SYMBOLIC LOGIC

SYMBOLIC LOGIC

{COMPLETE & ILLUSTRATED}

BY

LEWIS CARROLL

ILLUSTRATED BY MURAT UKRAY

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SYMBOLIC LOGIC

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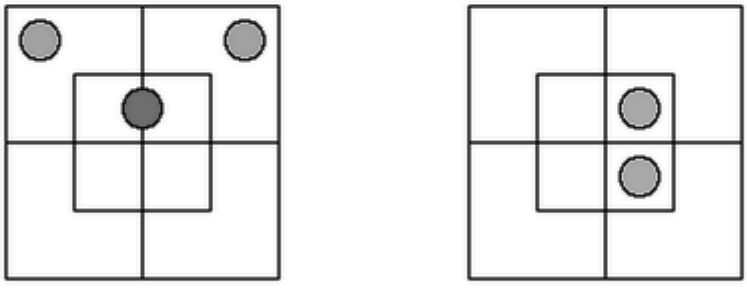
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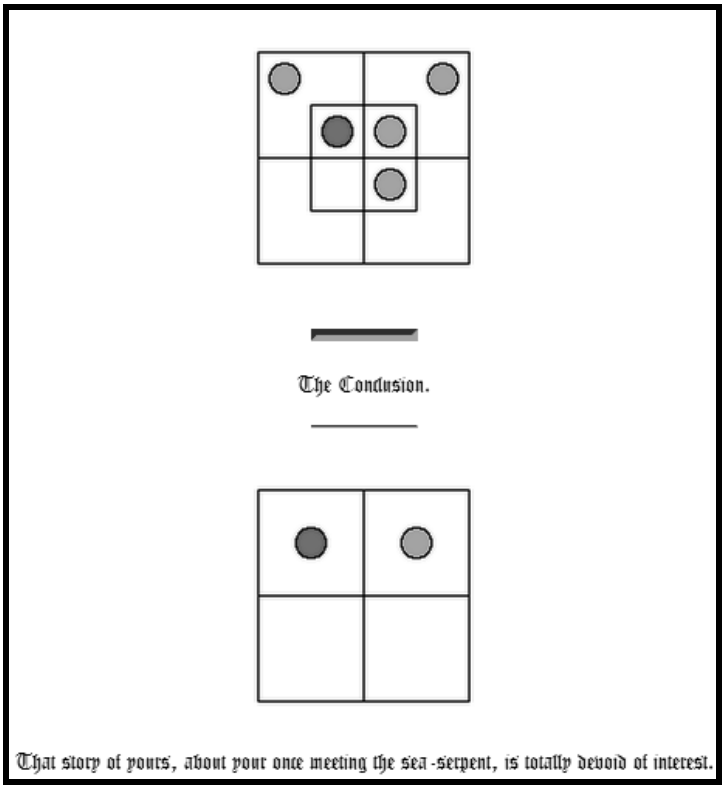
A Syllogism worked out.

That story of yours, about your once meeting the sea-serpent, always sets me off yawning;
I never yawn, unless when I'm listening to something totally devoid of interest.

The Premisses, separately.



The Premisses, combined.



I shall be grateful to any Reader of this book who will point out any mistakes or misprints he may happen to notice in it, or any passage which he thinks is not clearly expressed.

I have a quantity of MS. in hand for Parts II and III, and hope to be able——should life, and health, and opportunity, be granted to me, to publish them in the course of the next few years. Their contents will be as follows:—

PART II. ADVANCED.

Further investigations in the subjects of Part I. Propositions of other forms (such as "Not-all *x* are *y*"). Triliteral and Multiliteral Propositions (such as "All *abc* are *de*"). Hypotheticals. Dilemmas. &c. &c.

Part III. TRANSCENDENTAL.

Analysis of a Proposition into its Elements. Numerical and Geometrical Problems. The Theory of Inference. The Construction of Problems. And many other *Curiosa Logica*.

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Preface to the Fourth Edition

In Book I, Chapter II, I have adopted a new definition of 'Classification', which enables me to regard the whole Universe as a 'Class,' and thus to dispense with the very awkward phrase 'a Set of Things.'

In the Chapter on 'Propositions of Existence' I have adopted a new 'normal form,' in which the Class, whose existence is affirmed or denied, is regarded as the *Predicate*, instead of the *Subject*, of the Proposition, thus evading a very subtle difficulty which besets the other form. These subtle difficulties seem to lie at the root of every Tree of Knowledge, and they are *far* more hopeless to grapple with than any that occur in its higher branches. For example, the difficulties of the Forty-Seventh Proposition of Euclid are mere child's play compared with the mental torture endured in the effort to think out the essential nature of a straight Line. And, in the present work, the difficulties of the "5 Liars"" compared with the bewildering question "What is a Thing?"

In the Chapter on 'Propositions of Relation' I have inserted a new Section, containing the proof that a Proposition, beginning with "All," is a *Double* Proposition (a fact that is quite independent of the arbitrary rule, laid down in the next Section, that such a Proposition is to be understood as implying the actual *existence* of its Subject). This proof was given, in the earlier editions, incidentally, in the course of the discussion of the Biliteral Diagram: but its *proper* place, in this treatise, is where I have now introduced it.

In the Sorites-Examples, I have made a good many verbal alterations, in order to evade a difficulty, which I fear will have perplexed some of the Readers of the first three Editions. Some of the Premisses were so worded that their Terms were not Specieses of the Univ. named in the Dictionary, but of a larger Class, of which the Univ. was only a portion. In all such cases, it was intended that the Reader should perceive that what was asserted of the larger Class was thereby asserted of the Univ., and should ignore, as superfluous, all that it asserted of its *other* portion. Thus, in Ex. 15, the Univ. was stated to be "ducks in this village," and the third Premiss was "Mrs. Bond has no gray

ducks," i.e. "No gray ducks are ducks belonging to Mrs. Bond." Here the Terms are *not* Specieses of the Univ., but of the larger Class "ducks," of which the Univ. is only a portion: and it was intended that the Reader should perceive that what is here asserted of " ducks" is thereby asserted of " ducks in this village." and should treat this Premiss as if it were "Mrs. Bond has no gray ducks in this village," and should ignore, as superfluous, what it asserts as to the *other* portion of the Class "ducks," viz. " Mrs. Bond has no gray ducks *out of* this village".

In the Appendix I have given a new version of the Problem of the "Five Liars." My object, in doing so, is to escape the subtle and mysterious difficulties which beset all attempts at regarding a Proposition as being its own Subject, or a Set of Propositions as being Subjects for one another. It is certainly, a most bewildering and unsatisfactory theory: one cannot help feeling that there is a great lack of *substance* in all this shadowy host——that, as the procession of phantoms glides before us, there is not *one* that we can pounce upon, and say "*Here* is a Proposition that *must* be either true or false!"——that it is but a Barmecide Feast, to which we have been bidden—— and that its prototype is to be found in that mythical island, whose inhabitants "earned a precarious living by taking in each others' washing"! By simply translating "telling 2 Truths" into "taking *both* of 2 condiments (salt and mustard)," "telling 2 Lies" into "taking *neither* of them" and "telling a Truth and a Lie (order not specified)" into "taking only *one* condiment (it is not specified)," I have escaped all those metaphysical puzzles, and have produced a Problem which, when translated into a Set of symbolized Premisses, furnishes the very same *Data* as were furnished by the Problem of the "Five Liars."

The coined words, introduced in previous editions, such as "Eliminands" and "Retinends", perhaps hardly need any apology: they were indispensable to my system: but the new plural, here used for the first time, viz. "Soriteses", will, I fear, be condemned as "bad English", unless I say a word in its defence. We have *three* singular nouns, in English, of plural *form*, "series", "species", and "Sorites": in all three, the awkwardness, of using the same word for both singular and plural, must often have been felt: this has been remedied, in the

case of "series" by coining the plural "serieses", which has already found it way into the dictionaries: so I am no rash innovator, but am merely "following suit", in using the new plural "Soriteses".

In conclusion, let me point out that even those, who are obliged to study *Formal* Logic, with a view to being able to answer Examination-Papers in that subject, will find the study of *Symbolic* Logic most helpful for this purpose, in throwing light upon many of the obscurities with which Formal Logic abounds, and in furnishing a delightfully easy method of *testing* the results arrived at by the cumbrous processes which Formal Logic enforces upon its votaries.

This is, I believe, the very first attempt (with the exception of my own little book, *The Game of Logic*, published in 1886, a very incomplete performance) that has been made to *popularise* this fascinating subject. It has cost me *years* of hard work: but if it should prove, as I hope it may, to be of *real* service to the young, and to be taken up, in High Schools and in private families, as a valuable addition to their stock of healthful mental recreations, such a result would more than repay ten times the labour that I have expended on it.

L. C.

29, Bedford Street, Strand.
Christmas, 1896.

Introduction

TO LEARNERS.

[N.B. Some remarks, addressed to *Teachers*, will be found in the Appendix]

The Learner, who wishes to try the question *fairly*, whether this little book does, or does not, supply the materials for a most interesting mental recreation, is *earnestly* advised to adopt the following Rules:—

(1) Begin at the *beginning*, and do not allow yourself to gratify a mere idle curiosity by dipping into the book, here and there. This would very likely lead to your throwing it aside, with the remark "This is *much* too hard for me!", and thus losing the chance of adding a very *large* item to your stock of mental delights. This Rule (of not *dipping*) is very *desirable* with *other* kinds of books——such as novels, for instance, where you may easily spoil much of the enjoyment you would otherwise get from the story, by dipping into it further on, so that what the author meant to be a pleasant surprise comes to you as a matter of course. Some people, I know, make a practice of looking into Vol. III first, just to see how the story ends: and perhaps it *is* as well just to know that all ends *happily*——that the much-persecuted lovers *do* marry after all, that he is proved to be quite innocent of the murder, that the wicked cousin is completely foiled in his plot and gets the punishment he deserves, and that the rich uncle in India (*Qu.* Why in *India*? *Ans.* Because, somehow, uncles never *can* get rich anywhere else) dies at exactly the right moment——before taking the trouble to read Vol. I. This, I say, is *just* permissible with a *novel*, where Vol. III has a *meaning*, even for those who have not read the earlier part of the story; but, with a *scientific* book, it is sheer insanity: you will find the latter part *hopelessly* unintelligible, if you read it before reaching it in regular course.

(2) Don't begin any fresh Chapter, or Section, until you are certain that you *thoroughly* understand the whole book *up to that point*, and that you have worked, correctly, most if not all of the examples which have been set. So long as you are conscious that all the land you have passed through is absolutely

conquered, and that you are leaving no unsolved difficulties *behind* you, which will be sure to turn up again later on, your triumphal progress will be easy and delightful. Otherwise, you will find your state of puzzlement get worse and worse as you proceed, till you give up the whole thing in utter disgust.

(3) When you come to any passage you don't understand, *read it again*: if you *still* don't understand it, *read it again*: if you fail, even after *three* readings, very likely your brain is getting a little tired. In that case, put the book away, and take to other occupations, and next day, when you come to it fresh, you will very likely find that it is *quite* easy.

(4) If possible, find some genial friend, who will read the book along with you, and will talk over the difficulties with you. *Talking* is a wonderful smoother-over of difficulties. When *I* come upon anything——in Logic or in any other hard subject——that entirely puzzles me, I find it a capital plan to talk it over, *aloud*, even when I am all alone. One can explain things so *clearly* to one's self! And then, you know, one is so *patient* with one's self: one *never* gets irritated at one's own stupidity!

If, dear Reader, you will faithfully observe these Rules, and so give my little book a really *fair* trial, I promise you, most confidently, that you will find Symbolic Logic to be one of the most, if not *the* most, fascinating of mental recreations! In this First Part, I have carefully avoided all difficulties which seemed to me to be beyond the grasp of an intelligent child of (say) twelve or fourteen years of age. I have myself taught most of its contents, *vivâ voce*, to *many* children, and have found them take a real intelligent interest in the subject. For those, who succeed in mastering Part I, and who begin, like Oliver, "asking for more," I hope to provide, in Part II, some *tolerably* hard nuts to crack——nuts that will require all the nut-crackers they happen to possess!

Mental recreation is a thing that we all of us need for our mental health; and you may get much healthy enjoyment, no doubt, from Games, such as Back-gammon, Chess, and the new Game "Halma". But, after all, when you have made yourself a first-rate player at any one of these Games, you have nothing real to *show* for it, as a *result!* You enjoyed the Game, and the victory, no doubt, *at the time*: but you have no *result* that you can treasure up and get

real *good* out of. And, all the while, you have been leaving unexplored a perfect *mine* of wealth. Once master the machinery of Symbolic Logic, and you have a mental occupation always at hand, of absorbing interest, and one that will be of real *use* to you in *any* subject you may take up. It will give you clearness of thought——the ability to *see your way* through a puzzle——the habit of arranging your ideas in an orderly and get-at-able form——and, more valuable than all, the power to detect *fallacies*, and to tear to pieces the flimsy illogical arguments, which you will so continually encounter in books, in newspapers, in speeches, and even in sermons, and which so easily delude those who have never taken the trouble to master this fascinating Art. *Try it.* That is all I ask of you!

L. C.

29, Bedford Street, Strand.

February 21, 1896.

Book I. Things and Their Attributes

Chapter I. Introductory

The Universe contains '**Things**.'

[For example, "I," "London," "roses," "redness," "old English books," "the letter which I received yesterday."]

Things have '**Attributes**.'

[For example, "large," "red," "old," "which I received yesterday."]

One Thing may have many Attributes; and one Attribute may belong to many Things.

[Thus, the Thing "a rose" may have the Attributes "red," "scented," "full-blown," &c.; and the Attribute "red" may belong to the Things "a rose," "a brick," "a ribbon," &c.]

Any Attribute, or any Set of Attributes, may be called an '**Adjunct**.'

[This word is introduced in order to avoid the constant repetition of the phrase "Attribute or Set of Attributes."

Thus, we may say that a rose has the Attribute "red" (or the Adjunct "red," whichever we prefer); or we may say that it has the Adjunct "red, scented and full-blown."]

Chapter II. Classification

'Classification,' or the formation of Classes, is a Mental Process, in which we imagine that we have put together, in a group, certain Things. Such a group is called a '**Class**.'

This Process may be performed in three different ways, as follows:—

(1) We may imagine that we have put together all Things. The Class so formed (i.e. the Class "Things") contains the whole Universe.

(2) We may think of the Class "Things," and may imagine that we have picked out from it all the Things which possess a certain Adjunct *not* possessed by the whole Class. This Adjunct is said to be '**peculiar**' to the Class so formed. In this case, the Class "Things" is called a '**Genus**' with regard to the Class so formed: the Class, so formed, is called a '**Species**' of the Class "Things": and its peculiar Adjunct is called its '**Differentia**'.

As this Process is entirely *Mental*, we can perform it whether there *is*, or *is not*, an *existing* Thing which possesses that Adjunct. If there *is*, the Class is said to be '**Real**'; if not, it is said to be '**Unreal**', or '**Imaginary**.'

[For example, we may imagine that we have picked out, from the Class "Things," all the Things which possess the Adjunct "material, artificial, consisting of houses and streets"; and we may thus form the Real Class "towns." Here we may regard "Things" as a *Genus*, "Towns" as a *Species* of Things, and "material, artificial, consisting of houses and streets" as its *Differentia*.

Again, we may imagine that we have picked out all the Things which possess the Adjunct "weighing a ton, easily lifted by a baby"; and we may thus form the *Imaginary* Class "Things that weigh a ton and are easily lifted by a baby."]

(3) We may think of a certain Class, *not* the Class "Things," and may imagine that we have picked out from it all the Members of it which possess a certain Adjunct *not* possessed by the whole Class. This Adjunct is said to be '**peculiar**' to the smaller Class so formed. In this case, the Class thought of is called a '**Genus**' with regard to the smaller Class picked out from it: the smaller Class is called a '**Species**' of the larger: and its peculiar Adjunct is called its '**Differentia**'.

[For example, we may think of the Class "towns," and imagine that we have picked out from it all the towns which possess the Attribute "lit with gas"; and we may thus form the Real Class "towns lit with gas." Here we may regard

"Towns" as a *Genus*, "Towns lit with gas" as a *Species* of Towns, and "lit with gas" as its *Differentia*.

If, in the above example, we were to alter "lit with gas" into "paved with gold," we should get the *Imaginary* Class "towns paved with gold."]

A Class, containing only *one* Member is called an '**Individual**.'

[For example, the Class "towns having four million inhabitants," which Class contains only *one* Member, viz. "London."]

Hence, any single Thing, which we can name so as to distinguish it from all other Things, may be regarded as a one-Member Class.

[Thus "London" may be regarded as the one-Member Class, picked out from the Class "towns," which has, as its Differentia, "having four million inhabitants."]

A Class, containing two or more Members, is sometimes regarded as *one single Thing*. When so regarded, it may possess an Adjunct which is *not* possessed by any Member of it taken separately.

[Thus, the Class "The soldiers of the Tenth Regiment," when regarded as *one single Thing*, may possess the Attribute "formed in square," which is *not* possessed by any Member of it taken separately.]

Chapter III. *Division*

§ 1.

Introductory.

'Division' is a Mental Process, in which we think of a certain Class of Things, and imagine that we have divided it into two or more smaller Classes.

[Thus, we might think of the Class "books," and imagine that we had divided it into the two smaller Classes "bound books" and "unbound books," or into the three Classes, "books priced at less than a shilling," "shilling-books,"

"books priced at more than a shilling," or into the twenty-six Classes, "books whose names begin with *A*," "books whose names begin with *B*," &c.]

A Class, that has been obtained by a certain Division, is said to be 'codivisional' with every Class obtained by that Division.

[Thus, the Class "bound books" is codivisional with each of the two Classes, "bound books" and "unbound books."

Similarly, the Battle of Waterloo may be said to have been "contemporary" with every event that happened in 1815.]

Hence a Class, obtained by Division, is codivisional with itself.

[Thus, the Class "bound books" is codivisional with itself.

Similarly, the Battle of Waterloo may be said to have been "contemporary" with itself.]

Dichotomy.

If we think of a certain Class, and imagine that we have picked out from it a certain smaller Class, it is evident that the *Remainder* of the large Class does *not* possess the Differentia of that smaller Class. Hence it may be regarded as *another* smaller Class, whose Differentia may be formed, from that of the Class first picked out, by prefixing the word "not"; and we may imagine that we have *divided* the Class first thought of into *two* smaller Classes, whose Differentiæ are *contradictory*. This kind of Division is called '**Dichotomy**'.

[For example, we may divide "books" into the two Classes whose Differentiæ are "old" and "not-old."]

In performing this Process, we may sometimes find that the Attributes we have chosen are used so loosely, in ordinary conversation, that it is not easy to decide *which* of the Things belong to the one Class and *which* to the other. In such a case, it would be necessary to lay down some arbitrary *rule*, as to *where* the one Class should end and the other begin.

[Thus, in dividing "books" into "old" and "not-old," we may say "Let all books printed before a.d. 1801, be regarded as 'old,' and all others as 'not-old'."]

Henceforwards let it be understood that, if a Class of Things be divided into two Classes, whose Differentiæ have contrary meanings, each Differentia is to be regarded as equivalent to the other with the word "not" prefixed.

[Thus, if "books" be divided into "old" and "new" the Attribute "old" is to be regarded as equivalent to "not-new," and the Attribute "new" as equivalent to "not-old."]

After dividing a Class, by the Process of *Dichotomy*, into two smaller Classes, we may sub-divide each of these into two still smaller Classes; and this Process may be repeated over and over again, the number of Classes being doubled at each repetition.

[For example, we may divide "books" into "old" and "new" (i.e. "*not*-old"): we may then sub-divide each of these into "English" and "foreign" (i.e. "*not*-English"), thus getting *four* Classes, viz. old English;
(2) old foreign;
(3) new English;
(4) new foreign.

If we had begun by dividing into "English" and "foreign," and had then sub-divided into "old" and "new," the four Classes would have been

English old;
(2) English new;
(3) foreign old;
(4) foreign new.

The Reader will easily see that these are the very same four Classes which we had before.]

Chapter IV. *Names*

The word "Thing", which conveys the idea of a Thing, *without* any idea of an Adjunct, represents *any* single Thing. Any other word (or phrase), which conveys the idea of a Thing, *with* the idea of an Adjunct represents *any* Thing which possesses that Adjunct; i.e., it represents any Member of the Class to which that Adjunct is *peculiar*.

Such a word (or phrase) is called a '**Name**'; and, if there be an existing Thing which it represents, it is said to be a Name of that Thing.

[For example, the words "Thing," "Treasure," "Town," and the phrases "valuable Thing," "material artificial Thing consisting of houses and streets," "Town lit with gas," "Town paved with gold," "old English Book."]

Just as a Class is said to be *Real*, or *Unreal*, according as there *is*, or *is not*, an existing Thing in it, so also a Name is said to be *Real*, or *Unreal*, according as there *is*, or *is not*, an existing Thing represented by it.

[Thus, "Town lit with gas" is a *Real* Name: "Town paved with gold" is an *Unreal* Name.]

Every Name is either a Substantive only, or else a phrase consisting of a Substantive and one or more Adjectives (or phrases used as Adjectives).

Every Name, except "Thing", may usually be expressed in three different forms:—

The Substantive "Thing", and one or more Adjectives (or phrases used as Adjectives) conveying the ideas of the Attributes;

(*b*) A Substantive, conveying the idea of a Thing with the ideas of *some* of the Attributes, and one or more Adjectives (or phrases used as Adjectives) conveying the ideas of the *other* Attributes;

(*c*) A Substantive conveying the idea of a Thing with the ideas of *all* the Attributes.

[Thus, the phrase "material living Thing, belonging to the Animal Kingdom, having two hands and two feet" is a Name expressed in Form (*a*).

If we choose to roll up together the Substantive "Thing" and the Adjectives "material, living, belonging to the Animal Kingdom," so as to make the new Substantive "Animal," we get the phrase "Animal having two hands and two feet," which is a Name (representing the same Thing as before) expressed in Form (*b*).

And, if we choose to roll up the whole phrase into one word, so as to make the new Substantive "Man," we get a Name (still representing the very same Thing) expressed in Form (*c*).]

A Name, whose Substantive is in the *plural* number, may be used to represent either

Members of a Class, *regarded as separate Things*;
or (2) a whole Class, *regarded as one single Thing*.

[Thus, when I say "Some soldiers of the Tenth Regiment are tall," or "The soldiers of the Tenth Regiment are brave," I am using the Name "soldiers of the Tenth Regiment" in the *first* sense; and it is just the same as if I were to point to each of them *separately*, and to say "*This* soldier of the Tenth Regiment is tall," "*That* soldier of the Tenth Regiment is tall," and so on.

But, when I say "The soldiers of the Tenth Regiment are formed in square," I am using the phrase in the *second* sense; and it is just the same as if I were to say "The *Tenth Regiment* is formed in square."]

Chapter V. Definitions

It is evident that every Member of a *Species* is *also* a Member of the *Genus* out of which that Species has been picked, and that it possesses the *Differentia* of that Species. Hence it may be represented by a Name consisting of two parts, one being a Name representing any Member of the *Genus*, and the other being the *Differentia* of that Species. Such a Name is called a

'**Definition**' of any Member of that Species, and to give it such a Name is to '**define**' it.

[Thus, we may define a "Treasure" as a "valuable Thing." In this case we regard "Things" as the *Genus*, and "valuable" as the *Differentia*.]

The following Examples, of this Process, may be taken as models for working others.

[Note that, in each Definition, the Substantive, representing a Member (or Members) of the *Genus*, is printed in Capitals.]

1. Define "a Treasure."

Ans. "a valuable Thing."

2. Define "Treasures."

Ans. "valuable Things."

3. Define "a Town."

Ans. "a material artificial Thing, consisting of houses and streets."

4. Define "Men."

Ans. "material, living Things, belonging to the Animal Kingdom, having two hands and two feet";

or else

"Animals having two hands and two feet."

5. Define "London."

Ans. "the material artificial Thing, which consists of houses and streets, and has four million inhabitants";

or else

"the Town which has four million inhabitants."

[Note that we here use the article "the" instead of "a", because we happen to know that there is only *one* such Thing.

The Reader can set himself any number of Examples of this Process, by simply choosing the Name of any common Thing (such as "house," "tree," "knife"), making a Definition for it, and then testing his answer by referring to any English Dictionary.]

Book II. Propositions

Chapter I. Propositions Generally

§ 1.

Introductory.

Note that the word "some" is to be regarded, henceforward, as meaning "one or more."

The word 'Proposition,' as used in ordinary conversation, may be applied to *any* word, or phrase, which conveys any information whatever.

[Thus the words "yes" and "no" are Propositions in the ordinary sense of the word; and so are the phrases "you owe me five farthings" and "I don't!"

Such words as "oh!" or "never!", and such phrases as "fetch me that book!" "which book do you mean?" do not seem, at first sight, to convey any *information*; but they can easily be turned into equivalent forms which do so, viz. "I am surprised," "I will never consent to it," "I order you to fetch me that book," "I want to know which book you mean."]

But a '**Proposition**,' as used in this First Part of "Symbolic Logic," has a peculiar form, which may be called its '**Normal form**'; and if any Proposition, which we wish to use in an argument, is not in normal form, we must reduce it to such a form, before we can use it.

A '**Proposition**,' when in normal form, asserts, as to certain two Classes, which are called its '**Subject**' and '**Predicate**,' either

that *some* Members of its Subject are Members of its Predicate;

or (2) that *no* Members of its Subject are Members of its Predicate;

or (3) that *all* Members of its Subject are Members of its Predicate.

The Subject and the Predicate of a Proposition are called its '**Terms**.'

Two Propositions, which convey the *same* information, are said to be '**equivalent**'.

[Thus, the two Propositions, "I see John" and "John is seen by me," are equivalent.]

§ 2.

Normal form of a Proposition.

A Proposition, in normal form, consists of four parts, viz.—

The word "some," or "no," or "all." (This word, which tells us *how many* Members of the Subject are also Members of the Predicate, is called the '**Sign of Quantity**.')

Name of Subject.

The verb "are" (or "is"). (This is called the '**Copula**.')

Name of Predicate.

Various kinds of Propositions.

A Proposition, that begins with "Some", is said to be '**Particular**.' It is also called 'a Proposition **in I**.'

[Note, that it is called 'Particular,' because it refers to a *part* only of the Subject.]

A Proposition, that begins with "No", is said to be '**Universal Negative**.' It is also called 'a Proposition **in E**.'

A Proposition, that begins with "All", is said to be '**Universal Affirmative**.' It is also called 'a Proposition **in A**.'

[Note, that they are called 'Universal', because they refer to the *whole* of the Subject.]

A Proposition, whose Subject is an *Individual*, is to be regarded as *Universal*.

[Let us take, as an example, the Proposition "John is not well". This of course implies that there is an *Individual*, to whom the speaker refers when he mentions "John", and whom the listener *knows* to be referred to. Hence the Class "men referred to by the speaker when he mentions 'John'" is a one-Member Class, and the Proposition is equivalent to "*All* the men, who are referred to by the speaker when he mentions 'John', are not well."]

Propositions are of two kinds, 'Propositions of Existence' and 'Propositions of Relation.'

These shall be discussed separately.

Chapter II. Propositions of Existence

A '**Proposition of Existence**', when in normal form, has, for its *Subject*, the Class "existing Things".

Its Sign of Quantity is "Some" or "No".

[Note that, though its Sign of Quantity tells us *how many* existing Things are Members of its Predicate, it does *not* tell us the *exact* number: in fact, it only deals with *two* numbers, which are, in ascending order, "0" and "1 or more."]

It is called "a Proposition of Existence" because its effect is to assert the *Reality* (i.e. the real *existence*), or else the *Imaginariness*, of its Predicate.

[Thus, the Proposition "Some existing Things are honest men" asserts that the Class "honest men" is *Real*.

This is the *normal* form; but it may also be expressed in any one of the following forms:—

"Honest men exist";
(2) "Some honest men exist";
(3) "The Class 'honest men' exists";
(4) "There are honest men";
(5) "There are some honest men".

Similarly, the Proposition "No existing Things are men fifty feet high" asserts that the Class "men 50 feet high" is *Imaginary*.

This is the *normal* form; but it may also be expressed in any one of the following forms:—

"Men 50 feet high do not exist";
(2) "No men 50 feet high exist";
(3) "The Class 'men 50 feet high' does not exist";
(4) "There are not any men 50 feet high";
(5) "There are no men 50 feet high."]

Chapter III. Propositions of Relations

§ 1.

Introductory.

A **Proposition of Relation**, of the kind to be here discussed, has, for its Terms, two Specieses of the same Genus, such that each of the two Names conveys the idea of some Attribute *not* conveyed by the other.

[Thus, the Proposition "Some merchants are misers" is of the right kind, since "merchants" and "misers" are Specieses of the same Genus "men"; and since the Name "merchants" conveys the idea of the Attribute "mercantile", and the name "misers" the idea of the Attribute "miserly", each of which ideas is *not* conveyed by the other Name.

But the Proposition "Some dogs are setters" is *not* of the right kind, since, although it is true that "dogs" and "setters" are Specieses of the same Genus "animals", it is *not* true that the Name "dogs" conveys the idea of any

Attribute not conveyed by the Name "setters". Such Propositions will be discussed in Part II.]

The Genus, of which the two Terms are Specieses, is called the '**Universe of Discourse**,' or (more briefly) the '**Univ.**'

The Sign of Quantity is "Some" or "No" or "All".

[Note that, though its Sign of Quantity tells us *how many* Members of its Subject are *also* Members of its Predicate, it does not tell us the *exact* number: in fact, it only deals with *three* numbers, which are, in ascending order, "0", "1 or more", "the total number of Members of the Subject".]

It is called "a Proposition of Relation" because its effect is to assert that a certain *relationship* exists between its Terms.

Reduction of a Proposition of Relation to Normal form.

The Rules, for doing this, are as follows:—

(1) Ascertain what is the *Subject* (i.e., ascertain what Class we are *talking about*);

(2) If the verb, governed by the Subject, is *not* the verb "are" (or "is"), substitute for it a phrase beginning with "are" (or "is");

(3) Ascertain what is the *Predicate* (i.e., ascertain what Class it is, which is asserted to contain *some*, or *none*, or *all*, of the Members of the Subject);

(4) If the Name of each Term is *completely expressed* (i.e. if it contains a Substantive), there is no need to determine the 'Univ.'; but, if either Name is *incompletely expressed*, and contains *Attributes* only, it is then necessary to determine a 'Univ.', in order to insert its Name as the Substantive.

(5) Ascertain the *Sign of Quantity*;

(6) Arrange in the following order:—

Sign of Quantity,
Subject,