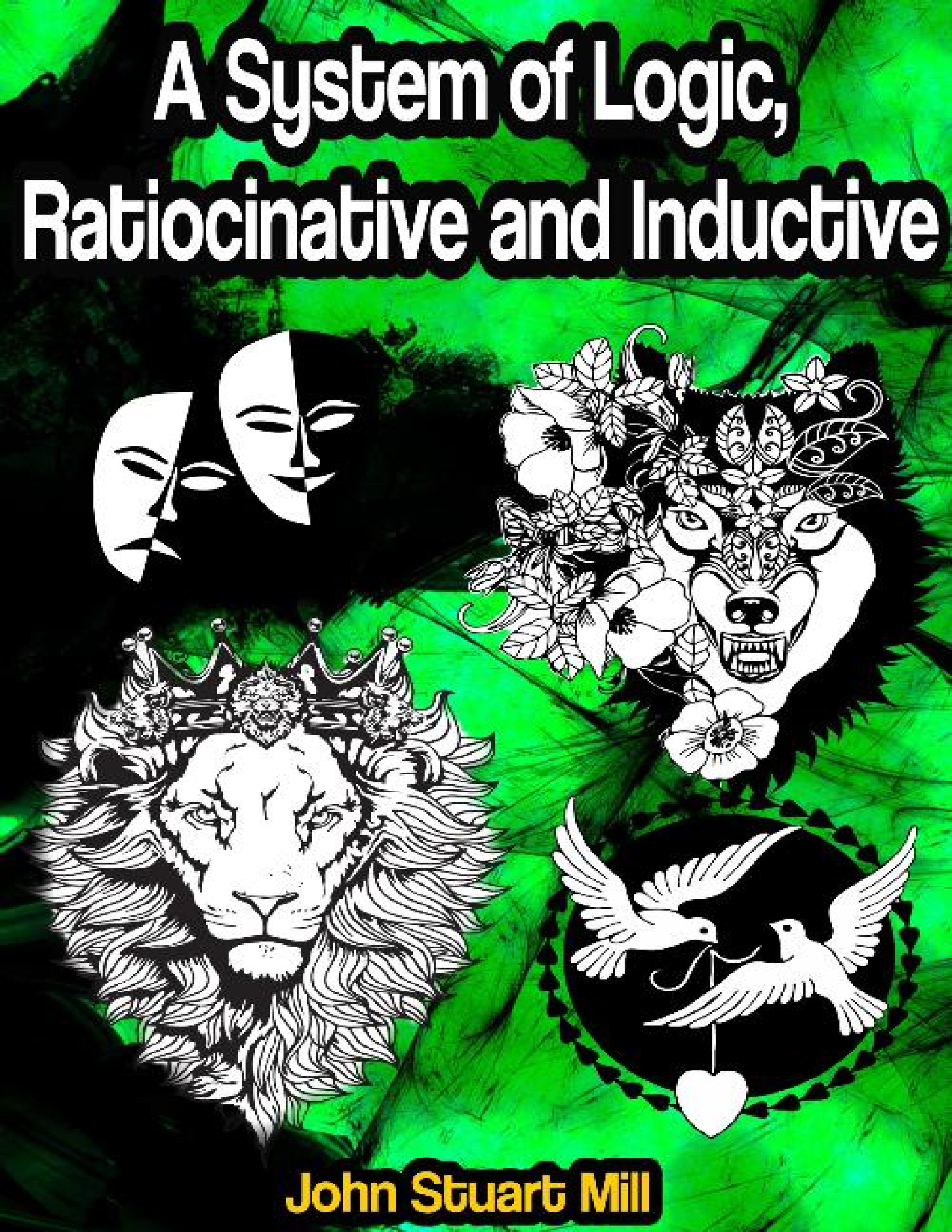
A System of Logic, Ratiocinative and Inductive



John Stuart Mill

Preface To The First Edition

This book makes no pretense of giving to the world a new theory of the intellectual operations. Its claim to attention, if it possess any, is grounded on the fact that it is an attempt, not to supersede, but to embody and systematize, the best ideas which have been either promulgated on its subject by speculative writers, or conformed to by accurate thinkers in their scientific inquiries.

To cement together the detached fragments of a subject, never yet treated as a whole; to harmonize the true portions of discordant theories, by supplying the links of thought necessary to connect them, and by disentangling them from the errors with which they are always more or less interwoven, must necessarily require a considerable amount of original speculation. To other originality than this, the present work lays no claim. In the existing state of the cultivation of the sciences, there would be a very strong presumption against any one who should imagine that he had effected a revolution in the theory of the investigation of truth, or added any fundamentally new process to the practice of it. The improvement which remains to be effected in the methods of philosophizing (and the author believes that they have much need of improvement) can only consist in performing more systematically and accurately operations with which, at least in their elementary form, the human intellect, in some one or other of its employments, is already familiar.

In the portion of the work which treats of Ratiocination, the author has not deemed it necessary to enter into technical details which may be obtained in so perfect a shape from the existing treatises on what is termed the Logic of the Schools. In the contempt entertained by many modern philosophers for the syllogistic art, it will be seen that he by no means participates; though the scientific theory on which its defense is usually rested appears to him erroneous: and the view which he has suggested of the nature and functions of the Syllogism may, perhaps, afford the means of conciliating the principles of the art with as

much as is well grounded in the doctrines and objections of its assailants.

The same abstinence from details could not be observed in the First Book, on Names and Propositions; because many useful principles and distinctions which were contained in the old Logic have been gradually omitted from the writings of its later teachers; and it appeared desirable both to revive these, and to reform and rationalize the philosophical foundation on which they stood. The earlier chapters of this preliminary Book will consequently appear, to some readers, needlessly elementary and scholastic. But those who know in what darkness the nature of our knowledge, and of the processes by which it is obtained, is often involved by a confused apprehension of the import of the different classes of Words and Assertions, will not regard these discussions as either frivolous, or irrelevant to the topics considered in the later Books.

On the subject of Induction, the task to be performed was that of generalizing the modes of investigating truth and estimating evidence, by which so many important and recondite laws of nature have, in the various sciences, been aggregated to the stock of human knowledge. That this is not a task free from difficulty may be presumed from the fact that even at a very recent period, eminent writers (among whom it is sufficient to name Archbishop Whately, and the author of a celebrated article on Bacon in the *Edinburgh Review*) have not scrupled to pronounce it impossible.[1] The author has endeavored to combat their theory in the manner in which Diogenes confuted the skeptical reasonings against the possibility of motion; remembering that Diogenes's argument would have been equally conclusive, though his individual perambulations might not have extended beyond the circuit of his own tub.

Whatever may be the value of what the author has succeeded in effecting on this branch of his subject, it is a duty to acknowledge that for much of it he has been indebted to several important treatises, partly historical and partly philosophical, on the generalities and processes of physical science, which have been published within the last few years. To these treatises, and to their authors, he has endeavored to do justice in the body of the work. But as with one of these writers, Dr. Whewell, he has occasion frequently to express differences of opinion, it is more particularly incumbent on him in this place to declare, that

without the aid derived from the facts and ideas contained in that gentleman's “History of the Inductive Sciences,” the corresponding portion of this work would probably not have been written.

The concluding Book is an attempt to contribute toward the solution of a question which the decay of old opinions, and the agitation that disturbs European society to its inmost depths, render as important in the present day to the practical interests of human life, as it must at all times be to the completeness of our speculative knowledge—viz.: Whether moral and social phenomena are really exceptions to the general certainty and uniformity of the course of nature; and how far the methods by which so many of the laws of the physical world have been numbered among truths irrevocably acquired and universally assented to, can be made instrumental to the formation of a similar body of received doctrine in moral and political science.

Preface To The Third And Fourth Editions

Several criticisms, of a more or less controversial character, on this work, have appeared since the publication of the second edition; and Dr. Whewell has lately published a reply to those parts of it in which some of his opinions were controverted.[2]

I have carefully reconsidered all the points on which my conclusions have been assailed. But I have not to announce a change of opinion on any matter of importance. Such minor oversights as have been detected, either by myself or by my critics, I have, in general silently, corrected: but it is not to be inferred that I agree with the objections which have been made to a passage, in every instance in which I have altered or canceled it. I have often done so, merely that it might not remain a stumbling-block, when the amount of discussion necessary to place the matter in its true light would have exceeded what was suitable to the occasion.

To several of the arguments which have been urged against me, I have thought it useful to reply with some degree of minuteness; not from any taste for controversy, but because the opportunity was favorable for placing my own conclusions, and the grounds of them, more clearly and completely before the reader. Truth on these subjects is militant, and can only establish itself by means of conflict. The most opposite opinions can make a plausible show of evidence while each has the statement of its own case; and it is only possible to ascertain which of them is in the right, after hearing and comparing what each can say against the other, and what the other can urge in its defense.

Even the criticisms from which I most dissent have been of great service to me, by showing in what places the exposition most needed to be improved, or the argument strengthened. And I should have been well pleased if the book had undergone a much greater amount of attack; as in that case I should probably have been enabled to improve it still more than I believe I have now done.

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In the subsequent editions, the attempt to improve the work by additions and corrections, suggested by criticism or by thought, has been continued. The additions and corrections in the present (eighth) edition, which are not very considerable, are chiefly such as have been suggested by Professor Bain's “Logic,” a book of great merit and value. Mr. Bain's view of the science is essentially the same with that taken in the present treatise, the differences of opinion being few and unimportant compared with the agreements; and he has not only enriched the exposition by many applications and illustrative details, but has appended to it a minute and very valuable discussion of the logical principles specially applicable to each of the sciences—a task for which the encyclopedical character of his knowledge peculiarly qualified him. I have in several instances made use of his exposition to improve my own, by adopting, and occasionally by controverting, matter contained in his treatise.

The longest of the additions belongs to the chapter on Causation, and is a discussion of the question how far, if at all, the ordinary mode of stating the law of Cause and Effect requires modification to adapt it to the new doctrine of the Conservation of Force—a point still more fully and elaborately treated in Mr. Bain's work.

Introduction

§ 1. There is as great diversity among authors in the modes which they have adopted of defining logic, as in their treatment of the details of it. This is what might naturally be expected on any subject on which writers have availed themselves of the same language as a means of delivering different ideas. Ethics and jurisprudence are liable to the remark in common with logic. Almost every writer having taken a different view of some of the particulars which these branches of knowledge are usually understood to include; each has so framed his definition as to indicate beforehand his own peculiar tenets, and sometimes to beg the question in their favor.

This diversity is not so much an evil to be complained of, as an inevitable and in some degree a proper result of the imperfect state of those sciences. It is not to be expected that there should be agreement about the definition of any thing, until there is agreement about the thing itself. To define, is to select from among all the properties of a thing, those which shall be understood to be designated and declared by its name; and the properties must be well known to us before we can be competent to determine which of them are fittest to be chosen for this purpose. Accordingly, in the case of so complex an aggregation of particulars as are comprehended in any thing which can be called a science, the definition we set out with is seldom that which a more extensive knowledge of the subject shows to be the most appropriate. Until we know the particulars themselves, we can not fix upon the most correct and compact mode of circumscribing them by a general description. It was not until after an extensive and accurate acquaintance with the details of chemical phenomena, that it was found possible to frame a rational definition of chemistry; and the definition of the science of life and organization is still a matter of dispute. So long as the sciences are imperfect, the definitions must partake of their imperfection; and if the former are progressive, the latter ought to be so too. As much, therefore, as is to be expected from a definition placed at the commencement of

a subject, is that it should define the scope of our inquiries: and the definition which I am about to offer of the science of logic, pretends to nothing more than to be a statement of the question which I have put to myself, and which this book is an attempt to resolve. The reader is at liberty to object to it as a definition of logic; but it is at all events a correct definition of the subject of this volume.

§ 2. Logic has often been called the Art of Reasoning. A writer[3] who has done more than any other person to restore this study to the rank from which it had fallen in the estimation of the cultivated class in our own country, has adopted the above definition with an amendment; he has defined Logic to be the Science, as well as the Art, of reasoning; meaning by the former term, the analysis of the mental process which takes place whenever we reason, and by the latter, the rules, grounded on that analysis, for conducting the process correctly. There can be no doubt as to the propriety of the emendation. A right understanding of the mental process itself, of the conditions it depends on, and the steps of which it consists, is the only basis on which a system of rules, fitted for the direction of the process, can possibly be founded. Art necessarily presupposes knowledge; art, in any but its infant state, presupposes scientific knowledge: and if every art does not bear the name of a science, it is only because several sciences are often necessary to form the groundwork of a single art. So complicated are the conditions which govern our practical agency, that to enable one thing to be *done*, it is often requisite to *know* the nature and properties of many things.

Logic, then, comprises the science of reasoning, as well as an art, founded on that science. But the word Reasoning, again, like most other scientific terms in popular use, abounds in ambiguities. In one of its acceptations, it means syllogizing; or the mode of inference which may be called (with sufficient accuracy for the present purpose) concluding from generals to particulars. In another of its senses, to reason is simply to infer any assertion, from assertions already admitted: and in this sense induction is as much entitled to be called reasoning as the demonstrations of geometry.

Writers on logic have generally preferred the former acceptation of the term: the latter, and more extensive signification is that in which I mean to use it. I do this by virtue of the right I claim for every author, to give whatever

provisional definition he pleases of his own subject. But sufficient reasons will, I believe, unfold themselves as we advance, why this should be not only the provisional but the final definition. It involves, at all events, no arbitrary change in the meaning of the word; for, with the general usage of the English language, the wider signification, I believe, accords better than the more restricted one.

§ 3. But reasoning, even in the widest sense of which the word is susceptible, does not seem to comprehend all that is included, either in the best, or even in the most current, conception of the scope and province of our science. The employment of the word Logic to denote the theory of Argumentation, is derived from the Aristotelian, or, as they are commonly termed, the scholastic, logicians. Yet even with them, in their systematic treatises, Argumentation was the subject only of the third part: the two former treated of Terms, and of Propositions; under one or other of which heads were also included Definition and Division. By some, indeed, these previous topics were professedly introduced only on account of their connection with reasoning, and as a preparation for the doctrine and rules of the syllogism. Yet they were treated with greater minuteness, and dwelt on at greater length, than was required for that purpose alone. More recent writers on logic have generally understood the term as it was employed by the able author of the Port Royal Logic; viz., as equivalent to the Art of Thinking. Nor is this acceptation confined to books, and scientific inquiries. Even in ordinary conversation, the ideas connected with the word Logic include at least precision of language, and accuracy of classification: and we perhaps oftener hear persons speak of a logical arrangement, or of expressions logically defined, than of conclusions logically deduced from premises. Again, a man is often called a great logician, or a man of powerful logic, not for the accuracy of his deductions, but for the extent of his command over premises; because the general propositions required for explaining a difficulty or refuting a sophism, copiously and promptly occur to him: because, in short, his knowledge, besides being ample, is well under his command for argumentative use. Whether, therefore, we conform to the practice of those who have made the subject their particular study, or to that of popular writers and common discourse, the province of logic will include several operations of the intellect not usually considered to

fall within the meaning of the terms Reasoning and Argumentation.

These various operations might be brought within the compass of the science, and the additional advantage be obtained of a very simple definition, if, by an extension of the term, sanctioned by high authorities, we were to define logic as the science which treats of the operations of the human understanding in the pursuit of truth. For to this ultimate end, naming, classification, definition, and all other operations over which logic has ever claimed jurisdiction, are essentially subsidiary. They may all be regarded as contrivances for enabling a person to know the truths which are needful to him, and to know them at the precise moment at which they are needful. Other purposes, indeed, are also served by these operations; for instance, that of imparting our knowledge to others. But, viewed with regard to this purpose, they have never been considered as within the province of the logician. The sole object of Logic is the guidance of one's own thoughts: the communication of those thoughts to others falls under the consideration of Rhetoric, in the large sense in which that art was conceived by the ancients; or of the still more extensive art of Education. Logic takes cognizance of our intellectual operations only as they conduce to our own knowledge, and to our command over that knowledge for our own uses. If there were but one rational being in the universe, that being might be a perfect logician; and the science and art of logic would be the same for that one person as for the whole human race.

§ 4. But, if the definition which we formerly examined included too little, that which is now suggested has the opposite fault of including too much.

Truths are known to us in two ways: some are known directly, and of themselves; some through the medium of other truths. The former are the subject of Intuition, or Consciousness;[4] the latter, of Inference. The truths known by intuition are the original premises from which all others are inferred. Our assent to the conclusion being grounded on the truth of the premises, we never could arrive at any knowledge by reasoning, unless something could be known antecedently to all reasoning.

Examples of truths known to us by immediate consciousness, are our own bodily sensations and mental

feelings. I know directly, and of my own knowledge, that I was vexed yesterday, or that I am hungry to-day. Examples of truths which we know only by way of inference, are occurrences which took place while we were absent, the events recorded in history, or the theorems of mathematics. The two former we infer from the testimony adduced, or from the traces of those past occurrences which still exist; the latter, from the premises laid down in books of geometry, under the title of definitions and axioms. Whatever we are capable of knowing must belong to the one class or to the other; must be in the number of the primitive data, or of the conclusions which can be drawn from these.

With the original data, or ultimate premises of our knowledge; with their number or nature, the mode in which they are obtained, or the tests by which they may be distinguished; logic, in a direct way at least, has, in the sense in which I conceive the science, nothing to do. These questions are partly not a subject of science at all, partly that of a very different science.

Whatever is known to us by consciousness is known beyond possibility of question. What one sees or feels, whether bodily or mentally, one can not but be sure that one sees or feels. No science is required for the purpose of establishing such truths; no rules of art can render our knowledge of them more certain than it is in itself. There is no logic for this portion of our knowledge.

But we may fancy that we see or feel what we in reality infer. A truth, or supposed truth, which is really the result of a very rapid inference, may seem to be apprehended intuitively. It has long been agreed by thinkers of the most opposite schools, that this mistake is actually made in so familiar an instance as that of the eyesight. There is nothing of which we appear to ourselves to be more directly conscious than the distance of an object from us. Yet it has long been ascertained, that what is perceived by the eye, is at most nothing more than a variously colored surface; that when we fancy we see distance, all we really see is certain variations of apparent size, and degrees of faintness of color; that our estimate of the object's distance from us is the result partly of a rapid inference from the muscular sensations accompanying the adjustment of the focal distance of the eye to objects unequally remote from us, and partly of a comparison (made with so much rapidity

that we are unconscious of making it) between the size and color of the object as they appear at the time, and the size and color of the same or of similar objects as they appeared when close at hand, or when their degree of remoteness was known by other evidence. The perception of distance by the eye, which seems so like intuition, is thus, in reality, an inference grounded on experience; an inference, too, which we learn to make; and which we make with more and more correctness as our experience increases; though in familiar cases it takes place so rapidly as to appear exactly on a par with those perceptions of sight which are really intuitive, our perceptions of color.[5]

Of the science, therefore, which expounds the operations of the human understanding in the pursuit of truth, one essential part is the inquiry: What are the facts which are the objects of intuition or consciousness, and what are those which we merely infer? But this inquiry has never been considered a portion of logic. Its place is in another and a perfectly distinct department of science, to which the name metaphysics more particularly belongs: that portion of mental philosophy which attempts to determine what part of the furniture of the mind belongs to it originally, and what part is constructed out of materials furnished to it from without. To this science appertain the great and much debated questions of the existence of matter; the existence of spirit, and of a distinction between it and matter; the reality of time and space, as things without the mind, and distinguishable from the objects which are said to exist in them. For in the present state of the discussion on these topics, it is almost universally allowed that the existence of matter or of spirit, of space or of time, is in its nature unsusceptible of being proved; and that if any thing is known of them, it must be by immediate intuition. To the same science belong the inquiries into the nature of Conception, Perception, Memory, and Belief; all of which are operations of the understanding in the pursuit of truth; but with which, as phenomena of the mind, or with the possibility which may or may not exist of analyzing any of them into simpler phenomena, the logician as such has no concern. To this science must also be referred the following, and all analogous questions: To what extent our intellectual faculties and our emotions are innate—to what extent the result of association: Whether God and duty are realities, the existence of which is manifest to us *a priori* by

the constitution of our rational faculty; or whether our ideas of them are acquired notions, the origin of which we are able to trace and explain; and the reality of the objects themselves a question not of consciousness or intuition, but of evidence and reasoning.

The province of logic must be restricted to that portion of our knowledge which consists of inferences from truths previously known; whether those antecedent data be general propositions, or particular observations and perceptions. Logic is not the science of Belief, but the science of Proof, or Evidence. In so far as belief professes to be founded on proof, the office of logic is to supply a test for ascertaining whether or not the belief is well grounded. With the claims which any proposition has to belief on the evidence of consciousness—that is, without evidence in the proper sense of the word—logic has nothing to do.

§ 5. By far the greatest portion of our knowledge, whether of general truths or of particular facts, being avowedly matter of inference, nearly the whole, not only of science, but of human conduct, is amenable to the authority of logic. To draw inferences has been said to be the great business of life. Every one has daily, hourly, and momentary need of ascertaining facts which he has not directly observed; not from any general purpose of adding to his stock of knowledge, but because the facts themselves are of importance to his interests or to his occupations. The business of the magistrate, of the military commander, of the navigator, of the physician, of the agriculturist, is merely to judge of evidence, and to act accordingly. They all have to ascertain certain facts, in order that they may afterward apply certain rules, either devised by themselves or prescribed for their guidance by others; and as they do this well or ill, so they discharge well or ill the duties of their several callings. It is the only occupation in which the mind never ceases to be engaged; and is the subject, not of logic, but of knowledge in general.

Logic, however, is not the same thing with knowledge, though the field of logic is co-extensive with the field of knowledge. Logic is the common judge and arbiter of all particular investigations. It does not undertake to find evidence, but to determine whether it has been found. Logic neither observes, nor invents, nor discovers; but judges. It is no part of the business of logic to inform the surgeon what appearances are found to accompany a

violent death. This he must learn from his own experience and observation, or from that of others, his predecessors in his peculiar pursuit. But logic sits in judgment on the sufficiency of that observation and experience to justify his rules, and on the sufficiency of his rules to justify his conduct. It does not give him proofs, but teaches him what makes them proofs, and how he is to judge of them. It does not teach that any particular fact proves any other, but points out to what conditions all facts must conform, in order that they may prove other facts. To decide whether any given fact fulfills these conditions, or whether facts can be found which fulfill them in a given case, belongs exclusively to the particular art or science, or to our knowledge of the particular subject.

It is in this sense that logic is, what it was so expressively called by the schoolmen and by Bacon, *ars artium*; the science of science itself. All science consists of data and conclusions from those data, of proofs and what they prove: now logic points out what relations must subsist between data and whatever can be concluded from them, between proof and every thing which it can prove. If there be any such indispensable relations, and if these can be precisely determined, every particular branch of science, as well as every individual in the guidance of his conduct, is bound to conform to those relations, under the penalty of making false inferences—of drawing conclusions which are not grounded in the realities of things. Whatever has at any time been concluded justly, whatever knowledge has been acquired otherwise than by immediate intuition, depended on the observance of the laws which it is the province of logic to investigate. If the conclusions are just, and the knowledge real, those laws, whether known or not, have been observed.

§ 6. We need not, therefore, seek any further for a solution of the question, so often agitated, respecting the utility of logic. If a science of logic exists, or is capable of existing, it must be useful. If there be rules to which every mind consciously or unconsciously conforms in every instance in which it infers rightly, there seems little necessity for discussing whether a person is more likely to observe those rules, when he knows the rules, than when he is unacquainted with them.

A science may undoubtedly be brought to a certain, not inconsiderable, stage of advancement, without the

application of any other logic to it than what all persons, who are said to have a sound understanding, acquire empirically in the course of their studies. Mankind judged of evidence, and often correctly, before logic was a science, or they never could have made it one. And they executed great mechanical works before they understood the laws of mechanics. But there are limits both to what mechanicians can do without principles of mechanics, and to what thinkers can do without principles of logic. A few individuals, by extraordinary genius, or by the accidental acquisition of a good set of intellectual habits, may work without principles in the same way, or nearly the same way, in which they would have worked if they had been in possession of principles. But the bulk of mankind require either to understand the theory of what they are doing, or to have rules laid down for them by those who have understood the theory. In the progress of science from its easiest to its more difficult problems, each great step in advance has usually had either as its precursor, or as its accompaniment and necessary condition, a corresponding improvement in the notions and principles of logic received among the most advanced thinkers. And if several of the more difficult sciences are still in so defective a state; if not only so little is proved, but disputation has not terminated even about the little which seemed to be so; the reason perhaps is, that men's logical notions have not yet acquired the degree of extension, or of accuracy, requisite for the estimation of the evidence proper to those particular departments of knowledge.

§ 7. Logic, then, is the science of the operations of the understanding which are subservient to the estimation of evidence: both the process itself of advancing from known truths to unknown, and all other intellectual operations in so far as auxiliary to this. It includes, therefore, the operation of Naming; for language is an instrument of thought, as well as a means of communicating our thoughts. It includes, also, Definition, and Classification. For, the use of these operations (putting all other minds than one's own out of consideration) is to serve not only for keeping our evidences and the conclusions from them permanent and readily accessible in the memory, but for so marshaling the facts which we may at any time be engaged in investigating, as to enable us to perceive more clearly what evidence there is, and to judge with fewer chances of error whether it be sufficient. These, therefore, are

operations specially instrumental to the estimation of evidence, and, as such, are within the province of Logic. There are other more elementary processes, concerned in all thinking, such as Conception, Memory, and the like; but of these it is not necessary that Logic should take any peculiar cognizance, since they have no special connection with the problem of Evidence, further than that, like all other problems addressed to the understanding, it presupposes them.

Our object, then, will be, to attempt a correct analysis of the intellectual process called Reasoning or Inference, and of such other mental operations as are intended to facilitate this: as well as, on the foundation of this analysis, and *pari passu* with it, to bring together or frame a set of rules or canons for testing the sufficiency of any given evidence to prove any given proposition.

With respect to the first part of this undertaking, I do not attempt to decompose the mental operations in question into their ultimate elements. It is enough if the analysis as far as it goes is correct, and if it goes far enough for the practical purposes of logic considered as an art. The separation of a complicated phenomenon into its component parts is not like a connected and interdependent chain of proof. If one link of an argument breaks, the whole drops to the ground; but one step toward an analysis holds good and has an independent value, though we should never be able to make a second. The results which have been obtained by analytical chemistry are not the less valuable, though it should be discovered that all which we now call simple substances are really compounds. All other things are at any rate compounded of those elements: whether the elements themselves admit of decomposition, is an important inquiry, but does not affect the certainty of the science up to that point.

I shall, accordingly, attempt to analyze the process of inference, and the processes subordinate to inference, so far only as may be requisite for ascertaining the difference between a correct and an incorrect performance of those processes. The reason for thus limiting our design, is evident. It has been said by objectors to logic, that we do not learn to use our muscles by studying their anatomy. The fact is not quite fairly stated; for if the action of any of our muscles were vitiated by local weakness, or other physical defect, a knowledge of their anatomy might be very

necessary for effecting a cure. But we should be justly liable to the criticism involved in this objection, were we, in a treatise on logic, to carry the analysis of the reasoning process beyond the point at which any inaccuracy which may have crept into it must become visible. In learning bodily exercises (to carry on the same illustration) we do, and must, analyze the bodily motions so far as is necessary for distinguishing those which ought to be performed from those which ought not. To a similar extent, and no further, it is necessary that the logician should analyze the mental processes with which Logic is concerned. Logic has no interest in carrying the analysis beyond the point at which it becomes apparent whether the operations have in any individual case been rightly or wrongly performed: in the same manner as the science of music teaches us to discriminate between musical notes, and to know the combinations of which they are susceptible, but not what number of vibrations in a second correspond to each; which, though useful to be known, is useful for totally different purposes. The extension of Logic as a Science is determined by its necessities as an Art: whatever it does not need for its practical ends, it leaves to the larger science which may be said to correspond, not to any particular art, but to art in general; the science which deals with the constitution of the human faculties; and to which, in the part of our mental nature which concerns Logic, as well as in all other parts, it belongs to decide what are ultimate facts, and what are resolvable into other facts. And I believe it will be found that most of the conclusions arrived at in this work have no necessary connection with any particular views respecting the ulterior analysis. Logic is common ground on which the partisans of Hartley and of Reid, of Locke and of Kant, may meet and join hands. Particular and detached opinions of all these thinkers will no doubt occasionally be controverted, since all of them were logicians as well as metaphysicians; but the field on which their principal battles have been fought, lies beyond the boundaries of our science.

It can not, indeed, be pretended that logical principles can be altogether irrelevant to those more abstruse discussions; nor is it possible but that the view we are led to take of the problem which logic proposes, must have a tendency favorable to the adoption of some one opinion, on these controverted subjects, rather than another. For metaphysics, in endeavoring to solve its own peculiar

problem, must employ means, the validity of which falls under the cognizance of logic. It proceeds, no doubt, as far as possible, merely by a closer and more attentive interrogation of our consciousness, or more properly speaking, of our memory; and so far is not amenable to logic. But wherever this method is insufficient to attain the end of its inquiries, it must proceed, like other sciences, by means of evidence. Now, the moment this science begins to draw inferences from evidence, logic becomes the sovereign judge whether its inferences are well grounded, or what other inferences would be so.

This, however, constitutes no nearer or other relation between logic and metaphysics, than that which exists between logic and every other science. And I can conscientiously affirm that no one proposition laid down in this work has been adopted for the sake of establishing, or with any reference to its fitness for being employed in establishing, preconceived opinions in any department of knowledge or of inquiry on which the speculative world is still undecided.[6]

BOOK 1. OF NAMES AND PROPOSITIONS

“La scolastique, qui produisit dans la logique, comme dans la morale, et dans une partie de la métaphysique, une subtilité, une précision d'idées, dont l'habitude inconnue aux anciens, a contribué plus qu'on ne croit au progrès de la bonne philosophie.”—Condorcet, *Vie de Turgot*.

“To the schoolmen the vulgar languages are principally indebted for what precision and analytic subtlety they possess.”—Sir W. Hamilton, *Discussions in Philosophy*.

Chapter 1. Of The Necessity Of Commencing With An Analysis Of Language

§ 1. It is so much the established practice of writers on logic to commence their treatises by a few general observations (in most cases, it is true, rather meagre) on Terms and their varieties, that it will, perhaps, scarcely be required from me, in merely following the common usage, to be as particular in assigning my reasons, as it is usually expected that those should be who deviate from it.

The practice, indeed, is recommended by considerations far too obvious to require a formal justification. Logic is a portion of the Art of Thinking: Language is evidently, and by the admission of all philosophers, one of the principal instruments or helps of thought; and any imperfection in the instrument, or in the mode of employing it, is confessedly liable, still more than in almost any other art, to confuse and impede the process, and destroy all ground of confidence in the result. For a mind not previously versed in the meaning and right use of the various kinds of words, to attempt the study of methods of philosophizing, would be as if some one should attempt to become an astronomical observer, having never learned to adjust the focal distance of his optical instruments so as to see distinctly.

Since Reasoning, or Inference, the principal subject of logic, is an operation which usually takes place by means of words, and in complicated cases can take place in no other way; those who have not a thorough insight into the signification and purposes of words, will be under chances, amounting almost to certainty, of reasoning or inferring incorrectly. And logicians have generally felt that unless, in the very first stage, they removed this source of error; unless they taught their pupil to put away the glasses which distort the object, and to use those which are

adapted to his purpose in such a manner as to assist, not perplex, his vision; he would not be in a condition to practice the remaining part of their discipline with any prospect of advantage. Therefore it is that an inquiry into language, so far as is needful to guard against the errors to which it gives rise, has at all times been deemed a necessary preliminary to the study of logic.

But there is another reason, of a still more fundamental nature, why the import of words should be the earliest subject of the logician's consideration: because without it he can not examine into the import of Propositions. Now this is a subject which stands on the very threshold of the science of logic.

The object of logic, as defined in the Introductory Chapter, is to ascertain how we come by that portion of our knowledge (much the greatest portion) which is not intuitive: and by what criterion we can, in matters not self-evident, distinguish between things proved and things not proved, between what is worthy and what is unworthy of belief. Of the various questions which present themselves to our inquiring faculties, some receive an answer from direct consciousness, others, if resolved at all, can only be resolved by means of evidence. Logic is concerned with these last. But before inquiring into the mode of resolving questions, it is necessary to inquire what are those which offer themselves; what questions are conceivable; what inquiries are there, to which mankind have either obtained, or been able to imagine it possible that they should obtain, an answer. This point is best ascertained by a survey and analysis of Propositions.

§ 2. The answer to every question which it is possible to frame, must be contained in a Proposition, or Assertion. Whatever can be an object of belief, or even of disbelief, must, when put into words, assume the form of a proposition. All truth and all error lie in propositions. What, by a convenient misapplication of an abstract term, we call a Truth, means simply a True Proposition; and errors are false propositions. To know the import of all possible propositions would be to know all questions which can be raised, all matters which are susceptible of being either believed or disbelieved. How many kinds of inquiries can be propounded; how many kinds of judgments can be made; and how many kinds of propositions it is possible to frame with a meaning, are but different forms of one and the

same question. Since, then, the objects of all Belief and of all Inquiry express themselves in propositions, a sufficient scrutiny of Propositions and of their varieties will apprise us what questions mankind have actually asked of themselves, and what, in the nature of answers to those questions, they have actually thought they had grounds to believe.

Now the first glance at a proposition shows that it is formed by putting together two names. A proposition, according to the common simple definition, which is sufficient for our purpose is, *discourse, in which something is affirmed or denied of something*. Thus, in the proposition, Gold is yellow, the quality yellow is affirmed of the substance *gold*. In the proposition, Franklin was not born in England, the fact expressed by the words *born in England* is denied of the man Franklin.

Every proposition consists of three parts: the Subject, the Predicate, and the Copula. The predicate is the name denoting that which is affirmed or denied. The subject is the name denoting the person or thing which something is affirmed or denied of. The copula is the sign denoting that there is an affirmation or denial, and thereby enabling the hearer or reader to distinguish a proposition from any other kind of discourse. Thus, in the proposition, The earth is round, the Predicate is the word *round*, which denotes the quality affirmed, or (as the phrase is) predicated: *the earth*, words denoting the object which that quality is affirmed of, compose the Subject; the word *is*, which serves as the connecting mark between the subject and predicate, to show that one of them is affirmed of the other, is called the Copula.

Dismissing, for the present, the copula, of which more will be said hereafter, every proposition, then, consists of at least two names—brings together two names, in a particular manner. This is already a first step toward what we are in quest of. It appears from this, that for an act of belief, *one* object is not sufficient; the simplest act of belief supposes, and has something to do with, *two* objects—two names, to say the least; and (since the names must be names of something) two *namable things*. A large class of thinkers would cut the matter short by saying, two *ideas*. They would say, that the subject and predicate are both of them names of ideas; the idea of gold, for instance, and the idea of yellow; and that what takes place (or part of what

takes place) in the act of belief consists in bringing (as it is often expressed) one of these ideas under the other. But this we are not yet in a condition to say: whether such be the correct mode of describing the phenomenon, is an after consideration. The result with which for the present we must be contented, is, that in every act of belief *two* objects are in some manner taken cognizance of; that there can be no belief claimed, or question propounded, which does not embrace two distinct (either material or intellectual) subjects of thought; each of them capable, or not, of being conceived by itself, but incapable of being believed by itself.

I may say, for instance, “the sun.” The word has a meaning, and suggests that meaning to the mind of any one who is listening to me. But suppose I ask him, Whether it is true: whether he believes it? He can give no answer. There is as yet nothing to believe, or to disbelieve. Now, however, let me make, of all possible assertions respecting the sun, the one which involves the least of reference to any object besides itself; let me say, “the sun exists.” Here, at once, is something which a person can say he believes. But here, instead of only one, we find two distinct objects of conception: the sun is one object; existence is another. Let it not be said that this second conception, existence, is involved in the first; for the sun may be conceived as no longer existing. “The sun” does not convey all the meaning that is conveyed by “the sun exists:” “my father” does not include all the meaning of “my father exists,” for he may be dead; “a round square” does not include the meaning of “a round square exists,” for it does not and can not exist. When I say “the sun,” “my father,” or a “round square,” I do not call upon the hearer for any belief or disbelief, nor can either the one or the other be afforded me; but if I say, “the sun exists,” “my father exists,” or “a round square exists,” I call for belief; and should, in the first of the three instances, meet with it; in the second, with belief or disbelief, as the case might be; in the third, with disbelief.

§ 3. This first step in the analysis of the object of belief, which, though so obvious, will be found to be not unimportant, is the only one which we shall find it practicable to make without a preliminary survey of language. If we attempt to proceed further in the same path, that is, to analyze any further the import of Propositions; we find forced upon us, as a subject of

previous consideration, the import of Names. For every proposition consists of two names; and every proposition affirms or denies one of these names, of the other. Now what we do, what passes in our mind, when we affirm or deny two names of one another, must depend on what they are names of; since it is with reference to that, and not to the mere names themselves, that we make the affirmation or denial. Here, therefore, we find a new reason why the signification of names, and the relation generally between names and the things signified by them, must occupy the preliminary stage of the inquiry we are engaged in.

It may be objected that the meaning of names can guide us at most only to the opinions, possibly the foolish and groundless opinions, which mankind have formed concerning things, and that as the object of philosophy is truth, not opinion, the philosopher should dismiss words and look into things themselves, to ascertain what questions can be asked and answered in regard to them. This advice (which no one has it in his power to follow) is in reality an exhortation to discard the whole fruits of the labors of his predecessors, and conduct himself as if he were the first person who had ever turned an inquiring eye upon nature. What does any one's personal knowledge of Things amount to, after subtracting all which he has acquired by means of the words of other people? Even after he has learned as much as people usually do learn from others, will the notions of things contained in his individual mind afford as sufficient a basis for a *catalogue raisonné* as the notions which are in the minds of all mankind?

In any enumeration and classification of Things, which does not set out from their names, no varieties of things will of course be comprehended but those recognized by the particular inquirer; and it will still remain to be established, by a subsequent examination of names, that the enumeration has omitted nothing which ought to have been included. But if we begin with names, and use them as our clue to the things, we bring at once before us all the distinctions which have been recognized, not by a single inquirer, but by all inquirers taken together. It doubtless may, and I believe it will, be found, that mankind have multiplied the varieties unnecessarily, and have imagined distinctions among things, where there were only distinctions in the manner of naming them. But we are not entitled to assume this in the commencement. We must

begin by recognizing the distinctions made by ordinary language. If some of these appear, on a close examination, not to be fundamental, the enumeration of the different kinds of realities may be abridged accordingly. But to impose upon the facts in the first instance the yoke of a theory, while the grounds of the theory are reserved for discussion in a subsequent stage, is not a course which a logician can reasonably adopt.

Chapter 2. Of Names

§ 1. “A name,” says Hobbes,[7] “is a word taken at pleasure to serve for a mark which may raise in our mind a thought like to some thought we had before, and which being pronounced to others, may be to them a sign of what thought the speaker had[8] before in his mind.” This simple definition of a name, as a word (or set of words) serving the double purpose of a mark to recall to ourselves the likeness of a former thought, and a sign to make it known to others, appears unexceptionable. Names, indeed, do much more than this; but whatever else they do, grows out of, and is the result of this: as will appear in its proper place.

Are names more properly said to be the names of things, or of our ideas of things? The first is the expression in common use; the last is that of some metaphysicians, who conceived that in adopting it they were introducing a highly important distinction. The eminent thinker, just quoted, seems to countenance the latter opinion. “But seeing,” he continues, “names ordered in speech (as is defined) are signs of our conceptions, it is manifest they are not signs of the things themselves; for that the sound of this word *stone* should be the sign of a stone, can not be understood in any sense but this, that he that hears it collects that he that pronounces it thinks of a stone.”

If it be merely meant that the conception alone, and not the thing itself, is recalled by the name, or imparted to the hearer, this of course can not be denied. Nevertheless, there seems good reason for adhering to the common usage, and calling (as indeed Hobbes himself does in other places) the word *sun* the name of the sun, and not the name of our idea of the sun. For names are not intended only to make the hearer conceive what we conceive, but also to inform him what we believe. Now, when I use a name for the purpose of expressing a belief, it is a belief concerning the thing itself, not concerning my idea of it. When I say, “the sun is the cause of day,” I do not mean that my idea of the sun causes or excites in me the idea of day; or in other words, that thinking of the sun makes me think of day. I mean, that a certain physical fact, which is called the

sun's presence (and which, in the ultimate analysis, resolves itself into sensations, not ideas) causes another physical fact, which is called day. It seems proper to consider a word as the *name* of that which we intend to be understood by it when we use it; of that which any fact that we assert of it is to be understood of; that, in short, concerning which, when we employ the word, we intend to give information. Names, therefore, shall always be spoken of in this work as the names of things themselves, and not merely of our ideas of things.

But the question now arises, of what things? and to answer this it is necessary to take into consideration the different kinds of names.

§ 2. It is usual, before examining the various classes into which names are commonly divided, to begin by distinguishing from names of every description, those words which are not names, but only parts of names. Among such are reckoned particles, as *of*, *to*, *truly*, *often*; the inflected cases of nouns substantive, as *me*, *him*, *John's*; and even adjectives, as *large*, *heavy*. These words do not express things of which any thing can be affirmed or denied. We can not say, Heavy fell, or A heavy fell; Truly, or A truly, was asserted; Of, or An of, was in the room. Unless, indeed, we are speaking of the mere words themselves, as when we say, Truly is an English word, or, Heavy is an adjective. In that case they are complete names—viz., names of those particular sounds, or of those particular collections of written characters. This employment of a word to denote the mere letters and syllables of which it is composed, was termed by the schoolmen the *suppositio materialis* of the word. In any other sense we can not introduce one of these words into the subject of a proposition, unless in combination with other words; as, A heavy *body* fell, A truly *important fact* was asserted, A *member* of *parliament* was in the room.

An adjective, however, is capable of standing by itself as the predicate of a proposition; as when we say, Snow is white; and occasionally even as the subject, for we may say, White is an agreeable color. The adjective is often said to be so used by a grammatical ellipsis: Snow is white, instead of Snow is a white object; White is an agreeable color, instead of, A white color, or, The color white, is agreeable. The Greeks and Romans were allowed, by the rules of their language, to employ this ellipsis universally in the subject

as well as in the predicate of a proposition. In English this can not, generally speaking, be done. We may say, The earth is round; but we can not say, Round is easily moved; we must say, A round object. This distinction, however, is rather grammatical than logical. Since there is no difference of meaning between *round*, and *a round object*, it is only custom which prescribes that on any given occasion one shall be used, and not the other. We shall, therefore, without scruple, speak of adjectives as names, whether in their own right, or as representative of the more circuitous forms of expression above exemplified. The other classes of subsidiary words have no title whatever to be considered as names. An adverb, or an accusative case, can not under any circumstances (except when their mere letters and syllables are spoken of) figure as one of the terms of a proposition.

Words which are not capable of being used as names, but only as parts of names, were called by some of the schoolmen Syncategorematic terms: from σὺν, with, and κατηγορέω, to predicate, because it was only *with* some other word that they could be predicated. A word which could be used either as the subject or predicate of a proposition without being accompanied by any other word, was termed by the same authorities a Categorematic term. A combination of one or more Categorematic, and one or more Syncategorematic words, as A heavy body, or A court of justice, they sometimes called a *mixed* term; but this seems a needless multiplication of technical expressions. A mixed term is, in the only useful sense of the word, Categorematic. It belongs to the class of what have been called many-worded names.

For, as one word is frequently not a name, but only part of a name, so a number of words often compose one single name, and no more. These words, “The place which the wisdom or policy of antiquity had destined for the residence of the Abyssinian princes,” form in the estimation of the logician only one name; one Categorematic term. A mode of determining whether any set of words makes only one name, or more than one, is by predicating something of it, and observing whether, by this predication, we make only one assertion or several. Thus, when we say, John Nokes, who was the mayor of the town, died yesterday—by this predication we make but one assertion; whence it appears that “John Nokes, who was the mayor of the

town," is no more than one name. It is true that in this proposition, besides the assertion that John Nokes died yesterday, there is included another assertion, namely, that John Nokes was mayor of the town. But this last assertion was already made: we did not make it by adding the predicate, "died yesterday." Suppose, however, that the words had been, John Nokes *and* the mayor of the town, they would have formed two names instead of one. For when we say, John Nokes and the mayor of the town died yesterday, we make two assertions: one, that John Nokes died yesterday; the other, that the mayor of the town died yesterday.

It being needless to illustrate at any greater length the subject of many-worded names, we proceed to the distinctions which have been established among names, not according to the words they are composed of, but according to their signification.

§ 3. All names are names of something, real or imaginary; but all things have not names appropriated to them individually. For some individual objects we require, and consequently have, separate distinguishing names; there is a name for every person, and for every remarkable place. Other objects, of which we have not occasion to speak so frequently, we do not designate by a name of their own; but when the necessity arises for naming them, we do so by putting together several words, each of which, by itself, might be and is used for an indefinite number of other objects; as when I say, *this stone*: "this" and "stone" being, each of them, names that may be used of many other objects besides the particular one meant, though the only object of which they can both be used at the given moment, consistently with their signification, may be the one of which I wish to speak.

Were this the sole purpose for which names, that are common to more things than one, could be employed; if they only served, by mutually limiting each other, to afford a designation for such individual objects as have no names of their own: they could only be ranked among contrivances for economizing the use of language. But it is evident that this is not their sole function. It is by their means that we are enabled to assert *general* propositions; to affirm or deny any predicate of an indefinite number of things at once. The distinction, therefore, between *general* names,

and *individual* or *singular* names, is fundamental; and may be considered as the first grand division of names.

A general name is familiarly defined, a name which is capable of being truly affirmed, in the same sense, of each of an indefinite number of things. An individual or singular name is a name which is only capable of being truly affirmed, in the same sense, of one thing.

Thus, *man* is capable of being truly affirmed of John, George, Mary, and other persons without assignable limit; and it is affirmed of all of them in the same sense; for the word man expresses certain qualities, and when we predicate it of those persons, we assert that they all possess those qualities. But *John* is only capable of being truly affirmed of one single person, at least in the same sense. For, though there are many persons who bear that name, it is not conferred upon them to indicate any qualities, or any thing which belongs to them in common; and can not be said to be affirmed of them in any *sense* at all, consequently not in the same sense. "The king who succeeded William the Conqueror," is also an individual name. For, that there can not be more than one person of whom it can be truly affirmed, is implied in the meaning of the words. Even "*the* king," when the occasion or the context defines the individual of whom it is to be understood, may justly be regarded as an individual name.

It is not unusual, by way of explaining what is meant by a general name, to say that it is the name of a *class*. But this, though a convenient mode of expression for some purposes, is objectionable as a definition, since it explains the clearer of two things by the more obscure. It would be more logical to reverse the proposition, and turn it into a definition of the word *class*: "A class is the indefinite multitude of individuals denoted by a general name."

It is necessary to distinguish *general* from *collective* names. A general name is one which can be predicated of *each* individual of a multitude; a collective name can not be predicated of each separately, but only of all taken together. "The 76th regiment of foot in the British army," which is a collective name, is not a general but an individual name; for though it can be predicated of a multitude of individual soldiers taken jointly, it can not be predicated of them severally. We may say, Jones is a soldier, and Thompson is a soldier, and Smith is a soldier, but we