as my notion of the attributes which are common to this species.’ From these passages, the opinion of this philosopher, concerning the origin and nature of generic terms, appears pretty clearly to have been, that we first form notions of the separate attributes belonging to a class or genus, for which names would naturally be assigned, and that we combine these attributes into one complex notion, to which we give a generic appellation, common to all the individuals of the class or genus. This opinion does not appear to me strictly conformable to the process of distinct mental

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conception,

conception, nor to the natural progress of language; for generic terms are manifestly of a very early origin, and greatly precede, in the order of time, the names of many of those attributes which ought, according to this account of the matter, to have been had in view when the generic terms were invented.

The ingenious Abbé de Condillac, in his small treatise entitled *La Logique*, appears to me to have well illustrated the natural origin of generic terms. ‘When,’ says he, ‘we shew a child a tree, and tell him that it is so named, the word tree will be to him the name of an individual object. Nevertheless, if we shew him another tree, he will not think of demanding its name, but will call it a tree; and thus he will proceed with a third, and a fourth, &c. object of the same kind. Nay, so serviceable will this term become to him, that he will call trees all that we comprehend under the term plants. Thus

‘ Thus is he naturally led to generalize, be-
 ‘ cause it is more convenient for him to make
 ‘ use of a name which he has learnt, than to
 ‘ employ a new one. He generalizes, there-
 ‘ fore, without being at all conscious that he
 ‘ does so. The same regard to convenience,
 ‘ however, which prompted him to generalize,
 ‘ will also induce him to form subordinate
 ‘ classes. Thus, if we conduct him into a
 ‘ garden, and give him different fruits to eat,
 ‘ he will soon learn the terms, cherry-tree,
 ‘ plum-tree, apple-tree, &c. and will be in-
 ‘ clined afterwards to make use of them.
 ‘ Thus men form genera, and again subdi-
 ‘ vide them, without at all thinking of the
 ‘ matter.’ *

Mr

* Un enfant nommera *arbre* d’après nous, le premier
 ‘ arbre que nous lui montrerons ; et ce nom fera pour lui
 ‘ le nom d’un individu. Cependant, si on lui montre un
 ‘ autre arbre, il n’imaginera pas d’en demander le nom : il

Mr Smith, in his Dissertation on the Origin of Languages, gives a similar account of the extension of individual names to whole classes of objects ; and the hypothesis appears to be equally simple and satisfactory. I am, however, by no means inclined to acquiesce in the conclusions

‘ le nommera *arbre*, et il rendra ce nom commun à deux
‘ individus. Il le rendra de même commun à trois, à
‘ quatre, et enfin à toutes les plantes qui lui paraîtront
‘ avoir quelque ressemblance avec les premiers arbres qu’il
‘ a vus. Ce nom deviendra même si général, qu’il nom-
‘ mera *arbre* tout ce que nous nommons *plante*. Il est
‘ naturellement porté à généraliser, parce qu’il lui est
‘ plus commode de se servir d’un nom qu’il fait, que
‘ d’en apprendre un nouveau. Il généralise, donc, sans
‘ avoir formé le dessein de généraliser, et sans même re-
‘ marquer qu’il généralise. Il ne fera qu’obéir à ses
‘ besoins. C’est pourquoi, je dis, qu’il fera ses distribu-
‘ tions naturellement, et à son insçu. En effet, si on le
‘ mène dans un jardin, et qu’on lui fasse cueillir et man-
‘ ger différentes sortes de fruits, nous verrons qu’il
‘ apprendra bientôt les noms de cerisier, pêcher, poirier,
‘ pommier, et qu’il distinguera différentes espèces d’ar-
‘ bres.’ (*La Logique*, prim. partie, c. 4.)

conclusions which have been drawn from it, by M. de Condillac, as well as by Mr Stewart and others, *viz.* that generic terms are mere signs of convenience, which we acquire the habit of employing with accuracy, but to which no distinct notion can be annexed. The following passage, (from Elements of the Philosophy of the Human Mind, c. 4. § 3.) appears to contain the most distinct exposition of Mr Stewart's sentiments on this subject. ' Still, ' however, it may be urged that, although, ' in such cases, there should be no object of ' thought in the mind, there must exist some- ' thing or other to which its attention is ' directed. To this difficulty I have no an- ' swer to make, but by repeating the fact ' which I have already endeavoured to esta- ' blish; that there are only two ways in which ' we can possibly speculate about classes of ' objects; the one, by means of a word, or ' generic term; the other, by means of one par- ' ticular individual of the class, which we con-

'sider as the representation of the rest ; and
 ' that these two methods of carrying on our
 ' general speculations, are, at bottom, so much
 ' the same, as to authorise us to lay down as
 ' a principle, that, *without the use of signs, all*
 ' *our thoughts must have related to individuals.*
 ' *When we reason, therefore, concerning classes*
 ' *or genera, the objects of our attention are mere-*
 ' *ly signs ;* or if, in any instance, the generic
 ' word should recal some individual, this cir-
 ' cumstance is to be regarded only as the con-
 ' sequence of an accidental association, which
 ' has rather a tendency to disturb, than to
 ' assist us in our reasoning.' ' Whether,'
 adds Mr Stewart, ' it might have been possible
 ' to have so formed us, that we might have
 ' been capable of reasoning concerning classes
 ' or genera of objects, without the use of signs,
 ' I shall not take upon me to determine. But
 ' this we may venture to affirm, with confi-
 ' dence, that man is not such a being.'

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In opposition to this ingenious philosopher, I take upon me to affirm, that *man is such a being*; and that, though generic terms are very convenient and useful signs, both for communicating our thoughts, and giving them precision, they are by no means indispensably requisite for enabling us to speculate concerning general classes of objects. Thus, I think, though language had contained no such generic term as *man*, we might have entered into many very useful speculations concerning the whole human race: and, in like manner, though we had wanted the words *plant* and *mineral*, we should not have been entirely ignorant of the general properties of the vegetable and fossil kingdoms. Nay, I maintain, that we are actually without such generic terms, in many departments where scientific speculation has been most successfully conducted. Thus, I know of no term, in any language, that properly defines and comprehends the objects of astronomical science. The term

stars,

stars, excludes the sun and moon, and perhaps the planets and comets; and hence, in giving a brief explanation of the objects of this science, we are obliged to make use of a circumlocution, *viz. the heavenly bodies.* *indor* But certainly a circumlocution is not *a term*, but a clumsy substitute for one, which necessity prompts us to employ. *effor* I would likewise observe, that the sense in which generic terms are understood, is by no means fixed and precisely limited; so that to one person they may indicate all the individuals of a certain subject of speculation, while to another their meaning may be more circumscribed. Thus, many writers upon Pneumatology employ the term *mind*, as comprehending not only the intellectual part of man, but also the Divine mind, and every spiritual being; while others limit it to the human mind alone; and are, therefore, without any generic appellation for all the objects of this science. The conclusion I would deduce from these illustrations, is, that generic terms,

terms, though extremely useful and convenient, are by no means essential to general speculations, or to the formation of general notions.

The next point which it is of importance to examine, is, When we reason concerning classes or genera, are the objects of our attention ‘merely signs?’ that is, have generic terms any distinct signification, of which a clear conception can be formed, or not? And here, too, I must dissent from the doctrine laid down by Mr Stewart; for I cannot conceive in what manner accurate reasonings can be carried on, or speculation successfully pursued, by means of terms to which we are incapable of annexing a distinct meaning; inasmuch, that when casual association does lead us to annex some meaning to them, *viz.* that of an individual of the class which they denote, this ‘has rather a tendency to disturb, than to assist us in our reasoning.’

The

The meaning that, according to my apprehension, is attached to a generic term, is an inclusive notion of all the individuals which that term is intended to comprehend. Thus, the word *tree* includes in its meaning all those vegetables to which that name is usually applied ; the word *man* comprehends all the individuals of the human race ; and so forth. This account of the matter is perfectly agreeable to the origin of these terms, as above detailed, where we find a name successively applied to a variety of individuals, on account of a general resemblance observed among them ; and consequently, when the name comes to be again employed, the mind naturally attaches to it the notion, not of one, but of many individuals.

Here, perhaps, it may be objected, that the mind is incapable of forming a notion of such a multiplicity of individuals as must, according to this account of the matter, be conceived to be attached to generic terms. But,
in

in reply to this objection, I would ask, are we capable of distinctly comprehending what is meant by the term *forest*, for example? And I suppose it will be granted that we are; in thus far, at least, that we understand, by it, a great collection of trees; although it would be absurd to suppose that any definite number of trees must be thought of when we use the term. Precisely of the same kind, I conceive to be the notion which we attach to the term *tree*, viz. an indefinite number of that kind of plants to which the name can be properly applied. Hence, I would describe the notion which the mind attaches to a generic term, to be a general indefinite notion of the various individuals to which the term extends.

Thus, generic terms, though usually singular in form, are really plural in signification; or, as the logicians express it, are *complex in sense, but not in words*; and this circumstance seems to have been one considerable cause of
the

the misconception of their meaning, which has so generally prevailed among metaphysicians. Thus, Dr Reid, in the passages above quoted from his 5th Essay, represents a general conception as an individual thing, formed of a combination of the various characteristic attributes of the class of things to which it applies. If, however, we try to form such a conception as this, we are of necessity obliged to turn the attention to some one individual of the class in question; and this appears to furnish the strongest argument for the Nominal doctrine, or that which reduces generality to a mere term. This argument is very clearly stated in the following passage of Mr Hobbes's *Tripes*. ‘ The universality of one name to
‘ many things, hath been the cause that men
‘ think the beings themselves are universal;
‘ so, seriously contend, that besides Peter and
‘ John, and all the rest of the men that are,
‘ have been, or shall be in the world, there is
‘ yet something else, that we call Man, *viz.*
‘ man

‘ man in general ; deceiving themselves, by
 ‘ taking the universal, or general appellation,
 ‘ for the thing it signifieth. ’ (c. 5. § 6.) I
 am very ready to grant, that the mind is as
 incapable of conceiving this individual *man* in
 the abstract, as the painter would be to deli-
 neate him ; but I see no difficulty in conceiv-
 ing an indefinite collection of individuals whom
 we call *men*. *

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* Mr Locke appears fully aware of the difficulty
 here stated, yet is not deterred, by it, from maintaining
 the *individuality* of the notion attached to a general term.
 ‘ When,’ says he, (b. 4. c. 7. § 9.) ‘ we nicely reflect
 ‘ upon them, we shall find that general ideas are fictions
 ‘ and contrivances of the mind, that carry difficulty with
 ‘ them, and do not so easily offer themselves as we are
 ‘ apt to imagine. For example, does it not require some
 ‘ pains and skill to form the general idea of a triangle,
 ‘ (which is yet none of the most abstract, comprehensive,
 ‘ and difficult) ; for it must be neither oblique, nor rect-
 ‘ angle, neither equilateral, equicrural, nor scalenon ;
 ‘ but all, and none, of these at once ? In effect, it is
 ‘ something

In various instances of generic terms, the plural form may be employed as well as the singular; and then the plurality of signification

‘ something imperfect, that cannot exist; an idea, where-
‘ in some parts of several different and inconsistent ideas
‘ are put together.’

Dr Cudworth appears to have been fully aware of the incompetency of the Nominal doctrine; and, in the following passage of his Intellectual system, strongly censures the opinion of Hobbes above quoted. ‘ It is a
‘ ridiculous conceit,’ says he, (p. 731.) ‘ of a modern
‘ atheistical writer, that universals are nothing else but
‘ names, attributed to many singular bodies, because
‘ whatever is, is singular. For, though whatsoever exist
‘ without the mind be singular, yet it is plain that there
‘ are conceptions in our minds, objectively universal.
‘ Which universal objects of our mind, though they ex-
‘ ist not as such any where without it, yet they are not,
‘ therefore, nothing, but have an intelligible entity, for
‘ this very reason, because they are conceivable; for,
‘ since nonentity is not conceivable, whatsoever is con-
‘ ceivable, and an object of the mind, is therefore some-
‘ thing.’

tion is more apparent. Thus, we may say, 'Man is mortal,' or 'All men are mortal;' and the meaning of both phrases is evidently the same; while it appears manifest, that the object of our thoughts, in the second instance, includes many individuals. This, perhaps, appears more plainly in the case of words which are less general in their application, as in those which denote the subordinate classes of men. Thus, when we speak of certain qualities belonging to *the European*, it is pretty manifest that the object of our thoughts is the whole inhabitants of Europe; just as much as if we were to say that the qualities belong to *Europeans in general*. Thus, too, we certainly think of all the inhabitants of France, whether we say *the Frenchman*, or *Frenchmen*, or *the French*; and so in other instances.

The conclusion that I wish to establish, from all that has been said, is; that general terms are not to be considered as mere signs,

or words, to which we are incapable of annexing any distinct signification ; but that the mental conception, of which they are the sign, is sufficiently intelligible. It is not, however, a single object of thought, made up of a collection of attributes ; but a general indefinite notion of the various individuals to which the generic term may be applied.

SECTION III.

Of the Ambiguity of General and Abstract Terms.

As general terms are introduced into language, merely from the suggestions of necessity, or convenience, their meaning, in many cases, may not be precisely fixed ; which naturally

turally gives rise to a misuse, or misapprehension of them. ‘ It is said to have been sometimes a matter of dispute,’ says Dr Reid, (Essay 5th on the Intellectual Powers, c. 2.) ‘ with regard to a monstrous birth of a woman, whether it was a man or not. Although,’ adds he, ‘ this be, in reality, a question about the meaning of a word, it may be of importance, on account of the privileges which laws have annexed to the human character. To make such laws perfectly precise, the definition of a man would be necessary, which I believe legislators have seldom or never thought fit to give.’ In fact, it will be found, upon examination, that scarce any of the generic terms, which have been introduced by common usage into language, have so much precision as to prevent all ambiguity of signification. It is the business of science, as it advances, to fix and define their precise meaning, and to supply the places where they are deficient by the inven-

tion of new terms, or technical expressions, which shall accurately denote the various departments of being which form the objects of its investigation.*

It

* ‘ Ce n’est pas aux philosophes,’ says *Helvetius*,
‘ c’est au besoin qu’on doit l’invention des langues ; et
‘ le besoin en ce genre n’est pas difficile à satisfaire. En
‘ conséquence, on a d’abord attaché quelques fausses idées
‘ à certains mots ; ensuite on a combiné, comparé ces
‘ idées et ces mots entre eux, chaque nouvelle combi-
‘ naison a produit une nouvelle erreur ; ces erreurs se
‘ sont multipliées, et en se multipliant, se sont tellement
‘ compliquées, qu’il seroit maintenant impossible, sans une
‘ peine et un travail infinis, d’en suivre, et d’en decouvrir
‘ la source. Il en est des langues comme d’un calcul
‘ algebrique ; il s’y glisse d’abord quelques erreurs ; ces
‘ erreurs ne sont point apperçus ; on calcule d’après ses
‘ premiers calculs, de proposition en proposition ; l’on ar-
‘ rive à des conséquences entièrement ridicules. On en
‘ sent l’absurdité ; mais comment retrouver l’endroit où
‘ s’est glissé la premiere erreur ? Pour cet effet, il faud-
‘ roit refaire et vérifier un grand nombre de calculs ;
‘ malheureusement, il est peu de gens qui puissent l’en-
‘ treprendre,

It has been universally admitted, that one of the great causes of the clearness and certainty of the science of Mathematics, is the accuracy and precision of its terms : which have their meaning settled by distinct definition, and possess the peculiar advantage of being solely appropriated to the objects of that science ; and consequently are free from all ambiguity. The science of Algebra is justly accounted the most extensively useful of all the branches of the Mathematics ; which, though chiefly ascribable

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‘ treprendre, encore moins qui le veulent, surtout, lorsque l’intérêt des hommes s’oppose à cette vérification.’ *De l’Esprit*, Disc. 1. ch. 4.

‘ Il est peu de mots abstraits dans les langues sauvages,’ says the same philosopher, ‘ et beaucoup dans celles des peuples policés. Ces derniers intéressés à l’examen d’une infinité d’objets, sentent à chaque instant le besoin de se communiquer nettement et rapidement leurs idées; c’est à cet effet qu’ils invitent tant de mots abstraits ; l’étude des sciences les y nécessite,’ *De l’Homme*, sect. 8. ch. 19.

to its wonderful analytical resources, is no doubt due, in part, to the ingenuity and extensive application of its language, or, as it is usually expressed, of its characters and signs; which are so contrived, that by means of a few letters and simple marks, the meaning of many sentences may be at once conveyed, and afterwards distinctly developed, although those symbols have been subjected to a variety of numerical processes.

Mr Stewart appears to consider the characters of Algebra as affording one of the strongest confirmations of the system of Nominalism; *i. e.* as a system of signs, ‘ which, from their
‘ generality, have no tendency to awaken the
‘ powers of conception and imagination.’ And he subjoins, that ‘ the perfection of philosophical language, considered either as an
‘ instrument of thought, or as a medium of
‘ communication with others, consists in its
‘ approaching, as nearly as possible, in its nature,
‘ ture,

‘ ture, to the language of Algebra. ’ (Elem. &c. c. 4. sect. 3.) The algebraic symbols are doubtless of very general application; but I cannot help thinking that their meaning admits of being very precisely defined. Thus, I conceive the import of the letters *a*, *b*, *c*, *d*, &c. which it employs, to be quantity, (*i. e.* what is susceptible of being numbered, or measured with accuracy), considered in general, or according to some particular limits pointed out by the terms of the problem; + denotes addition; — subtraction; and so on. And if we ever wholly lose sight of these significations during an analytical process, the certainty of the result is nothing dissimilar to what happens in other cases of practical facility, which have usually been explained by a recourse to the principle of habit, and of which the real nature has been so philosophically explained by Mr Stewart himself, (Elem. &c. c. 2.) I do not think that the nature of syllogism affords an argument in any degree more satisfactory

in support of the system of Nominalism. ‘ In
‘ the following fyllogism,’ says Mr Stewart,
(Elem. &c. c. 4. sect. 3.) “ All men must
“ die : Peter is a man ; therefore, Peter must
“ die ”—the evidence of the conclusion does not
‘ in the least depend on the particular notions
‘ I annex to the words *man* and *Peter* ; but
‘ would be equally complete, if we were to
‘ substitute, instead of them, two letters of the
‘ alphabet, or any other insignificant charac-
‘ ters. “ All x’s must die : z is an x ; there-
“ fore, z must die,” is a fyllogism which for-
‘ ces the assent no less than the former. It is
‘ farther obvious that this fyllogism would be
‘ equally conclusive, if, instead of the word
‘ *die*, I were to substitute any other verb that
‘ the language contains ; and that, in order to
‘ perceive the justness of the inference, it is
‘ not even necessary that I should *understand*
‘ *its meaning*. In general,” adds he, ‘ it might
‘ be easily shewn, that all the rules of logic,
‘ with respect to fyllogism, might be demon-
‘ strated,

‘ strated, without having recourse to any thing
 ‘ but letters of the alphabet ; in the same man-
 ‘ ner (and, I may add, on the very same
 ‘ principle) on which the algebraist demon-
 ‘ strates, by means of these letters, the various
 ‘ rules for transposing the terms of an equa-
 ‘ tion. ’

Though I by no means admit that it is not necessary to *understand the meaning* of a fyllogism, in order to perceive the justness of its inference, yet, without doubt, our assent will be given to a fyllogism, although its terms be successively varied, according to a certain principle. Of this, the reason is satisfactorily assigned by Mr Stewart afterwards, *viz.* that ‘ in
 ‘ every fyllogism, the inference is only a par-
 ‘ ticular instance of the general axiom ; that
 ‘ whatever is true universally of any *sign*, (or,
 ‘ as I would say, *genus*) must also be true of
 ‘ every individual which that sign can be em-
 ‘ ployed to express. ’ As long, therefore, as
 the

the major proposition contains the genus, of which the minor denotes a species, or individual, our assent will doubtless be given to the conclusion. But if this be not the case, our assent will necessarily be withheld; on which account, I think Mr Stewart has not given a well-selected example of substitution in the syllogism, whose minor is, *x is an x*; which will never enforce our assent, unless we settle, by previous definition, that *x* denotes a genus, or species, of which *x* is an individual. All which, I think, results properly from the necessity of understanding the meaning of the terms of a syllogism, and indeed of every process of reasoning, before we admit the conclusion.

The last observation I have to make on Mr Stewart's illustrations of the Nominal system, is upon his remark relative to abstract terms, (in c. 4. sect. 1. of the Elem. of the Phil. &c.) viz. ' that it frequently happens that we can
' reason

‘ reason concerning one quality or property of
 ‘ an object abstracted from the rest, while, at
 ‘ the same time, we find it impossible to con-
 ‘ ceive it separately. Thus, I can reason con-
 ‘ cerning extension and figure, without any
 ‘ reference to colour; although it may be
 ‘ doubted, if a person possessed of sight can
 ‘ make extension and figure steady objects of
 ‘ conception, without connecting with them
 ‘ one colour or another. Nor is this always
 ‘ owing (as it is in the instance now mention-
 ‘ ed) merely to the association of ideas; for
 ‘ there are cases in which we can reason con-
 ‘ cerning things separately, which it is impos-
 ‘ sible for us to suppose any being so consti-
 ‘ tuted as to conceive apart. Thus, we can
 ‘ reason concerning length, abstracted from
 ‘ any other dimension; although, surely, no
 ‘ understanding can make length, without
 ‘ breadth, an object of conception.’

It would seem as if philosophers had, in
 many

many cases, supposed it to be impossible that we can form any conception relative to sensible objects, which we should be unable to picture, as it were, before the eyes ; or rather, absolutely to delineate upon canvas. Every object which we so delineate must, doubtless, have some colour, at least if we take that term in its vulgar acceptation ; but it is by no means a consequence of this, that colour must form a part of the *mere mental conception* of magnitude. Indeed, Mr Stewart acknowledges that, when it does, it is merely the consequence of association ; and that it cannot at all hold in the case of the blind. A similar solution may be given of the difficulty with regard to the associated ideas of length and breadth. Although every delineated line, however fine, must have breadth as well as length, yet, in the *mere mental conception* of length, breadth may be entirely kept out of view ; and certainly is, in many of our geometrical speculations. Nay, I am inclined to go a little farther, and to express a doubt whether

whether extension without colour, and length without breadth, are not only objects of distinct conception, but even, occasionally, objects of sight. Thus, when I look around me in an empty apartment, I have a clear perception of its solid capacity or extent; yet this capacity or extent is without colour; for, though the walls of the apartment may be of one colour, the roof of another, and the floor of a third; none of these is the colour of that mass of air, which is accurately defined by the limits of the chamber, and which cannot be said to have any colour at all. Again, I would ask, when we contemplate the direct distance between any two given points, what is the object of our perception, in this case, but length without breadth?

It is not, however, necessary to give a decided opinion upon these particulars, in order to admit the force of the preceding reasoning, of which the object is, to establish that we are
capable

capable of annexing a distinct conception, or meaning, both to abstract and general terms; but, with this difference, that the object of our thoughts, when we employ the former, is one individual quality or attribute; and, when we employ the latter, an indefinite collection, or class, of individual objects: a distinction which, I apprehend, has by no means been sufficiently attended to by those who have treated of this subject.

I do not, however, mean to assert, that we are capable of forming a distinct conception of the meaning of every abstract term which usage authorises, or which may be found in the writings of the most approved authors. Many abstract, as well as many general terms, have come into use without a strict examination of their precise import; which, in fact, it may be by no means easy to ascertain. Many, too, owe their origin to philosophical systems, and do not admit of having any distinct

tinct notion annexed to them. * ‘ Because,’
 says the Abbé de Condillac, (*La Logique*, part.
 1. c. 5.) ‘ we give names to things of which
 ‘ we have ideas, it is supposed that we have
 ‘ ideas of every thing to which we assign a
 ‘ name. This, however, is a great error; for
 ‘ many things are named, of which we have
 ‘ no distinct notion.’—‘ The logician,’ says
 he again, (*Sur l’Orig. des Con. Hum.* part. 1.
 § 5.) ‘ having laid it down, that the essence of
 ‘ a thing is that which makes it to be what it
 ‘ is, thought, that to form ideas of these essen-
 ‘ ces, nothing more was necessary than to give
 ‘ them names. Thus they formed the words
 ‘ *corporiety, animality, humanity*, to denote the
 ‘ essences

* ‘ Parce que nous donnons des noms à des choses
 ‘ dont nous avons une idée, on suppose que nous avons
 ‘ une idée de toutes celles auxquelles nous donnons des
 ‘ noms. Voilà une erreur dont il faut se garantir. Il
 ‘ se peut qu’un nom ne soit donné à une chose que parce
 ‘ que nous sommes assurés de son existence.’

‘ essences of body (*corpus*) of animal, and of
 ‘ man (*homo.*) ’ ‘ To this source,’ adds he
 again, ‘ we owe the genera, species, essences,
 ‘ and differences, which are represented as
 ‘ existing in each substance, and causing it to
 ‘ be what it is ; and which these learned men
 ‘ would have us to believe are not mere
 ‘ words, but real beings, hidden from all the
 ‘ rest of the world *.

In respect to such terms as these, I have no
 scruple in admitting the system of nominalism ;
 for I believe they are words to which no dis-
 tinct meaning or conception belongs. But, on
 this

* ‘ Or, l’essence d’une chose étant, selon les philo-
 ‘ sophes, ce qui la constitue ce qu’elle est.—C’est peut-
 ‘ être là une des raisons qui a fait croire aux scolastiques
 ‘ que pour avoir des noms qui exprimassent les essences
 ‘ des substances, ils n’avoient qu’à suivre l’analogie du
 ‘ langage. Ainsi, ils ont fait les mots de *corporiété*,
 ‘ d’*animalité*, et d’*humanité*, pour désigner les essences du
 ‘ corps,

this very account, I consider them as words which will never enable us to make real advances in scientific investigations, but which are rather calculated to retard our progress in true knowledge. They are the remnant of the jargon of the schoolmen, who were wont to conceal their ignorance of things under the veil of learned and high-sounding phrases, which they themselves neither did or could understand ; and which, therefore, ought to be discarded from the language, not only of science, but even of common life. Most of these terms are derived from the learned languages, where they may have originally had an intelligible signification, very different from that which philosophical usage afterwards confers upon them ; a circumstance, which serves

K

to

‘ *corps, de l’animal, et de l’homme. C’est à elles que nous devons ces genres, ces espèces, des essences, et ces différences, qui sont tout autant d’êtres qui vont se placer dans chaque substance, pour la déterminer à être ce qu’elle est. . . . tous dévoilent aux yeux des philosophes des êtres cachés au reste des hommes.*’

to render their want of meaning less perceptible. Thus, the philosophic import of *substantia*, is very different from its natural meaning, *viz.* ‘that which is beneath;’ and that of *essentia* or *essence*, from its original import, *viz.* a mere *being* or *existence*. We are told, that this last word was first of all employed by Cicero, whom we should little have suspected of having rendered so great a service to the schoolmen. It is an ingenious remark of M. de Condillac (*La Logique*), ‘that the best language for philosophical purposes, would be one which should borrow nothing from any other; because the analogy of such a language would exhibit the progressive advances of knowledge, and would be, itself, a commentary upon science.’ *

But,

* ‘Une langue ferait bien supérieure, si le peuple qui la fait, cultivait les arts et les sciences, sans rien emprunter d’aucun autre; car l’analogie, dans cette langue, montrerait sensiblement le progrès des connoissances, et l’on n’aurait pas besoin d’en chercher l’histoire ailleurs.’
La Logique, 2de partie, c. 4.

But, even in cases in which words admit of having their meaning defined with precision, men are but too apt to employ them vaguely, and without sufficient consideration. ‘When,’ says M. de Condillac, (*Sur l’Orig. des Con. Hum. Part. 1. § 4. c. 1.*) ‘we reflect how much more the memory is stored with words, than the understanding with ideas, we shall not be surpris’d at the inaccuracy of many of our notions and expressions. This must necessarily follow, from the great interval which elapses between the time when the memory of a child is stored with words, and that in which its judgment comes to be exercis’d in settling their meaning. And what a labour is it to accomplish this, with every ambiguous expression? a labour which the greatest part of mankind never think of attempting, it being sufficient, for their purpose, to take words as they find them, and use them in something like their proper sense. The consequence is, that those who

K 2

‘ examine

‘ examine their own thoughts will find, that
‘ they employ a great number of words to
‘ which they annex very imperfect ideas, and
‘ some, to which they attach no ideas at all. ’ *

The

* ‘ Cette vérité fera connoître à tous ceux qui vou-
‘ dront réfléchir sur eux-mêmes, combien le nombre des
‘ mots que nous avons dans la mémoire, est supérieur à
‘ celui de nos idées. Cela devoit être naturellement
‘ ainsi ; soit, parceque la reflexion ne venant qu’après la
‘ mémoire, elle n’a pas toujours repassé avec assez de soin
‘ sur les idées auxquelles on avoit donné des signes, soit
‘ parceque nous voyons qu’il y a un grand intervalle entre
‘ le tems où l’on commence à cultiver la mémoire d’un
‘ enfant, en y gravant bien des mots dont il ne peut
‘ encore remarquer les idées, et celui où il commence à
‘ être capable d’analyser ses notions, pour s’en rendre
‘ quelque compte. Quel travail ne feroit ce pas s’il fal-
‘ loit qu’elle en examinât tous les signes ? Combien
‘ d’hommes chez qui elle n’a jamais lieu ! On les em-
‘ ploie donc tels qu’ils se présentent, et l’on se contente
‘ ordinairement d’en saisir à peu-près le sens. Je le
‘ répète donc ; tous ceux qui rentreront en eux-mêmes, y
‘ trouveront grand nombre de signes auxquels ils n’ont lié
‘ que

The above observations appear to me fully sufficient to explain the common causes of ambiguity

‘ que des idées fort imparfaites, et plusieurs mêmes auxquels ils n’en attachent point du tout.’

A similar remark occurs in Mr Locke’s Essay (B. III. c. 10. § 4.) ‘ Men,’ says he, ‘ having been accustomed from their cradles to learn words, which are easily got and retained, before they knew, or had framed the complex ideas to which they were annexed, or which were to be found in the things they were thought to stand for, they usually continue to do so all their lives ; and, without taking the pains necessary to settle in their minds determined ideas, they use their words for such unsteady and confused notions as they have, contenting themselves with the same words other people use ; as if their very sound necessarily carried with it instantly the same meaning. This, though men make a shift with, in the ordinary occurrences of life, where they find it necessary to be understood, and, therefore, they make signs till they are so ; yet this insignificancy in their words, when they come to reason, concerning either their tenets or interest, manifestly fills their discourse with abundance of empty, unintelligible noise and jar-

ambiguity in language, without having recourse to the system of Nominalism. They will also explain the circumstance so ingeniously illustrated by Dr Campbell, (Phil. of Rhet. B. II. c. 7.) *viz.* ‘ how it happens ’ (as he expresses it) ‘ that nonsense so often escapes ‘ being detected, both by the writer and the ‘ reader.’ The cases in which, according to him, this most frequently occurs are, *1st*, Where there is an exuberance of metaphor; *2dly*, When the terms most frequently occurring, denote things which are of a complicated nature, and to which the mind is not sufficiently familiarized; and, *3dly*, When the terms employed are very abstract, and, consequently, of very extensive signification. In all these

‘ gon, especially in moral matters, where the words, for
‘ the most part, standing for arbitrary and numerous col-
‘ lections of ideas, not regularly and permanently united
‘ in nature, their bare sounds are often only thought on,
‘ or, at least, very obscure and uncertain notions annexed
‘ to them.’

these cases; the causes of mistake plainly arise, either from employing terms which have in fact no meaning at all, or which we have been accustomed to use, without sufficiently attending to their signification.

Mr Burke (in his Treatise on the Sublime and Beautiful) has supported the Nominal doctrine upon similar grounds. ‘If,’ says he, ‘words have all their possible extent of power, three effects arise in the mind of the hearer. The first is, the *sound*; the second, the *picture*, or representation of the thing signified by the sound; the third is, the *affection* of the soul, produced by one or both of the foregoing. Compounded, abstract words, (honour, justice, liberty, and the like,) produce the first and last of these effects, but not the second.’ He seems even inclined to carry the Nominal system farther than any of his predecessors; for he is of opinion, ‘that the most general effect of these words (which

‘ are capable of effecting all three of the purposes of words), does not arise from their forming pictures of the several things they would represent in the imagination ; because,’ says he, ‘ on a very diligent examination of my own mind, and getting others to consider theirs, I do not find that, once in twenty times, any such picture is formed ; and, when it is, there is most commonly a particular effort of the imagination for that purpose.’ ‘ Indeed,’ adds he afterwards, ‘ it is impossible, in the rapidity and quick succession of words in conversation, to have ideas both of the sound of the word, and the thing represented. Besides, some words expressing real essences, are so mixed with others of a general and nominal import, that it is impracticable to jump from sense to thought, from particulars to generals, from things to words, in such a manner as to answer the purposes of life ; nor is it necessary that we should.’ This ingenious writer
appears,

appears, from his conclusive remark, to have formed a very inadequate notion of the rapidity of human thought ; a subject which I have had occasion partly to illustrate in the chapter upon Consciousness, and which appears to me perfectly to explain how Mr Burke was unable to ascertain, in the case of his own mind, that ‘ once in twenty times any such picture ‘ is formed.’ In fact, nothing appears to be more evanescent than the thoughts or conceptions which, on some occasions, pass through our minds ; and it furnishes abundance of employment for the philosopher, to detect and bring to light those rapid trains of thinking by which our judgements are sometimes regulated, as it were, unknown to ourselves. All this, however, corroborates the doctrine, that conceptions must be raised in the mind, and are actually raised, by the appropriate terms of language, on every occasion where we can be said to *understand the meaning* intended to be conveyed.

The

The practical inference that I would deduce from this investigation of the nature and import of the various terms of language, is, that it should be our sedulous endeavour, precisely to fix the meaning of every term which we have occasion to employ during our investigations ; and if the term is liable to any ambiguity, either from its own nature, or on account of a laxity of usage, we ought accurately to define or describe the precise sense in which we mean to employ it. As for those terms which we have represented as devoid of any real intelligible signification, I think scientific investigation would be greatly promoted, by discarding them altogether ; and the attempt accurately to define their meaning, will form a very convenient test, by which such useless incumbrances of language may be discovered. *

It

* ‘ Une idée fausse,’ says *Helvetius*, ‘ exige une
‘ expression obscure. L’erreur, clairement exposée, est
‘ bientôt

It is for want of attending to some such rules as these, that many philosophical speculations have tended rather to darken and perplex, than to enlighten the mind; and that others, instead of solid information, have contained nothing but empty quibbles, and frivolous verbal

bientôt reconnue pour erreur. Oser exprimer nettement ses idées, c'est être sûr de leur vérité. En aucun genre les charlatans n'écrivent clairement. Point de scholastique qui puisse dire comme Boileau,

“ Ma pensée au grand jour toujours s'offre et s'expose. ”

De l'Homme, sect. 8. ch. 17.

‘ Verba autem plerumque, ’ (says Bacon) ‘ ex captu vulgi induntur, atque per lineas vulgari intellectui maxime conspicuas res fecant. Quum autem intellectus acutior, aut observatio diligentior eas lineas transferre velit, ut illæ sint magis secundum naturam, verba obstrepunt. Unde fit ut magnæ et solennes disputationes hominum doctorum sæpe in controversias circa verba et nomina definant; a quibus ex more et prudentia mathematicorum, incipere consultius foret, easque per definitiones in ordinem redigere. ’

Novum Organum, 59. 1.

bal disputation. Hence the just complaint of Mr Locke concerning the abuses of language, when he says (B. 3. c. 11. § 4.), that he ‘ who
‘ shall well consider the errors and obscurity,
‘ the mistakes and confusion, that are spread
‘ in the world by an ill use of words, will find
‘ some reason to doubt whether language, as
‘ it has been employed, has contributed more
‘ to the improvement or hinderance of know-
‘ ledge in the world. ’ This judicious philo-
sopher has dedicated a whole book of his *Essay*
(B. 3.) to the examination of the imperfec-
tions of language, and their remedies. The
attentive study of the whole book, and more
particularly of chapters 10th and 11th, which
treat more expressly of the abuse of words and
its remedies, cannot be too strongly recom-
mended.

CHAPTER FIFTH.

Of Affociation, or Combination.

SECTION I.

General Remarks upon this Faculty.

IT is matter of the most familiar observation, that we are apt to connect together the various objects of our thoughts according to some real or supposed relations which we observe among them ; so that they come afterwards to be suggested to the mind, the one by the other. This principle of the human constitution has received a considerable degree of attention from late philosophers ; and, in particular, it has

has been very successfully illustrated by Mr Stewart. It has usually been denominated the *Association of Ideas*; a term which is exceptionable, both on account of its redundancy, and of its allusion to the visionary Ideal theory. The faculty will be sufficiently discriminated by the term *Association* alone; or by a name which, I think, still more precisely and unexceptionably expresses its nature, viz. *Combination*.

The faculty of Combination is the direct counterpart of Abstraction. By the latter, we analyze the individual objects with which nature presents us; so as to make their various qualities and attributes separate subjects of our thoughts. By the former, we form these objects into various classes, or groups, according to some observed resemblance among them; or we connect together certain individuals, which have no real relation to one another, merely on account of some accidental circumstance

stance which has occasioned them to be present to our thoughts at the same moment. Both faculties are eminently subservient to the advancement of our knowledge, and the progress of scientific investigation ; the object of which is, to ascertain those general laws, or first principles, according to which the phenomena of whole classes of beings are regulated.

Philosophers appear, in general, to have spoken of the faculty of Association, as if it were altogether involuntary, and placed beyond our own controul. They represent the connexion which comes to be established between the objects of our thoughts, as taking place, as it were, entirely of itself ; so that the one spontaneously suggests the other, upon all occasions. In fact, however, the power of Association seems, on many occasions, to demand an active effort ; although, like all the other powers of the understanding, it frequently operates without any great energy of volition.

tion. Thus, when we form classes of objects, in consequence of an observed resemblance among them, the active effort of the mind, in tracing the resemblance, is sufficiently apparent: and the man of wit must frequently be conscious of a sufficiently active effort in tracing out those remote allusions and analogies which form the charm of the effusions of his fancy.

The importance of the principle of Association in the human constitution, is so great, that it would be very desirable to have an accurate analysis of the laws by which it is regulated; or of those particular circumstances by which we are induced to form combinations among the objects of our thoughts. But, though various enumerations of these circumstances have been offered by philosophers, it does not appear that this object has yet been successfully accomplished.

Aristotle,

Aristotle, in his treatise *de Memoria et Reminiscencia*, remarks, that the relations by which we are led from one thought to another, in tracing out any particular thought which does not immediately occur, are chiefly three, Resemblance, Contrariety, and Contiguity; and this may be considered as the earliest attempt at an enumeration of the principles of Association among our thoughts. Mr Hume appears to have been the first among modern philosophers, who endeavoured particularly to supply this desideratum. His enumeration of the principles of Association, as is well known, consists likewise of three divisions, *viz.* Resemblance, Contiguity in time and place, and Cause and Effect. Subsequent philosophers have not done much to increase the list; as the enumerations of Dr Beattie, Dr Gerard, &c. are little more than a combination of those of Aristotle and Mr Hume.

Mr Stewart (Elem. of the Phil. of the Hum.

I.

Mind,

Mind, c. 5. part 1. § 2.) expresses his opinion that this problem does not admit of a satisfactory solution; 'for,' says he, 'there is no possible relation, among the objects of our knowledge, which may not serve to connect them together in the mind; and therefore, although one enumeration may be more comprehensive than another, a perfectly complete enumeration is scarcely to be expected.' He appears however, afterwards, to have mentioned all the most remarkable of the principles of association, when he takes occasion to notice a distinction among them which he thinks of importance. 'The relations,' says he, 'upon which some of them are founded, are perfectly obvious to the mind. Those which are the foundation of others, are discovered only in consequence of particular efforts of attention. Of the former kind, are the relations of Resemblance and Analogy, of Contrariety, of Vicinity in time and place, and those which arise

‘ arise from accidental coincidences in the sound
 ‘ of different words. These, in general, connect
 ‘ our thoughts together, when they are suffered
 ‘ to take their natural course, and when we are
 ‘ conscious of little or no active exertion. Of
 ‘ the latter kind, are the relations of Cause and
 ‘ Effect, of Means and End, of Premises and
 ‘ Conclusion; and those others, which regulate
 ‘ the train of thought in the mind of the philo-
 ‘ sopher, when he is engaged in a particular in-
 ‘ vestigation.’

There is another distinction which may be pointed out between the various classes of associating principles, and which, in my apprehension, is of yet more importance than that mentioned by Mr Stewart in the above passage. According to this distinction, the relations in consequence of which Association takes place, are either *essential*, or *accidental*. Among the essential relations, the most remarkable appear to be, 1. Resemblance; 2. Analogy; 3. Contrariety; 4. Mutual De-
 L 2 pendency,

pendence, as of cause and effect, premises and conclusion, means and end, &c. The accidental relations, or sources of Association, seem chiefly reducible to the circumstance of the two objects of thought having been presented to the mind together; or, from what Mr Hume has called contiguity in time and place, in consequence of which we are led afterwards to think of them at the same time, and to conceive some real connexion between them. It will not be an useless employment to offer a few illustrations of each of these sources of combination.

1. That resemblance is a natural species of relation, and leads us to connect together the objects of our thoughts, is matter of the most familiar observation. It is our proneness to trace out this kind of relation, that leads us to give generic names to certain classes of objects; such as animals, trees, stones, &c.; as has been illustrated in the preceding chapter: and so powerfully are we prompted to this exercise

ercise of our faculties, that we are in much greater danger of supposing resemblances between objects which are essentially different, than of not discovering a resemblance where it really exists. The gratification, however, which nature has attached to the exercise of this act of the mind, is of the greatest advantage in promoting our knowledge; for, by continually seeking to discover new points of likeness in the objects of nature, we are led to reduce them to a few simple classes, and to discover the general laws by which their phenomena are regulated.

Many of the pleasures of taste may be ascribed to the gratification accompanying the discovery of resemblance. The merit of wit appears to be justly placed in tracing remote and unexpected resemblances among the objects of our thoughts, which, from their novelty and singularity, are calculated to excite admiration. The pleasing effect of simile, poetical

tical allusion, metaphor, and allegory, also arises, in a great measure, from the same cause ; although, very generally, in all these cases, the principle of relation, or association, is rather reducible to analogy than to resemblance ; as there is more room for ingenuity and the exercise of fancy, in tracing a similarity of effects, or general consequences, which constitutes an analogy, than in discovering a mere likeness, or precise identity.

Resemblance of sound is one pretty copious source of this kind of gratification. Of this we have sufficient proof, in the structure of modern verse, which, in most of the languages of Europe, has not only the accompaniment of rhythm, or a measured number of long and short, or emphatic and unemphatic syllables ; but likewise that of rhyme, or a recurrence of resembling sounds at the termination of its lines. This accompaniment of verse was rejected by the poets of Greece and
Rome,

Rome, which seems to have arisen from its being considered as of no value, on account of the great facility with which it might have been accomplished in the ancient languages; and, in fact, the examples which we have of its effect in the monkish poetry of the dark ages, are not calculated to give us a high idea of its beauty. But rhyme appears to have been adopted in the poetical compositions of our Gothic forefathers; and is likewise found in the poetry of various Eastern nations, as well as of the Indian tribes; so that it is a source of gratification evidently founded in the natural constitution of man.

The pun, or *paronomasia*, which has been so generally decried, and yet so universally practised, consists in nothing more than employing a word which is ambiguous either in sense or sound, and of which both the meanings are suggested at once by the way in which it is used: It gratifies, therefore, as an example of

a newly discovered resemblance. The gratification, if there be any, which *alliteration* produces, is to be ascribed to the same source; of which the admirers have a rich treat, in the ‘*Pugna Porcorum, per Publium Porcium poetam.*’

2. Analogy is a copious source of combination among our thoughts. It may be defined, a similitude, or correspondence, not of the objects of thought themselves, but of their general effects or consequences. Thus, the spring of the year, or the morning of the day, suggests to our thoughts the period of infancy, or youth; as winter, or evening, is naturally associated with the idea of old age. The mind is, indeed, extremely prone to trace out such analogies, which are, in fact, after all, but resemblances of a particular kind: and, in many cases, it may fancy them to exist without any real foundation; of which we have the most remarkable example in the so generally conceived

ceived analogy between the properties of body, and those of mind; the erroneouſneſs of which we have already had occaſion to remark.

I have already hinted, that the relations obſervable in the effuſions of wit, in poetical alluſion, ſimile, metaphor, and allegory, belong rather to the combinations of analogy, than to thoſe of reſemblance; and there is certainly much more ingenuity in tracing the former than the latter. Thus, the well known ſimilitude of Butler,

And now like lobſter boil'd the morn,
From black to red began to turn.

exhibits an analogy certainly very remote from common apprehenſion. The witty Swift can, in like manner, trace an analogy between wiſdom and a cheeſe, a ſack-poſſet, a hen, and a nut, &c. (See Introd. to the Tale of a Tub.) It is an analogy of a ſtriking and intereſting kind, that was traced by Cicero, and, after him, by Mr Locke, between the mind and the eye,
which

which sees every object around it, but is invisible to itself.

The discovery of such analogies has the double merit of embellishing and illustrating a subject; and they are therefore, with propriety, introduced, not only into the amusing kinds of composition, but also into those of the grave and didactic form. The following are happy instances of the effects of such well chosen analogies, though not in works professedly didactic. ‘To endeavour’ (says Pope, in his *Thoughts on Various Subjects*) ‘to work upon the vulgar with fine sense, is like attempting to cut blocks with a razor.’ ‘Did you ever’ (says Swift in one of his *Letters to Lord Bolingbroke*) ‘observe one of your clerks cutting his paper with a blunt ivory knife? Did you ever know the knife fail to go the right way? Whereas, if you had used a razor, or a penknife, you had odds against you of spoiling a whole sheet.’

This

This allusion is happily employed by the Dean, to illustrate the diversity between genius, and ordinary useful abilities. An analogy of the most remote kind, consisting merely in the general effect produced upon the mind, is expressed in the following beautiful similitude of Ossian. ‘ The music of Carryl was like the
‘ memory of joys that are past ; pleasant and
‘ mournful to the soul.’

3. Contrariety or Contrast, is likewise a common source of combination among our ideas. The darkness of night will frequently induce us to think of the splendour of day ; and excessive cold naturally turns our thoughts to the comforts of heat. It was contrariety that associated in the mind of Xerxes, the melancholy idea of mortality and dissolution, with the prospect of his millions in the pride of activity and military splendour ; when he lamented, that in a short period of time, not one of them would be found upon the earth. This bias of the mind is
likewise

likewise eminently conducive to the advancement of our knowledge; for it leads us to inquire in what respects the various objects of nature differ from one another, as well as wherein they agree; and, thus, stimulates us to acquire an accurate knowledge of their properties.

The relation of contrariety enters pretty largely into the allusions of wit, in conjunction with those of resemblance, or analogy; for, as already observed, the combinations of wit must not be obvious, or readily discoverable; that is, they must partake both of resemblance or analogy, and of contrariety. That species of wit which constitutes the ludicrous, exhibits a due share of this mixture of resemblance and contrast; for, according to the best analysis we have of the essence of the ludicrous, it consists in ‘ a mixture of relation and contrariety; or
‘ of incongruity in the parts of an object, or
‘ assemblage of related objects.’ (See Dr Beattie’s Essay on the Ludicrous in Composition.)

tion.) It may, however, be doubted whether this definition is not too comprehensive, so as to include within it, not only the ludicrous, but all the allusions and combinations of wit ; which must possess, together with the relation of resemblance, that also of contrast. Those combinations which are more strictly ludicrous, doubtless, in general, exhibit ‘ the contrast or opposition, ’ as Mr Hutchison calls it, ‘ of dignity and meanness ; ’ which always has a direct tendency to excite laughter, and may justly be considered as the principal source of that emotion. Our burlesque compositions, mock-heroics, travesties, &c. furnish ample proofs of the truth of this position.

4. The fourth natural source of connexion among the objects of our thoughts, which we particularised, is Mutual Dependence. If we find one occurrence or phenomenon constantly succeeded by another, it is extremely natural that the one should be suggested by the other to our minds.

minds. On the same principle, the notion of the means employed, suggests the end which they are to accomplish. Thus, when we observe the labours of the husbandman, we naturally think of the harvest which is to ensue ; and the study of an argument or piece of reasoning, induces the consideration of the conclusion or conviction which it tends to produce. To this source of combination we, in a great measure, owe our desire to discover the hidden causes of the phenomena of nature, or the established dependence which these have one upon another.

It is the province of the philosopher to ascertain the real connexion between events, or what, in common language, we call their causes ; and this task cannot be accomplished, but by a long and careful study of nature herself. The vulgar are, indeed, sufficiently ready to assign causes for whatever they see ; but their want of knowledge is a copious source of error in this field of speculation. ‘ I remember,’
says

says Dr Reid, ‘ many years ago, a white ox
 ‘ was brought into the country, of so enor-
 ‘ mous a size, that people came many miles to
 ‘ see him. There happened, some months
 ‘ after, an uncommon fatality among women
 ‘ in child-bearing. Two such uncommon
 ‘ events following one another, gave a suspi-
 ‘ cion of their connexion; and occasioned a
 ‘ common opinion among the country people,
 ‘ that the white ox was the cause of this fatal-
 ‘ ity.’ ‘ However silly and ridiculous this
 ‘ opinion was,’ adds our author, ‘ it sprung
 ‘ from the same root in human nature, on
 ‘ which all natural philosophy grows, namely,
 ‘ an eager desire to find out connexions in
 ‘ things; and a natural, original, and unac-
 ‘ countable propensity to believe, that the con-
 ‘ nexions which we have observed in time
 ‘ past, will continue in time to come.’ (In-
 ‘ quiry into the Human Mind.) The many
 ‘ superstitious observances which prevail among
 ‘ the vulgar, and, still more, among savage nations,
 may

may be ascribed entirely to this ignorance of the real dependence of events upon each other, and a proneness to admit a connexion where none really exists.

But, secondly, we not only connect the objects of our thoughts together, according to those essential and natural relations which we observe among them, but also in consequence of the mere accidental circumstance of their having been presented to the mind together. This fact is of so familiar observation, as scarcely to stand in need of illustration. ‘ In passing along a road, which we have formerly travelled in company with a friend,’ (observes Mr Stewart, c. 5. part 1. § 1.) ‘ the particulars of the conversation in which we were then engaged, are frequently suggested to us by the objects we meet with. In such a scene, we recollect that a particular subject was started ; and, in passing the different houses, and plantations, and rivers, the arguments

‘ments we were discussing when we last saw them, recur spontaneously to the memory.’ ‘That man,’ says Dr Johnson, ‘is little to be envied, whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona.’ (Journey to the Western Islands, p. 347.)

This law of association is manifestly of the greatest utility in promoting the exercise of memory; and, indeed, spontaneous or involuntary memory seems entirely to depend upon those associations which the mind has previously formed, whether according to natural or accidental relations. Of these, the accidental, or merely arbitrary combinations are, by no means, the least extensively useful to the memory, on account of their unlimited range; and what is called mechanical, or artificial memory, is entirely founded upon these combinations. It is in general a merely arbitrary

M
relation

relation that subsists between the sign and the thing signified : as between the letters of the alphabet, and the sounds of which they are expressive ; as well as between these sounds, or the various words of a language, and the thoughts which they are intended to denote. Thus, the whole fabric of language, whether written or oral, rests upon that law of the human constitution, whereby things which are repeatedly presented to the mind together, are afterwards suggested, the one by the other. The same may be said of the signs and characters which the algebraist employs ; the notes of the musician ; and various other like cases.

Associations which are merely arbitrary, appear to operate upon the mind with fully as much power as those which are founded in nature. The well known effect of the national air, called ‘ Rans des Vaches,’ upon the Swiss regiments in foreign countries, in exciting what is called the ‘ *maladie du pays*,’
affords

affords a striking illustration of this fact. A similar effect is said to be produced upon our Highlanders, when at a distance from home, by the air of ‘Lochaber no more.’ The consequences of these arbitrary associations are sometimes sufficiently whimsical; of which Mr Locke records two remarkable instances. The first is, of a person ‘perfectly cured of madness, by a very harsh and offensive operation.’ The gentleman, who was thus recovered, 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.’ The second instance is ‘of a young gentleman who having learnt to dance, and that to great perfection, there happened to stand an old trunk in the room where he learnt. The idea of this remarkable piece of household stuff, had so mixed itself with the turns and steps of all his dan-

‘ces, that, though in that chamber he could
‘dance excellently well, yet it was only while
‘that trunk was there ; nor could he perform
‘well in any other place, unless that, or some
‘such other trunk, had its due position in the
‘room.’ (B. II. c. 33. § 14. & 16.)

Indeed, there are few parts of the human constitution productive of more important effects, than the law which induces us to form arbitrary connexions among the objects of our thoughts ; and few which demand more the cultivating care of the preceptor and guardian ; a fact which seems to have excited due attention in some of our late treatises upon education. To this source are due many of the errors and prejudices of the human mind, not only in matters merely speculative, but even in the judgements and decisions of the moral faculty. The evident importance of this subject is therefore sufficient to justify its separate illustration,

illustration, which will form the subject of the next Section.

SECTION II.

Of the Influence of Association on our various Judgments.

THE influence of arbitrary association, in giving a bias to our opinions and judgements, we shall consider under three heads: 1st, As it affects the decisions of taste; 2^d, As it affects our speculative opinions; and, 3^d, As it influences our moral judgements.

1. The influence of association, in regulating the decisions of taste, is indeed very powerful. To this source alone, is to be ascribed the approbation which we bestow upon the dress,

pronunciation, language, and manner of the great and the fashionable. That it is no intrinsic excellence in the mode itself, which causes our approbation, is manifest from this, that, when it ceases to be the fashion, we immediately cease to approve it; and bestow our admiration upon some other mode, which we before should have condemned, but which comes now to be sanctioned by the adoption of the great. The pronunciation, or language of the Court, may frequently be inferior, in real merit, to that of the provinces: but the latter is uniformly condemned, because associated with the ideas of coarseness and vulgarity; while the former is uniformly applauded, on account of the contrary association. Thus, the cause of our approbation of whatever is called fashionable, is to be sought in the principle of association alone.

The effect of arbitrary association in matters of taste, is still more strongly evinced in
the

the permanent character which it frequently gives to the taste of a nation. The Chinese, for example, love a foot, in their women, so small, as to be scarcely of any use in walking, because with this they have associated the notion of delicacy and elegance ; while they despise a foot of the just proportions, because, in their minds, it is associated with mean and vulgar qualities. The same principle serves to explain why, in Holland, and, indeed, in most parts of the world, a style of gardening has prevailed, which the better taste of this country condemns as stiff and unnatural. In those countries, the efforts of artifice, skill, and labour, have become associated with the notion of a garden ; and the more visible that the exertion of these is rendered, the more perfect is the work reckoned ; and hence the profusion of parterres, terraces, alleys, fountains, statues, formal shrubs, and hedges, with which the Dutch gardens are loaded.

The influence of arbitrary association, is also manifested in the high value which we set upon the compositions with which we have been familiarized in early youth. These are connected, in our minds, with a variety of pleasing occurrences which have happened at that period ; and, therefore, acquire a value, in our estimation, which they do not intrinsically possess. Thus, Mr Addison himself, though so acute a critic, under the bias of this natural prepossession, could find every beauty of Homer or Virgil, in the ancient ballad of Chevy Chase, of which, undoubtedly, the principal merit is, a native and unadorned simplicity. (See Spectator, No. 70. & 74.)

It is upon a similar principle that the compositions of celebrated authors come to be considered as perfect models of imitation ; and their very defects are exalted into beauties, on account of their being so closely combined with those parts of their works which are justly entitled

titled to admiration. Few things have tended more to retard the progress of genuine taste, than this superstitious veneration for great names. In this way the dictates of nature have been made to yield to authority; and the practice of an eminent writer has passed into a law never to be violated. Bossu, a celebrated French critic, can find no better foundation for the numerous rules which he has given, than the practice of Homer or Virgil, supported by the authority of Aristotle. ‘Strange,’ says Lord Kaimes, ‘that in so long a work, the concordance, or discordance of these rules with human nature, should never once have entered his thoughts.’ (Elem. of Criticism.)

Men, however, are now becoming more temperate in these matters, and can allow that there may be faulty passages even in such works as the Iliad or Æneid. The cultivation of philosophical criticism has tended to dissipate the

the prejudices which are so apt to warp our decisions in matters of taste, and to correct the influence of arbitrary association. By the diffusion of this science, the standard of true taste comes gradually to be ascertained; while it is rendered more and more manifest, that the decisions of that faculty are not naturally guided by whim and prejudice, but have their foundation in the original constitution of man.

2. But, again, many of our speculative opinions, and conclusions of reasoning, are unduly influenced by casual association. This influence is by no means confined to the vulgar and illiterate, in whom its operation is indeed peculiarly manifest; but has a powerful effect on many of the reasonings of the philosopher. A remarkable example of this we have had occasion to illustrate at length in Chap. III., when treating of the theories concerning Perception. The Ideal theory, which has so long been implicitly admitted by philosophers, it would seem,

seem, owes its evidence to nothing else but the arbitrary association which exists in the minds of most men, between the notions of an effect, or motion produced, and that of an actual contact of the bodies, or substances, which produce the effect, the one upon the other. ' Nothing, ' it was conceived, ' can act, or ' be acted upon, but when and where it is ' present. ' And yet, as is observed in that chapter, when we come to examine the matter strictly, we no more understand how bodies act upon one another, when in contact, than when at a distance ; and there are not only many intellectual phenomena, but also many material phenomena, such as those of the various attractions, which appear to be produced by the mutual action of bodies at a distance from one another ; so that this association, though so universally prevalent, is to be accounted a mere prejudice, or vulgar error.

The connexion conceived to subsist between
between

tween the faculties of Sensation and Perception, affords another instance of the same kind, and, as such, has been taken notice of by Mr Stewart, (*Elem. &c. c. 5. part 2. § 1.*) These two faculties were uniformly confounded together by all metaphysical writers previous to Dr Reid; from which circumstance alone arose much erroneous speculation. ‘A clear conception of this distinction,’ says Mr Stewart, ‘may be regarded as the key to all Dr Reid’s reasonings concerning the process of nature in perception.’ Of this truth Dr Reid himself appears to have been sufficiently aware; for he says, (*Essay II. on the Intell. Powers, c. 16.*) ‘I shall conclude this chapter, by observing, that as the confounding our sensations with that perception of external objects which is constantly conjoined with them, has been the occasion of most of the errors and false theories of philosophers with regard to the senses; so, the distinguishing these operations seems to me to
‘be

‘ be the key that leads to a right understanding of them.’

Mr Stewart has likewise taken notice of the influence of arbitrary association upon our speculative conclusions, in the examples of the connexion which is established in the mind between the notions of *colour* and *extension*; between those of *space* and *time*; and between the relations of *acuteness* and *gravity* in the musical scale, and the notions of *superiority* and *inferiority*, or *high* and *low*. (See as above.) These, and other examples which might be mentioned, are sufficient to establish the necessity of guarding against the influence of casual combination in our philosophical speculations; and more especially in those which are of the metaphysical or abstract kind.

3. In the last place, we have to contemplate the influence of arbitrary association, in a yet more

more important point of view, *viz.* as it affects our moral judgments. There is a fashion, it is well known, not only in matters of taste and speculative inquiry, but even in morality and religion. The man of spirit, as he is called, will but too often be ashamed to own his respect for the sacred truths of revelation, or his obedience to those precepts of morality, which enjoin the practice of temperance, sobriety, and the restraint of the passions. He has been accustomed to treat those persons who habitually practise such duties, as of low and grovelling minds; and to consider a deviation from them as a mark of superior endowments, and of a mind emancipated from vulgar prejudices. Thus, it but too frequently happens, that men of rank and fortune become habitually vicious, from the mere influence of casual association, and the false shame of avowing themselves the friends of virtue.

Again, if we examine the moral and religious

gious opinions which have prevailed in different ages of the world, and among the people of different climates and nations, we shall find a striking diversity in many important particulars. The ancient heathen and the modern savage enjoin us, while we do all the good we can to our friends, to be equally studious to injure our enemies. The milder precepts of Christianity, on the other hand, exhort to the complete forgiveness of injuries. Among the Romans, suicide was a virtue; among Christians, it is a crime of the deepest dye. The South-Sea islanders, and the ancient Lacedæmonians, practised theft without scruple; while, by the laws of Europe, it is punished with death. So great, indeed, is the diversity which prevails among the individuals of various climates and countries, in their opinions of right and wrong, that many philosophers have been induced to consider man as entirely the creature of education and habit, in what regards the sentiments of morality. Of this opinion
appears

appears to have been even the candid Locke himself, (See Essay on the Hum. Und. book 1. c. 3.) But such facts amount to nothing more than a proof of the extensive influence of the principle of association, which, however it may bias, can never totally subvert the inherent power of the moral sense. As is justly observed by Mr Stewart, (Elem., &c. c. 5. part 2. § 3.) ‘ there must be some limit, beyond which
‘ the theory of association cannot possibly be
‘ carried; for the explanation which it gives
‘ of the formation of new principles of action,
‘ proceeds on the supposition that there are o-
‘ ther principles previously existing in the
‘ mind.’

The heathen and the savage combine the ideas of valour and heroism with the revenge of injuries, and the destruction of their enemies; and hence deem such conduct as praiseworthy as gratitude for benefits received. But the more enlightened Christian discerns true magnanimity

magnanimity in the forgiveness of injury ; and justly deems it a greater act of heroism to return good for evil, than to satisfy the impulse of his vengeance. A similar explanation may be given of the diversity of opinion between the Heathen and the Christian, on the subject of suicide. While the one deems this a heroic act, the better instruction of the other leads him to consider it rather as a proof of timidity ; as well as a highly culpable renunciation of the controul of the Supreme Power.

With respect to the practice of theft, so prevalent among certain tribes, it may be remarked, that in those countries where it has prevailed, property has been considered as of little or no value. In the South-Sea islands, the spontaneous bounty of nature renders hoarding altogether superfluous ; and, in ancient Sparta, the accumulation of property was positively prohibited. In this latter country, too, it was merely the display of skill that functioned the

theft; for detection was sure to cover the perpetrator with disgrace.

Thus it appears, that the diversities which are discovered in the moral sentiments of mankind, arise from known laws of the human constitution. The basis on which these moral sentiments are founded is immutable; but they may be variously modified according to circumstances peculiar to the individual. It is thus that the language of different tribes assumes a particular character and idiom, according to the peculiar circumstances of their situation; but the fundamental principles of grammar continue radically the same in all dialects.

An important effect of the faculty of Combination, or Affociation, remains yet to be examined, *viz.* the power which it has in regulating the succession of our ideas, and in directing the transition from one object of thought

to

to another. This subject, however, we shall reserve for the next Chapter, where a consideration of the various objects on which the faculty of conception is exercised, will naturally lead us to treat of the succession or train of our thoughts.

CHAPTER SIXTH.

Of Conception and Imagination.

SECTION I.

General Remarks upon Conception.

‘ CONCEIVING, imagining, apprehending,
 ‘ understanding, having a notion of a thing,’
 says Dr Reid, (Essay 4. on the Intel. Powers,
 c. 1.) ‘ are common words used to exprefs that
 ‘ operation of the understanding, which the
 ‘ logicians call *simple apprehension*. The hav-
 ‘ ing an idea of a thing is, in common lan-
 ‘ guage, used in the fame fenfe, chiefly, I
 ‘ think, fince Mr Locke’s time. Logicians,’
 continues

continues he, ‘ define simple apprehension to
 ‘ be the bare conception of a thing, without
 ‘ any judgment or belief about it. If this were
 ‘ intended for a strictly logical definition, it
 ‘ might be a just objection to it, that concep-
 ‘ tion and apprehension are only synonymous
 ‘ words; and that we may as well define con-
 ‘ ception by apprehension, as apprehension by
 ‘ conception. But it ought to be remembered,
 ‘ that the most simple operations of the mind
 ‘ cannot be logically defined. To have a di-
 ‘ stinct notion of them, we must attend to
 ‘ them as we feel them in our own minds.’

The account which we have given of Con-
 ception, or Imagination, is, that it is the facul-
 ty by which we represent to our minds the ob-
 jects of any of our other faculties, variously
 modified; which, though not a logical defi-
 nition, perhaps conveys a more distinct notion
 of the nature of the power, than an enumera-
 tion of those terms, which, though nearly sy-

nonymous with Conception, are yet occasionally used in very different senses. Thus, when we reflect upon the nature of any particular intellectual faculty, as the memory, the judgment, &c. we exercise the faculty of Conception upon an object of Consciousness. If we reflect upon any agreeable or disagreeable taste, smell, feeling, &c. it is exercised upon an object of Sensation ; if the object of our thoughts be any individual material body, conception is employed upon an object of Perception ; if it be a single quality, or attribute, it is an object of Abstraction ; and if it be a combination which does not exist in nature, it is an object of Association. I do not, however, assert that this enumeration includes all the objects upon which conception can be employed ; but that all these may, occasionally, be objects of this faculty.

Indeed, as is observed by Dr Reid (*ut supra*), Conception seems to form an ingredient in every

ry operation of the mind. ‘ Our senses,’ says he, ‘ cannot give us the belief of any object, without giving some conception of it at the same time. No man can either remember or reason about things of which he hath no conception. When we will to exert any of our active powers, there must be some conception of what we will to do; there can be no desire nor aversion, love nor hatred, without some conception of the object: we cannot feel pain without conceiving it, though we can conceive it without feeling it. These things are self-evident. In every operation of the mind, therefore, in every thing we call thought, there must be conception. When we analyze the various operations either of the understanding, or of the will, we shall always find this at the bottom, like the *caput mortuum* of the Chemists, or the *materia prima* of the Peripatetics; but, though there is no operation of the mind without conception, yet it may be found naked, de-

‘ tached from all others ; and then it is called
‘ simple apprehension, or the bare conception
‘ of a thing. ’

The objects of this faculty, when it is exercised by itself, and unassociated with any other, are usually denoted by single words, or by two or more words which do not form a complete sentence or proposition ; as, ‘ the river Thames,’ ‘ a man,’ ‘ a man of virtue.’ For it is not the province of conception either to affirm or deny, or to express any opinion or judgment ; but merely to exhibit to the mind a notion of that object upon which it is exercised. Hence the terms *true* and *false* are improperly applied to our conceptions ; they may be distinct or confused, strong and lively, or weak and languid ; but as they do not necessarily include any opinion, they cannot properly be said to imply either truth or falsehood.

Mr

Mr Stewart (Elem. &c. c. 3.) has employed the term, Conception, in a much more limited acceptation than what we have above assigned to it. ‘ By conception,’ says he, ‘ I mean ‘ that power of the mind which enables it to ‘ form a notion of an absent object of perception, or of a sensation which it has formerly ‘ felt.’ ‘ I do not,’ adds he, ‘ contend that ‘ this is, exclusively, the proper meaning of ‘ the word; but I think that the faculty which ‘ I have now defined, deserves to be distinguished by an appropriated name.’

If, indeed, the forming a notion of an absent object of perception, or of a former sensation, be the sole employment of a peculiar faculty of the mind, that faculty certainly deserves an appropriated name. But if that faculty has likewise other functions, these, surely, should be included in its description, and in the enumeration of its objects; and this I take to be the case with the faculty of Conception.

ception. We form conceptions, as I apprehend, of objects of intellect, as well as of objects of sense; of the objects of consciousness or abstraction, as well as of those of sensation and perception: and if these be only different employments or modifications of the same faculty, it surely tends to error, entirely to overlook a certain class of the objects of the faculty, and to limit its application to one denomination of them alone. As well might we limit the term, Memory, to the recollection of the events of the material world alone; or Abstraction, to the analyzing of the objects of sense, exclusive of those of intellect.

The term, Imagination, is, as above stated, one of those which is employed, in common language, to denote the faculty of which we are treating. Thus, it is no uncommon expression, to say, ‘ I cannot imagine what you mean;’ or, ‘ I imagined so and so to be the case;’ where the word *imagine* has evidently

evidently the same signification with *conceive*. This term, however, is not unfrequently employed in a more limited sense. ‘Imagination,’ says Dr Reid (as above), ‘when it is distinguished from Conception, seems to me to signify one species of conception, to wit, the conception of visible objects. Thus, in a mathematical proposition, I imagine the figure, and I conceive the demonstration: it would not, I think, be improper to say, I conceive both; but it would not be so proper to say, I imagine the demonstration.’ The etymology of the word appears to warrant its being employed in this sense; but something more seems to be included in its meaning, as usually applied. Thus, when we speak of the imagination of a poet, or an orator, something more is certainly meant than a lively conception of objects of sight.

Mr Stewart appears to have well defined the meaning of the word, in this its more appropriate

appropriate sense, when he assigns its province to be, ‘ to make a selection of qualities and of
‘ circumstances, from a variety of different ob-
‘ jects, and, by combining and disposing these,
‘ to form a new creation of its own.’ (Elem.
&c. c. 7. § 1.) I cannot, however, see the
necessity of considering this as the province of
a separate and independent faculty of the mind,
as is done by Mr Stewart ; and the reason for
this opinion may be deduced from what he
has himself said, in defining the functions of
the imagination. ‘ From what has been said,
‘ it is sufficiently evident, that Imagination is
‘ not a simple power of the mind, like atten-
‘ tion, conception, or abstraction ; but that it
‘ is formed by a combination of various facul-
‘ ties. It includes conception, or simple ap-
‘ prehension, 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 sepa-
‘ rates the selected materials from the qualities
‘ and

‘ and circumstances which are connected with
 ‘ them in nature ; and Judgement, or Taste,
 ‘ which selects the materials, and directs their
 ‘ combination.’ (Elem. &c. c. 7. § 1.) Now,
 allowing that imagination does include all these
 things, this does not constitute it a separate
 and peculiar faculty of the mind, but merely
 a complex mental operation : and this com-
 plexity is by no means peculiar to it ; for few
 mental processes can be reduced to the exercise
 of one simple faculty alone.

All the mental faculties, mentioned in the
 above enumeration of Mr Stewart, are included
 in the operation of the faculty of Combination
 or Association, already treated of ; with this
 difference merely, that the subjects upon which
 it operates may be supplied, not only by con-
 ception, but also by perception, memory, or
 other sources. It appears to me, therefore,
 more accurate, to consider the faculty of Ima-
 gination as the same, either with the ready
 formation,

formation, or with the conception of new combinations of thought : and accordingly, it will be seen, by looking back to the 1st Sect. of the preceding Chapter, that many of those efforts which are ascribed to the man of lively imagination, such as the effusions of wit, ridicule, poetical allusion, simile, and metaphor, are to be considered properly as exertions of the faculty of Association or Combination.

In few things do men differ more from one another, than in the extent and force of their powers of conception and imagination. It appears to be a just remark of Dr Reid, (*Essay 4. on the Intellectual Powers, c. 1.*) ‘ that indistinct conceptions of things are, for the most part, the cause, not only of obscurity in writing and speaking, but of error in judging.’ From this he infers, ‘ that men are very much upon a level with regard to mere judgment, when we take that faculty apart from the apprehension or conception of the things about

‘ about which we judge ; so that a sound
 ‘ judgment seems to be the inseparable com-
 ‘ panion of a clear and steady apprehension.’
 He quotes Descartes and Cicero in support of
 this doctrine ; the former of whom, in his
 Dissertation on Method, says, ‘ Nothing is so
 ‘ equally distributed among men as judgment ;’
 and the latter, in the 3d. book De Oratore,
 makes this observation, ‘ It is wonderful, when
 ‘ the learned and unlearned differ so much in
 ‘ art, how little they differ in judgment.’ The
 well known truth, that many philosophical
 controversies have been found to originate in
 nothing more than the misapprehension or
 misapplication of a term, affords a strong con-
 firmation of this doctrine ; and shews the ne-
 cessity of endeavouring to annex clear and pre-
 cise conceptions to the terms which we employ,
 before we endeavour, by means of them, to
 advance our knowledge, or to communicate it
 to others.

That

That men differ from each other greatly, in the force of their imagination, or in the power of forming or conceiving new combinations, is matter of the most familiar remark. As far as the term, Genius, has yet been distinctly limited, it appears to denote a facility in forming such combinations. This, in fact, is the proper province of invention, which is the peculiar prerogative of genius; for this can have no farther range than an analysis, and new disposition, of the various objects which nature presents to us; and never can extend to a new creation of our own, in the strict and proper acceptation of the word. Thus, a blind man, let his invention be ever so lively, could never discover a new property of light. *

According

* 'Fancy,' says Dr. Reid, 'may combine things that never were combined in reality. It may enlarge or diminish, multiply or divide, compound and fashion the objects which nature presents; but it cannot, by the utmost efforts of that creative power which we ascribe

According to this view of the subject, a man of genius is no more than a man of active imagination ;

‘ ascribe to it, bring any one single ingredient into its
 ‘ production, which nature has not framed, and brought
 ‘ to our knowledge by some other faculty.’ ‘ This,’
 continues he, ‘ Mr Locke has expressed, as beautifully as
 ‘ justly. 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, how-
 ‘ ever managed by art or skill, reaches no farther than to
 ‘ compound and divide the materials that are made to his
 ‘ hand, but can do nothing towards making the least par-
 ‘ ticle of matter, or destroying one atom that is already in
 ‘ being. The same inability will every one find in him-
 ‘ self, to fashion in his understanding any simple idea not
 ‘ received from the powers which God has given him.’
 (Essay IV. on the Intellectual Powers, c. 1.) The passage
 of Mr Locke, here alluded to, occurs in Book II. c. 1. § 2.
 of his Essay.

The same doctrine is distinctly stated by Dr Cudworth,
 in the following passage of his Intellectual System. ‘ For
 ‘ the mind cannot make any new cogitation, which was
 ‘ not before, but only compound that which is. As the
 O painter

imagination ; and though both terms are more usually appropriated to literary eminence, yet if we take them in this sense, the inventor in mechanics, in mathematics, agriculture, or any of the useful arts or pursuits of life, is as much entitled to the appellation of a man of genius and imagination, as the poet and the orator.

That kind of imagination which is limited to a ready conception of new combinations, when suggested to it, and does not extend to the original formation of such combinations, may be called passive. This, though it does not go so far as to constitute a man of genius, yet it seems to furnish the proper qualification for

‘ painter cannot feign colours, but must use such as exist
‘ in nature, only he can variously compound them toge-
‘ ther, and, by his pencil, draw the figures and linea-
‘ ments of such things as no where are ; as he can add to
‘ the head and face of a man, the neck, shoulders, and
‘ body of a horse.’ p. 694.

for the man of taste, since it enables him to relish and appreciate the productions of genius, although not to rival or excel them. Of the two qualifications, it may be doubted whether the latter does not most contribute to real enjoyment. The pleasure which the man of fine taste derives from contemplating the productions of genius, is scarcely inferior to the high relish which the exercise of invention itself imparts; and the inventive imagination of the man of genius, is but too apt to conjure up phantoms for his own torment; and to burn with jealousies, which his fancy knows but too well how to feed. The history of Rousseau, of Chatterton, of Swift, Johnson, and other geniuses of heated, or of gloomy imaginations, affords ample confirmation of the truth of this remark.*

It

* I would by no means be understood, here, to sanction that indiscriminate censure of genius, in which men of moderate abilities are sometimes prone to indulge, and

It is observed by Mr. Stewart, (Elem. &c. c. 3.) that we are able to conceive the objects

of

which is so fairly ridiculed by Mr. Hume, as already quoted at p. 109. It is noticed, in very similar terms, in the following passage of Helvetius : ‘ Les gens médiocres se sentant plus près du bon sens que de l’esprit, ils doivent faire peu de cas de celui-ci, le regarder comme un don futile ; et de-là cette phrase répétée par les gens médiocres : *Bon sens vaut mieux qu’esprit et que génie* ; phrase par laquelle chacun d’eux veut insinuer qu’au fond il a plus d’esprit qu’aucun de nos hommes célèbres. ’ (*De l’Esprit, Disc. 4. Ch. 12.*) I allude, here, merely to the unfortunate eccentricities of genius, which will always be subjects of deep regret.

In the following passage of the same lively author, the term Imagination is defined and limited nearly as in the present work. ‘ L’imagination consiste dans une combinaison, un assemblage nouveau d’images, et un rapport de convenances apperçues entre ces images et le sentiment qu’on veut exciter. Est-ce la terreur ? l’imagination donne l’être aux Sphinx, aux Furies. Est-ce l’étonnement ou l’admiration ? elle crée le Jardin des Hespérides, l’Île enchantée d’Armide, et le Palais d’Atlant. L’imagination est donc l’invention en fait d’images, comme l’esprit l’est en fait d’idées. ’ (*Disc. 4. Ch. 2.*)

of some of the senses, much more easily than those of others. Thus, we can conceive an absent visible object, such as a building, that is familiar to us, much more easily than a particular sound, a particular taste, or a particular pain, which we have formerly felt. The reason of this he appears to have justly assigned to be, 'that when we think of a sound, or of a taste, the object of our conception is one single detached sensation; whereas every visible object is complex; and the conception which we form of it as a whole, is aided by the association of ideas.' In confirmation of this may be stated, the facts which he mentions, of persons acquiring the power of amusing themselves with reading written music; and that the harmony of verse may be enjoyed without articulating the words, even in a whisper. This shews that, though we can scarcely form a distinct conception of a single sound, yet a strong conception may be formed of a series of connected sounds, where

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we

we are aided by the principle of association.

A very singular error on the subject of Conception, which appears to have pervaded the writings of the ablest metaphysical philosophers, was first successfully refuted by Dr Reid. It is, that our conception of things is a test of their possibility ; so that what we can distinctly conceive, we may conclude to be possible ; while of what is impossible we can have no conception. ‘ This opinion,’ says Dr Reid, (Essay IV. on the Intellect. Powers, c. 3.) ‘ has been held by philosophers for more than an hundred years, without contradiction or dissent, as far as I know.’

In the philosophy of Descartes, this maxim was carried still farther ; for there it was held, that whatever we clearly and distinctly conceive, is not only possible, but true. This maxim, however, was necessarily abandoned, when the philosophy which inculcated it grew
into

into disrepute ; but subsequent philosophers seem to have had no hesitation in admitting, that our conceptions, though not in all cases a test of truth, are yet a test of possibility. ‘ This, indeed,’ says Dr Reid, ‘ seems to be ‘ a necessary consequence of the received doctrine of ideas ; it being evident, that there ‘ can be no distinct image, either in the mind, ‘ or any where else, of that which is impossible.’

The maxim, in its fullest extent, is thus stated by Wolfius, (*Ontolog.*) ‘ Impossibile est ‘ *cujus nullam notionem formare possumus ;* ‘ *possibile e contra cui aliqua respondet notio.*’ Other philosophers have contented themselves with stating one half of the proposition ; and have maintained, either the possibility of what may be conceived, or the impossibility of what we are unable to conceive. But a little reflection is sufficient to shew the fallacy of both tenets. For, in the first place, there are many

O 4

things

things which we not only believe to be possible, but actually know to be true, such as many phenomena, both of the natural and moral world; which yet we never could have conceived, had they not been actually exhibited to our observation: so that there are certainly many things possible, of which we have no conception.

Again, every proposition which is true, stands opposed to another which is false; but no one will deny that the false proposition may be as readily conceived as the true one. If the proposition expresses a truth which is necessary, as is the case with mathematical propositions, its opposite must be necessarily false, that is, impossible. Thus, the proposition, ‘any
‘two sides of a triangle are equal to the third
‘side,’ is not only false but impossible, and inconsistent with the very notion of a triangle: yet this proposition may be as distinctly conceived as the opposite and true one, *viz.* ‘any
‘two

‘ two sides of a triangle are greater than the
 ‘ third side.’ Indeed, the ‘ demonstratio ad ab-
 ‘ surdum ’ proceeds upon the assumption, and,
 consequently, complete conception, of a false
 and impossible proposition ; and thence, by
 legitimate inferences, arrives at the demonstra-
 tion of the truth. It may, therefore, be held
 as clearly established, that the faculty of con-
 ception furnishes no test, either of possibility or
 impossibility.

The Logicians, who reduced all the opera-
 tions of the human mind to three, *viz.* Simple
 Apprehension (or Conception), Judgment, and
 Reasoning, included under the first of these,
 Sensation, Imagination, and what they called
 Pure Intellection. That Sensation is very im-
 properly considered as a kind of conception,
 has been satisfactorily shewn by Dr Reid, who
 was also the first to point out in what Sensation
 truly consisted ; and the difference between it
 and the mental operation of Perception. (See
 Chapters

Chapters 2. & 3.) The distinction which the logicians make between imagination and pure intellection, is not, as might have been supposed, that the one is the conception or apprehension of objects of sense, the other of objects of intellect; which might have been admitted as a just division of the objects of conception: but, say they, in imagination, the image is in the brain; in pure intellection, it is in the intellect. When images have actually been discovered, either in the brain, or in the intellect, it will be time enough to examine into the justness of this distinction.

The circumstance of considering sensation as a species of simple apprehension, seems to have given rise to the doctrine taught by the logicians, that simple apprehension is the earliest exercise of the understanding, and furnishes the mind with a stock of simple ideas, which are afterwards combined, by judgment and our other faculties, into various complex notions.

notions. It is justly observed by Dr Reid, that
 ‘ simple apprehension, though it be the sim-
 ‘ plest, is not the first operation of the under-
 ‘ standing : and, instead of saying that the
 ‘ more complex operations of the mind are
 ‘ formed by compounding simple apprehen-
 ‘ sions ; we ought rather to say, that simple
 ‘ apprehensions are got by analyzing more
 ‘ complex operations. ’ ‘ It is generally al-
 ‘ lowed,’ says he, ‘ that we cannot conceive
 ‘ sounds, if we have never heard ; nor colours,
 ‘ if we have never seen : and the same thing
 ‘ may be said of the objects of the other sen-
 ‘ ses. In like manner, we must have judged,
 ‘ or reasoned, before we have the conception,
 ‘ or simple apprehension, of judgement and of
 ‘ reasoning. ’ (Essay 4. on the Intel. Powers,
 c. 3.)

It may, however, be doubted, whether this
 able philosopher be equally correct in the analo-
 gous opinion, which he states immediately after-
 wards.

wards. ‘ A similar mistake,’ says he, ‘ which
‘ is carried through the whole of Mr Locke’s
‘ Essay, may be here mentioned. It is, that
‘ our simplest ideas, or conceptions, are got
‘ immediately by the senses, or by consciousness;
‘ and the complex afterwards formed by
‘ compounding them. I apprehend it is far
‘ otherwise. Nature presents no object to the
‘ senses, or to consciousness, that is not complex.
‘ Thus, by our senses, we perceive
‘ bodies of various kinds : but every body is
‘ a complex object ; it has length, breadth,
‘ and thickness ; it has figure, and colour, and
‘ various other sensible qualities, which are
‘ blended together in the same subject ; and,
‘ I apprehend, that brute animals, who have
‘ the same senses that we have, cannot separate
‘ the different qualities belonging to the
‘ same subject, and have only a complex and
‘ confused notion of the whole : Such also
‘ would be our notions of the objects of sense,
‘ if we had not superior powers of understanding,

‘ standing, by which we can analyze the com-
 ‘ plex object, abstract every particular attri-
 ‘ bute from the rest, and form a distinct con-
 ‘ ception of it. ’

Dr Reid concludes thus : ‘ So that it is
 ‘ not by the senses immediately, but rather by
 ‘ the powers of analyzing and abstraction, that
 ‘ we get the most simple and the most distinct
 ‘ notions even of the objects of sense. ’ This
 last observation, I think, must be admitted in
 its fullest extent ; notwithstanding which, the
 view given, in the above passage, of the manner
 in which the notions derived from the senses
 are acquired, appears to me somewhat errone-
 ous. It would seem to be Dr Reid’s opinion,
 that the whole complex object of sense is at
 once perceived, and that its various attributes
 are blended in the mind, and contemplated to-
 gether as one whole. This, however, appears
 to me to be too great an effort for the percep-
 tive faculty, especially in its early stages ; and
 it

it seems more natural to conclude, that it is by successive acts of perception that an adequate notion is formed of objects which are in any degree complex.

Let us suppose that a child has, for the first time, a distinct object of sight, as an apple, presented before him ; and let us examine what will be the notion formed in his mind. In my opinion, this notion will include nothing more than that of a coloured surface, of a certain form and dimension ; that is, the child will perceive colour and extension, which perhaps are never separated in the mind, but by a deliberate exercise of abstraction. By successive examinations of the apple, a notion of its spherical form, of its precise shape, of its smell and of its taste, come to be acquired ; and thus, by a combination of the results of successive acts of perception, the complex notion attached to the word Apple is formed. Had we supposed the apple to be presented to
the

the touch of the child, and not to the eye, the first perception must have been that of hardness, combined probably with that of extension ; and the other attributes would have been made known by successive perceptions, much in the same way here, as in the former case.

Thus, it seems natural to conclude, that the notions we acquire by the senses are originally simple, at least to a certain degree, and are afterwards combined, or rendered complex, as our acquaintance with the various attributes of the objects of nature becomes extended. In fact, the notion which the adult forms of an apple, is infinitely more complex than that of the child ; for this notion includes not only the form, colour, taste, smell, &c. of the apple, but likewise that of its being the fruit of a certain tree, the season at which it ripens, the places in which it grows, and various other particulars. Thus, as our experience enlarges, our knowledge of the attributes of objects ex-

tends ;

tends ; and consequently, the notions which we annex to the names of those objects, become more and more complex.

At the same time, it must be observed, that the mind of the infant is so unconscious of the successive efforts by which it acquires a knowledge of the different attributes of natural objects, and these attributes come afterwards to be so intimately blended together by the influence of association, that they must be again analyzed by the faculty of abstraction, before they can be contemplated by the mind in their most simple and uncombined state. Thus, though the progress of our acquired experience, or acquaintance with the objects of nature, is *synthetical* ; the progress of scientific investigation, by which we obtain a more intimate knowledge of the true characteristics of those objects, is in general *analytical* ; and in many cases it leads us to trace back the very steps by which the mind, unconsciously, formed
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an acquaintance with the objects of its knowledge. Of this last process the minds of brutes seem to be utterly incapable ; and consequently, the notions they have of objects must always be inadequate and obscure.

SECTION II.

*Whether there is any Belief accompanying
Conception.*

IT has been nearly the uniform doctrine of metaphysical writers, as well the Logicians, as philosophers of a more modern date, that conception, or imagination, is not accompanied with any belief of the existence of its object. ‘ Perception,’ says Dr Reid, (Essay 4. on the Intel. Powers, c. 1.), ‘ is attended with a be-
P ‘ lief

‘ lief of the present existence of its object ;
‘ Memory, with a belief of its past existence ;
‘ but Imagination is attended with no belief at
‘ all ; and was therefore called by the school-
‘ men, *apprehensio simplex*.’ Indeed, this
doctrine is implied in the very definition of
the faculty, and the explanation which is given
of its proper functions. ‘ It is not,’ we have
said in the preceding section, ‘ the province of
‘ conception either to affirm, or deny, or to
‘ express any opinion or judgment, but mere-
‘ ly to exhibit to the mind a notion of that
‘ object upon which it is exercised : Hence
‘ the terms *true* and *false* (i. e. *belief* or *dis-*
‘ *belief*) are improperly applied to our con-
‘ ceptions.’

Mr Stewart, in his *Elements of the Philo-*
sophy of the Human Mind, calls in question
this so generally prevalent opinion concerning
Conception, though, as he himself expresses it,
with great diffidence ; and, notwithstanding he
has

has treated of Imagination and Conception as different faculties of the mind, yet he considers the observations which he has made on the supposed belief accompanying conception, as ‘ holding equally, with respect to both faculties.’ (Elem. c. 3.) In examining his reasons for deviating from the received opinion, it will however be proper to keep in view, the sense in which he employs the term Conception, *viz.* to denote ‘ that power of the mind which enables it to form a notion of an absent object, of perception, or of a sensation which it has formerly felt.’

‘ If,’ says Mr Stewart, ‘ it were a specific distinction between perception and imagination, that the former is always attended with belief, and the latter with none; then the more lively our imagination were of any object, and the more completely that object occupied the attention, the less should we be apt to believe its existence; for it is reason-

‘ able to think, that when any ^{one} of our powers
‘ is employed separately from the rest, and
‘ there is nothing to withdraw the attention
‘ from it, the laws which regulate its opera-
‘ tion will be most obvious to our observation,
‘ and will be most completely discriminated
‘ from those which are characteristical of the
‘ other powers of the mind. So very dif-
‘ ferent, however, is the fact, that it is matter
‘ of common remark, that when imagination
‘ is very lively, we are apt to ascribe to its ob-
‘ jects a real existence, as in the case of dream-
‘ ing, or of madness ; and we may add, in the
‘ case of those who, in spite of their own ge-
‘ neral belief of the absurdity of the vulgar
‘ stories of apparitions, dare not trust them-
‘ selves alone with their own imaginations in
‘ the dark. That imagination is, in these in-
‘ stances, attended with belief, we have all the
‘ evidence that the nature of the thing admits
‘ of ; for we feel and act in the same manner
‘ as we should do, if we believed that the ob-
‘ jects

‘jects of our attention were real ; which is the
 ‘ only proof that metaphysicians produce, or
 ‘ can produce, of the belief which accompa-
 ‘ nies perception. ’ (*Ut supra.*)

This reasoning is doubtless very ingenious ;
 but, to me, it appears by no means conclusive.
 No just inference can, I think, be made, con-
 cerning the natural operation of the human
 faculties, from what takes place in madness,
 which is a diseased state of the mind ; any
 more than we could deduce the true physiolo-
 gy of any organ of the human body, from an
 examination of it when in a state of inflamma-
 tion, or mortification. The same objection
 also applies, in a great measure, to any infer-
 ence made from the phenomena of dreaming ;
 where many of the mental faculties, as well as
 corporeal functions, are evidently suspended ;
 and, in particular, the influence of the will, or
 volition : so that the impresson of reality with
 which our conceptions are then attended, seems

to arise from their being presented spontaneously to the mind, and from our want of power to dismiss or recal them at pleasure.

That state of mind which is called a reverie, approaches very nearly to dreaming. The exercise of volition, then, appears almost to be at a stand : and the mind is delivered over to the spontaneous current of its successive thoughts, which then obtrude themselves upon it, as it were, without its own consent ; and, in consequence, have a kind of temporary reality, similar to what takes place in sleep. But though the mind is occasionally thus imposed upon during the dreams, whether of the day or of the night ; it surely by no means necessarily follows, that during the moments when its faculties are exercised in a more natural and deliberate manner, the same deception takes place.

Mr Stewart's position, ' that when any ^{one} of
' the

‘ the powers is employed separately from the
 ‘ rest, and there is nothing to withdraw the
 ‘ attention from it, the laws which regulate its
 ‘ operation will be most obvious to our ob-
 ‘ servation, and will be most completely dis-
 ‘ criminated from those which are characteris-
 ‘ tical of the other powers of the mind,’
 doubtless appears to be strictly ‘logical. But I
 do not apprehend that, in those states of the
 mind above described, in which our conceptions
 impress us with the conviction of their reality,
 the faculty in question is deliberately, or natu-
 rally exercised. The phenomenon rather arises,
 as I have endeavoured to explain, from the in-
 voluntary obtrusion and spontaneous flow of
 the train of thought; which is not properly an
 immediate exercise either of conception or
 imagination, but a consequence of the previ-
 ous exercise of those powers, and of the fa-
 culty of combination, or association, by which
 our various conceptions are successively sug-
 gested to the mind. (See the next Section.)

Any man has it in his power to exercise the faculty of conception deliberately, and separately from any other ; and thus to subject to his own consciousness the truth or fallacy of the doctrine in question. The result, I apprehend, will be contradictory to the supposition of a belief accompanying conception. Mr Stewart, indeed, distinctly expresses the contrary opinion. ‘ When,’ says he, ‘ 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.’ If this be the case, Mr Stewart’s conclusions must be admitted as well founded ; but whether it be, or be not the case, can, I apprehend, be determined only by the testimony of consciousness.

✓ In the deliberate exercise of that peculiar kind of conception which we have called Imagination, I think the want even of a momentary belief is still more apparent. To take another

other example from Mr Stewart. When Milton created his imaginary garden of Eden, according to our author, the association of ideas suggested to him, and the power of conception placed before him, a variety of striking and beautiful scenes, which he had formerly beheld; the power of abstraction enabled him to separate their beauties from their imperfections, and taste directed him in the selection; by which means he has created a landscape more perfect perhaps than has ever been realized in nature, (Elem. &c. c. 7.) Can it then be believed that Milton, even for a moment, had any belief in the real existence of this paradise, which he so coolly and deliberately fabricated? As well, in my opinion, might we suppose that Cervantes believed his Don Quixotte actually to have routed a flock of sheep, under the conviction of their being a host of armed men; or that Rabelais really believed that there had existed such gigantic and extraordinary personages as his Gargantua and Pantagruel.

A second argument, in support of the belief accompanying conception, is derived by Mr Stewart from what takes place in certain optical deceptions. The image of a lighted candle may, by means of a concave mirror, be made to appear in the air between the mirror and the eye of the observer; by the same means, the image of a flower may be presented; and when the spectator attempts to lay hold of it, a stroke may be aimed at his hand by the image of a dagger. Even persons who are acquainted with the principles of optics, act in these circumstances, as if influenced by a belief in the reality of these illusions; and have a momentary repugnance at exposing themselves to the visionary danger. In a similar way, by the contrivance of a common shew-box, the mind may be led to form the conception of a widely-extended and variegated prospect, although it has a speculative conviction that the sphere of its vision only extends to a few inches.

These

These, and similar instances, appear to afford examples of what Mr Stewart calls ‘ the compatibility of a speculative disbelief of the existence of an object, with a contrary momentary belief.’ But let it be observed, that the faculty exercised in such cases, is not Conception or Imagination, but *Perception*, of which it is an essential requisite to be accompanied with belief. The image of the candle, of the flower, and dagger, and the magnified scene of perspective, are real objects of sight, and as such, are properly calculated to produce a conviction of reality : this conviction, however, is destroyed, when it is discovered that these are nothing but images ; and a little practice will enable any person, whether optician or not, to hold his finger in the image, either of the candle or of the dagger, without even a momentary apprehension. These illusions, therefore, are upon the same footing with other deceptions of sight, such as the erroneous notions of magnitude, distance, colour, form, &c. which
are

are originally derived from the eye, but which come to be corrected by the juster testimony of the sense of touch ; so that the false belief to which they are calculated to give rise, soon ceases for ever.

The circumstances accompanying the exhibition of fictitious scenes of distress ; and the dread which is felt in situations of imaginary danger, afford additional arguments to Mr Stewart, in support of the doctrine in question. ‘ I believe, ’ says our author, (Elem. &c. c. 3.) ‘ it will be found that the
‘ violent emotions which are sometimes pro-
‘ duced by the distresses of the stage, take
‘ their rise, in most cases, from a momentary
‘ belief that the distresses are real. I say, in
‘ most cases ; because, I acknowledge that, in-
‘ dependently of any such belief, there is some-
‘ thing contagious in a faithful expression of
‘ any of the passions. The emotions pro-
‘ duced by tragedy are, upon this supposition,
‘ somewhat

‘ somewhat analogous to the dread we feel
 ‘ when we look down from the battlement of
 ‘ a tower. In both cases, we have a general
 ‘ conviction that there is no ground for the
 ‘ feelings we experience ; but the momentary
 ‘ influences of imagination are so powerful, as
 ‘ to produce these feelings, before reflection has
 ‘ time to come to our relief. ’

The emotions which are excited in such cases as these, may, I think, be more satisfactorily explained, by the operation of another well known principle of the human constitution, I mean *sympathy* ; in consequence of which, we enter into the condition of another person, even when that condition is only forcibly described or represented to us ; and feel, in some degree, the pain or pleasure that we think we should feel if we were really in that condition. It is not necessary, for the exercise of sympathy, that those with whom we sympathize should have the same sense of their condition

condition as we have. Thus, we blush for another's ill-breeding, even when he himself is not aware of it; and we pity a madman, though we believe him to be happy in his frenzy. Nay, we sympathize with the lower animals, and even with the inanimate objects of nature; we rejoice in the song of the lark, or the sporting of the lamb; and we lament the fallen grandeur of a venerable decayed oak, or ancient Gothic ruin.

In consequence of this principle, then, our emotions may be strongly raised by an exhibition of fictitious distress, without even a momentary belief in the reality of the distress; because we sympathize with those who have by no means the same sense of their condition as we have. And this serves to explain a circumstance, with respect to narratives of distress, which has appeared not a little paradoxical, *viz.* that our emotions may be as strongly raised by a pure fiction, as by a detail of events

events which have actually happened in the world ; and by the exhibition of characters which have really been in the situations assigned to them. If the feelings of nature be justly expressed, in the details of the composition which is purely fictitious, sympathy will be as completely excited, and, consequently, emotion as strongly raised, as by an accurate narrative of real sufferings of the severest kind.

The momentary terror which is excited by looking down a precipice, or from the top of a high building, even when we believe ourselves in a state of perfect safety, may be accounted for on similar principles. We figure to ourselves a person in the act of falling down the precipice, and our sympathy is roused for the creature of our own imagination, without the necessity of even a momentary belief of the reality of the accident. By a similar operation of sympathy, we tremble for a mason standing on a high scaffold, though we know that cus-

tom has rendered the situation quite familiar to him ; and surely, here, there cannot be any belief that the mason is falling ; as we have a strong and distinct perception of the contrary. The operation of sympathy will also serve to account for much of the apprehension of supernatural danger, to which many persons are liable in the dark. But some of this, I think, should be ascribed to a real belief in the possibility of such danger, which will lurk in the minds even of the most rational part of mankind, in some degree unknown to themselves.

But although we deny belief, however transient, to be an inherent accompaniment to the faculty of Conception or Imagination ; yet belief may be, and very frequently is, attached to certain operations of the imagination, which are then mistaken for realities, and produce as remarkable effects upon the individual, as if they were the very things they are mistaken for. The facts of this kind, which are both

numerous

numerous and well established, furnish some of the most singular, and, at the same time, inexplicable phenomena of the human mind.

Those unfortunate persons who are in the state of hypochondriacs, or imaginary invalids, furnish some striking examples of this truth. The wildest suggestions of the imagination, impress upon them the full conviction of reality; and all the reasoning of their friends or physicians is insufficient to convince them that they are formed like other men, and have not some part of their bodies, either unnaturally distorted, or fashioned of materials different from flesh and blood. When hypochondriasis arrives at this height, it makes a near approach to certain stages of madness; and if the physician should deny that the bodily disease exists, of which his patient complains, he must yet allow that there is a real disease of the mind.

But, even when the intellects are in a comparatively

comparatively sound state, the visions of the imagination may be made to produce, in certain persons, all the effects of reality. The success of certain empirical impositions, among which we may particularize the Animal Magnetism of Mesmer, and the Tractors of Perkins, sufficiently establish this fact. The reign of Animal Magnetism is now over ; but it will be remembered how rapidly its fame was circulated, and with what avidity its wonders were detailed. The most incredulous could not deny the reality of its effects ; as convulsions were produced, and strong bodily agitations excited, in persons who could not be suspected of lending their aid to the imposture. But the examination of the Academy of Sciences at Paris dispelled the illusion, and satisfactorily established that, as far as the effects were real, they were to be ascribed merely to the influence of the imagination.

The more modern quackery of the Metallic
Tractors,

Tractors, seems fairly reducible to the same class. If these have ever produced a real cure, the effect is to be ascribed to the influence of the imagination, and not to the virtue of the metal. This seems, indeed, to be completely established by Dr Haygarth, who found that his patients thought themselves equally benefited, whether he employed the tractors of Perkins, or tractors of his own manufacture, or even tractors of wood, coloured so as to resemble those of metal. (See his Treatise on Imagination, as a Cause and Cure of Diseases.)

This influence of the imagination on the corporeal frame, forms one feature of the mysterious union between the body and the mind, in consequence of which, the one cannot be affected without some corresponding change in the other; an union so difficult to be comprehended; although of its reality, we have the testimony of our daily experience.

SECTION III.

Of the Train of Thought.

EVERY one is conscious of a constant succession, or train of thoughts which passes through his mind while he is awake ; so that one thought continually suggests another, which, in its turn, introduces another, and so on, even without the intervention of external objects. Sometimes the succession of thoughts is rapid, and their suggestions lively ; at other times, they succeed each other more languidly, and scarcely excite our attention ; but it may be considered as an invariable law of the human mind, that, during its waking hours, it is never wholly without some object of reflection.

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This current of thought appears to pass through the mind, without any volition, or active effort of the individual, insomuch, that it requires an active effort to stop its natural flow, and to single out some one particular object for consideration; and no effort of the will is sufficient, entirely to dismiss the train of thought, or to reduce the mind to an unconscious and unthinking state. So completely, indeed, is the mind in a passive condition, with respect to the succession of its thoughts, that, as has been remarked by Lord Kaimes, (*Elements of Criticism*,) we are unable to call up in the mind any particular object at pleasure, although previously acquainted with it; for the very circumstance of thinking of this object proves it to have been already suggested to the mind.

If it be asked, What is the cause of the succession of our thoughts, if this does not depend upon the volition of the person who

thinks? It may be answered, That it is the relations or combinations previously established among the objects of thought, in consequence of which one of these suggests another *in infinitum*. Sometimes these relations are obvious, and easily traced; at other times, it may be a matter of some difficulty to detect the principle of combination, by which a transition from one thought to another was regulated; but a little attention will serve to convince us that, in all cases, the succession of our thoughts is occasioned by previous combinations and associations established among them.

Mr Hobbes (in his Leviathan) has given an ingenious illustration of this frequently imperceptible source of transition, in the particulars of a supposed or real conversation. ‘In a company,’ says he, ‘in which the conversation turned upon the civil war, what could be conceived more impertinent, than for a person to ask abruptly, What was the value

‘ value of a Roman denarius? On a little
 ‘ reflection, however, I was easily able to trace
 ‘ the train of thought which suggested the
 ‘ question ; for the original subject of dis-
 ‘ course naturally introduced the history of
 ‘ the King, and of the treachery of those who
 ‘ surrendered his person to his enemies ; this
 ‘ again introduced the treachery of Judas
 ‘ Iscariot, and the sum of money which he
 ‘ received for his reward.’

As, then, the train of thought goes on spontaneously in the human mind, in consequence of associations previously established among our ideas ; and as no thought can be called up in the mind, which had not previously offered itself to its consideration, it would seem to follow, that man has no controul whatever over his thoughts, but is, in this respect, a mere involuntary agent. This consequence has, accordingly, been drawn from these very premises ; and, in particular, has been fully

illustrated by Lord Kaimes, (*Elements of Criticism*) ; but a little reflexion will serve to shew that it, by no means, necessarily follows.

Although the train of thought moves on continually without any voluntary effort ; yet we are not without very considerable powers over it. For, not to mention the influence of external circumstances and conversation, in consequence of which, by a change of situation, we can always produce a change in our thoughts ; we can, moreover, as it were, stop the spontaneous current of our thoughts, by singling out some one idea at pleasure, detaining it in the mind, and making it a particular object of attention. The consequence of this is, that we bring into view the less obvious connexions among our thoughts, and thus divert their current into an entirely new channel. In this way, we may be said to possess, in some degree, a power of recalling to the mind a circumstance which was not immediately suggested to it.

For

For, suppose the train of my thoughts should bring to my remembrance, a company in which I had lately been, and where some interesting conversation had passed, which, however, I did not distinctly recollect : By dwelling upon the various circumstances which happened at that time, I may, at length, succeed in recollecting the conversation in question ; and thus, by an active effort, I recover a stock of ideas, which would otherwise have been lost.

‘ We seem,’ says Dr Reid, (Essay IV. on the Intellectual Powers, c. 4.) ‘ to treat the
 ‘ thoughts that present themselves to the fancy
 ‘ in crowds, as a great man treats those that
 ‘ attend his levee. They are all ambitious of
 ‘ his attention ; he goes round the circle, be-
 ‘ flowing a bow upon one, a smile upon ano-
 ‘ ther ; asks a short question of a third, while
 ‘ a fourth is honoured with a particular con-
 ‘ versation ; and the greater part have no par-
 ‘ ticular mark of attention, but go as they
 ‘ came,

‘ came. It is true, he can give no mark of his
‘ attention to those who were not there ; but
‘ he has a sufficient number for making a
‘ choice and distinction. ’

But by far the most important controul which we possess over the train of our thoughts is, the power which we have in directing those original affociations and combinations, by which their succession is regulated. In this manner, we fashion, as it were, the very train of thought itself, and furnish the materials for our future mental investigations. We have already had occasion to observe, (c. 5. § 3.) of what importance it is, in the early periods of life, to direct, and duly superintend, that principle of the human constitution, by which we are led to combine together the different objects of our knowledge, according to various relations, either natural or arbitrary. The preceding remark tends to set this observation in the strongest point of view ; as it leads to the
conclusion,

conclusion, that the character, and mental endowments of the individual, principally depend upon the direction which is given to this important part of the human constitution.

The effect of a sedulous cultivation, and reiterated practice, in giving us a self-command in this particular, are well illustrated by Dr Reid, in the following passage: ‘ The habits,’ says he, ‘ which the human mind is capable of acquiring by exercise, are wonderful in many instances ; in none more wonderful, than in that versatility of imagination which a well-bred man acquires by being much exercised in the various scenes of life. In the morning, he visits a friend in affliction. Here, his imagination brings forth from its store every topic of consolation; every thing that is agreeable to the laws of friendship and sympathy, and nothing that is not so. From thence he drives to the minister’s levee, where imagination readily suggests what is proper to
‘ be

‘ be said or replied to every man, and in what
‘ manner, according to the degree of acquaint-
‘ ance or familiarity, of rank or dependence,
‘ of opposition or concurrence of interests, of
‘ confidence or distrust that is between them.
‘ Nor does all this employment hinder him
‘ from carrying on some design with much
‘ artifice, and endeavouring to penetrate into
‘ the views of others through the closest dis-
‘ guises. From the levee he goes to the
‘ House of Commons, and speaks upon the
‘ affairs of the nation; from thence to a ball
‘ or assembly, and entertains the ladies. His
‘ imagination puts on the friend, the courtier,
‘ the patriot, the fine gentleman, with more
‘ ease than we put off one suit, and put on an-
‘ other.’ (Essay IV. on the Intellect. Powers,
c. 4.)

The same author has admirably illustrated
the various characters which the train of thought
assumes in different individuals, and its influ-
ence

ence upon the happiness of men, at the end of the above quoted chapter. ‘ The human imagination,’ says he, ‘ is an ample theatre, upon which every thing in human life, good or bad, great or mean, laudable or base, is acted. In children, and in some frivolous minds, it is a mere toy-shop. And, in some, who exercise their memory without their judgment, its furniture is made up of old scraps of knowledge, that are thread-bare and worn out. In some, this theatre is often occupied by ghastly Superstition, with all her train of *gorgons, and bydras, and chimeras dire*. Sometimes it is haunted with all the infernal demons, and made the forge of plots, and rapine, and murder. Here, every thing that is black and detestable is first contrived, and a thousand wicked designs conceived that are never executed. Here, too, the Furies act their part, taking a severe, though secret vengeance, upon the self-condemned criminal. How happy is that mind, in which

‘ the

‘ the light of real knowledge dispels the phan-
‘ toms of superstition : In which the belief and
‘ reverence of a perfect all-governing mind
‘ casts out all fear, but the fear of acting
‘ wrong : In which serenity and cheerfulness,
‘ innocence, humanity, and candour, guard
‘ the imagination against the entrance of every
‘ unhallowed intruder, and invite more ami-
‘ able and worthier guests to dwell ! ’

The whole, indeed, of Dr Reid’s observations upon the train of thought, contained in this chapter, is in the highest degree interesting and judicious. Among other matters will be found some sensible remarks upon that difficult subject, the gradual developement of the train of thinking in the minds of children. If, to what this author has said upon the train of thought, be added Mr Stewart’s philosophical investigations on the same subject, contained in the 5th chapter of his Elements, &c. part 1. sect. 3. & 4., little appears to be wanting to
complete

complete our notions upon this important subject.

Mr Stewart, in a subsequent section, goes on to apply the principles which he has established to the explanation of the phenomena of dreaming ; in which inquiry he has displayed great ingenuity, and a truly philosophical spirit of investigation. I have only to observe upon his interesting disquisitions on this head, that there appears to me to be no necessity for resorting to a belief, which at all times, and of natural consequence, accompanies our conceptions and imaginations, in order to account for the impression of reality which is produced by our dreams. In consequence of the suspension of the influence of the will over our mental operations during sleep, the train of thought then goes on in the mind wholly involuntarily ; and we lose that degree of controul over it which we possess when awake. This circumstance, I think, of itself sufficiently explains why its suggestions

suggestions are mistaken for realities, because we have then no power whatever of dismissing and recalling them at pleasure.

C H A P -

CHAPTER SEVENTH.

Of Memory.

SECTION I.

Analysis of the Faculty.

THE faculty of Memory is so familiarly known to all men, and its exercise is so constant, and commences at so early a period of life, that to attempt any precise definition of it, appears to be superfluous. In order, however, to distinguish it from other faculties with which it has an intimate relation, I shall describe it as being that faculty, by means of which we have an immediate knowledge of

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what we have formerly perceived, felt, or thought.

As there is none of our faculties with which we are more familiarly acquainted than Memory, so there is none upon which more has been written by philosophers, or concerning which we have a greater variety both of useful practical remarks, and of visionary speculations. Reasoning from a supposed analogy between the properties of matter and of mind, that fruitful source of false conclusions, has here been employed with great readiness; and the hypothesis of images, or representations, of things present in the mind, has been considered as receiving a very strong proof from the operation of memory. Indeed, the analogy between committing a thing to memory, and delineating it upon a blank tablet, is one of the strongest that can be pointed out between an intellectual and corporeal process, and has therefore naturally influenced the disquisitions of philosophers concerning Memory.

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The Platonists and Peripatetics inform us, that those pictures, or representations, of external objects, which enter the mind through the senses, leave an impression, or image, upon our original sensorium; which impression, when the external object is no longer present, remains, and becomes the cause of memory. Upon this principle Aristotle imputes the shortness of memory in children to this cause, that their brain is too moist and soft to retain the impressions made upon it; and the defect of memory in old men, he imputes, on the contrary, to the hardness and rigidity of the brain, which hinders its receiving a firm impression.

Descartes, though favourable to the doctrine of impressions, has here superadded a mechanical theory of his own. According to him, all impressions of external objects being conveyed to the soul, at the pineal gland, through the different nerves, when any motions of the spirits, which, according to him, are contained

in the nerves, are made in the same traces in which former motions were performed; by this means we have memory. The doctrine of Malebranche was very similar. He compared the fibres of the brain receiving impressions from the current of the animal spirits, to the branches of a tree, which, being bent after a particular manner, retain a facility of being bent afresh in the same manner; and hence, said he, we have memory, which consists only in a promptness, or facility, of renewing the same impressions.

Mr Locke, and his followers, speak with more reserve on this subject, although they seem to admit the same cause of memory, *viz.* traces, or marks, of former perceptions. The images of things, which, according to Mr Locke, are present in the mind in all its operations, he represents as being laid up in the memory as in a storehouse, whence they may be occasionally drawn and contemplated without the aid

aid or repetition of the original impressions by which those images were formed. But the images thus deposited in the memory are supposed gradually to decay, and, unless occasionally renewed by the senses, at length totally to disappear. The interval, or distance, between two images, or ideas, contemplated in the memory, is supposed by Mr Locke to furnish us with the notion of duration.

Mr Hume having discarded every object of knowledge, or belief, except his impressions and ideas, maintains that memory and imagination differ in nothing but the vivacity of the ideas which are their object. The ideas of memory he considers as something intermediate between the impressions which are the objects of the senses, and the ideas which more properly belong to the imagination. Hence, as the objects of memory and imagination differ only in degree, they may be considered as convertible, and the ideas of the one may be

mistaken for those of the other. The consequence is, that truth and falsehood are convertible, and proof of any kind altogether impossible.

It will not be necessary to enter into a serious refutation of these fallacious theories, since they rest upon no other foundation than the hypothesis of ideas, traces, or images present in the mind, and furnishing objects for its various operations; an hypothesis which has been amply discussed already, (See ch. 3. § 1.) If any further examination of the various theories concerning Memory, is deemed necessary, it will be found very satisfactorily accomplished by Dr Reid (Essay 3. on the Intel. Powers, c. 7.)

The truth appears to be, that of the precise manner in which the memory operates, we ought candidly to confess our ignorance. We know that we are possessed of a certain power, which enables us, in certain circumstances, to
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recal to the mind past occurrences ; but of the connexion between those occurrences, and this power of our minds, we know nothing ; and, had we not been endowed with such a power, we should probably have deemed it as incredible, and as difficult of comprehension, as a power which should give us a foreknowledge of future events : for there does not appear to be any more necessary connexion between the past and the present, than between the present and the future.

At the same time, the evidence which Memory carries along with it, of the existence of the events which are its object, is indisputable. Upon the evidence of Memory, when clear and distinct, we, without scruple, rest the most important concerns of life ; nor is this evidence at all inferior in degree to that of the senses, or of absolute demonstration. But it cannot be resolved into the evidence either of sense, or of any process of reasoning ; but must

be stated as a peculiar kind of evidence, which we are so constituted, as to admit of itself, immediately and incontestably.

This evidence, or belief, of past existence, which always accompanies memory, forms one important distinction between that faculty and the power of association, or combination, into which some have been inclined to resolve all the phenomena of memory. The suggestions which are made by the faculty of association alone, impress us with no belief of their reality. In fact, the very materials upon which they are employed, if not supplied by the immediate perception of the moment, must be furnished by the memory, or that faculty which enables us to treasure up past knowledge. Thus the power of association, in its most usual exercise, presupposes the power of memory; and when, during the spontaneous flow of the current of thought, we recognize a combination of which we had formerly been conscious, and distinguish

distinguish it from one newly formed, this necessarily implies an exercise of a faculty which can distinguish former knowledge from new ; which is not an attribute of the faculty of association, but of the memory alone. ‘ It is possible, surely, ’ says Mr Stewart, (Elem. &c. c. 6. § 1.) ‘ that our thoughts might have succeeded each other according to the same laws as at present, without suggesting to us at all the ideas of the past ; and, in fact, this supposition is realized to a certain degree in the case of some old men, who retain pretty exactly the information which they receive, but are sometimes unable to recollect in what manner the particulars which they find connected together in their thoughts at first came into the mind ; whether they occurred to them in a dream, or were communicated to them in conversation. ’

In such a case as this, we have an example of the power of association operating without
any

any aid from the memory. In some instances of active and voluntary recollection, we seem to have examples of the faculty of memory operating without any aid from the associating principle. But it must be acknowledged that, in most cases, the suggestions of memory are made by means of the combinations previously established among our thoughts. This, however, is but one part of the province of memory; for, as observed by Mr Stewart, ‘this faculty implies two things; a capacity of retaining knowledge, and a power of recalling it to our thoughts when we have occasion to apply it to use.’ (*ut supra.*) The first of these is entirely independent of the faculty of combination; but this faculty is the principal, though not the sole instrument, by which the latter purpose is accomplished. The advantages of this law of our nature are well stated by Mr Stewart, in the following passage: ‘On the other hand,’ says he, ‘it is evident, that without the associating principle, the
‘ power

‘ power of retaining our thoughts, and of re-
 ‘ cognizing them when they occur to us, would
 ‘ have been of little use ; for the most import-
 ‘ ant articles of our knowledge might have re-
 ‘ mained latent in the mind, even when those
 ‘ occasions presented themselves to which they
 ‘ are immediately applicable. In consequence
 ‘ of this law of our nature, not only are all our
 ‘ various ideas made to pass from time to time
 ‘ in review before us, and to offer themselves
 ‘ to our choice as subjects of meditation ; but,
 ‘ when an occasion occurs which calls for the
 ‘ aid of our past experience, the occasion it-
 ‘ self recalls to us all the information upon the
 ‘ subject which that experience has accumu-
 ‘ lated. ’ (*ut supra.*)

Mr Stewart has very candidly stated a dif-
 ficulty, which the belief of past existence, ac-
 companying memory, presents to his doctrine
 of a belief of present existence, accompanying
 every act of conception ; a doctrine which we
 examined

examined at some length in Chapter 6. sect. 2.
' It is evident, ' says he, ' that when I think
' of an event, in which any object of sense
' was concerned, my recollection of the event
' must necessarily involve an act of conception.
' But every act of recollection which relates to
' events, is accompanied with a belief of their
' past existence. How then are we to recon-
' cile this conclusion with the doctrine former-
' ly maintained concerning conception, accord-
' ing to which, every exertion of that power is
' accompanied with a belief that its object ex-
' ists before us at the present moment ?' The
solution he gives of the difficulty is, that the
first act of the mind, in such cases, is the be-
lief of present existence (which accompanies
conception ; and that, afterwards, a judgment is
formed from circumstances, or by the proper
exercise of memory, of the period of time to
which the thing in question is to be referred.
He however subjoins, that although he is
himself satisfied with this solution, he is far
from

from expecting that all his readers will be so. The difficulty, indeed, may fairly be stated, as an additional argument to those detailed in the above mentioned Section, against the reality of a belief accompanying conception.

I must likewise claim the liberty of differing from this ingenious philosopher in another point, which naturally comes to be considered here. He states the exercise of the memory, as depending principally upon two faculties of the mind, the Association of Ideas, and Attention. The connexion between Memory and the faculty of Association, we have just been endeavouring to illustrate; and the dependence of Memory upon the exercise of Attention, taking that word in its common acceptation, cannot be denied: the point which I think controvertible is, the considering Attention as a distinct faculty of the human mind, which has its own peculiar objects, just as Memory, Abstraction, or Perception have.

Mr

Mr Stewart has a very ingenious and interesting chapter on the subject of Attention, (Elem. &c. c. 2.), in which he ably illustrates that law of our nature, in consequence of which, if some attention be not given to the objects of our thoughts, that is, if they be not retained in the mind for a certain period of time, (perhaps to the exclusion of every other thought for that period); they will leave no trace behind them, and never be recollected, even the next succeeding moment. These reasonings serve to explain the curious fact, that there are many currents of thought, and even processes of reasoning, which pass through the mind so rapidly, that we remain for ever unconscious of them; of which some examples have been given in our chapter upon Conscientiousness, (c. 1.)

Still, however, though I admit the justness and the utility of these illustrations, I can see no necessity for assigning to the mind a peculiar

liar faculty called Attention, whose office it is to take previous cognizance of our various thoughts, in order that they may be again recognized by the memory. I can find no peculiar objects for the employment of this faculty, which do not belong to some one or other of those whose existence seems to be certainly established. Whatever is afterwards remembered, is either an object of the senses, that is, of the faculties of sensation and perception; or, it is some mental abstraction, some real or fancied relation, some object of consciousness or conception; in short, of some one or other of those mental faculties which are contained in the enumerations of Pneumatology, without, however, resorting to this disputed one of Attention. Thus, the Attention, if it be a peculiar faculty, must be a generally assisting faculty, which comes occasionally to the help of all the others, to give them clearer views of their several objects.

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Instead of adopting this conclusion, I would be inclined to reject the existence of the faculty altogether, and consider the meaning of the term *Attention*, or of *doing a thing attentively*, to be no more than a sedulous and steady exertion of the particular mental power then in question, whether it be Perception, Abstraction, Combination, or any other. To assert the contrary doctrine, appears to be nearly as inconsistent as to say, that, when a man lifts a burden of a hundred pounds weight, he must exert a muscular power, different in kind, as well as in degree, from that by which he is enabled to lift a weight of ten pounds. The rapid currents of thought which pass in our minds, generally unknown to ourselves, and which afford the most plausible argument for the necessity of a peculiar faculty, of the nature of Attention, appear to me to be proper objects, not of Attention, but of Consciousness, and, as such, have been considered in Chapter 1st.

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Mr Stewart seems likewise to have fallen into an error, in considering himself as the first writer who has treated of Attention as a distinct faculty of the human mind. ‘Although,’ says he, (Elem. &c. c. 2.) ‘the connexion between Attention and Memory has been frequently remarked in general terms, I do not recollect that the power of Attention has been mentioned by any of the writers on Pneumatology, in their enumeration of the faculties of the mind; nor has it been considered by any one, so far as I know, as of sufficient importance to deserve a particular examination. Helvetius, indeed, in his very ingenious work *De l’Esprit*, has entitled one of his chapters, “*De l’inégale capacité d’Attention*,” but what he considers under this article, is chiefly that capacity of patient inquiry, (or, as he calls it, “*une attention suivie*”), upon which philosophical genius seems, in a great measure, to depend. He has also remarked, with other writers, that the impression which any thing makes on the

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‘ memory,

‘ memory, depends much on the degree of
‘ attention we give it ; but he has taken no
‘ notice of that effort which is absolutely ne-
‘ cessary to the lowest degree of memory.’

Considering Mr Stewart’s acquaintance with the writings of Condillac, it is rather singular that he should not have known that that author treats of Attention as a peculiar faculty of the human mind ; (See his *Essai sur l’Origine des Connaissances Humaines*, § 2. c. 1.) ; more especially as we find in this author (See the same Chapter) a distinct illustration of the very doctrine here stated by Mr Stewart, *viz.*
‘ That our thoughts and perceptions must
‘ have become, for a certain time, objects of
‘ *attention*, before they leave any traces at all
‘ on the mind.’ *

The decay of memory in old men, is a matter of familiar observation, as well as that peculiarity with which it is usually accompanied,

* See also the introduction to the ‘ Cours d’Etude,’ and the beginning of the ‘ Art de Penser ’ of Condillac.

nied, *viz.* that a complete, and even minute recollection, usually remains of the events of an older date, and the occurrences of early life. The cause of the failure of memory, in regard to recent occurrences, is usually said to be the decay of Attention, in consequence of which, these occurrences do not make a sufficient impression on the mind to be afterwards recollected, while, at the same time, the associating principle remaining in full vigour, and the train of thought continuing to perform its office, circumstances which have been already familiarized to the mind are still suggested with the wonted accuracy. This explanation may be admitted as satisfactory, if we understand, by a decay of attention, not the diminished energy of some one peculiar faculty of the mind, but the relaxed vigour of all, or most of the mental faculties, which, like the bodily functions, being impaired by the approach of age, are incapable of contemplating their respective objects with that degree of

force which is requisite to their being distinctly remembered afterwards. The decay of sensibility, and extinction of passion, which are the consequences of old age, likewise powerfully cooperate in producing this effect, by diminishing the interest which the common occurrences of life are calculated to produce.

That kind of memory which old men possess, generally in a state of vigour, by which circumstances are presented spontaneously to the mind without any voluntary effort, has been called *Reminiscence*, or *Remembrance*; while that which requires a more vigorous effort, and is more dependent upon the will of the individual, has been distinguished by the name of *Recollection*. The former, as above mentioned, is chiefly dependent upon the faculty of *Association*; while the latter will not be found, but where the mind is capable of that active exertion of its faculties called *Attention*.

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The distinction is as old as Aristotle, (*De Memor. & Reminisc.*) who remarks, that the brutes possess the first kind of memory, but exhibit no traces of the last; which is therefore a valuable characteristic of man.

To the exercise of memory, we appear to be entirely indebted for the notion of Time, or Duration, which a being, destitute of that faculty, could never have possessed. Dr Reid has clearly pointed out the fallacy of Mr Locke's doctrine, which derives the notion of duration from a contemplation of the interval or distance between two ideas which we have acquired successively. (Essay III. on the Intel. Powers, c. 5.) As these ideas must, by the supposition, be both present in the mind at once, the idea of succession, or of time, is by no means necessarily included in the distance between them, unless we call in the aid of Memory, which informs us that we acquired the one idea before we acquired the other.

Such information as this, is the proper business of the faculty of Memory; which therefore, alone, and of itself, necessarily includes the notion or idea of Succession, and of Duration. It has farther been observed, that, without Memory, we could have had no idea of such a thing as Motion, which, being a *successive* change of place, presupposes the notion of succession or duration.

The notion of a limited duration, which we distinctly remember, leads us, by a kind of necessity, to the admission of a duration which has no limits.—which neither began, nor will have an end. In like manner, the notion of limited extension and magnitude, which we acquire by the senses, leads us to the belief of an unlimited extension, or of space which has no boundaries. Thus are acquired the notions of infinite space, and of infinite time, or eternity. It cannot, however, be pretended, that our finite capacities are capable of forming
adequate

adequate conceptions of these immense and unbounded attributes; it can only be said, that there is less difficulty in conceiving infinite space, and infinite time, than in conceiving the final boundaries of space, or the beginning or end of time.

SECTION II.

Of the Improvement of Memory.

As Memory is the principal instrument, by which all human knowledge is retained and brought into use, much attention has naturally been bestowed on the state in which this faculty exists in different individuals, and on the best means of improving it. In nothing, perhaps, do individuals differ more from each

other, than in the extent and accuracy of Memory. One man readily imbibes the knowledge that is imparted to him, although, perhaps, he does not long retain it, or cannot accurately communicate it again. Another acquires information slowly, and with difficulty, although, when once he makes the acquisition, it does not afterwards easily escape him ; while a third, perhaps, has the good fortune to possess a memory, at once susceptible, retentive, and ready.

A prejudice has, indeed, not uncommonly prevailed, that a great memory is scarcely compatible with that acuteness of parts denominated Genius ; insomuch, that no one blushes at acknowledging a shortness of memory, while, to be accused of a defect of judgment, or a want of penetration, is usually considered as a high affront. This prejudice, however, appears to be entirely without foundation ; and memory, far from being incompatible with
genius,

genius, seems even to be necessary, in its utmost perfection, for those happy exertions of intellect which confer immortality upon their authors. A great memory may, indeed, exist, without giving birth to genius, and is not unfrequently found in persons little removed from the state of idiocy; which circumstance may have given rise to the prejudice in question. But if we look around us, at those individuals who have acquired eminence as men of genius, or examine into the endowments of those who have formerly been famed for their intellectual exertions, we shall uniformly find, that a retentive and capacious memory formed the basis upon which their literary fame was reared.

This truth has been amply and satisfactorily illustrated by Mr Stewart, (Elem. &c. c. 6. § 8.), to whose observations I shall therefore refer. One more example modern times has enabled us to add, of the connexion between
genius

genius and great memory, which it may not be improper to mention. It is of that completely self-taught genius, and pleasing poet, Mr Robert Bloomfield, of whom it is authentically recorded, that he composed the latter part of the Autumn, and the whole of the Winter of his ‘Farmer’s Boy,’ mentally, without ever putting pen to paper. Nor was this all; for he even completely corrected and revised this extensive portion of his poem, before he ever wrote a word of it, and this, too, while at work with his fellow journey-men in a garret; and then, as he himself expressed it, when it was thus prepared, he had nothing to do but to write it down.

Such exertions of memory are truly wonderful; and, in fact, exertions of this faculty, which are much more ordinary, are sufficient to call forth our highest admiration. ‘Of a human memory,’ says Dr Beattie, (Essay on Mem.) ‘improved to no extraordinary pitch,
‘how

‘ how vast is the comprehension ! With what
 ‘ an endless multitude of thoughts is it supplied,
 ‘ by reflection, reading, and conversation, and
 ‘ by a diversified experience ! Things natu-
 ‘ ral ; as animals, vegetables, minerals, fossils ;
 ‘ mountains and vallies ; land and water ;
 ‘ earth and heaven ; the sun, moon, and stars,
 ‘ with their several appearances, motions, and
 ‘ periods ; the atmosphere and meteors, with
 ‘ all the vicissitudes of weather ; things artifi-
 ‘ cial, as towns, streets, houses, highways, and
 ‘ machines, with their various appendages ;—
 ‘ abstract notions with regard to truth and
 ‘ falsehood, beauty and deformity, virtue and
 ‘ vice ; proportions in quantity and number ;
 ‘ religion, commerce, and policy, whereof the
 ‘ brutes know nothing, and which are the
 ‘ chief materials of human conversation :—
 ‘ These are some of the general heads under
 ‘ which may be arranged the manifold trea-
 ‘ sures of human memory : and under each of
 ‘ these heads, what an infinity of individual
 ‘ things

‘ things are comprehended ! ’ — ‘ How numerous, ’ adds he afterwards, ‘ are the words even of one language ! He who is master of four, must be supposed to retain two hundred thousand words, at least, with all the different ways of applying them according to rule, and innumerable passages in books to illustrate their meaning. And that four languages do not exceed the capacity of an ordinary man, will not be denied by those who believe with Pliny and Quintilian, that Mithridates understood two and twenty. ’

The cultivation of so noble a faculty as the Memory, is surely then a matter of the highest importance ; and it is not to be wondered, that so much investigation has been bestowed upon the subject. At the same time, we must not expect that any cultivation, however assiduous, will completely supply the natural deficiencies of Memory, any more than those of Judgment, Taste, or any other faculty. The
utmost

utmost that can be expected from any exertion of our own, is to direct the Memory to its proper objects, and in that order and succession which will most facilitate its operation ; to remove, as much as may be, those obstructions which are calculated to retard the due action of the faculty ; and, by a repeated and sedulous exertion, to bring it to that degree of maturity and energy, which exercise so highly promotes in every human attainment.

In the preceding Section it has been stated, that the due exercise of Memory depends chiefly upon what is called attention, and the association of ideas ; whence we may conclude, that in order successfully to cultivate the Memory, we must cultivate those subordinate efforts of the mind. It is matter of the most familiar observation, that we must be attentive to any thing which we wish afterwards to remember ; that is, we must diligently exert that peculiar faculty of which it is an object, whether
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it be Perception, Sensation, Consciousness, Abstraction, or any other. In this exercise of attention, a due exertion of the faculty of Conception, which, as already observed, forms an ingredient in almost every mental operation, is of the greatest consequence. Whatever is distinctly conceived or understood, will in general be afterwards recollected; while vaguely formed or indefinite notions will leave no permanent traces upon the mind. When we read, therefore, let us labour to understand, clearly and precisely, our author's meaning; let us compare what goes before, with what follows in his work; let us search for the characteristic features of his system, and compare his opinions with those of other authors who have treated of the same subject. By this means, not only the faculty of conception, but the reasoning powers, will be usefully exercised; and the best provision will be made for a distinct recollection.

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It has been much disputed, whether it be an useful exercise to write down those things which we are desirous to remember ; but there can be little doubt, that in some cases this may be exceedingly proper ; in others not so. To write a great deal, cannot be highly useful to Memory ; for the attention is but too apt to be diverted from the matter itself, to the mere manual operation : but it is surely useful to transcribe certain short passages which we select, on account of the importance or curiosity of the matters which they contain, and to which we, by this means, can afterwards conveniently refer. It would likewise, no doubt, be a very useful exercise to write a short abridgement and character of any important treatise we have read ; or at least to state the leading tenets of the work, and our opinion of its merits, in a few short paragraphs. We should thus form a sort of register of our studies, to which we might afterwards refer with the greatest advantage.

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This last exercise is evidently subservient to the faculty of Association, as well as to Attention ; and, whatever aids that important principle of our nature, is in the highest degree conducive to Memory. Most of the above remarks have indeed a tendency to promote the exercise of Association, as well as of Attention. Thus, when we compare together the different parts of an author's work, so as to form out of it one consistent whole, we provide that, by means of the associating principle, the recollection of one part shall suggest to us the complete system. If, again, we compare the opinions of one writer with those of another who has treated of the same subject, we shall digest the whole into one system, by which the principle of Association will be still farther promoted. This systematic arrangement of the principles of any branch of knowledge, will be found to be attended with the greatest advantage ; and if some such general system of principles is not formed, reading will furnish nothing

thing but a desultory collection of ideas, scarcely applicable to any useful purpose:

It has been remarked, that in those branches of knowledge which have not yet been formed into a real philosophical system, which is perhaps the case with Medicine, Physiology, Chemistry, and some others, it is better to adopt a merely hypothetical system, for the purpose of reference and arrangement, than to be destitute of all system. In such a case, however, we must be careful to recollect, that our system is but an hypothesis, lest it should usurp in our minds the place of legitimate theory. In the study of history, short abridgments answer the end of systems, by forming a general chart, to which the more minute details may be referred; and an abridgement of universal history enables us to ascertain the relative importance of those particular histories to which our attention has been directed, and their mutual connexion one with another. Some such

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general chart of science would be of the greatest importance to the assiduous student, by giving him clearer views of the relative value of the particular branch to which he has devoted himself, and its connexion with the other branches of human knowledge.

With respect to the mechanical expedients which have been proposed for aiding the memory, it does not appear that much real advantage is to be expected from them. Of these the most celebrated is the *loci*, or topical memory of the ancient rhetoricians, of which some account is delivered in the writings of Cicero and Quintilian. The intention of this expedient was to facilitate the recollection of the various heads of an oration, by associating them in the mind with the different apartments of a house; or the various houses in a street, the precise succession of which had been previously rendered familiar to the mind. The subordinate parts of the discourse were to be associated

associated with the furniture of the rooms, or the subdivisions of the houses; and thus the whole oration was to be suggested to the memory, with very little effort.

This mechanical contrivance is no doubt founded in nature; for, as Quintilian observes, ‘when we revisit any place after a lapse of time, we not only recognize the scene, but we are led to recollect all that passed in it when we were there before.’* Mr Stewart, too, speaks of a young woman, in a very low rank of life, who contrived a method of committing to memory the sermons which she was accustomed to hear, by fixing her attention, during the different heads of the discourse, on

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* Cum in loca aliqua post tempus reversi sumus, non ipsa agnoscimus tantum, sed etiam quæ in his fecerimus, reminiscimur, personæque subeunt, nonnunquam tacitæ quoque cogitationes in mentem revertuntur.—*Quint. Inst. Orator. l. II. c. 2.*

different compartments of the roof of the church, in such a manner, as that when she afterwards saw the roof, or recollected the order in which its departments were disposed, she recollected the method which the preacher had observed in treating his subject. (Elem. &c. c. 6. § 6.) Yet, after all, it may fairly be questioned, whether, in the case of an oration, it would not prove more laborious permanently to associate the various heads of discourse with the different apartments of a house, than at once to fix in the memory the natural succession of the heads themselves. Quintilian, indeed, candidly acknowledges, that he never received any benefit from this artificial kind of memory, which has now fallen entirely into disuse. In allusion to it, however, the heads of a discourse are still called *topics*, and we continue to say *in the first place, in the second place, &c.*

An artificial help to the memory, which is
certainly

certainly more useful, is the employment of memorial lines, or verses, in which, by the substitution of the letters of the alphabet for the numeral characters, we can easily commit to memory certain dates, measures, computations, &c. This is called the *Ars Lulliana*, on account of the attention which the famous Lully bestowed upon it; and an ample collection of such memorial verses, is to be found in a small volume by Gray, called *Memoria Technica*. The merit of this art consists in substituting words which are easily remembered, instead of numbers, which it is very difficult to remember. But neither it, nor any other mechanical expedient, affords any real cultivation to the faculty of Memory. This object, it would seem, can be accomplished only by cultivating those exertions of the mind on which the faculty of Memory depends, *viz.* Attention, and the Association of Ideas.

CHAPTER EIGHTH.

Of Reason.

SECTION I.*Analysis of the Faculty.*

THAT man is endowed with Reason, a faculty by which he is enabled to examine and appreciate the various objects of his observation, and even to ascend to the knowledge of the First Cause of all created beings, has naturally furnished the subject of his exultation; and the title of 'rational animal,' by which he chooses to distinguish himself, forms at once an honourable and a precise mark of discrimination.

crimination between him and the lower animals. It is therefore an object of the highest interest, as well as importance, to examine into the nature of this faculty, and to ascertain the principles by which it is regulated ; an object which not only forms the primary purpose of all the treatises of Logic, but even of those treatises which take a more enlarged view of the various faculties of the human mind.

A distinction has very generally prevailed among the writers on Intellectual philosophy, according to which the power of Reason is represented as constituted by two distinct faculties, one of which is called Judgment, the other Reasoning. This distinction seems to have originated with the ancient Logicians, to whose system it was very conveniently adapted ; for, according to this system, the natural progress of knowledge was represented to be, First, the formation of ideas, or simple notions, unaccompanied by belief, which was the pro-

vince of Simple Apprehension, *i. e.* Perception, or Conception: Secondly, the comparing these simple notions together, and the expressing a belief, or opinion, concerning them, which was the province of Judgment, and is always expressed by a proposition: And, Thirdly, the comparing together our various judgments, and deducing conclusions from them, which was represented to be the province of Reasoning. Thus, says Dr Watts, ‘ As the
‘ first work of the mind is Perception, where-
‘ by our ideas are framed, and the second is
‘ judgment, which joins or disjoins our ideas,
‘ and forms a proposition; so, the third operation of the mind is Reasoning, which joins
‘ several propositions together, and makes a
‘ syllogism; that is, an argument whereby we
‘ are wont to infer something that is less known,
‘ from truths that are more evident.’ (Logic, Part 3. at the beginning.)

But this distinction of the rational faculty,
into

into Judgment and Reasoning, has been by no means confined to the Logicians, whose purpose it so manifestly answered, but has been followed by most of the subsequent writers on the intellectual powers of man. Dr Reid, like Locke, treats separately of the two faculties, and precisely states that there is a distinction between them. * Having adopted the
logical

* Locke seems to use the term Judgment in a sense different from that which is usually given to it. ‘ The mind,’ says he, (B. IV. c. 14. § 4.) ‘ has two faculties ‘ conversant about truth and falsehood. 1st, Knowledge, ‘ whereby it certainly perceives, and is undoubtedly satisfied of the agreement or disagreement of any ideas. ‘ 2^{dly}, 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.’ The term Judgment, in its philosophical sense, is, doubtless, more usually applied to the first of these acts of the mind, than to the second. The term *Reasoning*, however, or *Reason*, is used by Mr Locke in its ordinary acceptation. ‘ The greatest part of
‘ our

logical definition of Judgment, which states it to be ‘ an act of the mind, whereby one thing ‘ is affirmed or denied of another,’ (Essay VI. c. 1.),

‘ our knowledge,’ says he, (B. IV. c. 17. § 2.), ‘ depends upon deductions and intermediate ideas; and in ‘ those cases, where we are fain to substitute assent instead of knowledge, and take propositions for true, ‘ without being certain they are so, we have need to find ‘ out, examine, and compare the grounds of their probability. In both these cases, the faculty which finds ‘ out the means, and rightly applies them to discover ‘ certainty in the one, and probability in the other, is ‘ that which we call Reason.’ In the same Chapter, (Sect. 17.), he thus defines the boundaries of these three species of knowledge. ‘ *Intuitive* knowledge,’ says he, ‘ is the perception of the certain agreement or disagreement of two ideas, immediately compared together. ‘ *Rational* knowledge is the perception of the certain ‘ agreement or disagreement of any two ideas, by the ‘ intervention of one or more other ideas. *Judgment* is ‘ the thinking or taking two ideas to agree or disagree, by ‘ the intervention of one or more ideas, whose certain ‘ agreement, or disagreement, with them, it does not perceive, but hath observed to be frequent and usual.’

c. 1.), he says, (Essay VII. c. 1.), ‘ There is a
 ‘ distinction between Reasoning and Judging.
 ‘ Reasoning is the process by which we pass
 ‘ from one judgement to another which is the
 ‘ consequence of it. Accordingly, our judge-
 ‘ ments are distinguished into intuitive, which
 ‘ are not grounded upon any preceding judge-
 ‘ ment ; and discursive, which are deduced
 ‘ from some preceding judgment, by reason-
 ‘ ing. In all reasoning, therefore, there must
 ‘ be a proposition inferred, and one or more
 ‘ from which it is inferred. And this power
 ‘ of inferring, or drawing a conclusion, is only
 ‘ another name for Reasoning ; the proposition
 ‘ inferred being called the *conclusion*, and the
 ‘ proposition, or propositions, from which it is
 ‘ inferred, the *premises*. ’

Dr Reid, however, is candid enough to ac-
 knowledge, that the limits between Judgment
 and Reasoning are not very precisely settled.
 ‘ A process,’ says he (as above), ‘ consisting
 ‘ of

‘ of many steps, is so easily distinguished from
‘ Judgment, that it is never called by that
‘ name. But, when there is only a single step
‘ to the conclusion, the distinction is less obvi-
‘ ous ; and the process is sometimes called
‘ Judgment, sometimes Reasoning.’ And he
adds afterwards, ‘ we are taught in Logic, that
‘ Judgment is expressed by one proposition,
‘ but that Reasoning requires two or three.
‘ But so various are the modes of speech, that
‘ what in one mode is expressed by two or
‘ three propositions, may, in another mode, be
‘ expressed by one. Thus, I may say, “ *God*
“ *is good, therefore good men shall be happy.*”
‘ This is reasoning of that kind which logici-
‘ ans call an *enthymeme*, consisting of an ante-
‘ cedent proposition, and a conclusion drawn
‘ from it. But this reasoning may be express-
‘ ed by one proposition, thus: “ *Because God*
“ *is good, good men shall be happy.*” This is
‘ what they call a causal proposition, and
‘ therefore expresses Judgment ; yet the en-
‘ thymeme,

‘ thymeme, which is Reasoning, expresses no
‘ more. ’

I am inclined to infer from these considerations, as well as from the illustrations which are to follow, that the distinction which has been made between Judgment and Reasoning, is not founded in any natural diversity of the nature or objects of the faculties ; and has no other foundation than the various manner in which the same faculty is occasionally applied. When the truth which is asserted, or the falsity which is denied, are perfectly obvious, and require little or no examination, the faculty is then commonly called Judgment ; but, when they are more remote from common apprehension, and require a careful investigation, it has then been dignified with the name of Reasoning. In fact, in the very definition which the logicians give of Judgment, it is allowed that two things or ideas are compared together, *viz.* the subject and predicate of the proposition expressed ;

pressed ; and, in a process of Reasoning, each step consists of nothing more than a like comparison of the agreement or disagreement of the propositions which immediately follow one another.

This will be rendered still more apparent, if we take for an example any clear and indisputable process of reasoning, and examine what is the evidence by which we are led to infer one step from the immediately preceding one ; or the conclusion from the general premises ; when it will appear that this is accomplished solely by the application of some self-evident truth, or necessary first principle, *i. e.* by the intervention of what is called Judgment alone. Thus, in the first proposition of Euclid's Elements, in which two circles are described having a common radius, we infer, that the radii of the one circle are all equal to those of the other, because each of them, according to the definition of a circle, must be equal to this one
common

common radius. What then, I ask, is the principle which leads us to make this inference? Euclid will inform us that it is the self-evident truth or axiom, that, when two magnitudes are severally equal to some third magnitude, they must be equal to one another. But this truth is among those which are allowed to be known by the faculty of Judgment; so that, in this instance, the process of reasoning is nothing more than a particular application of an intuitive judgment; nor would it be difficult to extend the illustration to a variety of examples.

If this account of the matter be just, it would seem adviseable to lay aside the distinction between Judgment and Reasoning, as void of any natural foundation; and to substitute, in the room of both, the term Reason, which has been indiscriminately used for either. It is not, however, so easy to say what is the precise office of this noble faculty, or accurately to ascertain

ascertain what are the peculiar objects on which it is properly exercised. From what has been just stated, it seems natural to infer, that the objects of reason are no other than those self-evident truths or axioms, to which we find ourselves compelled to assent by a kind of necessity, inasmuch, that we cannot conceive that their opposites should be true. Admitting this to be the case, Reason may be defined, that faculty by which we are made acquainted with abstract, or necessary truth ; but this definition I propose with much diffidence, as it is not supported by the concurrence of any authority.

Dr Reid has assigned a much more extensive range than what is here allotted to our rational powers; for, having discarded Mr Locke's account of Judgment, which assigns for its office, the ascertainment of the agreement or disagreement of our ideas, he adopts in its stead the older definition of the Logicians, *viz.* that Judgment is an act of the mind, whereby
one

one thing is affirmed or denied of another. (Essay VI. on the Intellectual Powers, c. 1.) It follows from this, that every kind of belief, whether accompanying the contemplation of abstract truth, or following the operation of the faculties of Perception, Memory, Conscioufness, &c. is the consequence of Judgment alone. Accordingly, this doctrine is distinctly stated by Dr Reid, who says, (*ut supra*,) ‘ In persons
‘ come to years of understanding, Judge-
‘ ment necessarily accompanies all sensation ;
‘ perceptions by the senses, conscioufness and
‘ memory, but not conception. ’ And he adds afterwards, ‘ It is evident, that a man
‘ who feels pain, judges and believes that he is
‘ really pained. The man who perceives an
‘ object, believes that it exists, and is what
‘ he distinctly perceives it to be ; nor is it in
‘ his power to ayoid such judgment. And the
‘ like may be said of Memory and of Con-
‘ scioufness. It is certain, that all of them are
‘ accompanied with a determination that some-
‘ thing

‘ thing is true or false, and a consequent
 ‘ belief. If this determination be not Judge-
 ‘ ment, it is an operation that has got no
 ‘ name ; for it is not simple Apprehension,
 ‘ neither is it Reasoning ; it is a mental affir-
 ‘ mation or negation ; it may be expressed by
 ‘ a proposition affirmative or negative, and it
 ‘ is accompanied with the firmest belief. These
 ‘ are the characteristics of Judgment ; and I
 ‘ must call it Judgment till I can find another
 ‘ name to it.’

I confess I am unable to reconcile this doctrine, with what Dr Reid had previously laid down concerning the evidence of the senses, of memory, &c. to which I implicitly subscribe. ‘ It appears, therefore,’ says he, (Essay II. c. 5.) ‘ that the clear and distinct
 ‘ testimony of our senses carries irresistible
 ‘ conviction along with it, to every man in
 ‘ his right judgment. That this conviction is
 ‘ not only irresistible, but it is immediate. We
 ‘ ask

‘ask no argument for the existence of the
 ‘object, but that we perceive it; Perception
 ‘commands our belief upon its own authority,
 ‘and disdains to rest its authority upon any
 ‘reasoning whatever.’ Again, when speaking
 of Memory in the following Essay, (c. 1.) he
 observes, ‘Memory is always accompanied
 ‘with the belief of that which we remember,
 ‘as Perception is accompanied with the belief
 ‘of that which we perceive, and Consciousness
 ‘with the belief of that whereof we are con-
 ‘scious.’ ‘I find in my mind,’ adds he,
 (c. 2.) ‘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 firm-
 ‘ly what I distinctly remember; but I can
 ‘give no reason of this belief. It is the in-
 ‘spiration of the Almighty that gives me this
 ‘understanding.’

The conclusion to which these observations appear to me to lead is, that the evidence of Sense, and the evidence of Memory, as well as that of Consciousness, are, each of them, completely independent sources of belief, which cannot be resolved either into one another, or into any common principle; and to this conclusion I willingly subscribe my assent. But this conclusion appears to me utterly irreconcilable with the doctrine which resolves the belief accompanying these operations, and, indeed, all belief whatever, into an exercise of Judgment. Instead of this I should be inclined to say, that, in like manner as the belief derived from the senses, that from Memory, and that from Consciousness, are all independent of each other, and are inherent in the very faculties themselves; so does the faculty of Judgment, or rather Reason, produce an implicit belief of the reality of those distinctions which it points out, and of those truths which it immediately recognizes; which belief is of

peculiar kind, and cannot be resolved into any other species, although it demands our assent with equal force.

The objects of Reason, then, are those general truths, which have usually been called necessary; by which is meant, that we not only believe them to be true, and their opposites to be false, but that we believe their opposites to be impossible, and in their very nature self-contradictory. The cause of this belief and conviction I am unable to resolve into any thing else than the original constitution of our nature, by which it is decreed that we cannot refuse our assent to those truths which are the proper objects of reason, without the consciousness of acting absurdly and inconsistently. In like manner, the belief which accompanies Perception, Memory, and Consciousness, cannot be resolved into any thing else than the original constitution of our nature; and it impresses us with the conviction of equal certainty, as that

which is inherent in Reason. But we do not call the truths which are ascertained by these first mentioned faculties necessary truths, because we conceive their opposites to be possible, although we believe them to be false. Both kinds of truths, however, are called intuitive, or self-evident, because they are admitted, immediately, and upon their own proper evidence alone; and this last mentioned class of truths are called Contingent, to distinguish them from the necessary truths which are the objects of Reason.

Philosophers, in general, have been much more disposed to admit the evidence of Reason, than that of the various classes of contingent truths; and have too frequently attempted to undermine the latter by means of the former. Thus, Descartes, as we have repeatedly had occasion to remark, rejected all contingent evidence, except the evidence of Consciousness; and most metaphysicians, both ancient and modern, have deemed the testimony
of

of the senses very questionable. But the sceptical sect of philosophers, as is well known, have carried disbelief so far as to reject the evidence of Reason itself, and have asserted, that there was no sufficient cause for believing one thing more than another. Mr Hume is doubtless the most ingenious defender of this wonderful paradox ; for a paradox it surely is, of the most extraordinary kind, to attempt to prove, by a laboured process of reasoning, that there is no evidence whatever in reasoning itself.

The argument of Mr Hume amounts principally to this, that Judgment and Reasoning resolve themselves into Conception, or the mere formation of arbitrary and fanciful ideas. To make the matter very clear, he tells us, (Treatise of Human Nature, Vol. I. p. 172.) that an opinion or belief may most accurately be defined, ‘ a lively idea, related to, or associated with a present impression.’ By such

unintelligible explanations, and self-contradictory assertions, has he attempted to subvert the evidence of the faculty of Reason, that invaluable prerogative of man.

Scepticism, it has been observed, takes its origin from a complete misapprehension of the nature of reasoning; which, of necessity, must rest upon something that is taken for granted, or admitted, upon its own proper evidence, forming what is called a first principle. To ascertain, therefore, what truths are deservedly entitled to be ranked as first principles, or are to be admitted intuitively, is evidently an inquiry of the highest importance; to which, as naturally offering itself for consideration in this place, we shall turn our attention in the next Section.

SECTION II.

Of First Principles ; or Intuitive Truths.

THE acute genius of Aristotle seems to have formed very just notions of the nature of first principles, and the necessity of grounding every scientific investigation upon them. In the second book of his *Analytics*, we have what may be called a treatise upon first principles ; and it is the oldest upon the subject of which we are possessed. Among other valuable remarks, Aristotle says, (*Analyt. l. 2. c. 16.*)

‘ Except some first principles be taken for
 ‘ granted, there can be neither reason nor
 ‘ reasoning. It is impossible that every truth
 ‘ should admit of proof, otherwise proof would
 ‘ extend *in infinitum*, which is altogether in-
 ‘ compatible with its nature ; and if ever men
 ‘ attempt

‘ attempt to prove a first principle, it is because
 ‘ they are ignorant of the nature of proof.’

Aristotle, however, has attempted no enumeration of first principles; and although he appears to have formed so very just notions of their general nature, yet it is manifest, from the tenor of the Peripatetic philosophy, that he assumed many things as first principles, which, not only have no claim to be considered as self-evident, but which we now certainly know to be false. Such were the assumptions, that the earth is at rest, that the heavenly bodies move in circles, that nature abhors a vacuum, that all bodies are composed of matter and form, and a variety of others.

Descartes was the first that successfully exposed the fallacy of the Aristotelian philosophy, at least in so far as regards Metaphysics; and appears to have been fully aware of the erroneous conclusions to which so many gratuitous assumptions

tions must lead. While, however, he rejected the numerous hypotheses of Aristotle, he went into an opposite error, no less dangerous to sound philosophy, by narrowing too much the basis of first principles, or truths which must be admitted on their own proper evidence. In the philosophy of mind, he expressly admits but one first principle, the consciousness of our existence; and he attempts to deduce all natural phenomena from the combined influence of matter and motion alone. To this circumstance may fairly be ascribed all the false philosophy of Berkeley, Hume, and the modern sceptics.

To mistakes in first principles, then, appears to be due much of the sophistry that has so long perplexed the world. The first person who seems to have been sufficiently aware of this truth, was the well-known Father Buffier, whose, ' *Traité des Premiers Vérités, et de la Source de nos Jugemens,* ' appeared about
the

the year 1724, and forms the first express treatise upon first principles since the time of Aristotle. The opinion given of this work, by a very competent judge (Dr Reid), is in the highest degree favourable. ‘ I think, ’ says he (Essay 6. on the Intellectual Powers, c. 7.) ‘ there is more which I take to be original in ‘ this Treatise, than in most books of the metaphysical kind I have met with ; that many ‘ of his notions are solid ; and that others, ‘ which I cannot altogether approve, are ingenious. ’

The work, indeed, appears to be justly entitled to this high encomium ; for it is characterized throughout by an uncommon portion of good sense, and a perfect freedom from attachment to any philosophical hypothesis or system. In the course of Buffier’s inquiries, the most celebrated controversies in philosophy come incidentally to be touched upon ; such as the spirituality of the human soul, the question

tion of moral liberty and necessity, the abstract attributes of time and space, property and accident, identity, essence, &c.; and even the celebrated ideal theory; and, upon all these difficult questions, the observations of this author are in the highest degree rational and satisfactory.

With respect to his more immediate subject, the first principles of knowledge, it may be said, that Buffier has been more successful in pointing out the necessity of admitting a variety of such upon their own proper evidence, than in the particular enumeration and classification which he has left us. The two great sources from which he derives his first principles, are the consciousness we have of our own thoughts, and common sense*; which last source, he says, is scarcely mentioned by philosophers; but which he employs in the common acceptation of the phrase, as denoting the faculty

* 'Sens commun.'

by which men form judgments on the ordinary objects of their experience, which are not properly subjects of Conscioufnefs. ‘ If,’ says he, ‘ the advocates for *innate ideas* understand, ‘ by that term, what I mean by *common sense*, ‘ I shall not cavil about words; and as they ‘ cannot avoid coinciding with me, and admitting common sense for the first rule of truth, ‘ I shall readily agree to admit their innate ‘ ideas, taking them, however, in their precise and true signification.’ (Part I. c. 5.)

In the same chapter, he gives the following examples of the principles of common sense, though not as a complete enumeration of them:

1. There are other beings, and other men in the world besides myself.
2. There is in them something that is called truth, wisdom, prudence; and this something is not merely arbitrary.
3. There is in me something that I call intelligence, or mind; and something which is
not

not that intelligence, or mind, and which is named *body*; so that each possesses properties different from the other.

4. What is generally said and thought by men in all ages and countries of the world, is true.

5. All men have not combined to deceive and impose upon me.

6. What is not intelligence, or mind, cannot produce all the effects of intelligence, or mind; neither can a fortuitous jumble of particles of matter form a work of such order, and so regular motion, as a watch.

In chapter 7th, Buffier mentions three qualities, or tests, by which first truths, or maxims, of common sense, may be distinguished from all others. 1st, They are so clear, that they cannot be proved by any thing clearer: 2d, They have been admitted in all countries, and at all times, with exceedingly few exceptions: and, 3d, They are so strongly imprinted in
our

our minds, that we regulate our conduct by them in spite of all the speculative refinements of that philosophy which denies them. In carrying on his inquiries, he seems to consider the general consent of mankind as affording the surest test, by which first truths are made known ; and, although aware of the objection which the generally prevailing prejudices, and false opinions, which have been found among men, furnish to this doctrine, he is not altogether successful in obviating its force. He has likewise fallen into the common error of his time, by considering the testimony of the senses, as at best affording but probable evidence, and by no means entitled to be ranked on the footing of certain and intuitive truth. The evidence of memory he likewise places on the same level as the evidence of sense. (See part 1. c. 14. 15. &c. and 20.)

The important science of first truths thus successfully commenced by Buffier, seems for

a while to have attracted little notice; and the career of scepticism was by no means impeded by the able arguments which the learned father had opposed to it. The writings of Mr Hume brought the sceptical system to its finished state, and proposed a set of doctrines so completely repugnant to common sense, that, as was naturally to be expected, men began again to seek for the foundations of a rational belief, and to endeavour to ascertain what the first principles of knowledge really were. Dr Reid was undoubtedly among the first, as well as the most eminent, in conducting this important inquiry; and was led to it, as he himself candidly confesses, by the repugnance he felt at admitting the obnoxious tenets of Mr Hume.

In the dedication to his Inquiry into the Human Mind, (first published in 1764) this philosopher informs us, that he never thought of calling in question the received principles with regard to the human understanding, until

the Treatise of Human Nature was published in the year 1739. To this he was led, by his reluctance to admit the sceptical doctrine; being firmly persuaded, he says, 'that absolute scepticism is not more destructive of the faith of a Christian, than of the science of a philosopher, and of the prudence of a man of common understanding.' In this, his first publication upon Intellectual Philosophy, he fully investigates those mental operations which depend upon the five senses, and attacks scepticism in its strongest hold, by establishing the authority of the senses as decisive in their own proper province, and affording principles of belief as certain as any which we possess. In this speculation, Dr Reid was completely original, as no philosopher before him had considered the evidence of sense as any thing more than probable at best; but this being once established as an intuitive truth, or first principle, the certainty of the evidence of memory, consciousness, and others of our faculties, easily followed;

lowed ; and nothing remained but to arrange and methodize the various species of intuitive truths, or certain and independent sources of belief.

The essay on the Immutability of Truth, published by Dr Beattie in 1770, successfully followed up the blow which Dr Reid had levelled against the sceptical system. It gives a more detailed examination to the obnoxious tenets of Hume, as well as of Berkeley and the other sceptical writers ; and contains many important observations on the nature of evidence, the rational grounds of belief, and the different species of truths. In this work the author proposes the following enumeration of the various kinds of evidence, or sources of belief. 1. Mathematical evidence. 2. The evidence of external sense. 3. The evidence of consciousness. 4. The evidence of memory. 5. That evidence which we have, when, from effects, we infer causes. 6. Probable evidence ;

x 2

and,

and, 7. The evidence of testimony. The first five, he states to be *certain* intuitive truths, or maxims of common sense. The remaining two he likewise considers as intuitive truths, or maxims of common sense, but which we hold only to be probable, and not certain; and he divides the 6th class into two species, 1st, The evidence by which we judge of future events by our past experience of similar events; and, 2d, The evidence of analogy. (See Essay on the Immutability of Truth, Part I. c. 2.)

The work of Dr Campbell on the Philosophy of Rhetoric, published in 1776, proceeded from the same school which had given birth to the writings of Reid and Beattie; and among all these authors there existed, not only a similarity of sentiments, but the greatest mutual cordiality. To this circumstance we may ascribe the chapter which Dr Campbell has introduced, 'of the different sources of evidence, and the different subjects to which they

‘ they are respectively adapted,’ (Vol. I. b. 1. c. 5.); and which he himself acknowledges not to be very intimately connected with his subject. Dr Campbell divides all evidence into two kinds ; Intuitive, which is admitted immediately, on a bare attention to the ideas under review ; and Deductive, which is admitted mediately, by a comparison of these with other ideas. Intuitive evidence he arranges under three heads, 1. Mathematical axioms, which he states to be the result of pure *Intelleétion* : 2. Conscioufness : and, 3. Common Sense ; under which last he seems to comprehend, both the evidence of Sense and that of Memory, as he gives the following specimen of the truths which we derive from this source. ‘ Whatever has a beginning, has a cause. When there is in the effect a manifest adjustment of the several parts to a certain end, there is intelligence in the cause. The course of nature will be the same to-morrow that it is to-day ; or, the future will resemble the past. *There is such*

' a thing as body ; or, there are material substances, independent of the mind's conceptions. There are other intelligent beings in the universe besides me. The clear representations of my memory, in regard to past events, are indubitably true.' Deductive evidence is founded upon the intuitive ; and Dr Campbell considers it as of two kinds ; that which is founded upon the axioms of pure intellection, which he calls Scientific or Demonstrative ; and that which is founded upon the dictates of consciousness and common sense, which he calls Moral or Probable Evidence, and divides it into, 1. The knowledge we derive from experience ; 2. That from analogy ; 3. Testimony ; and, 4. The calculation of chances ; which last he considers as a mixed kind of evidence, partly certain, and partly probable only.

The similarity of these two arrangements is very evident ; and it is likewise plain, that both are meant to comprehend, not only intuitive

tive truths, which are our immediate concern, but likewise the evidence which is derived from a chain of proof, or process of reasoning. Without stopping to inquire into the merits or defects of either classification, we shall proceed to state the result of Dr Reid's final examination of this important subject, as contained in his last production on the Intellectual Powers of Man, first published in 1785, after an interval of nineteen years continued reflection on the subject which had given birth to his Inquiry in 1764.

In the essay upon Judgment, Dr Reid has bestowed a great deal of consideration upon the subject of first principles, and devoted several chapters to their discussion. In Chapter 4. he observes, that, although it is contrary to the nature of a first principle to admit of a direct or apodictical proof, because it must necessarily be taken for granted upon its own proper evidence; yet we are not destitute of means, by

which those that are just and solid may be confirmed, and those that are false may be detected. He then proceeds to enumerate and illustrate these means, which he makes to be these five. 1st, To shew that a first principle stands upon the same footing with others which we implicitly admit. 2d, The proof *ad absurdum*, which furnishes a very satisfactory way of establishing the certainty of a first principle, by shewing the inconsistencies that result from rejecting it. 3d, Proving that the principle in question has had the consent of all ages and nations. 4th, Shewing that it has had a place in the human mind from earliest infancy; or, 5th, That it influences our practice in the common conduct of life, in spite of the refinements of sophistry.

This being premised, Dr Reid proceeds to an enumeration of first principles, or intuitive truths, which he divides into two classes; those which are necessary and immutable, whose contrary

trary is impossible ; and those which are contingent and mutable, and which depend upon the present constitution of things. (Essay VI. on the Intell. Powers, c. 5.)

He begins with the consideration of the second class, of which he enumerates the following species, at the same time illustrating each at length. ‘ 1st,’ says he, ‘ I hold as a first principle, the existence of every thing of which I am conscious. 2d, That the thoughts of which I am conscious, are the thoughts of a being which I call *myself*, my *mind*, my *person*. 3d, That those things did really happen which I distinctly remember. 4th, Another first principle is, our own personal identity, and continued existence, as far back as we remember any thing distinctly. 5th, Another, that those things do really exist which we distinctly perceive by our senses, and are what we perceive them to be. 6th, Another, that we have some degree of power
‘ over

‘ over our actions, and the determinations of
‘ our will. 7th, Another, that the natural
‘ faculties by which we distinguish truth from
‘ error are not fallacious. 8th, That there is
‘ life and intelligence in our fellow-men, with
‘ whom we converse. 9th, That certain fea-
‘ tures of the countenance, sounds of the voice,
‘ and gestures of the body, indicate certain
‘ thoughts and dispositions of mind. 10th,
‘ That there is a certain regard due to human
‘ testimony in matters of fact; and even to
‘ human authority in matters of opinion.
‘ 11th, There are many events depending up-
‘ on the will of man, in which there is a self-
‘ evident probability, greater or less, according
‘ to circumstances; and, 12th, That, in the
‘ phenomena of nature, what is to be, will
‘ probably be like to what has been in similar
‘ circumstances.’

The necessary first principles are what have
generally been denominated axioms; and, of
these,

these, Dr Reid reckons various species, according to the sciences to which they belong. ‘ 1st,

‘ There are grammatical axioms, such as, that
‘ every complete sentence must have a verb.

‘ 2d, Logical axioms, as that every propo-
‘ sition is either true or false; whatever may be

‘ truly affirmed of a genus, may be truly af-
‘ firmed of all the species, and all the indivi-

‘ duals belonging to that genus. 3d, Mathe-
‘ matical axioms, which are well known,

‘ 4th, There are axioms, he thinks, even in
‘ matters of taste, by which our decisions in

‘ the fine arts are regulated. 5th, There are
‘ likewise axioms in morals, which regulate

‘ our opinions of right and wrong. And, 6th,
‘ There are metaphysical axioms, such as, that

‘ all qualities must have a subject; whatever
‘ begins to exist, must have a cause which pro-

‘ duced it. And, lastly, that design and intelli-
‘ gence in the cause, may be inferred, with

‘ certainty, from marks or signs of it in the
‘ effect.’

‘ effect. ’ (Essay VI. on the Intellect. Powers, c. 6.)

All these first principles of knowledge are, according to Dr Reid’s system, the dictates of what he calls Common Sense. The following passage seems to convey the clearest explication of this philosopher’s sentiments respecting the meaning of this term. ‘ We ascribe ’ says he (Essay VI. on the Intellectual Powers, c. 2.) ‘ to reason, two offices or degrees. The first is, to judge of things self-evident; the second, to draw conclusions that are not self-evident, from those that are. The first of these is the province, and the sole province of Common Sense; and, therefore, it coincides with reason in its whole extent, and is only another name for one branch or one degree of reason. Perhaps it may be said, ‘ Why then should you give it a particular name, since it is acknowledged to be only a degree of reason? It would be a sufficient
‘ answer

‘ answer to this, Why do you abolish a name
 ‘ which is to be found in the language of all
 ‘ civilized nations, and has acquired a right
 ‘ by prescription?—Every wise man will be
 ‘ apt to think, that a name, which is found in
 ‘ all languages, as far back as we can trace
 ‘ them, is not without some use.’*

Dr Beattie seems to have employed the term
 in the same acceptation, or in a yet more ex-
 tensive

* A similar account of the province of Common Sense,
 is given at the conclusion of the Inquiry into the Human
 Mind. ‘ Such original and natural judgments,’ says our
 author, (c. 8.) ‘ are, therefore, a part of that furniture
 ‘ which nature hath given to the human understanding.
 ‘ They are a part of our constitution, and all the disco-
 ‘ veries of our reason are grounded upon them. They
 ‘ make up what is called *the common sense of mankind*;
 ‘ and what is manifestly contrary to any of those first
 ‘ principles, is what we call *absurd*.’—‘ A clear explica-
 ‘ tion and enumeration of the principles of Common
 ‘ Sense,’ adds Dr Reid, ‘ is one of the chief *desiderata*
 ‘ in logic.’

'tensive sense, so as to comprehend probable as
 well as certain truths. 'I am able,' says he,
 'to prove, that except we believe many things
 'without proof, we never can believe any
 'thing at all; for that all sound reasoning
 'must ultimately rest on the principles of com-
 'mon sense, that is, on principles intuitively
 'certain, or intuitively probable; and, conse-
 'quently, that common sense is the ultimate
 'judge of truth, to which reason must conti-
 'nually act in subordination.' (Essay on
 Truth, part 1. c.1.) He had before defined
 Reason to be 'that faculty which enables us,
 'from relations or ideas that are known, to
 'investigate such as are unknown;' by which
 he plainly confines it to what has more usually
 been called *reasoning*. This faculty he repre-
 sents as totally distinct from Common Sense,
 which signifies 'that power of the mind which
 'perceives truth, or commands belief; not by
 'progressive argumentation, but by an instan-
 'taneous, instinctive, and irresistible impulse;
 'derived

‘ derived neither from education, nor from
 ‘ habit, but from nature ; acting independently
 ‘ on our will, whenever its object is presented,
 ‘ according to an established law, and there-
 ‘ fore properly called *Sense* ; and acting in a
 ‘ similar manner upon all, or at least a great
 ‘ majority of mankind, and therefore properly
 ‘ called *Common Sense*. ’ (ut supra.)

Dr Campbell, as we may gather from his enumeration of the various kinds of evidence already quoted, employed the term in a more limited acceptation, as denoting only the faculty by which we are made acquainted with a limited class of first truths. The term is undoubtedly liable to considerable ambiguity, as, in common use, it is employed to denote not only the more ordinary application of our reasoning powers, but also practical prudence, a quick discernment of propriety of conduct, or what is generally called worldly wisdom. Even as defined by the philosophers whose words

words we have just quoted, it is confessedly but a substitute for some other operation of the mind, or combination of operations, to which more precise names have been given. On this account, in what I have yet to say upon the subject of first principles, I shall not have recourse to this undefined mental power in tracing their origin.

From the remarks made in the preceding Section, and the definition which has been given of Reason, it is evident that I cannot concur with Dr Reid in deriving the conviction which attends all intuitive truths, from the operation of judgment alone, or of common sense, or even of the faculty of Reason, taken in its most extensive signification. The evidence which accompanies certain of our faculties, such as Consciousness, Perception, Memory, &c. I conceive to stand solely upon its own ground, and not to be reducible to any other class of evidence. Instead, therefore, of
enumerating

enumerating the various individual truths to which our assent is unavoidably given, I shall only attempt to ascertain what are the faculties which, according to the constitution of man, are each accompanied with intuitive belief; at the same time examining under which of these the first principles enumerated in the preceding classifications are naturally comprehended; and how far all the particulars contained in these classifications are really entitled to the appellation of first truths.

SECTION III.

Classification of first Principles.

IN conformity to the plan mentioned at the conclusion of the preceding Section, I would

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propose

propose the following enumeration of the sources from which we derive our intuitive belief, or of those original faculties of man which are each accompanied with a complete and independent conviction of the certainty of those truths which they make known to us. 1st, The evidence of Consciouſness : 2d, The evidence of Sense : 3d, The evidence of Memory : 4th, The evidence of Reason : To which I have to add, 5th, The evidence of the Moral faculty.

1st, That the faculty of Consciouſness is accompanied with an irresistable belief of the real existence of its objects, we have had occasion particularly to state, when treating of that faculty in Chapter 1. It is in consequence of this law of our nature alone, that we believe ourselves to be endowed with such mental powers as Memory, Abstraction, or Conception, or to possess the active principles of Curiosity, Benevolence, Friendship, or Pity.

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In short, upon the evidence of this faculty must rest the whole science of the human mind; which must necessarily be considered as a mere baseless fabric, if it be denied that the evidence of Consciousness is certain and precise.

Under the evidence of Consciousness comes manifestly to be classed the first contingent truth in Dr Reid's enumeration. (See the preceding Section.) To the same class I am inclined likewise to refer the second truth of the same enumeration; while the fourth seems to derive its origin from the joint operation of Consciousness and Memory; for, as has been observed in Ch. 1., the conviction of our personal identity cannot be derived from consciousness alone, without very absurd consequences.

To this first class also, I think, may justly be referred the 6th of Dr Reid's contingent truths, *viz.* "that we have some degree of

‘ power over our actions, and the determinations of our will.’ That we possess, as a part of our constitution, that principle or faculty which is called *Volition*, or the active principle, and which is always exercised previous to every effort, or action of the individual, is, I think, as certainly made known to us by Consciousness, as that we have the intellectual faculties of Memory or Conception. But the very essence of this faculty consists in directing and controuling our actions; and the determination of the will is nothing else than the exercise of volition. To say, therefore, that ‘ we have some degree of power over our actions, and the determinations of our will,’ is the same thing as to say that we possess such a faculty as *Volition*; and for this, I think, we have the direct evidence of Consciousness, and of Consciousness alone.

From this it seems to follow, that those who argue against the free will and moral liberty of man,

man, argue against the direct testimony of Consciousness; which informs us that we have the power of volition, or of freely willing and determining our actions. It likewise follows, that the positive side of this question is incapable of any direct proof, other than a reference to Consciousness, as it is an intuitive truth, and self-evident first principle. As far as I have examined the disquisitions concerning this much debated question, these conclusions seem to me to be fully confirmed; for I find the advocates for moral liberty unable to bring forward any direct arguments in support of their doctrine, but very successful in exposing the absurdity and inconsistencies which follow from the tenets of their adversaries, as well as the weakness of the reasonings by which they are supported. Any further examination, however, of this question, would be foreign to our present purpose.

I should beg leave farther to suggest, whether

ther we may not deduce from the consciousness of Volition, or the principle of activity, contrasted with what our senses inform us concerning the characteristic properties of matter, our conviction of that truth, which Dr Reid has ranked as an axiom, and which most writers have considered as demanding our assent by its own proper evidence alone, *viz.* ‘ that
‘ whatever begins to exist, must have a cause
‘ to produce it ? ’ If we state this truth in the words of some writers, *viz.* ‘ that every
‘ effect must have a cause, ’ there is then no doubt of its being a necessary truth, implied in the very meaning of the words *cause* and *effect*; one of which has no signification without an allusion to the other ; so that the contrary of this maxim is not only false, but evidently absurd and impossible. But if we state the same truth in the other form given above, or perhaps still more unexceptionably, as follows,
‘ every thing that begins to exist, and every
‘ change in the state of existence, is produced
‘ by

‘ by the agency of an active being,’ it does not then evidently appear, that the contrary of this maxim is palpably absurd, however much we may believe it to be false and erroneous.

In proof of this, I apprehend that examples may be found, even in our most familiar reasonings, where our notions concerning the peculiar agency that is subservient to the phenomena which we observe, are by no means clear or explicit. When we observe a stone fall to the earth, a tree or a plant vegetate, the blood circulate, or the food digested, have we, I would ask, a complete and steady conviction that these remarkable changes are produced by the direct interposition of active beings? The fall of a stone, we are now taught, by the philosophy of Newton, to ascribe to gravitation. But what is *gravitation*? Is it an inherent quality of matter, and consequently not to be denominated an active, or efficient cause; or is it the result of the immediate operation of immaterial a-

gents, commissioned to produce the phenomena which are ascribed to this law of nature? Difficulties will be found in determining this question either way; for gravitation evidently produces motion, or a change of state; and, therefore, so far answers the description of an efficient active cause: at the same time it follows fixed and constant laws; on which account it favours more of material inactivity, than of immaterial agency. The same remarks may be easily applied to all the natural phenomena usually ascribed to the various kinds of attraction; as also, though not perhaps so clearly, to the circumstances which characterize vegetable and animal growth.

It is by no means my intention, in these remarks, to give the smallest countenance to the sceptical dogma of Hume, that the belief of the necessity of efficient causes is a mere vulgar prejudice, and that there is no absurdity in conceiving events to follow one another for
ever,

ever, without the interposition of any active cause at all. On the contrary, I esteem this doctrine, as stated by that philosopher, to be highly erroneous. My sole object is to ascertain upon what footing our belief of the necessity of efficient causes, or of active powers, rests; which, I think, has improperly been represented as a truth of the necessary kind; the contrary of which is inconceivable, and which cannot be derived from any other principle of belief.

The foundation of this belief appears to me, as already hinted, to be the conviction we have of our own activity, or voluntary agency, derived from Consciousness; and the knowledge we derive from our senses of the inactivity or inertness of matter. We find the characteristic qualities of matter to be, not to move of itself, but to be moved exactly in proportion to the force that is impressed upon it; or for ever to remain at rest, if no external force were applied to it. At the same time,

time, we feel within ourselves a principle of activity adapted to apply this impulse to material objects, and by which numerous changes are actually produced in these objects. The immediate inference of reason is, that wherever a change is produced in material objects, some active or immaterial being must have been concerned, which constitutes the efficient cause of that change ; and this inference never could have been made, without the operation of Consciousness and of Perception ; and is, therefore, among the class of contingent, and not of necessary truths.

The observations that have been made above, on the subject of gravitation, and some other sources of change in material objects, may seem to furnish a strong objection to this account of the matter ; and it has been already acknowledged, that these phenomena are not easily reconciled to any hypothesis concerning efficient causes. The following remarks may, perhaps,

perhaps, have some tendency to remove the difficulty. Although gravitation, in certain circumstances, is clearly a cause of motion, or a change of state; yet, without the cooperation of some other agency, its effects must soon come to an end. Were there no projectile force combined with gravitation in the planetary system, what would be the consequence? Manifestly, that the earth, and all the orbs which compose that system, would advance, with an accelerated motion, towards the sun, and at length combine in one solid and immoveable mass with his body. When this took place, all motion, or change of situation, in as far as depends upon gravitation, would necessarily be at an end. The inference is plain, that gravitation has not the essential characters of an efficient or active cause; since, without the cooperation of other causes, it must soon cease to produce motion. The projectile impulse by which, in conjunction with gravitation, the immense orbs of our system are made

made to wheel, with unabating velocity, in the regions of unbounded space, around the sun, the fountain of their light and heat, is the genuine token of voluntary efficiency, by which these sublime phenomena are produced. In this we trace the operation of the great First Cause of all, by whose dread fiat, worlds, and systems of worlds, first sprung into existence.

The same observations are, in some measure, applicable, not only to the other attractions, but, likewise, to the phenomena of vegetable and animal expansion. The gradual evolution of a plant from the seed, and the formation of all its wonderful appendages, of leaves, stem, circulating vessels, flowers, and fruit, are phenomena, upon which natural science has yet thrown but very little light: This much, however, may safely be said, that the due alternation of heat and cold, dryness and moisture, are essentially requisite to the production

production of these effects. But, did not the earth revolve around the sun, as well as upon its own axis, we should have no vicissitudes of seasons, no alternation of heat and cold, no refreshing showers, nor cooling breezes ; all would be sterile and desolate ; either burnt up by intolerable heat, or rendered torpid by unabating cold. One efficient cause, therefore, of vegetable, and the same may be said of animal life, is to be sought in that original mandate of Almighty agency, which caused the earth to wheel its stated course, that day and night, summer and winter, might regularly alternate.

It is not, however, without considerable diffidence, that I hazard these illustrations upon this difficult subject. There is, perhaps, no branch of metaphysical science that has occasioned more perplexity than the relation between cause and effect ; and much yet remains to be done, in order to remove the obscurity
in

in which our notions of the nature of this relation appear to be involved. The author of a mathematical proof of the absurdity of the Necessarian system, has thrown much light upon this subject; and it were greatly to be wished that he could find leisure and inclination to prosecute the inquiry which he has so successfully begun.

The result to which these observations lead, is, that a close examination of the circumstances which characterize natural phenomena, compared with the dictates of our own consciousness, produces the steady conviction, that ‘every change
‘in the state of existence, is the result, either
‘mediately or immediately, of the operation
‘of an active being, or efficient cause.’ * By
consequence,

* It is somewhat remarkable that Mr Locke, when treating of the origin of ideas of relation, assigns to that of cause and effect, the compound action of sensation and reflection. ‘I shall begin,’ says he, (Book II. c. 25.

consequence, this truth is not a necessary one, nor, indeed, strictly intuitive, since it is deduced

§ 11.) ‘ with the most comprehensive relation, wherein
 ‘ all things that do, or can exist, are concerned; and that
 ‘ is, the relation of cause and effect: the idea whereof,
 ‘ how derived from the two fountains of all our know-
 ‘ ledge, sensation and reflection, I shall, in the next
 ‘ place consider.’ The investigation, however, which
 follows, will not be found to have any similarity to the
 preceding detail; and, as far as it is clear and explicit,
 seems to comprehend little more than an explication of
 the common meaning of the words cause and effect, viz.
 as things constantly conjoined, and succeeding each other.
 ‘ In the notice’ says he, (B. II. c. 26. § 1.) ‘ that our
 ‘ senses take of the constant vicissitude of things, we can-
 ‘ not but observe, that several particulars, both qualities
 ‘ and substances, begin to exist, and that they receive
 ‘ their existence from the due application and operation
 ‘ of some other being. From this observation we get our
 ‘ ideas of cause and effect. That which produces any
 ‘ simple or complex idea, we denote by the general name,
 ‘ Cause; and that which is produced, Effect. Thus,
 ‘ finding that, in that substance which we call wax, fluidity,
 ‘ which is a simple idea, that was not in it before,
 ‘ is constantly produced by the application of a certain
 ‘ degree

ed by comparing together the evidence of Consciouſness with that of Perception ; but this deduction of reason, being merely a conclusion from particulars to generals, is ſo readily and clearly made, that it ſtrikes us with intuitive evidence, and may be conſidered, for every ordinary purpoſe, as carrying the force of a firſt principle. After all, moſt perſons may be inclined to admit this truth upon its own evidence, rather than upon the grounds here ſtated ; and then it may be ranked among thoſe firſt principles, of the neceſſary kind, which are judged of by the faculty of Reaſon. The difference of opinion concerning the origin of the truth, in no way affects its evidence, or the certainty of the ſpeculations which are grounded upon it.

I have farther to remark, that this principle
being

‘ degree of heat ; we call the ſimple idea of heat, in relation to fluidity in wax, the cauſe of it, and fluidity the effect. ’

being once admitted; another, which Dr Reid has stated as a separate axiom, appears clearly to follow as an inference from it, *viz.* ‘ That
 ‘ design and intelligence in the cause, may be
 ‘ inferred with certainty from marks or signs
 ‘ of it in the effect. ’ If the cause is necessarily inferred from the effect, so must wisdom in the cause be certainly inferred from marks of it exhibited in the effect; as well as a want of wisdom in the cause, from the want of marks of it in the effect. These are mere modifications, or particular examples of the general principle, which cannot be denied, if the principle itself be admitted, and, therefore, need not be stated as separate grounds of intuitive belief.

2. Having given so ample an examination to the evidence of Consciousness, little remains to be said concerning the second source of intuitive belief; the evidence of Sense. The objections to the certainty of this evidence have

already been examined, in Ch. III. § 3. ; and it has been clearly shewn, that our knowledge of the nature and qualities of material objects must ultimately rest upon the evidence of sense alone. Hence, all physical science, whether historical or philosophical, whether mechanical, physiological, or chemical, must implicitly admit the evidence of sense as a first principle. Upon this evidence too, if the preceding deduction, concerning the origin of our belief of efficient causes, be just, must, in part, be rested that irresistible conviction.

3. As the evidence of Sense communicates to us the knowledge of every thing that is present in the material world ; and the evidence of Consciousness informs us of whatever is passing in our own minds ; so the evidence of Memory is the sole source by which we have an immediate knowledge of what is past, whether of a material or intellectual kind. This, therefore, is a very extensive ground

ground of our belief, and evidently gives authority to all the information we receive of the historical kind, whether relating to the physical or intellectual world.

To the evidence of Memory, in conjunction with that of Perception, may, I think, be referred the ground of our belief in the truth which makes the 12th of Dr Reid's contingent first principles, *viz.* ' That, in the phenomena of ' nature, what is to be, will probably be like ' to what has been in similar circumstances. ' This conviction appears, to me, rather to be the result of experience, than an original and intuitive principle of belief. I can find no evidence that any such conviction exists in the mind of a child, even when it first begins to reason ; neither is it so strong in ourselves, as to lead us to conclude that the phenomena of nature will for ever be the same as they are at present ; or that they have been, from all eternity, what they are now.

On the contrary, every believer in the controul of a Supreme Power, has the conviction, that the sun rises and sets, the planets revolve, and the seasons return, in a certain order, solely because God so ordained it, when it pleased him to call the earth and the heavens into existence ; and that, at some unknown æra hereafter, the sun and the moon, the heavens and the earth, may pass away, and be as if they had never been. Nay, even within the limits of our own experience, we see something very nearly approaching to a suspension of the laws of nature. For, not to mention the miraculous events which Scripture informs us have, of old, taken place ; we must allow the eruption of the volcano, the bursting of the earthquake, or the fall of a stone from the clouds, to be appearances which depart very widely from the more ordinary course of natural phenomena.

The conviction, therefore, which we have of
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the regular return of the phenomena of nature, seems to amount to no more than this, that there is a very high probability, resulting from past experience, that this will be the case : such a probability as sufficiently warrants us to make a study of these phenomena, and to ascertain, as far as we are able, their nature and laws.

It is evident that the third of Dr Reid's contingent truths is to be ranked under the evidence of Memory ; as the fifth, and I think, likewise, the eighth, are reducible to the evidence of Sense, aided by reflection, or a slight degree of the reasoning faculty. With regard to the tenth and eleventh of those truths, they seem to be rather improperly classed among intuitive first principles, as they refer, not to evidence which we hold to be certain, but only to what is admitted as probable.

The foundation of our belief in human
Z 3 testimony,

testimony, (the 10th in the enumeration), appears to me to be the consciousness we have of a regard to veracity, existing in ourselves. Whether this regard to truth must be ascribed to an original principle in the human constitution, called by Dr Reid *the principle of veracity*, (see Inquiry into the Human Mind, Ch. VI. § 24.); or, whether it may be considered as an immediate dictate of conscience, or the moral faculty, which tells, in language not to be misunderstood, that deceit is a crime, it is not our business here to examine. But I think, if it be allowed that a regard to truth is natural to the mind of man, we are furnished with a sufficient reason for giving credit to our fellow creatures, whom we have every cause to believe to be constituted as we are ourselves. Hence, whatever necessity there may be for admitting Dr Reid's *principle of veracity* as an original faculty in man, I can see none for the admission of his *principle of credulity*, (see as above), any more than there could be for adding

ing a duplicate to every one of the faculties of the human mind, for the purpose of giving the proper assent to the corresponding faculty in the minds of our neighbours.

Experience informs us, that a regard to truth is sometimes counteracted by opposing principles in human nature ; either by misapprehension of the real state of the case, or a deliberate intention to deceive. We do not, therefore, when come to years of maturity, implicitly admit the testimony of others ; but, previous to giving it our assent, we carefully examine what are the probable sources, either of wilful misrepresentation, or unintentional mistake, as far as these are made known to us by our experience or observation. Hence it is evident, that though human testimony is a very copious source of our knowledge, its evidence amounts to no more than probability ; although, in many cases, it may approach very near to certainty.

Before proceeding to the next class of intuitive truths, we shall just take notice of the ninth article in Dr Reid's enumeration, as it may as well be introduced here as any where else. It must be acknowledged that it is not easy to account for the interpretation of natural signs by any known principles of human nature ; or, supposing that this must be considered as an ultimate principle, incapable of explanation, to say under which of our classes of intuitive belief it is to be placed. According to an ingenious explanation which has been offered of this difficulty, natural signs, or the involuntary expressions of feeling and passion, are interpreted through the agency of sympathy, by which similar expressions and gesticulations are excited in the beholders ; and such is the wonderful connexion between soul and body, that the gesticulations of the latter cannot take place without the corresponding emotions being excited in the former. Thus, natural signs are interpreted, not by immediate in-

stinct.

finct, but by a participation in the feeling and the admonitions of Consciuſness. Without examining whether this explanation be perfectly ſatisfactory, I ſhall conſider it as a ſufficient apology for not ranking the interpretation of natural ſigns among the ultimate and intuitive principles of our belief.

4. We come then to the fourth claſs of intuitive truths, the evidence of Reaſon, which I have conſidered in a light conſiderably different from that in which it has uſually been viewed by metaphyſical writers. The office of the faculty of Reaſon I have ſtated to be ‘to make us acquainted with abſtract or neceſſary truth,’ (Ch. VIII. § 1.); ſo that, by the evidence of reaſon is meant, our aſſent to thoſe general ſelf-evident truths called axioms, for the belief of which no cauſe can be aſſigned but their ſelf-evidence, and of which the contraries are conceived to be abſurd and impoſſible. The ſeventh of Dr Reid’s contin-
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gent truths, and the only one of which we have not already taken notice, is evidently but another way of stating, that there is such a thing as the evidence of Reason, by which truth can be discriminated from error.

The evidence of Reason, then, is that by which we are informed of the class of truths usually called Necessary, in contradistinction to those made known to us by the faculties of Consciousness, Perception, and Memory, which have been denominated Contingent. What Dr Beattie calls mathematical evidence, and Dr Campbell mathematical axioms, the result of pure *intellection*, belong to this class of truth. Dr Reid, indeed, gives a more extensive range to the class of necessary truth, and ranks axioms under a variety of different species, according to the different sciences to which he conceives them to belong.

I am rather of opinion, that those truths
which

which are justly entitled to the name of axioms, belong equally to all the sciences, and are by no means very numerous. It has indeed been the practice, in the elementary treatises of mathematics, formally to enumerate those axioms, or general truths, which are there taken for granted ; because that science pursues accuracy of method more than any other. But it would be by no means difficult to shew, that several at least of the axioms which Euclid has enumerated at the beginning of his Elements, are tacitly employed in almost every kind of reasoning, though not as precisely expressed in mathematical language. In every kind of classification, for example, we evidently proceed upon the admission of these axioms, that ‘ things which agree with the same thing, agree with one another ; ’ and that ‘ things which disagree with the same thing, do not agree with one another ; ’ but these are in fact the same, though more generally expressed, as Euclid’s 1st, 2d, 3d, 4th, &c. axioms.

Again,

Again, Euclid himself has employed, in his reasonings, various axioms, which are not to be found in his previous enumeration ; as, for example, this one, ‘ whatever is true of the ‘ genus, is true of all the species and individuals of that genus ; ’ which is called by Dr Reid a logical axiom. For he proves of triangles in general, or of the genus only, that the three angles are equal to two right angles ; which truth he afterwards applies to the various species of triangle, the equilateral, isosceles, or scalene, as occasion may require ; and thus, in this case, as well as many others that might be mentioned, evidently takes for granted the above axiom. Another axiom, more strictly mathematical, which he has omitted, is this, ‘ that the whole is equal to all its parts taken ‘ together ; ’ although it would be easy to show, that this is tacitly implied in his reasonings : and there is likewise another, upon which the whole evidence of the *demonstratio ad absurdum* rests ; although I do not recollect to

to have seen it distinctly stated by Euclid, or any other writer, *viz.* ‘ It is impossible for the same thing to have, at the same time, qualities which are plainly inconsistent with each other. ’

It is by no means my intention to attempt an enumeration of all those truths which are truly and legitimately entitled to the name of axioms, or first principles of reason. They are, as I have already hinted, probably not very numerous; and reason, when clear and unbiaſſed, will generally, of itself, give an accurate decision concerning the self-evidence of ſuch neceſſary truths. At the ſame time, very conſiderable miſtakes have been made in this matter, even by perſons of the greateſt acutenefs. Thus, it is generally acknowledged, that what Euclid calls the laſt, or 12th axiom, is very improperly ſo conſidered; as it is a truth by no means ſelf-evident, but which requires and admits of a proof as much as many of thoſe
which

which form his propositions. It is likewise well known, that all the ancient philosophers admitted, as an axiom or self-evident truth, the maxim, ‘*ex nihilo nihil fit* ;’ without considering that this necessarily led to the eternity, and consequently independence of matter, which modern philosophy teaches us to consider as absurd. Another maxim, which appears to have been admitted by all philosophers down to the time of Dr Reid, was, ‘that nothing can act but when and where it is present ;’ upon which alone rests the evidence of the ideal theory ; but which, being rejected as really destitute of evidence, that theory at once falls to the ground.

Even in the enumeration of Dr Reid, it does not appear that all the truths which are there stated as axioms, are justly entitled to that name. We have already endeavoured to trace some of those which he calls metaphysical axioms, to other principles of belief. What he

he calls axioms of morality, belong to our next general class of evidence ; and, with respect to the principles by which Taste is regulated, I am doubtful if any of them can be considered as having the evidence of an axiom, or even as admitting of clear and certain proof. I am likewise sceptical with regard to the existence of any axioms which peculiarly belong to grammar, and think the one specified by Dr Reid at least admits of dispute : For it may be said that *No, Yes, Where ? What ?* and various other like expressions, form complete sentences, without any aid from the verb.

Axioms ought to be distinguished from identical propositions, which are no more than a multiplied expression of the same truth ; as for example, the truisms, ‘ whatever *is*, *is* ; ’ — ‘ things which are equal are of the same dimensions,’ &c. Such arithmetical truths as these, ‘ 2 and 3 are 5 ; ’ ‘ 4 and 5 are 9,’ &c, although, by some, they have been denominated

minated axioms, seem rather to be of the nature of identical propositions, and amount to no more than this, ' 5 denotes the same number as 2 and 3 taken together ; ' ' 9 is the same as 4 and 5 together. ' Dr Campbell (*Philosophy of Rhetoric*, b. 1. c. 5. § 1.), while he admits this to be the case, yet seems to consider such truths as the following as real axioms : ' 2 and 3 are equal to 4 and 1 ; ' ' 4 and 5 are equal to 6 and 3, ' &c. ; because they convey a new idea, and imply an equation, or new relation of equality. But allowing that these are not to be considered as identical propositions, or mere variations of expression, they seem rather to be conclusions inferred from axioms, and the principles of notation, than original axioms. Such truths admit of proof as follows : ' the sum of 2 and 3 is 5 ; the sum of 4 and 1 is likewise 5 ; ' whence the sum of 2 and 3 is equal to the sum of 4 and 1 ; because things which are severally equal to the same thing, are equal to one another. '

I shall conclude these observations on the subject of axioms, or necessary first principles, with this remark,—that the true criterion of an axiom seems to be, in the first place, the manifest absurdity of denying it, or maintaining its opposite; and, in the second place, the impossibility of proving it by any thing more evident than itself.*

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* There are some ingenious observations on the subject of axioms, in Condillac's 'Art de raisonner,' (liv. i. c. 1.) I cannot, however, agree with this philosopher in considering the evidence of an axiom as resolvable into the identity of its subject and predicate. 'Pourquoi,' says he, 'celui qui connaît exactement les idées qu'on attache aux differens mots de cette proposition, *un tout est égal à ses parties prises ensemble*, ne peut-il pas douter de son évidence? C'est qu'il voit qu'elle est identique, ou qu'elle ne signifie autre chose, sinon qu'un tout est égal à lui-même.' This last identical proposition, or *truism*, I conceive to be by no means equivalent to the import of the axiom quoted by Condillac. This ingenious author, however, proceeds afterwards to apply the same principle to the evidence of *demonstration*, which, he says, consists in nothing more than a series of propositions, which are each identical with that which follows.

ed 5. I have stated, as a fifth source of intuitive belief, the evidence of the Moral faculty. To this I have been induced, from a conviction that our decisions concerning right and wrong, virtue and vice, cannot be satisfactorily explained upon any other principle than a reference to an original power of the mind, or internal sense, as it has been called by Hutchison. Some have endeavoured to resolve the dictates of morality into a refined selfishness; some into an exercise of reason; some into considerations of utility; some into motives of benevolence; and some into an obedience to the will of God. But all these systems are attended with difficulty, and appear insufficient to explain the paramount authority of moral sanction. These difficulties in a great measure vanish, if, with Hutchison, Butler, Reid, and various other respectable philosophers, we refer the principles of morality to the immediate dictates of an original faculty, of whose operation we have very clear evidence, when, under the name of *conscience*, it scrutinizes our own conduct.

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This faculty is chiefly employed in immediately prompting to action, and does not therefore come within the plan of a work which is expressly confined to an analysis of the powers of the understanding. At the same time, by the operation of the moral faculty, a new and very important class of notions is introduced into the human mind; and hence, this faculty, in certain respects, is to be considered as an intellectual power. It is on this account that Dr Reid has added ‘Moral Perception’ to his enumeration of the Powers of the human understanding, (Essay I. on the Intellectual Powers, c. 7.); although he has not treated of it in that volume which he has more expressly devoted to the examination of those powers, but in his subsequent work on the active powers of man.

It may be asked, are the intuitive truths, or first principles, which are made known to us by the moral faculty, necessary or contingent?

gent? This query I own I do not feel myself sufficiently prepared to answer decisively. Sound moralists have been accustomed to consider the functions of virtue as immutable and eternal, and consequently not contingent, or existing merely because the Supreme Being has so willed it. It might be considered as tending to weaken the controul of conscience, if its distinctions were represented as having a reference only to the present state of things, and not necessarily the same in every conceivable state and relation of being. In fact, however, the evidence and certainty of a contingent truth is equally great as that of a necessary one; so that the authority of the moral sense will not be diminished, whether we refer those first principles of belief, which it makes known to us, to the class of contingent, or of necessary truths. But as a further investigation of this point would lead into details which more properly belong to a system of Ethics, I shall leave it to be discussed by those who are better qualified for the task than I feel myself to be.

SECTION IV.

Of Definition, and the various Kinds of Proof.

HAVING now, at some length, examined into the nature of first principles, or those intuitive truths which are made known to us, not only by reason, but likewise by several others of our faculties, it remains that we should inquire into the application of our rational powers, in the discovery of truth which is not intuitively perceived; or in accomplishing the process of reasoning. Previous to this, however, I propose to make some observations on the nature of definition; as all legitimate proof must be founded upon a clear and accurate conception of the subject to which the proof relates; that is, upon a just and adequate definition, or at least explanation of the matter in question.

Upon the subject of Definition, the genius of Aristotle was sedulously exercised ; and it has been pretty generally supposed, that his account of the matter is not only ingenious, but very just and philosophical. A definition, says Aristotle, is a speech, declaring what a thing is. But the essence of a thing consists of these two parts ; first, what is common to it with other things of the same kind ; and secondly, what distinguishes it from other things of the same kind : the first is called the genus, the second the specific difference. Hence, the province of a definition is, to assign the genus and specific difference of the thing defined. Thus, says Dr Isaac Watts (Logic, part 1. c. 6. § 4.), ‘ if I would define what *winter* is, I consider, ‘ first, wherein it agrees with other things ‘ which are most like it, namely, *summer*, ‘ *spring*, *autumn*, and I find they are all *seasons of the year* ; therefore, a *season of the year is the genus*. Then I observe wherein ‘ it differs from those, and that is in the *short-* ‘ *ness*.

‘ *ness of the days* ; therefore, this may be call-
 ‘ ed *its special nature*, or *its difference*. Then,
 ‘ by joining these together, I make a *definition*.
 ‘ *Winter is that season of the year wherein the*
 ‘ *days are shortest.*’

This account of definition has considerable
 plausibility ; but, at the same time, it is liable
 to very material objections. In the first place,
 it is evident that it depends entirely upon our
 having a complete and satisfactory classification,
 properly arranged under genera and species, of
 all the objects which we propose to define.
 But such a classification is no where to be
 found ; nor will different persons agree with
 one another concerning what constitutes a ge-
 nus, and what a specific difference. Thus, Dr
 Watts himself acknowledges (in the section a-
 bove quoted), that ‘ some would as soon de-
 ‘ *fine winter by the coldness of the season*, as
 ‘ *by the shortness of the days* ;’ though he con-
 ceives the last to be ‘ doubtless the most just,

‘ primary, and philosophical difference betwixt
‘ that and the other seasons of the year.’

The bad success which has uniformly attended all attempts at an enumeration, or general classification, of all the objects of human knowledge, ought long ago to have shown the fallacy of the Aristotelian account of definition. Various such attempts have been made, but all so greatly differing from each other, as to evince that no reliance can be placed on any of them. Plato proposed an arrangement of every thing under five general heads, or categories, *viz.* ‘ Substance, Identity, Diversity, Motion, or Rest.’ Aristotle extended the number of categories to ten; and Mr Locke seems to have thought that three such general heads were quite sufficient, *viz.* ‘ Substances, Modes, and Relations.’ Perhaps no philosopher, except Aristotle, has bestowed so much consideration upon the subject of general division, as the celebrated Bishop Wilkins. His ‘ Essay towards a real character
‘ and

‘ and philosophical language, ’ proceeds upon the plan of arranging all the objects of human knowledge under various genera, which are again subdivided into their species and individuals, in order that each may be systematically distinguished by its appropriate character. The number of his *summa genera*, or what may be called his categories, is forty ; and each is divided into numerous species : but, in the present advanced state of knowledge, it may be doubted whether any one of his genera would be considered as very judiciously chosen, and, still more, whether it would be admitted that the various species peculiarly belong to one genus rather than to another.

In particular branches of science, indeed, divisions and classifications are necessarily employed for the sake of convenience and perspicuity ; and in reference to such classifications, the Aristotelian account of definition has its value. Thus, in natural history, the various ob-
jects

jects of inquiry have been carefully distributed into classes, orders, genera, species, and varieties; and in many cases here, a definition may be said to consist in assigning the genus and specific difference of the thing defined. But still it must be recollected, that these classifications are in general arbitrary, are liable to be changed according to the fancy of their inventors, and are seldom founded in the precise discriminations of nature. Hence, the definitions founded on these arrangements must be viewed rather as convenient expedients for the purposes of nomenclature, than as conveying just notions of the nature of things. In those branches of knowledge where no classification has been settled by general consent, we may venture to assert, that no benefit will accrue from an attempt to settle, by definition, the genus and specific difference of the objects of our inquiry.

But again, it is evident, that even should
we

we suppose a satisfactory classification of every object of knowledge to exist, still this logical system of definition is imperfect; for the highest genus or category itself could not be defined, because it is not a species; nor could individuals be defined, because they have no specific difference. There are, besides, many species of things, whose specific difference, though clearly perceived, scarcely admits of being expressed by any form of words: Such are the various species of colour, of which the difference is clearly discernible by the eye, but cannot at all be expressed by definition.

The first writer who seems clearly to have perceived the fallacy of the logical account of definition, is Mr Locke. ‘ Though,’ says this philosopher (b. 3. c. 3. § 10.), ‘ defining
‘ by *genus* and *differentia* be the shortest way,
‘ yet I think it may be doubted whether it be
‘ the best. This, I am sure, it is not the on-
‘ ly, and so not absolutely necessary. For, de-
‘ finition

‘ finition being nothing but making another
 ‘ underftand, by words, what idea the term
 ‘ defined ftands for, a definition is but made
 ‘ by enumerating thofe fimple ideas that are
 ‘ combined in the fignification of the term de-
 ‘ fined ; and if, inftead of fuch an enumera-
 ‘ tion, men have accuftomed themfelves to ufe
 ‘ the next general term, it has not been out of
 ‘ neceffity, or for greater clearnefs, but for
 ‘ quicknefs and defpatch fake. ’

In this paffage, according to my apprehen-
 fion, the true and juft notion of definition is
 conveyed, which, according to this view of
 the fubject, fhould confift of an enumeration
 of the various fimple attributes or properties
 comprehended in the thing defined. It fol-
 lows, that things, or notions, which are them-
 felves fimple, do not admit of definition ; but
 all thofe that are complex do. ‘ The names
 ‘ of fimple ideas ’ fays Mr Locke (b. 3. c. 4.
 § 4.) ‘ are not capable of any definition ; the
 ‘ names

‘ names of all complex are : ’ And he appears to have the merit of first distinctly stating this truth ; for he immediately subjoins, ‘ It has not, that I know, been yet observed by any body, what words are, and what are not, capable of being defined ; the want whereof is (as I am apt to think) not feldom the occasion of great wrangling and obscurity in mens discourses. ’

It is well known what ridiculous controversies arose in the schools, and among the ancient philosophers, from the attempt to define things which, from their simple nature, are incapable of definition ; as, for example, the defining motion to be, ‘ the act of a being in power, so far as it is in power ; ’ and light, ‘ the act of perspicuous, as far as it is perspicuous. ’ Such things admit properly of no definition, nor of any other explanation, than the substitution of a synonymous term, or circumlocution, calculated precisely to fix the meaning

meaning of the word, by shewing what notion it is intended to express, to the exclusion of every other. Thus, sometimes we find motion defined to be ‘ a change of place ; ’ this, however, is merely a synonymous expression ; for no person could understand what is meant by a change of place, who had no conception of motion. The definitions I have attempted to give of the various intellectual powers, are all of this kind, and would be void of meaning to a person who was not himself possessed of those powers.

This kind of definition corresponds to what the Logicians call ‘ the definition of the name,’ being the mere explanation of a word ; while ‘ the definition of the thing,’ according to them, informs us of the real essences of objects. The definition of the thing, according to our view of the subject, informs us, not of the essence, but only of the various qualities of the object defined ; not all of them, but such as
are

are sufficient to discriminate it from other like objects ; and the definition of the name, which, for the sake of distinction, may be called description, attaches exclusively to some simple notion, an appropriate name. It is not the individual things of nature, as the Logicians teach us, but these simple notions, that are incapable of definition. For what hinders that I should convey a clear notion by definition, or an enumeration of their various characteristic qualities, of the individuals John, James, London, or Edinburgh ; but who can tell by definition, wherein the colour blue differs from red ; or an acid taste from a bitter ?

At the same time, it appears to be justly remarked by Mr Locke, that, ‘ though the
 ‘ names of simple ideas have not the help of
 ‘ definition to determine their signification, yet
 ‘ that hinders not, but that they are generally
 ‘ less doubtful and uncertain, than those of
 ‘ mixed modes and substances ; because they
 ‘ stand

‘ standing only for one simple perception, men,
‘ for the most part, easily and perfectly agree
‘ in their signification ; and there is little room
‘ for mistake and wrangling about their mean-
‘ ing.’ (Book III. c. 4. § 15.) Whatever is
complex in its nature, is generally but imper-
fectly understood; and the name which use has
attached to it, may excite, in different indivi-
duals, notions which are considerably different
from each other. Hence the necessity for ade-
quate definitions of all complex terms ; and,
whether they are adequate or not, may pretty
certainly be known by observing, whether they
convey the same precise notion to all persons of
a competent understanding, both those who are
acquainted with the thing defined, and those to
whom it may be entirely new. We may men-
tion, as an example of such an adequate defi-
nition, that which Euclid has given of a
rhombus, (B. I. def. 32.) which, it is appre-
hended, will convey a distinct conception of
that particular figure, even to a person who
had never seen or heard of it before.

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The general result of these observations is, that simple notions do not admit of being defined otherwise than by a description, or precise limitation of the term which expresses them. Complex notions are defined by an enumeration of their most remarkable, or characteristic simple properties, and may thus be made known by definition to persons to whom they are new; provided they contain no simple property which is unknown to those persons. *

We

* Mr Locke, in B. III. c. 11. § 25. of his essay, suggests the following ingenious expedient for giving precise notions of things, which, on account of their simplicity or peculiarity, do not admit of being defined. ‘ It were to
 ‘ be wished,’ says he, ‘ that men, versed in physical
 ‘ inquiries, and acquainted with the several sorts of natural bodies, would set down those simple ideas, wherein they observe the individuals of each sort constantly
 ‘ to agree. But a dictionary of this sort, containing, as
 ‘ it were, a natural history, requires too many hands, as
 ‘ well as too much time, cost, pains, and sagacity, ever to
 ‘ be hoped for. Yet, methinks, it is not unreasonable to

We are next to inquire into the nature of the process of induction or reasoning, that admirable

‘ suppose, that words, standing for things which are
 ‘ known and distinguished by their outward shapes,
 ‘ should be expressed by little draughts and prints made
 ‘ of them. A vocabulary, made after this fashion, would,
 ‘ perhaps, with more ease, and in less time, teach the
 ‘ true signification of many terms, especially in languages
 ‘ of remote countries or ages, and settle truer ideas in
 ‘ men’s minds, of several things whereof we read the
 ‘ names in ancient authors, than all the large and laborious
 ‘ comments of learned critics. Naturalists, that treat of
 ‘ plants and animals, have found the benefit of this way;
 ‘ and he that has had occasion to consult them, will have
 ‘ occasion to confess that he has a clearer idea of *opium*
 ‘ or *ibex*, from a little print of that herb, or beast, than he
 ‘ could have from a long definition of the names of either
 ‘ of them. And so, no doubt, he would have of *strigil*
 ‘ and *sistrum*, if, instead of a *currycomb* and *cymbal*, which
 ‘ are the English names dictionaries render them by, he
 ‘ could see stamped in the margin small pictures of these
 ‘ instruments, as they were in use amongst the ancients.
 ‘ *Toga*, *tunica*, *pallium*, are words easily translated by
 ‘ *gown*, *coat*, and *cloke*; but we have thereby no more
 ‘ true ideas of the fashion of those habits amongst the
 ‘ Romans,

mirable expedient, by which hidden truth is brought to light, and which has, therefore, so deservedly exercised the ingenuity of inquisitive men. I have already had occasion to remark, that I do not consider the inductive process as the province of any peculiar or appropriate faculty, but merely to be the successive application of those truths which are intuitively acquired, principally by the faculty of Reason ;

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‘ Romans, than we have of the faces of the taylor’s who made them.’

The ingenious Abbé de l’Epée informs us, in his account of the institution for the deaf and dumb at Paris, that his academy was amply stocked with prints and drawings of all kinds of natural and artificial objects, for the purpose of communicating accurate ideas of such objects to his pupils.

Bacon displays his usual acuteness and judgment on the subject of Definition. ‘ Quæ tamen definitiones,’ says he, ‘ in rebus naturalibus et materiatis locum non habent : nam definitiones ipsæ ex verbis constant, et verba gignunt verba. Igitur oportet ad instantias particulares earumque series et ordines recurrere.’ (*Nov. Org.*)

son; so as to bring to light, truths which are not themselves immediately perceived by any of our faculties. (See Ch. VIII. § 1.)

The most general division of reasoning or proof, is into the demonstrative and probable. In the first species, the evidence of every step of the inductive process must be clear and certain; and we must perceive it to be impossible that, if the premises be true, the conclusion should be false. If, in any step of the induction, this necessary dependence is not seen, it ceases to be demonstrative; for the evidence of the final conclusion can be no greater than that of the weakest link of the chain of reasoning. In probable reasoning, this necessary connexion between the premises and conclusion is not apparent; nor do we perceive it to be impossible that the first should be true while the last is false.

It follows from this, that demonstrative reasoning has no degrees. One demonstration cannot

cannot be stronger than another, although it may be more perspicuous, more elegant, or more ingeniously conceived. It follows also, that it is superfluous to give more than one demonstration of the same truth. But the strength of probable reasoning depends more upon the number of its arguments, all tending to one point, than upon the force of any one individual argument; and this kind of proof admits of all degrees, from the slightest probability to the strongest, which may be considered as amounting to a complete certainty. ‘Such evidence,’ says Dr Reid, (Essay VII. on the Intellect. Powers, c. 3.) ‘may be compared to a rope made up of many slender filaments twisted together. The rope has strength more than sufficient to bear the stress laid upon it, though no one of the filaments of which it is composed would be sufficient for that purpose.’

It has been generally laid down, that demonstrative

demonstrative reasoning is applicable to truths of the necessary kind only. ‘ It was, I think,’ says Dr Reid, (Essay VII. on the Intellectual Powers, c. 1.), ‘ the opinion of all the ancients, ‘ that demonstrative reasoning can be applied ‘ only to truths that are necessary, and not to ‘ those that are contingent.’ ‘ In this,’ adds he, ‘ I believe they judged right. Of all created things, the existence, the attributes, and, ‘ consequently, the relations resulting from ‘ those attributes, are contingent. They depend upon the will and power of him who ‘ made them. These are matters of fact, and ‘ admit not of demonstration.’

This is, perhaps, too much narrowing the field of demonstration, and limiting the term to a more circumscribed import than legitimate usage requires. If, indeed, it be true, as Dr Reid, afterwards infers, that ‘ the field of demonstrative reasoning, therefore, is the various relations of things *abstract*, that is, of ‘ things

‘ things which we conceive, without regard to their existence ; ’ then, it no doubt will follow, that demonstration can be applied only to necessary truths, because such abstract relations are all of the necessary kind. But I conceive, that, taking the term demonstration in its usual signification, and as above defined, it may frequently be applied to inductive processes, founded upon contingent evidence. Many of the inductive processes in mechanical philosophy are clearly demonstrative, and even in the very form and language of mathematical reasoning ; yet they must all rest originally on observed facts or experiments, that is, upon the contingent evidence of the senses.

At the same time, it may be allowed to be thus far true, with respect to all demonstration being grounded upon necessary truth, that, in demonstrative proof, every step of the induction must consist of the clear and just application of some necessary truth, or abstract principle of

reason, *i. e.* of what is usually called an axiom. This I apprehend to be the true characteristic of demonstration, and that which makes us clearly perceive that there is a *necessary* connexion between the premises and conclusion. The first, or most elementary propositions of the demonstrative kind, furnish the plainest examples of the application of these axioms; in the succeeding propositions, these elementary theorems are resorted to during the proof, which thus, in fact, rests on precisely the same axioms, although they are not specifically quoted.

Dr Reid having limited the field of demonstration to necessary truth, can find only two classes of strictly demonstrative reasonings, *viz.* the metaphysical and mathematical, (*ut supra.*) In the first, however, he says, the process is always short, and the conclusion is but a step or two removed from the first principle, or axiom, on which it is founded; while the different conclusions depend not upon one
another.

another. It is far otherwise in mathematical reasoning, which conducts into an unbounded field of discovery. This is ascribed, by Dr Reid, to the endless relations of quantity, in respect of magnitude, figure, divisibility, ratio, &c.

It evidently cannot be meant by Dr Reid, that Metaphysics is a science, demonstrable in all its parts, like Mathematics. He was too well acquainted with the general uncertainty of metaphysical speculations to have advanced such an opinion. If, then, he asserts only that several metaphysical truths admit of demonstration, the same ought, doubtless, to be said of Physics, many of the reasonings of which have at least as much of demonstrative certainty, as any of the speculations of Metaphysics. The truth appears to be, that every branch of science may occasionally assume the demonstrative form. The existence of a Deity, the immateriality of the human soul, and other
moral

moral or metaphysical truths, have, perhaps, been as fairly demonstrated as the Pythagorean proposition, or the parabolic motion of projectiles. But some sciences are much more susceptible of this kind of proof than others; physics, admitting much more of demonstration than metaphysics or morals. Of all the sciences, Mathematics is that which admits the most largely of demonstration: its first principles are so certain, so definite, and clear; and its manner of proof so accurate and legitimate, that it may be fairly called a completely demonstrative science, and the only one which is justly entitled to that name.

Wherever demonstration cannot be obtained, we must be satisfied with probable evidence; to which we should only give a degree of assent, proportioned to the strength of the argument. Thus, it would be foolish to have much confidence that it will rain to-morrow, although the appearance of the clouds of to-day

day may indicate it. But it is wise to entertain the strongest conviction of the immortality of the human soul, and of a state of future rewards and punishments ; because the arguments for the reality of these truths are numerous, strong, and convincing.

Dr Reid has given the following enumeration of the principal kinds of probable evidence, (Essay VII. on the Intellect. Powers, c. 3.) 1st, Human testimony. 2d, The authority of those who are good judges of the point in question. 3d, That evidence by which we recognize the identity of things, and persons of our acquaintance. 4th, The evidence of men's future actions and conduct, from the general principles of action in man, or from our knowledge of the individuals. 5th, That by which we collect men's characters and designs from their actions, speech, and other external signs. 6th, The probability of chances; and, 7th, The evidence by which the known laws

laws of nature have been discovered, and the effects which have been produced by them in former ages, or which may be expected in time to come.

I am inclined to prefer to this enumeration of Dr Reid, the arrangement of probable evidence proposed by Dr Campbell, and already stated in Sect. 2. of this Chapter: According to this arrangement, probable evidence is divided into, 1st, The knowledge we derive from experience; 2d, That from analogy; 3d, Testimony; and, 4th, The calculation of chances, which is a mixed kind of evidence, partly certain, and partly probable only. Under one or other of these heads, most kinds of probable evidence may be conveniently arranged. But for the particular illustration of each kind, I shall refer to the Philosophy of Rhetoric, (B. I. c. 5.); to Beattie's Essay on Truth, (Part I. c. 2.); to Reid's Essays on the Intell. Powers, (Essay

(Essay VII. c. 3.); or to Locke's Essay, (B. IV. c. 15. & 16.)

The form of a proof, or arrangement of arguments, may be either Analytical or Synthetical; the last is called reasoning *a priori*; the first, reasoning *a posteriori*. The synthetical mode of proof, or reasoning *a priori*, can be resorted to only, when our first principles are clearly established, and such as, of themselves, readily lead to important conclusions. The science of mathematics affords the most copious examples of this mode of proof; as most of its demonstrations proceed by fair deductions from its first principles, to the establishment of new truths by synthetic reasoning. All reasonings concerning the existing properties of body and mind, it is now well understood, must first proceed analytically, so as to infer the primary laws by which they are regulated, from a careful comparison of facts and observations. When, however, such primary laws have been once legitimately established, they

they may fairly be applied to new cases, by the aid of *a priori* reasoning. It is thus that, in mechanical philosophy, it being once ascertained that matter and motion are susceptible of accurate measurement; the known properties of abstract quantity are resorted to for a foundation, upon which, by means of *a priori* reasoning, new relations of matter and motion may be established; and hence, in many instances, the evidence of physical investigations comes to be the same as that of mathematical demonstration. It should always, however, be recollected, that *analysis* is the true mode of discovery, even in mathematics itself; and that *synthesis*, although frequently the most convenient mode of communicating knowledge, is not so properly calculated to increase its stores.

The invention of arguments, or the formation of new processes of induction for the discovery of truth, is one of the noblest efforts of human genius; and is the essential requisite of the truly philosophic character. The degree
of

of excellence in which this character exists, may be said to depend chiefly upon the perfection in which it enjoys the faculties of Abstraction, Combination, and Reason. By the first we are enabled to analyze the individual objects of nature ; by the second, we dispose them into proper classes and assemblages ; whence, by the agency of reason, we are enabled to deduce general laws or first principles. To constitute a preeminent scientific character, all the three faculties are required in perfection. Without sound reasoning, the analyses and combinations of an ingenious mind, will be the mere vagaries of a heated fancy ; and, without a facility at analyzing and compounding, we may, indeed, fully comprehend, and reap the benefit of the discoveries of others ; but shall never, ourselves, merit the praise of original invention.*

The

* ‘ Alia ingenia aptiora ad notandas rerum differentias, alia ad similitudines ; utrumque labitur in excessum, prensando aut gradus rerum, aut umbras.’
(*Nov. Org.* 55.)

The history of science but too clearly evinces how apt reason is to be perverted, and to be led astray from the true path of discovery, by the influence of the imagination or the passions. We have no cause to suspect that the geniuses of antiquity were inferior in acuteness to those of modern times: yet, of how little value are all their philosophical speculations, or, indeed, those of any age, before the time of Lord Bacon! It is well known, that the merit of pointing out the only method by which real advances can be made in philosophy, *viz.* the method of induction by analysis, belongs exclusively to that great man; a truth which, however plain, had lain hid from all the philosophers of former times, to the irreparable injury of their philosophical speculations.

Lord Bacon has also been very successful in pointing out the common sources of prejudice, or erroneous reasoning, to which mankind are liable. Those which he has denominated

nated *idola*, or idols, he arranges under four classes. 1st, *Idola tribus*, or errors to which the whole human race are exposed. 2d, *Idola specus*, errors peculiar to certain individuals. 3d, *Idola fori*, errors arising from the abuse of language; and, 4th, *Idola theatri*, errors belonging to particular philosophical sects. These various sources of error may be seen illustrated, both in the *Novum Organum*, and treatise *De Augmentis Scientiarum*; as also by Dr Reid, in Ch. VIII. of his 6th Essay on the Intellectual Powers; where a very satisfactory view is taken of the influence of these various prejudices on the scientific opinions of more modern times.

Mr Locke has also a very useful chapter on error, or wrong assent; of which he assigns four causes, *viz.* want of proofs, want of ability to use them, want of will to use them, and wrong measures of probability. (B. IV. c. 20.) It is the principal intention of the author of the present work, to cooperate, as

far as he is able, in the detection of those erroneous modes of reasoning, by which the advancement of true science is retarded. And here, the proper object of the undertaking, *viz.* the analysis of the Intellectual Powers, may be considered as concluded ; it has, however, been thought useful to subjoin, by way of illustration of the principles of reasoning here recommended, an Appendix, containing a sketch of the methods of investigation peculiarly adapted to the various sciences.

APPEN-

APPENDIX.

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APPENDIX.

CHAPTER FIRST.

Of Mathematical Reasoning.

THE science of Mathematics has, from the remotest ages of antiquity, met with enthusiastic admirers, and successful cultivators. The peculiar simplicity and clearness of its first principles, the accuracy of its proofs, and the perspicuity of its method, have justly conferred upon it a peculiar dignity in the scale of human knowledge, insomuch, that its name (*μαθησις*) is that of *knowledge* or *science* itself; and it is indeed the only branch of science which is susceptible of demonstrative certainty in all its parts.

The cause of this peculiar certainty, and clearness of mathematical science, is chiefly to be sought in its almost total independence upon all human experience and observation. Those sciences which treat of the existing properties of body and mind, are evidently dependent upon observed facts and phenomena. Their simplest laws can be ascertained only by a laborious comparison of the individual cases which are comprehended under them; and the experience and research of ages is necessary to give to these branches of knowledge the consistency of system and legitimate theory. But the case is widely different with Mathematics; the materials upon which this science operates are a few simple postulates, definitions, and axioms, which are determined without the aid of protracted experience, or laborious investigation. By their assistance alone, without any aid derived from actual observation, it proceeds to establish, step by step, its various propositions, gradually advancing

vancing from the simplest to the more complicated, till at length it arrives at the discovery of truths of the most remote and unexpected kind. Hence we find, that the science of Mathematics made great and rapid advances among the ancients, while the various departments of philosophy were never successfully cultivated till these later ages.

We shall begin our view of the nature of mathematical reasoning, with some observations upon the first principles of Mathematics, or rather of Geometry, *viz.* its axioms, postulates, and definitions. We have already observed, that those axioms which are usually called Mathematical, do not exclusively belong to the science of Mathematics, but are in fact intuitive truths, discoverable by the faculty of reason, which are occasionally, though tacitly, employed in every branch of knowledge. As these axioms are enumerated in the systems of Geometry, as, for example, in that of Euclid,

they have, indeed, a mathematical form; but of this they might easily be divested, as has already been shewn, (c. 8. § 3.)

Neither is the enumeration of axioms given in the systems of Geometry by any means complete, or perfectly satisfactory. We have, in the above mentioned section, noticed several axioms omitted by Euclid, although tacitly referred to in his Demonstrations, as that ‘the whole is equal to all its parts taken together;’ ‘whatever is true of the genus, is true of all the species and individuals of that genus,’ &c. Such omissions may be in some measure unavoidable. But it is an error of a more inexcuseable kind in an elementary system of Geometry, to class, with the axioms, truths which are not only not self-evident, but even somewhat difficult of proof. Yet it has been acknowledged that Euclid has been guilty of this error in the case of his 12th axiom, which is so far from being a self-evident truth, that it

has

has cost his commentators various theorems, supported by new axioms and definitions, properly to establish it. Even the two which precede it, *viz.* ‘ two straight lines cannot enclose a space ; ’ and ‘ all right angles are equal to one another ; ’ seem rather to be of the nature of corollaries, properly deducible from the definitions of a right line, and a right angle, than axioms strictly so called.

I have already had occasion to make some remarks upon what have been stated to be the axioms of arithmetic ; such as, ‘ two and two make four ; ’ ‘ three and two are equal to four and one,’ &c. (c. 8. § 3.) These I have stated to be, not axioms properly so called, but either mere identical propositions, *i. e.* multiplied enunciations of the same truth, or conclusions of reasoning, founded upon the real and legitimate axioms of Arithmetic. These I conceive to be the very same as those of Geometry ; such as, that ‘ things which
are

‘ are equal to the same thing, are equal to one another ; ’ ‘ if equals be added to equals, the wholes are equal, ’ &c. ; with some additions arising from the peculiar nature of the science of number ; as that, ‘ if equals be multiplied by equals, the products will be equal ; ’ ‘ if equals be divided by equals, the quotients will be equal ; ’ and so on. These axioms, it is evident, belong likewise to the science of Algebra, which is only an universal or symbolical kind of arithmetic. The whole algebraic doctrine of the resolution of Equations evidently depends upon the axioms just quoted, together with some others of a like kind ; just as the primary rule of addition in arithmetic is entirely grounded upon this axiom, that ‘ the whole is equal to all its parts taken together. ’

The *definitions* of Mathematics, which come next to be considered, have always been highly admired upon account of their peculiar clearness

ness and certainty. They doubtless afford the most perfect specimens of definition which we possess, and ought to be the models by which all attempts in this way should be regulated. The cause of this peculiar clearness of mathematical definition, appears to be the same as the cause of the certainty of the reasonings of the science itself, *viz.* that its objects are not collected from actual observation, but are in a great measure the creatures of our own conceptions; so that we are able, by definition, to give full and adequate notions of the particular things treated of, which can scarcely be the case with the individual things of nature. ‘ A figure,’ says Mr Locke (b. 3. c. 3. § 18.) ‘ including a space between three lines, is the real, as well as nominal essence of a triangle; it being not only the abstract idea to which the general name is annexed, but the very *essentia* or being of the thing itself; that foundation from which all its properties flow, and to which they are all inseparably annex-
ed.

‘ ed. But,’ continues he, ‘ it is far other-
‘ wise concerning that parcel of matter which
‘ makes the ring on my finger, wherein these
‘ two essences are apparently different. For it
‘ is the real constitution of its insensible parts,
‘ on which depend all those properties of co-
‘ lour, weight, fusibility, fixedness, &c. which
‘ makes it to be gold, or gives it a right to that
‘ name, which is therefore its nominal es-
‘ sence. ’

The objects of mathematical science, how-
ever, though not real existences in nature, are
evidently founded upon our conceptions of
such existences variously modified and abstract-
ed; for we never could have formed the no-
tion of extension, which is the object of geo-
metry, without the faculty of perception; nor
of number, which is the object of Arithmetic,
without the previous operation of memory,
perception, or some faculty calculated to make
us acquainted with the existence of various in-
dividuals

dividuals of a like kind. Hence we infer, that Mathematics is not absolutely, though very nearly, an abstract science. To make this more evident by a particular instance : Euclid defines a circle to be such a plane figure, that all straight lines drawn from its centre to its circumference, are equal, (b. 1. def. 15.) If it be asked how I come to believe, with certainty, that such a figure may be formed ? I think we must resort to perception, or experience, for a satisfactory answer. We may have perceived a stretched thread to be fixed at one end, round which it is made to revolve, so as to describe a circle ; or the same thing to have been accomplished by a revolving rod ; or, what is equivalent, a pair of compasses, a machine so contrived, as to have the ends alone of the line or rod applied upon the plane on which the circle is to be described. In all these methods, the distance between the centre and point which describes the circumference, or the radius of the circle, has been virtually applied

applied to every portion of the circle ; and thus we get perceptive certainty of the possibility of the figure defined. Thus, the first principles of Mathematics rest partly on the evidence of perception. But so few and simple are the references to this source, and so undoubted is their evidence, as almost to elude our notice ; more especially, as the faculty of Abstraction has so large a share in mathematical definitions, which never relate to extension as it is actually found in nature, but as it is mentally conceived in its separate dimensions ; which are successively treated of in Geometry, although in nature they are always, of necessity, found combined. *

The

* The authority of Aristotle, it must be confessed, is in direct opposition to this doctrine of the senses being, in some measure, concerned in the determination of the first principles of mathematical science. ‘ It is evident,’ says that philosopher, ‘ that sense is not concerned in this knowledge (of the theorems of Geometry). For if we
‘ could

The abstractness of some mathematical conceptions has doubtless thrown considerable difficulties in the way of the learner ; and on this account, as little metaphysical subtilty as possible should be admitted into the elementary parts of this science. The very first definition of Euclid's Elements, *viz.* ' a point is that which hath no parts or magnitude,' has justly been objected to on account of its extreme abstractedness, as well as on the more solid ground, that it contains only a negative, and is not convertible, as every good definition ought to be. To obviate this objection, various other definitions of a point have been proposed,

' could perceive by sense, that the three angles of a triangle were equal to two right, yet should we not rest satisfied in this, but would yet seek after a demonstration of it ; sense reaching only to particulars, but knowledge to universals.' Ουδε πιστασθαι δι' αἰσθησεως εἰναι, ὅτι καὶ εἰ ἦν αἰσθάνεσθαι, ὅτι το τριγωνον δυσιν ὁρθαῖς ἔχει τας γωνιας, ἐζηταμεν ἀν' ἀποδείξειν καὶ ἔχ' ὡς φασι τινες ἐπισταμεθα· αἰσθάνεσθαι μὲν γὰρ ἀναγκη καθ' ἑκάστον, ἢ δὲ ἐπιστημη τῷ καθολῷ γνωρίζειν ἐστὶ.

posed, of which the most unexceptionable appears to be that of Professor Playfair, that ‘ a point has position, but not magnitude.’ It may still, however, be doubted, whether the apprehension of a tyro be fully adequate to this abstract and purely geometrical conception. To lead him, by gradual steps, and a kind of necessity, to the formation of this abstract notion, might not the first definitions of the Elements of Geometry have been advantageously expressed as follows, setting out with that which can never be superfluous, a definition of the objects of the science itself?

Def. 1. Geometry is that science which treats of the properties and relations of space, or continuous quantity ; which is exhibited under the various dimensions of length, breadth, and thickness.

2. Magnitudes which have all the three dimensions of length, breadth, and thickness, are called solids.

3. Magnitudes which have the two dimensions of length and breadth, but are void of thickness, are called superficies; and they are the boundaries of solids, and also their intersections one with another.

4. Magnitudes which have length only, and are void of breadth and thickness, are called lines; and they are the boundaries of superficies, and also their intersections.

5. The boundaries, and also the intersections, of lines, are called points; which, therefore, have neither length, breadth, nor thickness, but merely position.

The criticisms here offered on the first definitions of the Elements, relate merely to the attainment of perspicuity, and accuracy of conception. There are some others, which I hope I may be allowed to make, without being accused of going beyond my proper province, which have a more material reference, as they tend to affect the value and utility of the defini-

inition itself, and the purposes to which it can be subsequently applied.

A good definition, according to the view of the subject which we have taken in Ch. VIII. § 4., should contain an enumeration of certain simple characteristic attributes of the thing defined, by which it may be clearly distinguished from all other things of a like kind. Simplicity requires, that as few particulars as may be, should enter into the definition, and merely those which are essentially requisite to characterize the thing defined. In this respect, the definitions of Mathematics are, in general, peculiarly happy. They usually contain some one simple, but characteristic property of the thing in question, from which all its other properties may be readily and legitimately deduced. Thus, the equality of the radii of a circle, is the property of that figure assumed in its definition, from which all its other numerous properties are derived by the strictest reasoning.

reasoning. Thus also, the equality of all the sides of an equilateral triangle is assumed in its definition ; from which is deduced the equality of its angles, and its other properties.

According to this view of the subject, a definition will be faulty, if the property assumed in it be not such as is calculated naturally to lead to the demonstration of the other properties of the thing defined ; inasmuch, that some farther assumption may be requisite before those other properties can be legitimately established. This fault may fairly be presumed to exist in Euclid's definition of parallel lines, which he states to be such as, though infinitely produced both ways, do not meet, (B. I. def. 35.) ; because, before proceeding to the demonstration of any truth concerning these lines, he has found it necessary to assume a new property, evidently relating to them, and which constitutes what he calls the 12th axiom. It would lead me greatly too far from my present pur-

pose, to enter into the detail of the difficulties to which this imperfection in the Elements has given rise; or of the expedients which have been suggested for removing it. They may be seen at large in the commentaries which accompany the various editions of Euclid, particularly those of Clavius, Simson, and Playfair. Of the expedients which have been proposed for obviating this imperfection, the most proper, in my apprehension, is a new definition of parallel lines; and I think it would not be very difficult to point out a definition, which should be at once simple, and properly calculated to lead to the demonstration of the various properties of those lines.

Again, a definition appears to be faulty when it does not contain a distinct enunciation of any precise attribute of the thing defined, such as is calculated to lead to the discovery and establishment of its other attributes. To this censure, several of the definitions of Geometry,

metry, as given by Euclid, appear to be obnoxious. Such are, his definition of a straight line, *viz.* 'that which lies evenly between its 'extreme points,' (def. 4.); of a plane superficies, *viz.* 'that which lies evenly between its 'extreme lines,' (def. 7.); of a plane angle, *viz.* 'the inclination of two lines to one another, which meet, but are not in the same 'direction,' (def. 8.); and perhaps some others; for it is impossible to deduce, by reasoning, any one property of these figures from such vague and indefinite descriptions of their nature.

Dr Simson has substituted, in room of the above definition of a plane, one which contains a characteristic property of the thing defined, *viz.* 'that if any two points be taken in it, 'the straight line between them lies wholly in 'the plane.' He has, however, left the analogous definition of a right line just as he found it, although a corresponding correction was

equally requisite for it. We are indebted to the ingenious Boscovich, (See his Treatise *De Lumine*) for a distinct illustration of the true geometrical conception of a right line; according to which, it is such that, ‘ if it coincide with another right line in any two points, it must coincide with that line throughout its whole length.’

But the most faulty of the definitions above quoted, appears to be that of a plane angle, which, however, has been adopted with little variation by almost all subsequent geometers. The strange and paradoxical disquisitions which have been entertained concerning what is called *the angle of contact*, formed by the tangent of a circle, and the adjacent part of its circumference, are well known to mathematicians; and are to be found at large in Clavius’s commentary upon Prop. XVI. b. 3. of the Elements. These paradoxes seem to have no other foundation than the vague no-

tion

tion of an angle, which is contained in Euclid's definition, and which speaks merely of the *meeting* of the lines which form the angle; although every property of angles, which we find legitimately established in Geometry, is evidently founded upon the supposed *intersection* of those lines. All this mathematical sophistry, therefore, would have been completely obviated, if Euclid's definition had informed us, that a plane angle is formed by the *intersection* of two lines, instead of their *meeting* with one another.*

DD 4

It

* I cannot help thinking, that much of the obscurity and perplexity which is complained of in the Fifth Book of the Elements, or that which treats of the general properties of proportional quantities, arises from the want of a precise and satisfactory definition of geometrical ratio. For I cannot agree with those writers who think, that this relation, on account of its simplicity, does not admit of being defined; although the definition given by Euclid, viz. that 'Ratio is a mutual relation of two magnitudes

of

It is hoped that these protracted remarks upon the definitions of Géometry, will not appear superfluous ; since it may be gathered from the above illustrations, that an error in these definitions is calculated to produce material errors in the conclusions which are deduced from them. Remarks of a similar kind might be extended to the definitions of the higher branches of Mathematics ; but it may be deemed that I have already entered as minutely into this disquisition, as the plan of my undertaking will warrant. One further observation, however, I may be permitted to offer, *to wit*, that those things which are assumed in the definitions of new branches of the Mathematics, should never be inconsistent with the first assumptions of its purer elements. The method of *indivisibles*, as proposed by Cavallerius, was manifestly

‘ of the same kind to one another, in respect of quantity,’ is evidently too vague to form the foundation of any subsequent investigations.

manifestly liable to this objection, as it was assumed in it, that surfaces were made up of contiguous lines, and solids, of contiguous surfaces; in manifest contradiction to the first definitions of Geometry, which teach us, that a line has no breadth, and a superficies no thickness. On this account, the method of indivisibles was never considered as possessed of true geometric purity; and it has now happily given place to the much more unexceptionable, as well as infinitely more ingenious and useful, method of *Fluxions*.

With respect to those first principles of Mathematics, called Postulates, it is not necessary to enter into any very minute detail. It is pretty plain, that their claim to self-evidence is chiefly founded upon perceptive belief. For I know no other way in which we can be convinced that a line may be drawn between any two points,—that it may be indefinitely produced at pleasure,—and that a circle may be de-
scribed

scribed about any centre, and with any radius, than by an immediate reference to the senses. These are all the postulates which Euclid has expressly laid down as a foundation for his propositions. But the enumeration is not complete, any more than in the case of the axioms ; for, in the course of the Elements, several other postulates are tacitly assumed. Thus, the demonstration of the 4th Prop. of the 1st Book, proceeds upon the supposition that it is possible to apply one plane figure upon another, so as to make the parts of the one coincide with the corresponding parts of the other ; and the various definitions of the 11th Book, evidently proceed upon the assumed postulate, that a plane may be made to revolve around one of its sides as an axis. In the higher branches of the Mathematics, new postulates are in like manner assumed : thus, in the Conic Sections, it is assumed, that a solid, particularly a cone, may be cut by a plane in any required direction ; and so forth.

If

If the first principles of mathematical science, its axioms, postulates, and definitions, be fairly assumed, and accurately laid down, its investigations may then be carried on according to the strictest laws of demonstrative proof; for every step of its deductions seems to consist in the clear application of some necessary truth or axiom of reason. Let us examine how Euclid proceeds in the demonstration of his first proposition, so as necessarily to convince us that the triangle which he has constructed is really equilateral. It first follows, from his definition of a circle, that two sides of his triangle are equal to one another; and, likewise, that the third side is equal to one of these two. To prove, therefore, the equality of all the three sides, he has only to apply his first axiom, by which we are necessarily convinced, that ‘things which are equal to the same, are equal to one another.’ Here, therefore, the proof consists solely in the application of an axiom.

The

The demonstration of his second proposition contains no more than a similar application of his 3d axiom ; while, in its construction, not only the postulates are made use of, as in the construction of the first proposition, but likewise the construction of an equilateral triangle, now established by means of this first proposition ; and the demonstration of the 3d proposition rests, in like manner, upon a single axiom, while, in its construction, the 2d proposition is employed. Again, the 4th proposition, which is the *first* of the Theorems, is founded entirely upon the 10th axiom, and this other tacitly assumed one, that ‘ magnitudes, which may be made to coincide with each other throughout all their parts, are exactly equal to each other.’ And in the demonstration of the 5th, long as it is, no previous truth is applied except this 4th proposition, and the 3d axiom ; while, in its construction, the 3d proposition is employed.

Thus,

Thus, the science of Mathematics advances in its reasonings, either by the application of its first principles, or of those truths which it has already established, to new cases of an endless variety, till at length it arrives at the discovery of truths apparently the most remote from common apprehension. This successive application of its established truths to new cases, is evidently nothing else than an exemplification of that axiom, or principle of reason, which teaches us, that what is true of a genus, is true of all the individuals comprehended under it; so that, in this case also, the process of demonstration consists in nothing else than a particular application of an axiom, or necessary first principle. As this axiom constitutes the basis upon which the demonstrative evidence of the syllogistic mode of reasoning rests, we perceive the truth of an observation, which has been frequently made, that every demonstration, particularly every mathematical demonstration, may be turned into a series of syllogisms.

The

The demonstrations of Geometry, particularly those of its elements, are always given in the synthetical form, as regularly deducible from its first principles, and from one another. It must, however, be recollected, that the proper method of discovery, even in Geometry, is not Synthesis, but Analysis. That the ancient geometers possessed a method of analysis, which they highly prized, and which was systematically taught in various series, or books of geometrical propositions, is a fact well known to Mathematicians; although considerable uncertainty prevails as to the precise nature of this boasted method. This much, however, is certainly known, that the general principle upon which the ancient analysis proceeded, was, to take for granted the truth to be proved, and deduce therefrom a legitimate series of conclusions, until these should terminate in some self-evident, or previously ascertained truth. This process, when reversed, became a satisfactory synthetic demonstration of the
usual

usual kind ; and it is evident, that the principles by which our belief in the certainty of both kinds of reasoning is regulated, are precisely the same.

It cannot, however, be denied, that mathematical demonstrations may be, and frequently are, discovered by *synthesis*, as well as by *analysis*, although the latter method is best calculated for the purposes of discovery. One reason of this appears to be, that the conclusion of a proposition is one simple assertion, while the premises generally consist of two or more separate assumptions. While, therefore, we proceed to reason from the premises to the conclusion, we are liable to be bewildered by the multiplicity of paths which offer themselves to us ; but if we reverse this method, the road is usually simple, and may lead us to many different conclusions, all of which are calculated to prove the truth of our proposition.

But

But human ingenuity will make discoveries in Mathematics, as well as in other sciences, by methods which are neither strictly analytical, nor synthetical. Dr. Wallis, it appears, was accustomed to infer a general truth merely from observing it to take place in a variety of instances ; and, by this kind of induction, he discovered many of his most curious propositions. The great field of mathematical discovery has, in modern times, been chiefly confined to the science of Algebra, in which the method of discovery has the peculiar advantage of being purely analytical. In this science, although the solution of problems, of the more difficult kinds, doubtless demands a large portion of ingenuity ; yet so happy are the expedients which it possesses, and so precise the rules of its analysis, that, in ordinary cases, a common understanding is sufficient for overcoming the difficulties of a question. Hence, in the present advanced state of the mathematical sciences, we find the province of Geometry usually limited

limited to the demonstration, by a legitimate synthesis, of those truths which may have been brought to light by the happier expedients of algebraic analysis.

EE

CHAP-

CHAPTER II.

Of the Induction of Physical Science.

WHILE the science of Mathematics was advancing towards a state of high maturity, and had given birth to the immortal works of Euclid, Archimedes, and Apollonius, as well as to the more refined and abstracted investigations of the algebraic analysis, the science of Physics was yet in its infancy. The small progress made in physical science by the ancient Greeks, as well as by the Romans, who, in matters of science and literature, were only the imitators of the Greeks, is to be ascribed, partly to the peculiar genius of the people, partly to the manner in which they conducted their scientific investigations.

The

The Greeks were a nation, as Newton expresses it, ‘*magis philologica quam philosophica* ;’ more fitted to excel in elegant literature, and the cultivation of the fine arts, than in the severer investigations of philosophical science. Indeed, in some respects, it may be said, that the knowledge of nature rather declined, than advanced in the schools of Grecian philosophy. We have good reason to believe, that Pythagoras imported into Greece the true system of the universe, which represents the sun as the centre of the planetary motions. Yet, immediately after, it was taught by Anaxagoras, Democritus, and others, that the earth is fixed immoveably in the centre of the universe ; a doctrine which, being afterwards variously modified by Eudoxus, Ptolemy, and others, became the prevailing astronomical system of the Greeks.

The manner in which the Greeks endeavoured to cultivate the science of Physics, was

by no means calculated effectually to answer that end. Enamoured of mathematical speculations, and of the certainty, elegance, and simplicity of geometrical proof, they seem to have wished to introduce into physical research the same simplicity of principle, and elegance of arrangement. Not aware that all knowledge of the phenomena of nature must rest upon the basis of experience, and accurate observation, they attempted to establish a system of physical science by a synthetic deduction from a few assumed general principles, instead of by a careful analysis of the varied appearances which nature exhibits.

The philosophical speculations of Aristotle, the most admired of all the ancients for his scientific acuteness, afford a remarkable example of this truth. He offers to the world an arrangement, or classification, of all the objects of human knowledge, or every thing that can form a subject of our thoughts, past, present, and

and to come, comprehended under ten general heads, or categories. He then proceeds to inquire what might be asserted, or (according to the scholastic language) *predicated*, of such general conceptions as the categories; and, having done this, by the aid of abstract reasoning, little more remained to complete the Aristotelian system of philosophy, than to arrange, under their proper categories, the various individual things of nature. For the *Organon*, or *Logic* of Aristotle, after a most laborious investigation, establishes this truth, that whatever is predicable of a genus, is likewise predicable of all the species of that genus; which self-evident principle is the great result of all the ingenuity that has been bestowed by the Aristotelians on the syllogism and its various figures and modes. In the arrangements of the genera and species of the categories, however, the followers of Aristotle have differed very widely from one another, and have amply evinced the unsteadiness of the light by

which they were guided, when they no longer fervilely followed the footsteps of their great archetype.

The Aristotelian philosophy, like all the other systems of the ancient schools, contained a sufficient share of arbitrary assumption and visionary hypothesis. It was a rule with its followers, never to decline the solution of any phenomenon that might be proposed to them; and the imposing terms of *substantial forms*, *materia prima*, *generation*, *corruption*, *privation*, &c. were offered and received as satisfactory philosophical explanations of natural appearances. The learned jargon, and demonstrative solemnity, in which this system was enveloped, seems to have conspired, with the real acuteness and ingenuity occasionally displayed by its founder, in acquiring to it a reputation, and an extensive reception, unequalled before in the history of science.

The

The Aristotelian philosophy was carried by Alexander the Great into Asia; by his successors into Egypt; and it found its way to Rome, after Greece became a province of the empire. It was adopted by the Jews, by the Fathers of the Christian church, by the Mohammedan Arabs during the Caliphate, and continued to be cultivated by the schoolmen through all Europe, until the enlightened æra of the sixteenth century. At this remarkable period, destined to give birth to a reformation both in religion and philosophy, the illustrious Bacon, Lord Verulam, arose, whose superior genius clearly perceived the futility of what was then called knowledge, and prompted him to explore a more certain path for the prosecution of this desirable object. To him we owe two immortal treatises: the first ‘*De augmentis Scientiarum*,’ and the second the ‘*Novum Organum*;’ which have for their object, nothing less than to reform the system of human learning,

learning, and to point out the true and legitimate mode of scientific investigation. *

Rejecting the syllogistic mode of reasoning, which he justly represents as a mere instrument of scholastic disputation, and altogether incapable of advancing in the real knowledge of nature, Bacon proposes to substitute, in its room, the method of analytical induction; according to which, natural phenomena are subjected to the test of observation and diligent investigation, in order that known facts may furnish a sure foundation for general truths. He then points out physical experiment as the true *organ*, or instrument, by which discoveries in nature can be accomplished, and as the only effectual method of drawing men off from
those

* ‘ Frustra expectatur augmentum in scientiis ex superinductione novorum super vetera, instauratio facienda est ab imis fundamentis, nisi libeat perpetuò circumvolvi in orbem cum exili et quasi contemnendo progressu.’ (*Nov. Org. lib. i.*)

those uncertain speculations which contribute nothing towards discovering the true nature of things. He utterly rejects hypothesis and conjecture, as the means of solving natural phenomena ; he ably illustrates the various prejudices, or errors (called by him *idola*) to which the human intellect is more peculiarly obnoxious ; and happily ridicules the veneration for ancient names which had so long prevailed in the world. If, says he, age and experience entitle to the name of ancient, we, who live in the farthest advanced period of the world, and have the advantage of the observations of all who have gone before us, are to be called the ancients, and to have our opinions, at least in matters of science, treated with the greatest respect.

It was too much, however, to expect that the precepts of Bacon, however judicious, should at once overthrow a system of error, which had the accumulated authority of ages
to

to support it. Many physical inquirers, indeed, were sagacious enough to discover, that experiment and analytical induction were the only certain means of advancing the knowledge of nature. Such were the celebrated Roger Bacon, who flourished in the beginning of the thirteenth century; Gilbert of Colchester, who wrote immediately before Lord Verulam; Galileo, one of the principal ornaments of this illustrious æra of science; Mr Boyle, who made his philosophical experiments not long after, and some others. But the passion for hypothesis, and synthetic reasoning, was by no means extinguished; and was destined, soon after, to receive a powerful sanction from the example of the ingenious Descartes; who seems to have been actuated by the ambition of founding a sect, in that science which properly disclaims all sects, and admits of no other authority than nature herself. *

At

* ‘ De tous les philosophes,’ says Condillac, ‘ le
Chancelier

At the present advanced period of philosophical science, we cannot help wondering at the general reception, and unbounded applause which the physical system of Descartes experienced; when it is evident, that its whole fabric of *materia subtilis*, *absolute plenum*, *rotatory particles*, and *vortices*, had no other foundation than in the reveries of his own lively imagination. This should teach us an useful lesson

‘ Chancelier Bacon est celui qui a le mieux connu la
‘ cause de nos erreurs. Il a vu que les idées qui sont
‘ l’ouvrage de l’esprit, avaient été mal faites, et que par
‘ conséquent pour avancer dans la recherche de la vérité
‘ il fallait les refaire. Mais pouvait-on l’écouter? Pre-
‘ venu comme on l’étoit pour le jargon de l’école ou pour
‘ les idées innées ne devoit-on pas traiter de chimérique
‘ le projet de renouveler l’entendement humain? Bacon
‘ proposait une méthode trop parfaite pour être l’auteur
‘ d’une révolution. Descartes devait mieux réussir, soit
‘ parce qu’il laissait subsister une partie des erreurs, soit
‘ parce qu’il ne semblait quelquefois en détruire, que
‘ pour en substituer de plus séduisantes.’ (*Art de Penser*,
at the end.)

lesson of caution, against implicitly admitting any new system of speculation, however ingeniously constructed, or generally admired.

But the period was at hand, when the true mode of investigating nature was so admirably illustrated and exemplified, as to render it impossible that it should afterwards be wholly overlooked in the speculations of ingenious men. This inestimable service to science was performed by the immortal Newton, of whom it may safely be said, that during the period of his, fortunately, long life, he did more in elucidating the phenomena of nature, and communicating sound and important knowledge to mankind, than has been done by the collective labours of all the natural philosophers that have preceded or yet followed him. Bacon, indeed, had the merit of first inculcating the true principles of physical investigation; but it was left for Newton to prove to the world what wonderful discoveries might be made, by
strictly

strictly adhering to the rules of analytical induction; and to fix more precisely, both by precept and example, than had ever been done before, the true laws of philosophizing.

According, then, to the principles of what is now generally called the Newtonian philosophy, the object of the science of Physics, is to make us acquainted with the various phenomena of nature, and their general laws. These phenomena are made known to us, in the first instance, by the evidence of sense alone; which is, therefore, to be looked upon as one of the first principles, or foundations, of the science of Physics. Another first principle of this science is, the conviction which all men have of the steady recurrence of natural phenomena; or that, in the events of nature, the future will resemble the past; of which conviction I have already endeavoured to assign the origin, (Ch. VIII. § 3.) These natural phenomena, or events are, on the one hand, to be distinguished

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ed from the works of art, and, on the other, from preternatural or miraculous appearances. Thus, the figure of a house, or a chair, is not a natural phenomenon ; though that of a tree, or an animal, is : and, when I move a body with my hand, its motion is not a natural phenomenon, although, when it is thrown into the air, its path, after it goes out of my hand, is a natural phenomenon. Again, if a piece of iron sinks in water, this is a natural phenomenon ; but, if it is made to swim in that fluid, by the immediate interposition of Divine power, this is not a natural phenomenon, but a miracle.

The phenomena of nature, as they are exhibited to our senses, are of an almost endless variety and complication. To acquire a knowledge of them all, individually, is therefore manifestly impossible ; and it is only by the help of arrangement and classification that we are enabled to form an acquaintance with their
general

general nature. Aided by patient investigation, we find out points of resemblance in phenomena, which, in various respects, disagree ; we ascertain whether the diversity be permanent, or only accidental ; and, if it be the latter, we consider the phenomena as, in fact, reducible to the same class. Thus, the cultivation of the science of Physics, enables us gradually to generalize, or to advance from the knowledge of particulars to that of generals ; and, when we can no farther thus ascend, we give to that ultimate phenomenon, which constitutes the class to which a variety of subordinate appearances have been referred, the name of a *law of nature*.

To illustrate this analytical process, let us take, for an example, the investigation of any one general law of nature, as, for example, *Gravitation*. From time immemorial it has been observed, that heavy bodies naturally fall towards the earth ; but it was reserved for

Galileo

Galileo to investigate the particular laws by which this descent is regulated, and to shew, that the velocity of the falling body is uniformly accelerated, and the spaces it describes, regularly as the squares of the times. This illustrious philosopher likewise demonstrated, that the oblique path of a projectile, which is acted upon by the force of projection, and the tendency to descend, conjointly, is the precise curve of a parabola. The heavenly bodies, during their mutual approaches to each other, may be contemplated in the light of descending, or falling bodies; but this speculation was reserved for another genius, and another age. Meanwhile, Kepler, a Prussian astronomer, discovered, by means of patient observation and comparison, certain laws by which the planetary motions are regulated. He found, that these bodies all move in ellipses; that the areas they describe are proportional to the times of description; and, that the squares of the periods of their revolutions, are as the cubes of their distances

tances from the point about which they revolve. This advance in generalization, was the sole fruit of close observation ; but the immortal Newton was able afterwards to demonstrate, that Kepler's laws were necessarily true of every body made to revolve in a regular curve, by the joint action of a projectile force, and a central power ; such, that it diminished in intensity as the square of the distance from it increased. This also was known to be the law of that power by which a stone is made to fall towards the earth ; at the same time that the peculiar deflections of the planets were shewn, by Newton, precisely to accord to the same general principle. Thus was established, upon the surest basis, the Newtonian theory of *Universal Gravitation* ; a theory, of wonderful extent and importance in explaining the phenomena of nature. Subsequent philosophers have attempted still farther to generalize ; and to shew, that this widely extended principle, thus unfolded by Newton, is included in another still

more general, *viz.* that of *Impulse*. They ascribe the motions of the planetary bodies, as well as of those which are attracted by the earth, to the impulse of a certain invisible fluid, which they call Ether, and which they suppose to be every where present, moving in all directions. But, besides that it has never yet been demonstrated, that the motions of such a fluid are suited to produce the visible effects of gravitation; it is manifestly contrary to the spirit of the true, or Newtonian, philosophy, to ascribe phenomena to the agency of an element whose existence is not proved, but taken for granted. In this farther step of generalization, then, we are as yet unwarranted to proceed, without departing from the principles of true philosophy. *

Thus, it appears, that the true object of the science of Physics is, to arrange the phenome-

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* See *Æncyclop. Britan.* Articles *PHILOSOPHY* and *PHYSICS*.

na of nature under a certain number of general classes, which constitute the laws of nature, and are to be considered as ultimate facts, or first principles, till, by a farther progress in analytical investigation, we are able to diminish their number, and reduce the phenomena comprehended under one general law, to the class which constitutes another general law. While we thus reduce a new phenomenon to that law of nature to which it properly belongs, we are said, in common language, to assign its cause. Thus, Newton is said to have discovered that *gravitation* is the *cause* by which the planets are retained in their orbits, while they revolve round the sun. We must, however, carefully keep in mind, that the term *cause*, taken in this sense, imports something very different from that *active energy* which we are led to believe is necessarily concerned in the production of every natural phenomenon. However firmly we may be convinced of the reality of such active and efficient causes, candour obliges

us to acknowledge our ignorance of their nature and mode of operation. The ancient philosophical sects, indeed, made no scruple in giving their sentiments on this difficult subject; and much of the philosophy of Pythagoras, of Plato, and of Aristotle, consists in speculations concerning the agency of spiritual essences, of departed souls, of demons, or of the universal soul of the world, in producing the various changes of nature. The Newtonian philosopher, however, has wisely dismissed such speculations from its physical investigations; and professes merely to investigate the general laws of natural events, and to apply these to the explanation of particular phenomena. If, indeed, we adopt the language of the vulgar, and suppose a constantly preceding event to be the cause of that which immediately follows it, then, we may still consider Physics as the science of *causes*; but of the active and efficient causes of phenomena, it, in strict propriety, takes no cognizance.

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The reality of this distinction is admirably illustrated by Dr. Reid, in his *Essays on the Active Powers of Man*. (Essay I. c. 6.) Among other excellent remarks, it is there said, that ‘the whole object of natural philosophy, as Newton expressly teaches, is reducible to these two heads; first, by just induction, from experiment and observation, to discover the laws of nature; and then to apply those laws to the solution of the phenomena of nature. This was all that this great philosopher attempted, and all that he thought attainable. And this, indeed, he attained, in a great measure, with regard to the motions of our planetary system, and with regard to the rays of light. But supposing that all the phenomena that fall within the reach of our senses, were accounted for from general laws of nature, justly deduced from experience, that is, supposing natural philosophy brought to its utmost perfection, it does not discover the efficient cause of any one

‘ phenomenon in nature. The laws of nature
‘ are the rules, according to which the effects
‘ are produced ; but there must be a cause
‘ which operates according to these rules. The
‘ rules of navigation never navigated a ship.
‘ The rules of architecture never built a
‘ house. Natural philosophers, by great at-
‘ tention to the course of nature, have disco-
‘ vered many of her laws, and have very hap-
‘ pily applied them to account for many phe-
‘ nomena ; but they have never discovered the
‘ efficient cause of any one phenomenon ; nor
‘ do those who have distinct notions of the
‘ principles of the science, make any such pre-
‘ tence. Upon the theatre of nature we see
‘ innumerable effects, which require an agent
‘ endowed with active power ; but the agent
‘ is behind the scene. Whether it be the
‘ Supreme Cause alone, or a subordinate cause,
‘ or causes ; and, if subordinate causes be em-
‘ ployed by the Almighty, what their nature,
‘ their number, and their different offices may
‘ be,

‘ be, are things hid, for wise reasons, without
‘ doubt, from the human eye. ’

It is sufficiently evident, from what has been said, that the mode of investigation which is calculated to advance the science of Physics, is essentially different from that which is suited to Mathematical science. The induction of Physics is a pure analysis, ascending from observed facts and phenomena, to the discovery of their general laws, or principles ; the induction of Mathematics, although it may, for the sake of convenience, assume the analytical form, yet admits of being carried on by a strict synthesis, or reasoning *a priori*, from its first principles. The truths of Physics can be gathered only from a long continued experience ; but those of Mathematics are deduced, by the powers of reasoning alone, from the simple first principles of the science, without any reference to experience. Yet, when once general laws, or principles, are established in phy-

physical science, these may be advantageously applied to the elucidation of particular phenomena by strict synthetical reasoning. Thus, Galileo, finding that a projectile is acted upon by the two forces of gravitation and impulse, whose laws he had previously established, was able to demonstrate, synthetically, that it must describe the precise curve of a parabola. In these, and other cases of physical investigation, the very form of mathematical proof is advantageously employed, upon the consideration, that the various relations of matter and motion, to which many natural phenomena are reducible, admit of accurate measurement and calculation.

As physical science consists in ascribing particular phenomena to their proper general laws, it is evident that the certainty of our deductions in this science, will depend upon the just application of that principle of reason, which leads us to assert of every specific thing, that
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which is true of its comprehending genus; a principle or axiom which we have already seen to be of the most frequent employment in mathematical science. In Mathematics, however, if the just method of investigation be followed, there can be no room for doubting that this principle is fairly applied. But in Physics we have by no means the same certainty upon all occasions; because, though two phenomena may agree in all the circumstances which have come under our observation, they may yet differ in others, of which we are ignorant, and therefore, may be improperly reduced to the same general law. In many instances, however, the points of resemblance may be so numerous, as to remove all shadow of doubt concerning the identity of the general principle; as in the case of the planetary motions, which Newton has demonstrated to be regulated by the same law which causes a stone to fall to the earth.

Thus, Physics can only be called a probable science,

science, although, in a great many instances, attaining to certainty. The causes of error in this science, according to the view we have taken of the subject, can arise only, either, 1st, From the false assumption of phenomena, and the statement of those things to be facts, which have no real foundation in nature ; or, 2d, From arranging facts improperly, under classes to which they do not belong.

The first of these sources of error, the false assumption of phenomena, is, in general, much easier of detection than the last. It was, indeed, very fruitful in false philosophy, before the proper method of cultivating physical science was understood ; and the principal physical systems of the ancients, contain little else than absurd hypotheses, instead of a detail of the actual phenomena of nature. Such is the assertion of Heraclitus, concerning the cylindrical figure of the earth ; the doctrine of Calippus, that the celestial spheres are formed of crystal ;

crystal ; Aristotle's dogmas concerning substantial forms ; and so forth. In fact, till the time of Newton, who first successfully demonstrated the inefficiency of reasoning from hypotheses in Physics, the same source of error continued to be very prevalent among the moderns. Thus, the whole physical system of Descartes is grounded upon the assumption, that the universe originally consisted of nothing more than a set of cubes of matter, whirled about with a certain degree of rapidity. Leibnitz grounds his philosophy upon the hypothetical existence of a set of original particles of matter, of a peculiar kind, which he calls *monads*: other philosophers have assigned different qualities to these constituent particles, and called them *atoms*: But all the while, the existence of the atoms, the monads, and the Cartesian cubes, rests upon no other evidence than mere hypothesis.

At present, experience has rendered us
more

more cautious in this matter ; and if ingenious men are still prone to indulge in conjecture where facts are wanting, others are by no means inclined to mistake such hypothetical reveries for sound philosophy, but ask for facts fully investigated and cautiously ascertained, as the basis of physical reasoning and theory.

Opposite to the admission of phenomena, which have no real existence in nature, is the rejection of those which are grounded upon sufficient evidence ; a source of error chiefly confined, at least in modern times, to those philosophers called Sceptics. Those persons pretend to question the evidence of their senses, of their memory, or of their consciousness ; by the testimony of which the rational part of mankind have been guided in the regulation of their most important concerns in all ages of the world. In lieu of the irresistible conviction which those faculties bring along with them, they are disposed to substitute the
proofs

proofs afforded by their own sophisms ; which exhibits an instance of one of the strangest paralogisms, or an admission of the less evident, in lieu of the more convincing, to be found in the records of science. But we have already had repeated occasion to expose the futility of such sophistry ; and it is indeed the principal object of an inquiry like the present, to detect its absurdity, and to place upon their proper foundation those first principles of the different branches of knowledge which we derive from our various intellectual faculties.

The second general source of error in physical science, above stated, is a wrong classification of phenomena, or the assigning to the same law of nature phenomena which, in fact, belong to different laws. This is a cause of error, doubtless, very difficult to be avoided, and that which will, probably, always continue to render physical speculations in some degree uncertain. Even when natural laws appear to
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be very firmly established, new facts may be discovered, which shall alter our opinions concerning them. Thus, there are not wanting those who wish to substitute another explanation of the tides, in room of that assigned by the immortal Newton, *viz.* gravitation. With more reason, perhaps, do we find his theory of the rectilineal course, and materiality of the particles of light, still opposed by those who espouse the Cartesian hypothesis, of an ethereal luminous fluid. In other cases, the ground of dissent is far more substantial. Thus, chemists are at present divided in opinion, whether the phenomena of heat are to be ascribed to the agency of a peculiar fluid, according to the system of Boerhaave, which has been so strongly supported by the experiments of modern chemists; or may be accounted for by the mere specific action of the particles of body; a doctrine which is sanctioned by the illustrious names of Boyle, Bacon, and Newton, and seems at present to be gaining ground with
chemists

chemists of reputation. Again, although the Franklinian theory of a single electric fluid, existing sometimes in a redundant, sometimes in a deficient state, is that which is most generally admitted in the systems of electricity; yet there are not wanting many electricians, who think the phenomena of their science better explained by the supposition of two electric fluids of opposite qualities, sometimes existing in a separate and perceptible form, sometimes in a state of inactive combination.

These facts should induce us to be cautious how we admit, as certain, explanations of natural phenomena, which future discoveries may overturn; and should lead us to examine, with the most scrupulous attention, all the points of apparent identity and diversity among those phenomena which we class together. For it is the natural tendency of the human mind to seek for points of analogy where none really exist;

exist; and to endeavour to reduce, to a few general principles, all the facts which come within the sphere of its observation.

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CHAPTER THIRD.

Of the Induction of Metaphysics and other Sciences.

AFTER the full discussion which has been bestowed upon the nature of physical induction, it will not be necessary to make many observations upon the peculiarities of the induction adapted to Metaphysics, or the philosophy of mind. It may, indeed, be truly said that the sciences of Physics and Metaphysics differ much more from each other in the peculiar nature of their objects, than in the mode according to which they ought to be cultivated; and occasion has already been furnished, more than once in the course of this work, to detail the principal rules by which metaphysical investigation should in general be regulated.

The science of Metaphysics, like Physics, can be successfully cultivated only by a strict and cautious analysis. Both sciences must commence with a collection and examination of facts and phenomena, which come, by degrees, to be digested and arranged under certain general laws. But the sources from which the facts are derived, are widely different in these two branches of science. It is from the senses that we derive this information in the case of Physics; while, in the case of Metaphysics, the fundamental facts are derived from the evidence of Consciousness; or from a knowledge of the conduct of other men, as exhibited in the world; or as detailed in the records of history, voyages, travels, &c.; or to be gathered from the annals of philosophy and the arts, or an examination of the structure of language; all of which throw light upon the constitution of the human mind, to which they owe their source.

It is evident, that as metaphysical science, like physical, consists in arranging particular phenomena under their proper general laws, the certainty of its deductions, likewise, will depend upon the just application of that axiom, which teaches us, that what is true of a genus or class, is true of all the individuals comprehended under it. The usual causes of error in this science also, as in Physics, will be, either the false assumption of facts and phenomena; or the arrangement of these under classes to which they do not properly belong.

The first of these causes of error has been as fruitful of absurd speculation in Metaphysics, as in Physics. Witness the strange consequences that have been deduced from the celebrated hypothesis of ideas, or images of things present in the brain, as variously modified in the systems of ancient and modern philosophers. Other instances of a like kind are to be found in Hartley's hypothetical system of the vibra-

tions and vibratiuncles of the fibres of the brain and nerves ; in the various hypotheses which philosophers have offered concerning the immediate seat of the soul, or sentient principle ; and so forth. Indeed, so few persons are qualified, from their peculiar habits, or pursuits, to pay a diligent attention to the information to be derived from Consciousness, the most instructive source of information in intellectual science, that we ought to be scrupulously on our guard in admitting what are stated as new phenomena in this branch of knowledge ; and should cautiously weigh the evidence, according to which they are to be received or rejected.

We are, perhaps, less liable to mistake in Metaphysics, than in Physics, from the second general cause of error, *viz.* the wrong classification of phenomena ; because all the phenomena exhibited by a human being are much more completely within the compass of our observation,

observation, than all the varied phenomena of the material world ; so that we can more certainly ascertain the points of resemblance, or diversity, which occur among the former, than those which obtain among the latter.

Yet, in metaphysical science, as well as in physical, an inordinate desire of simplicity, or a deficiency of observation, will occasion a wrong classification of phenomena. Thus, the ethical system, which was supported by Epicurus among the ancients, and by Hobbes, Mandeville, and others among the moderns, represents *self-love* as the sole active principle by which man is prompted in his conduct, whether he seeks his own good, or the good of his neighbours. But this doctrine directly opposes the evidence of Consciousness, which very plainly informs us, that there is a principle of benevolence in man, as well as a principle of selfishness. Again, many Pneumatologists have treated of Taste as a peculiar and origi-

nal faculty of the human mind, by the operation of which we derive gratification from contemplating certain objects, or qualities, which are denominated, *sublime, beautiful, &c.* But in the farther progress of Pneumatology, it seems to have been established, that such objects are not gratifying on account of any peculiar characteristic qualities which they possess in common, but because they are suited to excite certain pleasing emotions in the mind. Thus, sublime objects seem all to agree in exciting a pleasing kind of awe, or gentle terror, (See Burke on the Sublime and Beautiful); and beautiful objects are calculated to excite affection, by their expression of delicacy or tenderness, (See Alison on Taste.) Hence, it becomes no longer necessary to refer to the faculty of Taste as an ultimate fact or principle of human nature, in explaining those gratifications which are thus shewn to have their source in other acknowledged emotions of the mind. If the conclusions to which our investigations of the reasoning powers

powers of man have led be well founded, there is likewise no cause for considering Judgment and Reasoning as separate and independent faculties of the human mind, but only as varied modes of exerting the single faculty of Reason.

In the science of Metaphysics, therefore, as in Physics, let us be circumspect in our observations, and in the admission of facts; as well as cautious how we class together phenomena, which may have some things in common, and yet are not essentially of the same order.

All philosophy, as we have had occasion to observe at the outset of this work, may be arranged under two general heads, or divisions; Physics, which treats of the laws of matter; and Metaphysics, which treats of the laws of mind. Under each of these general classes is comprehended a variety of more subordinate branches of science, admitting of a considerable diversity in the mode of their cultivation,

and the certainty to which they can be expected to attain. Thus, we cannot at present look for the same certainty in the speculations of the physiologist, or even of the chemist, as has been attained in Mechanical philosophy, although all these are equally branches of Physical science. Again, in the case of Metaphysical science, the departments of Politics and Jurisprudence are doubtless less certain in their conclusions than those of Ethics, or even Pneumatology. To enter into a detail of the degree of evidence to which each department of philosophical science is calculated to attain, or of the peculiarities which necessarily occur in their modes of investigation, is a task to which the abilities of the author of this work are by no means adequate. It is presumed, however, that the general remarks which have been made upon the two great divisions of philosophical science, are, in a great measure, applicable to all its subordinate departments; and may, with advantage, be kept in view by those
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who are desirous of advancing any of these branches of knowledge.

Besides the sciences of Mathematics, and Philosophy properly so called, there are some other branches of knowledge which have occasionally been considered as scientific, and in which the reasoning faculty is to a certain extent concerned. Such are history, natural, civil, and ecclesiastical ; voyages, antiquities, &c. The chief object in these branches of knowledge, is the ascertaining of facts ; and in so far as this is the case, the observations which have already been made on the evidence of testimony, or on that of the fundamental facts of Physics and Metaphysics, are applicable here. These branches of knowledge, too, occasionally indulge in speculations of a philosophical nature respecting the dependence of events on each other, and the tracing the effects of remote causes. When this is the case, the reasonings must be conducted

ed on similar principles as in works professedly philosophical, and must consist in an application of the previously ascertained general doctrines to specific instances.

Thus, if the preceding observations be well founded, the great instrument which we employ, in the cultivation of science, is that self-evident truth, or principle of reason, which teaches us, that whatever is true of the genus, is true of all the species of that genus. The conviction of this truth, induces us to classify and arrange all the phenomena of the material and intellectual world, in order that we may apply previously established truths, to new and peculiar cases. By the aid of the same instrument we apply the maxims and rules of judging, which experience has led us to form for the detection of error, or misrepresentation, in what are offered to us as facts or phenomena whereon to ground our conclusions. And, with this truth as his chief guide, the mathematician proceeds,

ceeds, from a few simple principles, step by step, to demonstrate the relations which exist in the most complicated examples of quantity and figure.

The boasted instrument of the ancient Logic, the *sylogism*, consists in nothing other than a formal expression of this great truth ; the major proposition being an enunciation of some general law ; the minor, of some specific case of that law ; and the conclusion, the obvious inference, that the assertion contained in the major, may be applied to the particular case expressed by the minor proposition. The acute genius of Aristotle, no doubt, saw the very general application of this truth in the investigations of science ; and, in particular, that the deductions of Mathematics are easily reducible under this principle of reason. Yet that sagacious philosopher was evidently guilty of the most perverted application of his ingenuity, when he exhausted it in ascertaining
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all the various forms in which the fyllogism could be expressed ; and in pointing out what were the legitimate forms, or, according to the logical language, *modes* and *figures* of the fyllogism, and what forms were not legitimate. For, in fact, a common understanding sees at once whether a fyllogism be expressed in a legitimate form or not ; that is, whether it truly exemplifies the fundamental axiom, that the properties of the genus belong to all the individuals of that genus.

In doing this, Aristotle exhausted his talents in perfecting the instrument of scientific investigation, which, in fact, was sufficiently perfect in itself, instead of successfully employing it in the process of discovery. His boasted Logic exhibits, likewise, another fundamental misapprehension of the nature of scientific research, as it represents the process of discovery to be synthetical, in material and intellectual science, as well as in Mathematics ; and, accordingly,

cordingly, attempts to lay down a set of general first principles, arranged under *categories* and *predicables*, from which all the investigations in these sciences are to flow : whereas, it is now well understood, as has been repeatedly observed in the present work, that the process of discovery, in the sciences of existing things, is analytical ; rising from the examination of particular facts and phenomena, to the ascertaining of general laws and first principles.

A rational system of Logic, calculated to serve as a guide for the discovery of truth, and detection of error, in scientific investigation, ought, it should seem, to proceed in a very different manner. Such a system ought to be founded upon an analysis of those faculties of the human mind, by which the various kinds of truth are made known to us, with a view, particularly, to ascertain the degree of evidence accompanying the testimony of each, and the sources of error to which they may be more peculiarly

peculiarly liable. In such a system, the faculty of Reason naturally demands a full investigation ; and the examination of those first truths, which are either immediately made known by that faculty, or are the province of other intellectual powers, is evidently an object of primary importance. Along with this, our system of Logic would require an examination of the process of discovery, adapted to each particular science, and a detection of the ordinary sources of error, and false reasoning, to which each may be exposed. In doing this, it would be very desirable to measure, as accurately as may be, the degree of credit which is due to every attempt at new discovery in scientific investigation, whether of particular facts or general laws ; to distinguish what is certain, from what is only probable ; and to proportion our assent to the degree of evidence which actually accompanies the proposed discovery.

The author of the present Sketch, is far
from

from believing himself adequate to the execution of a work of such importance, or capable of satisfactorily filling up the outline which he has here drawn. Indeed, if such a system of Logic were completely executed, it is not too much to say, that it would go far in putting a stop to the progress of false philosophy, and illegitimate reasoning, in the various departments of Science, and, consequently, would prove a most important benefit to mankind.

F I N I S.

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them, believing himself adequate to the execution of a work of such importance, or capable of distinctly fixing up the outline which he had here drawn. In fact, if such a system of logic were or might be executed, it is not more than to say that it would be in the way of stop to the progress of this philosophy, and the first to working in the various departments of science, and consequently, would prove itself to be a hindrance to mankind.

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