Title: How to Study

Author: George Fillmore Swain

Release Date: October 21, 2009 [EBook #30309]

Language: English

Credits: Produced by Al Haines

HOW TO STUDY

BY

GEORGE FILLMORE SWAIN, LL. D.

GORDON MCKAY PROFESSOR OF CIVIL ENGINEERING IN HARVARD UNIVERSITY; PAST-PRESIDENT, AM. SOC. C. E.; FORMERLY CHAIRMAN OF THE BOSTON TRANSIT COMMISSION; CONSULTING ENGINEER

FIRST EDITION
FOURTEENTH IMPRESSION

TOTAL ISSUE, 45,000

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK: 370 SEVENTH AVENUE
LONDON: 6 & 8 BOUVERIE ST., E. C. 4
1917

PRINTED IN THE UNITED STATES OF AMERICA

{v}

PREFACE

The present paper has been suggested by a long experience in teaching, in which the writer has been continually surprised at the ignorance manifested by students in the higher classes of our technical schools and universities, or graduates from such schools, with reference to proper methods of study. If his experience is a reliable guide, & large majority of the graduates from such schools, as well as some teachers in them, have not acquired proper habits and methods of study, and have devoted little or no attention to the consideration of the subject, vital though it is.

It is undoubtedly true that training in the proper habits and methods of study should be inculcated by each individual teacher in the course of his work, and exemplified by the occurrences in his class room. The individual teacher can do much in this direction, and indeed the writer may say that probably the most important part of his instruction during the past thirty-five years has been teaching his students how to study and how to think logically, by constant
{vi} reiteration of principles in the class room and by making any failure on the part of a student the occasion for pointing out how such failure arose from improper methods of study or reasoning.

Nevertheless, it has seemed to the writer desirable to formulate, in a brief but simple manner, certain fundamental principles which he has been in the habit of pointing out in the class room, and that such a statement might perhaps be found useful with students of any grade as a set subject of study in itself, occupying one or more lessons. With this object in view, the present paper has been written, and it is hoped that it will prove useful to teachers as well as to students, suggesting to the former directions in which they may seek to discover defects in their students and in which they may urge improvement. Most students desire to learn but do not know how. A student will frequently answer a question correctly, perhaps in the words of the book, but upon further probing the teacher will very likely find that he fails entirely to understand what he is talking about. The teacher should seek to discover if such is the case and should, if practicable, point out the cause of the trouble.

The writer believes that if the students in our colleges will read this paper carefully and
{vii} thoughtfully, and will endeavor to follow its precepts, they will derive some benefit. If such proves to be the case, and if this paper affords help in enabling students to save time and to study more understandingly, the aim of the writer will have been accomplished.

{ix}

CONTENTS

{1}

HOW TO STUDY

"For the end of education and training is to help nature to her perfection in the complete development of all the various powers."—*Richard Mulcaster*, 1522-1611.

Education is an opportunity, nothing more. It will not guarantee success, or happiness, or contentment, or riches. Everything depends upon what development is produced by it and what use is made of it. It does not mean morality or usefulness. It may make a man more capable of doing harm in the world, for an educated scoundrel is clearly more dangerous than an ignorant one. Properly employed, however, and combined with high character, with a due regard for the rights of others, and with simple and practicable but high ideals, it should help a man very greatly in making himself of service in the world and so in making his life really successful in the highest sense. What the student gets out of his education depends largely upon what he puts into it. The student is not an empty vessel to be pumped full of learning; he is a complex machine which education should help to run properly.

{2} The aim of education is purely utilitarian, and is expressed more clearly by the word power than by any other. Its object is to give the man power to meet the problems of life, and to develop all his faculties to the greatest degree. The word "utilitarian," however, is to be interpreted in its broadest sense. It is not simply bread-and-butter utility that is aimed at. Whatever makes a man more capable of legitimate enjoyment, or helps to make him contented and happy, or to enlarge his breadth of view, is really useful and helps to give him power. "The true order of learning should be first, what is necessary; second, what is useful; and third, what is ornamental. To reverse this arrangement is like beginning to build at the top of the edifice."

The only way that power and strength can be developed is by effort on the part of the student. The only real education is self-education. The best that the teacher can do for the student is to show him what he can do for himself and how he can do it.

"If little labor, little are our gains;
Man's fortunes are according to his pains."

But labor alone will not produce gains unless properly and intelligently directed. Misdirected
{3} labor, though honest and well-intentioned, may lead to naught; just as any virtue, such for instance, as perseverance, if misdirected or misapplied, or in the wrong proportion, may become a vice. Hegel's dictum that anything carried to its extreme tends to become its opposite, has profound significance. A student may work hard and earnestly in school or college and yet accomplish little or nothing. He should, therefore, be made to see—not only the necessity for hard work, and how to work—but also how to work *effectively*.

Among the most important things, then, for a student to learn, is how to study. Without a knowledge of this his labor may be largely in vain. He may pass his examinations and yet know nothing thoroughly and have little power. The importance of knowing how to study is evident when we realize that the amount of knowledge that a student can acquire in college, compared with the whole mass of human knowledge, even that bearing upon a single specialty, is entirely insignificant; and furthermore, that a student is generally quite unable to foresee with any degree of correctness what his work in life will be. Unless, therefore, his education has enabled
{4} him to take up a new subject or a new problem and to study and master it himself—that is to say, unless he has learned how to study, how to use his mind properly and to direct it efficiently upon the subject in hand—his education may have benefited him little and may not have fitted him for the career in which he finally finds himself.

Important as it is to learn how to study, it is singular that most students do not learn it, and that little effort is made to teach it. It is assumed that children know how to study because they have brains. Probably a large majority of our college graduates today have not learned how to study properly, and find it difficult or impossible to take up a new study and master it. They have only learned how to do certain routine things in a mechanical way. They have learned by rote.

It is with the hope of emphasizing this subject and of calling attention to some rules for proper study, that this article has been written.

In its broadest sense, the question to be considered is, "How to Investigate a Problem." In doing this the first step is to get together all available information regarding the problem, including books, experimental data and results of experience, and to consider and digest this
{5} material. Personal investigations and inquiry, further experimental research, correspondence, travel, etc., may then be necessary. This will be based, however, in general, upon a study of books, and with this part of the subject we are here particularly concerned.

Let us, therefore, consider the elements requisite for a proper method of study.

{6}

I

THE PROPER MENTAL ATTITUDE

The first essential is that *the student should have the proper mental attitude*. That attitude should not be one of subservience, of blind believing, but should be one of mental courage and determination. His object is to understand the subject, not simply to read a book. If the book is a proper one for him to read, that is to say, if he has the proper preparation, and requisite mental power, then he is capable of mastering it. He is to master the book, the book is not to master him. He is to learn what the writer of the book thinks in matters of opinion, but he is never to accept such views blindly, and is to believe them only when he sees them to be true. Many students accept blindly as truth whatever they see on a printed page that they are required to read. To do this, even if what is read be remembered, is to study by rote; it makes a routine, rule-of-thumb man, who merely imitates or copies. He should realize that nothing is true simply because it is in a book, but should accept it only when it passes the test of his own understanding. Mental
{7} courage, therefore, is essential for a proper method of study, without which the student will become little more than a parrot. He must possess self-confidence, a consciousness of his power to master the subject, and a firm determination to master it. Of course, nobody should read a book that he is incapable of mastering or unprepared to understand. A suitable preparation and sufficient mental power are of course essential, and are here assumed. The point is that the sense of his own power and the determination to use it should be constantly in his mind.

Students are of course frequently, if not generally, limited in the time which they have available for any given lesson, and they may not be able to follow out completely the methods recommended in this paper. It may therefore be necessary for a student frequently to accept a statement which he reads, although he is not at the time able to see the reason for it. In all cases, however, he should endeavor to perceive whether it is a mere fact or definition, or whether it has a reason, and if he cannot at the time understand the reason he should accept the statement only tentatively, making a note of it as something which he must return to and study further if he wishes thoroughly to master the subject.

{8} (*a*) THE STUDENT MUST DISTINGUISH CLEARLY BETWEEN READING AND UNDERSTANDING.—Reading alone, no matter how extensive, or how retentive the memory, will not give wisdom or power.

> "Who reads
> Incessantly, and to his reading brings not
> A spirit and judgment equal or superior
> Uncertain and unsettled still remains,
> Deep versed in books, and shallow in himself."

No doubt every one finds himself at times reading merely words or phrases without understanding them, reflecting about them, or translating them into terms which are intelligible to his understanding. Such reading is worse than useless; it leads to actual mental injury. Whenever we find ourselves doing this we should therefore arouse ourselves, make an effort of will, and concentrate our attention upon the subject, insisting upon understanding it. If for any reason we are unable to do this, we should close the book, take some exercise or recreation, or at any rate do something else, for we are not at the moment fitted for study. We might as well eat sawdust and deceive ourselves with thinking that we are taking nourishment. It is not what is read or what is remembered, but only what is understood, that gives power,

{9} "In this quest of knowledge ... there are two faults to be shunned—one, the taking of unknown things for known, and giving an assent to them too hastily, which fault he who wishes to escape (and all ought so to wish) will give time and diligence to reflect on the subjects proposed for his consideration. The other fault is that some bestow too great zeal and too much labor on things obscure and difficult, and at the same time useless."—*Cicero: de Officiis*.

(*b*) THE STUDENT MUST CLEARLY DISTINGUISH MERE FACTS FROM CONCLUSIONS OR OPINIONS.—Mere facts, some of which may be the result of laborious investigation, may be accepted without verification, if the authority is good. When the student reads that the river Nile rises in Equatorial Africa, flows in a northerly direction through Egypt into the Mediterranean sea, he cannot verify this statement nor reason out that it must be so. It is a mere fact and a name, and he simply accepts it, perhaps looking at the map to fix the fact in his mind. So, too, if he reads that the atomic weight of oxygen is 16, or that a cubic foot of water weighs 62.4 pounds, he cannot be expected to perform the experiments necessary to verify these statements. If he were to do this throughout his reading, he would have to make all the investigations made in the subject since man has studied it, taking no advantage of the labor of others.

{10} Very different are conclusions or opinions deduced from facts; and logical conclusions are very different from mere opinions. The facts may be sufficient to prove logically a certain conclusion. On the other hand, the facts may simply give reasonable ground, or appear to give reasonable ground, for a certain opinion, though they may fall far short of demonstration. The student must, therefore, discriminate constantly between mere statements of facts, necessary conclusions which follow therefrom, and mere opinions which they seem to render reasonable.

Some conclusions also, like those of mathematics or logic, may be arrived at by the unaided reason without the previous accumulation of facts deduced from experiments or observation. Such truths or conclusions should be distinguished from those which are based upon facts, experiments or observation. If the student reads, therefore, that the sum of the angles of a plane triangle is equal to two right angles, he should see that this is not a mere fact, but an inevitable truth, the reason for which he should perceive, and not accept simply because he reads it.

The continual exercise of this discrimination, which comes from an attitude of mental courage and independence, is an essential of proper study.

{11} (*c*) THE STUDENT'S MIND SHOULD BE A CONTINUAL INTERROGATION POINT.[1]—He should always ask himself, regarding any statement which he reads, whether there is a reason for it, and if there is, whether it is inherent in the nature of things, so that he might independently arrive at it, or whether it follows from facts which the writer has observed. For instance, there is at first sight no reason why a cubic foot of water should weigh 62.4 pounds. It simply does and that is all there is to it; it does, because it does. But if he reads that a cubic foot of water at one point on the earth's surface weighs less than it does at another point, or that in the Northern Hemisphere the wind in a storm revolves around the storm center in a direction contrary to the motion of the hands of a clock, he should perceive that these facts, if true, have a reason for them, and he should endeavor to perceive that reason.

It must be observed at this point that, strictly speaking, there must be a reason for any truth, even for what we may term mere facts, excepting those which are mere definitions. There is some reason, lying in the constitution and arrangement of its atoms, why a cubic foot of water at
{12} a given spot and at a given temperature weighs 62.4 pounds. But there is no reason why New York is 90 miles from Philadelphia; those two points 90 miles apart are simply so named or defined. Many truths which are accepted as mere facts, the explanation being unknown, in the course of time are explained by the progress of science. Thus, for many years the fact that a magnetic needle pointed toward the North was a mere unexplained fact, but later the reason was

discovered. The same is true of the fact that the pollution of drinking water by sewage may cause typhoid fever. The point is that the student must continually discriminate, continually inquire, and, as he reads, keep a list of points, the reason for which he cannot then discover, but which he perceives must have a discoverable reason. He should not go too deeply into this, but should preserve his sense of proportion; for if he follows every possible line of inquiry back to its source he will progress but slowly. Thus, if he is studying descriptive astronomy and reads that the sun is ninety-two million miles from the earth, or that Jupiter has nine moons, or that the star Sirius is moving away from the earth with a velocity of eleven miles per second, or that the moon always
{13} turns the same half toward the earth, he should perceive that he cannot at that stage try to get back of these facts, but he may well make a note of them as questions to be later examined, if not as to the cause, at least as to how the fact is ascertained.

It does not follow that he should never leave the subject until he has found a reason, for it may depend upon facts or principles of which he is not at the moment informed; but if such is the case, he should accept the fact tentatively, but make a mental note that it is something which clearly must have a reason which he is capable of perceiving, and which he will look up at some future time. In studying his book he may well make a list of such questions to ask the teacher or to look up later.

Students must of course proceed in a systematic way, and a student who has not studied physics cannot be expected to perceive reasons that depend upon the laws of physics, and yet without a knowledge of physics he may still perceive that a statement is not of a mere fact, but of something that must have a reason. To primitive peoples nature was a closed book. The simplest phenomena were beyond their understanding, and they, therefore, imagined deities of whose
{14} personal activities these phenomena were supposed to be manifestations. With the progress of science many phenomena once mysterious and looked upon as facts have become easily explained. The intelligent student, however, can generally distinguish between statements of the different kinds which have been described, and he should constantly endeavor to explain or seek the reason for new statements by relating them to the body of knowledge which he has previously gained. Unfortunately, the average student reads only to accept what is written, whether fact, conclusion, or opinion, perhaps memorizing it verbatim under the impression that by so doing he is learning; he does not examine or reflect upon it, and often even accepts as facts what are explicitly stated to be mere expressions of opinion. Thus palpable mistakes, or even typographical errors, which a careful student should detect at once, are often accepted and believed. It is for this reason that it is so easy to deceive most people, at least for part of the time. They do not think for themselves, and all that is necessary to make them believe what you say is in some way to get them to think you are an authority.

(*d*) REGARDING FACTS WHICH HE DOES NOT THEN INVESTIGATE THE REASON FOR,
{15} HE SHOULD ASK How THEY ARE ASCERTAINED.—This will draw his attention to methods of observation and experiment, or to the technique of the subject. How, for instance, is it ascertained that New York is 90 miles from Philadelphia, or that the sun is ninety-two million miles from the earth? It is always possible to ascertain, at least in a general way, how a fact is ascertained, though it may not be possible to determine the reason for the fact. This applies not alone to physical sciences, but to questions of an economic, historic or sociological character. If we read that at the Battle of Gettysburg 3072 Union soldiers were killed, we do not inquire why; such a question is clearly meaningless; but we may well inquire how this was ascertained, whether by counting the dead upon the field or by the roll call, etc.; or if we read that following the issue of large quantities of paper currency during the Civil War, the amount of gold in the country decreased, we may in this case also inquire how it was ascertained, and we may further perceive that this is a fact for which there must be a reason, and we may then or later ascertain why it is true.

(*e*) THE STUDENT MUST TRAIN HIMSELF TO BE CONSTANTLY ON THE WATCH FOR EVIDENCE OF RELIABILITY IN THE WRITER HE IS STUDYING, IN ORDER THAT HE MAY GET
{16} A CORRECT IMPRESSION AS TO WHETHER HIS STATEMENTS OF FACT MAY BE ACCEPTED, AS WELL AS HIS CONCLUSIONS AND OPINIONS.—Many writers are careless, some are entirely unreliable, and some wilfully distort. Not only are the opinions sometimes expressed entirely unwarranted by the facts, but often statements of mere fact, such as those of statistics, may be grossly perverted, sometimes intentionally. Erroneous conclusions or opinions which are the result of illogical reasoning from correct facts may be discovered by the student who himself knows how to reason, but perversions of fact may escape detection, if not traced back to original authorities or observations, which the student may not have time or opportunity to do. Statistical results, or statements made in books on economics, history, and sociology, are particularly liable to distortion, intentionally or unintentionally. Indeed by selecting certain statistics and excluding others, almost anything depending upon statistics may be proved.

The importance is thus obvious of being able to detect signs of reliability and accuracy, and of discarding a writer who cannot be depended upon. It is also important to make it a rule to ask
{17} whether any result when reached appears to be reliable in the light of common sense. Sometimes a suggestion of error will be observed if the subject is looked at in this light, which if traced back will lead to the discovery of some mistake in observation or some error in reasoning.

Evidence of unreliability shown by a writer may generally be discovered, if care is exercised. His temperament, age, environment, training, religion and other facts will contribute. One who is dogmatic or abusive in stating what are obviously mere opinions which cannot be demonstrated, or who is intolerant of those who reach different conclusions, is obviously by temperament untrustworthy. A writer who in a single instance can be shown to have intentionally distorted facts should, of course, be at once and forever rejected;[2] one who has distorted facts unintentionally may perhaps be forgiven once. So a writer who, in a matter not capable of mathematical demonstration, and to some extent a matter of opinion, sets out to prove a preconceived idea, shows himself in general not possessed of the qualities which should inspire confidence.

{18} By these and other tests the student should constantly be on the watch to form his opinion of the credibility and reliability of a writer or experimenter whose work he is studying. He may thus guide himself as to the books which he should pursue carefully, remembering the dictum of Bacon that "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested," except that very few, if any, are to be literally swallowed without digestion. By careful observance of the injunction to study constantly the credibility of a writer one may become what may be termed a discriminating student.

(*f*) ANOTHER ESSENTIAL ELEMENT OF A PROPER ATTITUDE OF MIND IS CAUTION.—Always realize the possibility of error both in another and in yourself. Be on your guard against intentional or unintentional deception. As Bacon said, "Read not to contradict and to confute, nor to believe and take for granted, nor to find talk and discourse, but to *weigh and consider*."[3] The author you are reading may have made a mistake, or may be trying to mislead you. "When we think of the difficulty of finding the way, when we are most desirous to go right, how easy to
{19} mislead those whom we wish to go wrong!" Be, therefore, always suspicious of your author, and subject all his statements to the test of your own intelligence.[4]

(*g*) STUDY WITH AN OPEN MIND, AND WITH NO PRECONCEIVED IDEAS.—Cultivate the scientific attitude of mind, which means, first to formulate clearly a problem, then to get together all the pertinent facts, and then to draw the logical conclusions. Be ready to accept gladly any logical conclusion from the facts, even if unpalatable. Truth is, or should be, the sole object of study.[5]

(*h*) BE MODEST INTELLECTUALLY, YET SELF-RELIANT. TRAIN YOURSELF TO LOVE CORRECTION.—Remember these sayings from wise men:

"Whoso loveth correction loveth knowledge;
But he that hateth reproof is brutish."
—*Proverbs*.

"Poverty and shame shall be to him that refuseth correction;
But he that regardeth reproof shall be honoured."
—*Proverbs*.

{20} "The beginning of wisdom is the knowledge of one's faults."
—*Epicurus*.

"He that being often reproved hardeneth his neck
Shall suddenly be broken, and that without remedy."
—*Proverbs*.

"Reprove not a scorner, lest he hate thee;
Reprove a wise man and he will love thee."
—*Proverbs*.

"Be not wise in thine own eyes."—Proverbs.

"The true beginning of wisdom is the desire of discipline."
—*Wisdom of Solomon*.

"Censure and criticism never hurt anybody. If false they can't hurt you unless you are wanting in manly character; and if true, they show a man his weak points, and forewarn him against failure and trouble."—*Gladstone*.

"If there's anything worse than knowing too little, it's knowing too much. Education will broaden a narrow mind, but there's no cure for a big head. The best you can hope is that it will swell up and bust, and then, of course, there's nothing left. Poverty never spoils a good man, but prosperity often does. It's easy to stand hard times, because that's the only thing you can do, but in good times the fool-killer has to do night work."—*Lorimer: Letters from a Self-made Merchant to his Son at College*.

Intellectual modesty is quite consistent with self-reliance and mental courage.

The study of books too often leads to intellectual arrogance, which is the surest bar to real mental progress. Realize the limitations of your own knowledge; see clearly what you know and
{21} what you do not know, otherwise you will see the things you know out of proportion. Make sure, however, that you know the fundamentals. Socrates said that a knowledge of our ignorance is the first step toward true knowledge, and a Persian proverb says:

> "He who knows not, and knows not that he knows not, is a fool; shun him.
> He who knows not, and knows that he knows not, is a child; teach him.
> He who knows, and knows not that he knows, is asleep; wake him.
> He who knows, and knows that he knows, is wise; follow him."

Ask yourself, which of these classes you belong to.

(*i*) REMEMBER THAT THE OBJECT OF STUDY SHOULD BE TO GAIN WISDOM, RATHER THAN KNOWLEDGE.—Facts are important and must be learned; but far more important is it to gain wisdom and to train the mind and judgment so that truth may be distinguished from error. As the poet says:

> "Knowledge and wisdom, far from being one,
> Have ofttimes no connection. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom, in minds attentive to their own.
> Knowledge is proud that he has learned so much,
> Wisdom is humble that he knows no more."

The above points all have to do with the mental attitude of the student, and may be summarized by simply stating that the student must be possessed of *mental courage, self-reliance, discrimination, modesty, and caution, all in proper proportion*.

[1] "He that questioneth much shall learn much."—*Bacon*.

[2] "Mendax in uno praesumitur mendax in alio."

[3] "There are always people ready to assume that things are what they are called, because it is much easier to deal with names than to examine facts."—*Bryce: South America*.

[4] "A wise man knows an ignorant one, because he has been ignorant himself, but the ignorant cannot recognize the wise, because he has never been wise."—*Persian Proverb*.

[5] "Table talk proves that nine out of ten people read what amuses them, rather than what instructs them, and proves also, that the last thing they read is something which tells them disagreeable truths or dispels groundless hopes. That popular education results in an extensive reading of publications which foster pleasant illusions rather than of those which insist on hard realities, is beyond question."—*Spencer: The Coming Slavery*.

{22}

II

STUDYING UNDERSTANDINGLY

The second essential which may be named, connected with the first, and already mentioned, but now to be discussed, is that *the student should understand what he reads*. This may seem almost a needless injunction, yet it is very surprising how commonly it is disregarded. It is, however, easy to understand why this should be so. A child, as it grows up, must gain all its knowledge either by the exercise of its own reasoning powers or from its senses. How does it learn the meaning of words? Certain nouns like "papa" or "cat" it may easily be made to understand by pointing at the object referred to and uttering the word, but how does it learn the meaning of abstract nouns, or of verbs and other parts of speech which cannot be illustrated by pantomime? It is almost inevitable that the child should use many words the meaning of which it does not understand, and when young children in school recite poetry at class-day exercises, it is almost certain that they do not understand the meaning of many of the words they use. Thus, it
{23} happens that they come into the habit of using words and phrases without carefully examining their meanings. This tendency should be counteracted from the earliest stage. The child should

be continually asked the meanings of words which it uses, and should be encouraged itself to inquire as to those meanings and to take the proper mental attitude. The use of the dictionary should be insisted upon even from an early age, the object being to avoid the formation of the habit of using words or phrases unintelligently, which is one of the worst habits that one can acquire.

Professor James, in his interesting book, "Talks to Teachers," illustrates this habit by an amusing anecdote:

> "A friend of mine visiting a school, was asked to examine a young class in geography. Glancing at the book, she said: 'Suppose you should dig a hole in the ground, hundreds of feet deep, how should you find it at the bottom—warmer or colder than on top?' None of the class replying, the teacher said: 'I'm sure they know, but I think you don't ask the question quite rightly. Let me try.' So, taking the book, she asked: 'In what condition is the interior of the globe?' and received the immediate answer from half the class at once; 'The interior of the globe is in a condition of igneous fusion!'"

Perhaps it may be thought that an incident like the foregoing would only occur in an
{24} elementary school. As a matter of fact, college students and graduates, and indeed most of us, do this very thing more often than we realize, even in subjects like mathematics or mechanics; and terms like "energy," "momentum," "rate of change," "period of vibration," "value," "social justice," etc., are often used without a clear understanding, and sometimes without any understanding at all, of what they mean.

(*a*) THE STUDENT SHOULD ACQUIRE AND INSIST UPON EXERCISING THE HABIT OF FORMING DEFINITE IDEAS.—This is one of the most important injunctions to be observed as an essential principle of intelligent study.[1] It is self-evident that facts or things cannot be reasoned about intelligently unless a definite idea is formed of the facts or things themselves. Vagueness of idea not alone precludes a proper conception of the thing itself, but may vitiate all reasoning regarding it. The student must resolutely make up his mind that he must not rest satisfied with hazy, uncertain, half-formed ideas. A half knowledge of a thing may not be useless, but it is generally found that it is the other half that is needed. If the student could learn this one precept and continually apply it, he would have little difficulty in studying properly.

{25} It is not easy to state just how the habit of forming definite ideas may be acquired. To a certain extent it is intuitive. Some students have it, while others do not; some can cultivate it, while others apparently cannot. It is probably safe to say, however, that a student who cannot cultivate it should not study books, or enter into a profession, but should go to work with his hands instead of taking a college course. Such a man will be always likely to be misled, his conclusions can never be depended upon, and what we term education may do him harm rather than good.

A definite idea is one that leaves no room for ambiguity—which means just one thing. The habit of forming such ideas habitually may be cultivated in several ways, as for instance:

1. STUDY THE DICTIONARY.—By study of the dictionary, the student may train himself to distinguish slight differences in meaning between words, and habitually to use precisely the word with the proper meaning to express his idea. A knowledge of the derivation of words will often assist, and such books as Archbishop Trench's on "The Study of Words," or a course in English
{26} composition under a good teacher, accompanied by exercises in expression, will all contribute to the formation of the habit.[2] Sometimes, however, the dictionary may give little assistance, for it may be found that one term is defined by means of another and on looking up that other, it will be found to be defined by means of the first. Sometimes also a definition of a word will be given in terms even more difficult to understand than the one which is defined. There are differences in dictionaries. The study of language, and particularly of the classics, if properly pursued, may be
{27} of great benefit, because it involves translating from one language into another, and should include much practice in discovering the precise word or phrase to express an idea. The reason why a study of the classics may be better than that of modern foreign languages, is that in studying the latter the object is more often considered—by the student at least—to become able to read professional books in a modern language, or to get a smattering which will be of use in travel or in business; while in the study of the classics these objects are entirely absent, and the attention is more apt to be concentrated on studying delicate shades of meaning. However, everything depends upon the teacher and the way the subject is taught.[3]

2. The habit of forming definite ideas may also be cultivated by each day attempting to define a certain number of common words, and after making as good a definition as possible comparing the result with that in the dictionary. If the student will practise this, he will at first receive many surprises, for any word may be defined in various ways, all correct as far as they go, but only one
{28} of which is a true definition. For instance, a cow may be defined as a four-legged animal, but this, while correct, obviously does not define a cow, for the same definition would apply to many other animals that are not cows. What constitutes a definition?

This subject is clearly allied with the discussion of the question as to what constitutes perfect knowledge; what elements, for instance, go to make up what may be called a perfect conception of a thing. According to Liebnitz, perfect knowledge is clear, distinct, adequate, and intuitive. The student will do well to look up the discussion of this subject in Jevon's "Elementary Lessons in Logic" (Lesson VII).

The importance of forming definite ideas, as an essential of proper study, and of understanding what is read, cannot be exaggerated. Without it one cannot acquire more than a partial knowledge, and one is always liable to those errors of reasoning which arise from the use of equivocal language, which may lead us unconsciously from one meaning of a word to another—a logical error which is perhaps the most fruitful cause of fallacious reasoning.

3. STUDY LOGIC.—Logic is the science of correct reasoning. It teaches us how to discover
{29} truth, how to recognize it when discovered, how to arrive at general laws from facts collected by observation or experiment, and how to deduce new facts from those already found to be true. It is thus the science of sciences, and finds its application in every branch of knowledge. The training of his power of logical thought is, therefore, one of the things that should be constantly aimed at by the student.

Now all thinking is concerned, first of all, with *terms* or names for things or qualities or conceptions of some sort. Then, it is concerned with comparisons of things, and the discovery of their identity or dissimilarity, as when I say "Iron is a metal" or "all metals are elements," each of which statements is a *proposition*, the truth or falsity of which I must be able to discover. Finally, it is concerned in deducing new propositions from old ones, and so arriving at new truths, as when I discover from the two propositions stated above, the new truth that "Iron is an element."

But there are many chances for error in this process; for instance, I might say:

"To call you an animal would be to state the truth"—to which you would agree; and, "To call you an ass would be to call you an animal"—to which you would also agree; from which I might
{30} conclude that, "To call you an ass would be to state the truth"—which you might have a vague idea was not true. If you wish to be sure that this conclusion is incorrect, you must be able to show just why it is incorrect. The study of logic would enable you to see just where the error lies. You must not be governed by vague ideas, or you will be intellectually at anybody's mercy.

In the logical study of *terms*, they are classified and distinguished, and the importance made manifest of having in mind a clear definition of the meaning of a term before reasoning about it. Many terms are ambiguous, as already explained, and may mean many different things, as for instance the terms "bill," "church," "evil," "value," "social justice." Here, then, the importance of definite ideas will be manifest.

Pascal laid down the essentials of logical method in the statement "Define everything and prove everything." In other words, do not attempt to think about a term until you have defined the term and have a clear idea what it means; and insist upon proving every statement at which you arrive, before accepting it finally and definitely; although for want of time, you may be obliged sometimes to accept or form a conclusion tentatively or provisionally. You may be able to
{31} draw correct conclusions from stated premises even though you do not understand the terms of the premises. For instance, if I say, "Selenium is a dyad element" and "A dyad element is one capable of replacing two equivalents of hydrogen," I can correctly draw the conclusion that, "Selenium is capable of replacing two equivalents of hydrogen," but I cannot know that the conclusion is correct unless I understand the meaning of the terms in the premises and so can be sure of the correctness of those premises.

Every student should, therefore, in the writer's opinion, take a systematic course in logic, or carefully study by himself such books as Jevons' "Elementary Lessons in Logic" or John Stuart Mill's "Logic."[4]

(*b*) LEARN TO STATE A THING IN DIFFERENT WAYS OR FROM DIFFERENT POINTS OF VIEW.—Almost anything may be looked at from different points of view, or a truth stated in
{32} different ways, and it may appear very different from different viewpoints. A student should practise doing this, first stating a principle perhaps from the mathematical point of view, and then in simple untechnical language that can be understood by one who is not a mathematician. The habit of stating even technical matters in simple untechnical language should be practised continually. As Bishop Berkeley urged, we should "think with the learned and speak with the vulgar." If you clearly understand a proposition, you can state it in clear and unambiguous language, though perhaps not in Addisonian English. Students frequently say "I understand that, but I cannot explain it." Such a student deceives himself: he does not understand it. If he understands it thoroughly, he can explain it clearly and without ambiguity, and so that others will understand him. For this reason an acute observer can get the mental measure of a man after a few minutes' conversation. Inaccurate or slipshod thinking will surely show itself in speech.

(*c*) STATE A THING NOT ONLY POSITIVELY BUT NEGATIVELY.—That is to say, state not

only what it is, but what it is not, even if incompletely. Perceive not only what it includes, but
{33} what it excludes. When a result or a principle is arrived at, it is essential not only to see that it is true, but how far the *reverse* is *untrue*. The student does not really understand a thing unless he recognizes it from any point of view, can describe it from any point of view, can state it in language to suit the particular emergency, and can see why the other thing is untrue. As Aristotle says:

"We must not only state the truth, but the cause of the untrue statement; this is an element in our belief; for when it is made apparent why a statement not true appears to be true, our belief in the truth is confirmed."

In other words, we must analyze every statement which is the result of reasoning, or a statement of opinion, and see what objections, if any, can be brought against it, and then convince ourselves where the truth lies and why. The lawyer has excellent practice in doing this, for in making his own argument he is obliged to scrutinize it closely to discover what objections he would make to it, if he were the counsel on the opposite side. The lawyer, however, does not always limit himself to the discovery of the truth, but often seeks to discover and bring to bear unsound but plausible arguments to refute the other side; and by his skill in dialectics he may
{34} often deliberately "make the worse appear the better reason." The student of mathematics, on the other hand, does not gain in that study much practice in weighing evidence or seeking objections to an argument, for he deals with principles which are rigid and not open to question. Professor Palmer, in his interesting book, "The Problem of Freedom," says: "Until we understand the objection to any line of thought, we do not understand that thought; nor can we feel the full force of such objections until we have them urged upon us by one who believes them." This is precisely what the advocate endeavors to do beforehand, and in the court room he is very sure to have the objections to his line of thought urged upon him and the jury by one who at all events *appears* to believe them.

(*d*) IN STUDYING A STATEMENT, OBSERVE WHICH ARE THE NECESSARY WORDS AND WHETHER THERE ARE ANY UNNECESSARY ONES WHICH MIGHT BE OMITTED.—For instance, in the following sentence, "When a force acts upon a body, and the point of application of the force moves in the direction of the line of action of the force, the force is said to do work on the body," what is the necessity and significance of the qualifying phrase "in the direction of the
{35} line of action of the force?" Are these words necessary, or could they be omitted?

Note whether another word could be substituted for one used, without rendering a statement incorrect, or whether such change would improve it and make it more accurate. For instance, in the definition "Matter is that which can occupy space" would it be proper to substitute "does" for "can" or "occupies" for "can occupy"?

Note what word or words should be emphasized in order to convey the intended meaning. In the sentence "Thou shalt not bear false witness against thy neighbor," several widely different meanings may be conveyed according to the word which is emphasized.

Students frequently seem to lack all sense of proportion and fail to acquire definite ideas because they do not see the meaning or necessity of qualifying words or phrases, or because they do not perceive where the emphasis should be placed.

(*e*) REFLECT UPON WHAT IS READ: ILLUSTRATE AND APPLY A RESULT AFTER REACHING IT, BEFORE PASSING ON TO SOMETHING ELSE.[5]—Apply it to cases entirely
{36} different from those shown in the book, and try to observe how generally it is applicable. Do not leave it in the abstract. An infallible test of whether you *understand* what you have read is your ability to *apply* it, particularly to cases entirely different from those used in the book. An abstract idea or result not illustrated or applied concretely is like food undigested; it is not assimilated, and it soon passes from the system. In illustrating, so far as time permits, the student should use pencil and paper, if the case demands, draw sketches where applicable, write out the statement arrived at in language different from that used by the author, study each word and the best method of expression, and practise to be concise and to omit everything unnecessary to the exact meaning. Herndon in his "Life of Lincoln" says of that great man, "He studied to see the subject matter clearly and to express it truly and strongly; I have known him to study for hours the best way of three to express an idea." This kind of practice inevitably leads to a thorough grasp of a subject.

Some of these principles may be illustrated by considering the study of the algebraical
{37} conditions under which a certain number of unknown quantities may be found from a number of equations. The student will perhaps find the necessary condition expressed by the statement that "the number of independent equations must equal the number of unknown quantities." Now this statement makes little or no concrete impression upon the minds of most students. They do not understand exactly what it means, and they can easily be trapped into misapplying it. To study it, the student should ask himself what each word of the statement means, and whether all are necessary. Can the word "independent" be omitted? If not, why not? What does this word really mean in this connection? Must each equation contain all the unknown quantities? May some of

these equations contain none of the unknown quantities? What would be the condition of things if there were fewer equations than unknown quantities? What if there were more equations than unknown quantities?

This problem too, affords a good illustration of the advantage of translation into other terms? What, for instance, is an equation anyway? Is it merely a combination of letters with signs between? The student should translate, and perceive that an equation is really an intelligible
{38} sentence, expressing some statement of fact, in which the terms are merely represented by letters. An equation tells us something. Let the student state what it tells in ordinary non-mathematical language. Then again, a certain combination of equations, taken together, may express some single fact or conclusion which may be stated entirely independent of the terms of the equations. Thus, in mechanics the three equations $\Sigma H=0$; $\Sigma V=0$; $\Sigma M=0$; taken together, merely say, in English, that a certain set of forces is in equilibrium; they are the mathematical statement of that simple fact. If the equations are fulfilled, the forces are in equilibrium; if not fulfilled, the forces are not in equilibrium.

Following this farther, the student should perceive, in non-mathematical language, that an equation is independent of other equations if the fact that it expresses is not expressed by any of the others, and cannot be deduced from the facts expressed in the others.

The benefit of translation into common, everyday language, may be shown by another mathematical illustration. Every student of Algebra learns the binomial theorem, or expression for the square of the sum of two quantities; but he does not reflect upon it, illustrate it, or
{39} perceive its every-day applications, and if asked to give the square of 21, will fail to see that he should be able to give the answer instantly without pencil or paper, by mental arithmetic alone. Any student who *fully grasps* the binomial theorem can give (without hesitation) the square of 21, or of 21.5, or any similar quantity. With practice and reflection, results which seem astonishing may be attained.

(*f*) KEEP THE MIND ACTIVE AND ALERT.—Do not simply sit and gaze upon a book, expecting to have ideas come to you, but exert the mind. Study is active and intelligent, not dreamy. By this is not meant that haste is to be practised. On the contrary, what might perhaps be called a sort of dreamy thinking often gives time and opportunity for ideas to clarify and take shape and proportion in the mind. We often learn most in hours of comparative idleness, meditating without strenuous mental activity upon what we have read. Such meditation is of the greatest value, but it is very different from the mental indolence of which the poet speaks when he says:

> "'Tis thus the imagination takes repose
> In indolent vacuity of thought,
> And rests and is refreshed."

{40} This is beneficial to the proper extent; but it is rest, not study.

(*g*) WHEN YOU MEET WITH DIFFERENCES OF OPINION UPON A SUBJECT, REFLECT UPON THE REASONS WHICH MAY CAUSE INTELLIGENT MEN TO ARRIVE AT DIFFERENT CONCLUSIONS.—These reasons are:

1. One or both may fail to grasp all the pertinent facts, or even the problem itself, or may assume, as true, facts or principles which are really erroneous. This should easily be ascertainable.

2. One or both may reason incorrectly even from accurate premises. This also should be discoverable.

3. One or both may see facts out of proportion—may lack a true mental balance or perspective.

4. One or both may illustrate the inherent stubbornness or imperviousness of the human mind.

Whether the student can discover the last two sources of error will depend upon his own mental characteristics. He must not forget, however, that on many matters no definite demonstrable conclusion is possible, and that the result must remain more or less a matter of opinion.

(*h*) REMEMBER THAT A STATEMENT IS NOT A PROOF. MANY STUDENTS THINK THEY PROVE A STATEMENT BY MERELY REPEATING IT IN DIFFERENT WORDS. YOU DO NOT UNDERSTAND A CONCLUSION UNLESS YOU CAN SEE THE STEPS IN ITS LOGICAL DEMONSTRATION.

{41} It is quite surprising how many students commit this error. For instance, if I am asked why can I see through glass and I reply, because it is transparent, I am giving no reason at all, for transparent means what can be seen through, so I am simply saying that I can see through glass

because I can see through glass. The same error often occurs in arguments or syllogisms. For instance, suppose I make the following statements:

> No unsportsmanlike act should be done;
> Smith's act was unsportsmanlike;
> Therefore, Smith's act should not have been done.

Now, this of itself is not correct reasoning, for the reason that the word "unsportsmanlike" simply means something which no sportsman should do. The conclusion, therefore, is simply a repetition of the second statement. The real thing to be proved in this case is whether Smith's act was or was not unsportsmanlike.

[1] "General ideas and great conceit are always in a fair way to bring about terrible misfortune."—*Goethe*.

[2] "I tell you earnestly and authoritatively (I know I am right in this) you must get into the habit of looking intensely at words, and assuring yourself of their meaning, syllable by syllable—nay, letter by letter."—*Ruskin: Sesame and Lilies*.

"Neither is a dictionary a bad book to read—it is full of suggestions."—*Emerson*.

Benjamin Franklin, writing to a lady who asked him to give her advice about reading said:

"I would advise you to read with a pen in your hand, and enter in a little book short hints of what you find that is curious or that may be useful ... and as many of the terms of science are such as you cannot have met with in your common reading, and may therefore be unacquainted with, I think it would be well for you to have a good dictionary at hand to consult immediately when you meet a word you do not know the precise meaning of. This may at first seem troublesome and interrupting, but it is a trouble that will daily diminish, and you will daily find less and less occasion for your dictionary, as you will become more acquainted with the terms; and in the mean time you will read with more satisfaction because with more understanding."

[3] "A man who has no acquaintance with foreign languages, knows nothing of his own."

[4] "The Principles of Argumentation" by Baker and Huntington, is another excellent book, not treating of formal logic, but discussing the general principles which should govern the preparation of a paper or argument, the principles of evidence, and the logical fallacies in reasoning. It is recommended to readers. This book is, or has been, used in the course in English at Harvard University, and similar books are used in other colleges. A thorough training in English under a good teacher is a good training in logic, for clear and logical writing requires clear and logical thinking. Nevertheless, the writer strongly advocates the study of formal logic also.

[5] "It is not enough to know, we must also apply; it is not enough to will, we must also do."—*Goethe*.

{42}

III

THE THIRD ESSENTIAL FOR A PROPER METHOD OF STUDY IS SYSTEM

(*a*) DISCOVER THE FUNDAMENTAL IDEA OF THE SUBJECT.—Strip off the detail and get down to the root of the thing. See the really important point. Then, after this has been clearly perceived and mastered, arrange the details in their proper relations to the fundamentals. The subject will thus have a skeleton, and upon this the details will be placed. A subject of study thus viewed may be compared to the human body, with its bony skeleton or framework, and all the various organs and parts supported by it; or to a tree, with its trunk, branches and leaves. Thus to consider the relative importance of facts, to sift out the essential ones, will train the power of mental discrimination and cultivate the judgment.

When this is done, subsequent facts relating to the subject can be correlated with what is already known, and will in this way be easily retained by the memory. Remember and observe
{43} Jacotot's maxim, "Learn something accurately, and refer the rest to that." Unessential facts, or those of secondary importance, may be passed over in the first reading, and left for a second or later reading, for a proper method of study *always involves re-reading*, perhaps many times.

You cannot possibly know everything even of a single subject, hence the importance of knowing the fundamental things about it and knowing them thoroughly. Even if you gain but an elementary knowledge of a subject, that knowledge may be thorough and should include fundamentals. Thorough elementary knowledge must not be confused with *a smattering*. The

latter is worse than useless, and is marked by vagueness, uncertainty, and failure to grasp fundamentals. But elementary knowledge, if clear and definite as far as it goes, is valuable, and the first step toward more complete knowledge. Many students deceive themselves and others into thinking that they know something of a subject, because they have looked into it, while their knowledge may be entirely superficial and valueless.

When the fundamental principle or fact is perceived, study this carefully until it is thoroughly mastered. One who knows how to study properly will thus pick out the sentence or the paragraph
{44} which contains the key to the subject—the fundamental fact or principle—and will read and re-read this many times until its full meaning is clearly grasped. When this is done it is sometimes remarkable how quickly the rest of the chapter or subject may be mastered, for it will often be found to consist of discussions or illustrations, which will be obvious once the fundamentals are clearly in the mind. The ordinary student, however, does not do this. He does not see the fundamental principle, and each illustration is like a separate problem, different from the others, which has to be studied by itself, and is never fully mastered, because the underlying fundamental principle is not grasped.

(*b*) BEFORE YOU BEGIN TO STUDY A SUBJECT, THINK IT OVER CAREFULLY AND FIND OUT WHAT YOU ALREADY KNOW OF IT OR WHAT YOU CAN ARRIVE AT BY YOUR UNAIDED EFFORTS.—Try also to perceive what you expect to get out of the study of the subject, and how it is related with what you have already studied, and how it is to find application.[1] The historian, Edward Gibbon, states in his autobiography that before reading any book, he made it a rule to
{45} reflect upon the subject, arranging and classifying what he already knew of it.

This method may be followed to different degrees, depending on the subject. A student beginning the study of a new science which he has never studied before, can do comparatively little; but at least he can insist upon getting a clear idea of what the subject or problem is, its extent, what its objects and methods are, how it is related to other subjects, what its uses are, and how other studies will find their application in it.

(*c*) CLASSIFY AND ARRANGE WHAT YOU HAVE LEARNED.—When you have finished part of a subject, stop and think over the ground that has been covered, and arrange the various points made. Draw up a topical index and compare it with the table of contents. Note the correlation or interdependence of facts and link them together. By the principle of association the retention of facts and principles in the memory will be much facilitated. Note down concisely the steps of an argument in your own words, and see if the conclusion is justified. Close the book from time to time and go over in your mind what you have learned.

{46} The importance of systematic classification is very great. The minds of many students are like a library without arrangement or catalogue; the books may be there, but cannot be found when wanted, and so are valueless for use.[2]

[1] "We must keep carefully that rule of Aristotle which teaches that the best way to learn anything well which has to be done after it is learned, is always to be a-doing while we are a-learning."—*Richard Mulcaster*.

[2] "There's a vast difference between having a carload of miscellaneous facts sloshing around loose in your head and getting all mixed up in transit, and carrying the same assortment properly boxed and crated for convenient handling and immediate delivery."—*Lorimer: Letters from a Self-made Merchant to his Son at College*.

{47}

IV

MENTAL INITIATIVE

It will become evident from the foregoing that a fourth essential for proper study is mental initiative. The student must have a definite purpose, and must do what is the proper thing without it being suggested to him. He must not simply do as he is told. If he have not initiative and cannot develop it, he will probably never study intelligently, nor gain a thorough understanding of what he reads, but will merely memorize.

Memory is a most important faculty; it is not, however, a *substitute* for thought, but should be based upon it. Thinking is essential in order to decide what to memorize. Memory, however, is

often made the sole factor in study. Fundamental principles should frequently be memorized, so that by numberless repetitions they may be permanently impressed upon the consciousness, and can be repeated verbatim as a guide in any concrete case where they are to be applied.

Some suggestions may be useful as to the use and cultivation of mental initiative.

{48} (*a*) CULTIVATE AN INTEREST IN WHAT YOU ARE STUDYING, AND SOME IDEA OF WHAT IT LEADS TO.—Without interest your study will be perfunctory and of little use to you. Make yourself believe that for you, at that time, it is the most important thing in the world. It is of course true that in most schools students are required to study definite subjects according to a curriculum arranged by the faculty. In some of these subjects a student may take little interest; indeed they may be so foreign to his natural tastes that he is not able to cultivate any interest in them. In such a case his study of them will be of little value to him. If, relying upon the judgment of those who prescribe the curriculum as necessary or desirable for the object which he has in view, he cannot persuade himself that they have value for him or make himself take an interest in them, it would probably be better for him to drop them even though he may thereby become a special student in the school or lose his degree. A degree which simply means slipshod, unintelligent and uninterested study of a considerable number of subjects embraced in the curriculum, is verily a "scrap of paper" not worth having. If you wish to concentrate your entire
{49} attention upon certain subjects in which you take an active interest you may become proficient in those, but you may become very narrow minded and altogether lacking in that all-around breadth of view which comes from the cultivation of other subjects which well informed men consider necessary.

(*b*) INSIST UPON FIRST CLEARLY FORMULATING THE PROBLEM, IF ONE IS BEFORE YOU.—Many students literally do not know what they are doing, because they neglect this injunction, which is a necessary corollary of the necessity of forming definite ideas. Do not proceed to endeavor to solve the problem until it is clearly formulated, no matter how long it may take. See what the data of the problem are, whether definite or not, and what is required. See also how variations of the data, if indefinite, would affect the result.

(*c*) WORK INDEPENDENTLY OF OTHERS.—Solve your own difficulties and welcome them. Do not expect things to be easy. You will never gain strength by being shown, but only by the exercise of your own unaided powers. Therefore, do everything for yourself, so far as possible. Seek only *suggestions* from your teacher, when you need help, except in regard to mere matters
{50} of fact, which you could not be expected to reason out. Let the suggestions be as slight as possible.

If you have problems assigned, solve them entirely by yourself, even if you make mistakes. Then, when those mistakes are pointed out, consider them with great care and discover the causes for them, and *remedy them*, so that you will not again make the same mistake or one analogous to it. You should delight in discovering difficulties which give you an opportunity to test and increase your strength and so avoid future errors. In the same way, examinations should be welcomed, not dreaded. The teacher does not mark you—you mark yourself; the teacher merely records the mark. Even if you fail in the examination, that should indicate to you what you lack, and so be a benefit. Indeed, it is better to fail than to scrape through.[1] There must be a line somewhere. The man just above the line passes, and the man just below the line fails. The former may not be as capable as the latter, but, having passed, he does not remedy his faults; while the man who has failed is required to remedy his. Huxley said that the next best thing to being right is to be completely and wholesomely wrong.

{51} (*d*) DRAW YOUR OWN CONCLUSIONS, WHENEVER POSSIBLE, BEFORE YOU KNOW THOSE OF THE WRITER You ARE STUDYING.—When you read, "From the above it is evident," stop, close the book, and see if you can state what is evident. When you have written this down, compare with the result reached by the writer. Practise such exercises in whatever form they present themselves. If your conclusions are different from those of the writer, in kind or in character, see which is right, or whether both are right. If you are right, why did the writer not reach your conclusion? Was it because it was not pertinent to his problem? Is it simply a difference of expression?

The process of investigating any subject is a process of question and answer. The student must first propound to himself a question, and it must be the proper question. He must be able to perceive what the proper question is, under the circumstances. Then he must give to himself the proper answer out of all the possible answers that are verbally correct, namely, the answer that affords a new vantage ground from which another question may be asked; and so the problem may be gradually unravelled.

{52} Then again, many questions are indefinite, and can only be answered indefinitely; but to all questions a correct answer can be given, and the student must give the most definite answer the case admits of, and must gain the ability to qualify his answer or classify possible cases in such

manner as may be necessary.

(*e*) IF YOU CANNOT SEE HOW THE AUTHOR REACHES A STATED CONCLUSION, BECAUSE HE DOES NOT INDICATE THE PROCESS WHICH HE FOLLOWS, DO NOT SPEND TOO MUCH TIME TRYING TO FIND OUT HOW HE DID IT, BUT RATHER SEE IF YOU CAN COME TO A CONCLUSION IN YOUR OWN WAY, THUS CULTIVATING YOUR OWN POWER AND INITIATIVE RATHER THAN FOLLOWING THE AUTHOR.—A good textbook should not make things too clear, or relieve the student of the necessity of exerting himself.

(*f*) LEARN TO GENERALIZE.—Draw the most general conclusion possible from the premises. Try to see if a general principle can be laid down. This is a most important faculty to acquire. At the same time, avoid the prevalent fault of hasty generalization, based on insufficient data.

(*g*) GO BEYOND THE BOOK.—Regard the book as suggestive and not final, as the assistant to
{53} your own powers that you are for the moment employing. Pursue the subject as much farther as you have time for. In this way you may develop a faculty for independent thinking.

(*h*) VISUALIZE YOUR RESULTS SO FAR AS POSSIBLE.—Train the imagination by perceiving results in your mind, in concrete form, and in imagining applications of facts and principles. Remember that use is the object of study, and try to see the use that may be made of what you have acquired.

We have seen that there are four main requisites for proper study, viz.: (1) Mental courage; (2) Understanding; (3) System; (4) Initiative. In addition to these may be mentioned (5) Proper habits and methods of work, under which head a number of minor but important suggestions may be made.

[1] "The greatest piece of good fortune is that which corrects our deficiencies and redeems our mistakes."—*Goethe*.

{54}

V

PROPER HABITS AND METHODS OF WORK

(*a*) SELECT THE BEST BOOK FOR YOUR PURPOSES AND STUDY IT THOROUGHLY.—The best book for your purposes will depend upon circumstances. If you are beginning a subject, do not start with the most complete book, but take a more elementary one. Remember that elementary knowledge is not the same thing as superficial knowledge, but may be quite the reverse. A knowledge of fundamental elementary principles is essential for the understanding of any subject. These should be obtained first from some elementary book, and made to form a skeleton or framework, upon which the more elaborate portions of the subject may be hung in their proper places. In large books there will be found too great detail for the beginner, and he will be discouraged by having too many things thrust upon his attention at once.

Elementary knowledge, thoroughly assimilated, is essential. Begin, therefore, with the best
{55} elementary book there is, one which will make you think, weigh, understand, test and discriminate; and get from it the kernel of the subject; and gain, if possible, a stimulation to go beyond to a more elaborate treatise.

(*b*) DO NOT STUDY TOO MANY SUBJECTS AT ONCE.—You need not concentrate on one thing to the exclusion of everything else, although when studying any one subject you should, for the time being, concentrate your entire attention upon it, as already explained; but the mind is rested by *change of occupation* which comes by passing from one study to another of a different kind. The point is, that you should not dissipate your powers by taking up too many subjects, looking into them cursorily, then dropping them and passing on to something else. This habit of beginning many things and completing nothing, is most demoralizing and will result in your doing nothing well. Do not attempt more than you can do properly. Select first the subjects that will be

directly useful to you, and study them thoroughly. Gain the power of concentrating your attention on one subject with intentness for several hours at a time. In the end your mind will become tired, and you can then change to an entirely different subject, or even to recreation, such as the
{56} study of good fiction. The mind does not need idleness, but it does need change of occupation. Probably from three to five studies are as many as the student can profitably pursue at once, but students differ greatly in this respect, as in others.

(*c*) DO NOT BE IN A HURRY.—Take time to think, so that you will not take the statements in the book for granted, but will study them with a sense of mastership. Remember that here, as elsewhere, "the more haste the less speed." You may think that you have not time to think about your studies. The fact is, that you have not time *not* to think about them, and that in the end you can do more in less time if you will insist upon taking pains.

(*d*) DO NOT TAKE UP A STUDY LIGHTLY, BUT WHEN TAKEN UP DO NOT ABANDON IT WITHOUT GOOD CAUSE.—At the beginning of your study try to get a definite idea before your mind what you want to get out of your study, and keep this point before your mind as you progress in the subject.

(*e*) CULTIVATE THE POWER OF JUDICIOUS SKIPPING.—You can do this if you study with a sense of mastery and a clear idea of what you want to get. It is not necessary to read every word
{57} in the book. Sometimes paragraphs, pages and perhaps chapters may be skipped. This, however, should not lead you into the habit of careless or superficial reading.

(*f*) BE SYSTEMATIC.—Have set times for your study of each subject, a regular program of work. Gain the habit of being able to start at once on your work without frittering away your time and thinking about beginning. Apply yourself steadily and persistently and do not let your work consist of a series of spasmodic efforts. By systematically doing one thing at a time and passing from study to study, you can finally, after a period of continuous application, dependent upon your powers, alternate with a period of relaxation or amusement. Your period of continuous study should not be so short as to prevent continuous effort, nor so long as to over-fatigue your mind. Some students are restless, spasmodic, and while they seem to be continually employed, they achieve nothing. Others by a steady, continuous pull, achieve much.

(*g*) CULTIVATE THE POWER, BY HABITUAL PRACTICE, OF FIXING YOUR MIND INTENSELY UPON ONE THING FOR A CONSIDERABLE TIME.—If you can acquire this, it will be most valuable to you. It has been said that the difference between clever and ordinary men is
{58} often mainly a difference in the power of directing and controlling the mind through the attention. Some minds go wool gathering or day dreaming, and flit from one thing to another in a desultory manner. Others go straight toward the object in view.

(*h*) REMEMBER TO APPLY WHAT YOU ARE STUDYING.—Study from things, by experiment, in the field, rather than entirely by books. In this way, what you learn will be real to you. Book knowledge is of very little value in itself.

(*i*) BE INTERESTED THOROUGHLY IN WHAT YOU ARE DOING.—Indifference is a fatal enemy to good work. Every subject has its difficulties and you must not be discouraged by them. If you can learn how to overcome difficulties, you will find that doing so affords the keenest intellectual pleasure, and that each difficulty overcome by your own unaided efforts will make you much stronger in attacking the next one.

(*j*) READ THE IMPORTANT THINGS AGAIN AND AGAIN UNTIL YOU KNOW YOUR BOOK THOROUGHLY.—As Herbert Spencer says, it is much better to know a few books thoroughly than to know many superficially. The same philosopher once said that if he had read as many
{59} books as certain other persons had read he would know as little as they did. Remember the old Latin proverb, "Multum legere non multa." [Read much but not many books.] If you learn your small book thoroughly and then take a larger one, you will be surprised to find how much of the latter you already know. You can then direct your attention to the new material and to relating it with the old.

(*k*) MAKE A LIST OF REFERENCES AS YOU PROCEED.—Summarize what you learn and construct an index. Learn where to go to find what you do not know. You cannot learn everything even about one subject, and the next best thing to knowing it is to know where to find it or how to work it out yourself.

(*l*) REVIEW YOUR WORK FREQUENTLY.—Review is not re-studying, but is going quickly over the main points, looking at them all in their proper perspective. This will be assisted if you make summaries; writing out a statement of a thing helps you to understand it clearly and to fix it in the memory. As Landon says: "The practice of reviewing keeps the mind in touch with the main lines of the subject; secures freshness and exactness of knowledge; shows what has been
{60} imperfectly learned, and gives an opportunity for remedying the trouble; strengthens the recollection and accustoms the mind to recover and give up its stores; saves waste of energy and the formation of bad mental habits; and thus leads to complete assimilation of the subject."

(*m*) SET SPECIAL TIMES FOR YOUR RECREATIVE STUDY.—Cultivate some hobby as a relief from your concentrated study of books. Music, some games of cards, chess, billiards, or other relaxations, are admirable means of recuperation. When you indulge in recreation or recreative reading, do not let the mind worry about problems of your previous studies. Make your recreative reading in itself have some aim. Do not allow yourself to develop in a one-sided manner, but have interests outside of your main study.

(*n*) IN CONNECTION WITH YOUR STUDIES DO NOT NEGLECT PROPER PHYSICAL EXERCISE.—Remember that the preservation of your health should be your principal aim rather than to cram your head with book learning. Study should not be allowed to interfere with a sufficient amount of physical exercise in the open air, but this should not be carried to the extent of severe bodily fatigue. A healthy body is necessary for the fullest cultivation of the mental
{61} powers, but on the other hand, the mind will not work when the body is exhausted. Moreover, see that your studies are done under proper conditions of air, light, sun; that you have a comfortable chair, but not one which leads to somnolence.

The suggestions contained in this paper should be of use not only to students but to the teacher who believes, as the writer does, that the main object which he should have in mind is not by lectures to pump his students full of information, but to train them, so far as possible, to think and study properly. With a good text book a lesson should be assigned and the student should be expected to master it. The lesson should not be so long that the average student cannot, in the time allowed, properly assimilate it. Then in the class-room the teacher should call up a student, question him on the lesson, or give him a problem to work out on the blackboard. He should question the student at all points of his work to ascertain whether he really understands the subject. Oftentimes the student will reply to a question with entire correctness, perhaps using the very words in the book, from which a superficial teacher might infer that he understood what he was saying; but if the teacher will probe more deeply, for instance by asking
{62} the student in a plausible way why some other and conflicting method or statement is not used, he will in many cases find the student quite as ready to accept the conflicting plausible method, showing that he had learned by rote and did not really understand. If the student correctly states a certain thing to be true, the teacher should make him explain why a conflicting statement is not true and should utilize the various suggestions in this paper, particularly those under the second and third essentials. He should also endeavor to cultivate in a student the proper attitude of mind, above discussed as the first essential, and while correcting unsparingly the faults of the student, should endeavor to make him perceive that, if he will think, he really has the capacity to understand what he is studying. If the teacher convinces himself that the student has not this capacity, he should not be allowed to go on with the class or perhaps should be required to withdraw from the school. It is an injury rather than a help to a man to endeavor to give him an education for which he is not fitted and which he cannot assimilate, and it often results in putting a man into a position in life for which he is entirely unadapted. The student should be made to
{63} realize that all labor is honorable, and that it is far better to be a successful mechanic, laborer, or clerk than an unsuccessful or incompetent lawyer, physician, or engineer. For every man there is some work which he is better fitted to do than anything else, and which he can do with reasonable success. His happiness in life will largely depend upon his finding this work. Much time and effort are wasted in our schools in the endeavor to fit men for spheres for which they are not adapted.

Finally, the student should be again urged to realize the importance of not becoming discouraged. Many an earnest student, after repeated failures, assumes a sort of hopeless, discouraged attitude of mind, which naturally leads him into the habit of trying to learn his lessons by memorizing in the hope of being able to pass, if only by scraping through, and into other bad habits which have been referred to in the foregoing pages. Such an attitude of mind should be resolutely opposed, and the teacher, even when severely correcting a student, should encourage him to see the possibilities that are within his reach if he will exercise his will and put forth his utmost powers in a proper manner. Success in the work of the world depends much
{64} more upon will than upon brains; but all faculties, whether mental or moral, can be cultivated

and developed to an almost unlimited extent. A study of the biographies of men who have succeeded should be urged upon the student, and such a study will show how often success has been attained only after repeated failures. It is scarcely too much to say to a student that he can attain anything he desires, if he desires it with sufficient intensity; that is to say, if he possesses sufficient will power, and if he will train himself to direct his efforts properly. Experience with students, however, will often show that a student is on the wrong track, or trying to do work for which he is not well adapted. If this can be demonstrated with reasonable certainty, the student should be the person most eager to take advantage of it, and should alter his course of study or his aim in life, in such a manner that he may train himself to do that work which he is best qualified to do. To put the right man in the right place should be one of the chief aims of education; but for a student to find that he is on the wrong track and that he had better change to another, is very different from becoming discouraged. The opportunities in the world are
{65} without number, and it is within the power of every man to be a successful, useful, and respected member of society. If a student finds himself constantly unsuccessful in his work, he should scrutinize himself carefully with the endeavor to ascertain the cause. He should not be too quick to conclude that he is on the wrong track, but should consult friends and teachers with frankness and sincerity. In no case, however, should he allow himself to become discouraged or disheartened, or to lose confidence in his own ability to attain ultimate success in some direction.

There are three books known to the present writer on the subject of "How to Study," but they do not appear to have been much used even by teachers. The ordinary student knows nothing of them. They are earnestly recommended to all who wish to learn how to study.

First in order may be mentioned "The Principles and Practice of Teaching and Class Management" by Joseph Landon, 1894, New York, Macmillan & Company. This is a general book on the conduct of classes, but on pages 12 to 24 is found the best summary of this subject known to the writer. He has made much use of it in the present paper, and here makes acknowledgment of his indebtedness.

Second, "How to Study and Teaching How to Study" by Frank M. McMurry, 1909, Houghton, Mifflin Company. This is a very suggestive little book and will be valuable to any thoughtful student.

Third, "Teaching Children to Study" by Lida B. Earhart, 1909, Riverside Educational Monograph, Houghton, Mifflin Company.

property (trademark/copyright) agreement. If you do not agree to abide by all the terms of this agreement, you must cease using and return or destroy all copies of Project Gutenberg™ electronic works in your possession. If you paid a fee for obtaining a copy of or access to a Project Gutenberg™ electronic work and you do not agree to be bound by the terms of this agreement, you may obtain a refund from the person or entity to whom you paid the fee as set forth in paragraph 1.E.8.

1.B. “Project Gutenberg” is a registered trademark. It may only be used on or associated in any way with an electronic work by people who agree to be bound by the terms of this agreement. There are a few things that you can do with most Project Gutenberg™ electronic works even without complying with the full terms of this agreement. See paragraph 1.C below. There are a lot of things you can do with Project Gutenberg™ electronic works if you follow the terms of this agreement and help preserve free future access to Project Gutenberg™ electronic works. See paragraph 1.E below.

1.C. The Project Gutenberg Literary Archive Foundation (“the Foundation” or PGLAF), owns a compilation copyright in the collection of Project Gutenberg™ electronic works. Nearly all the individual works in the collection are in the public domain in the United States. If an individual work is unprotected by copyright law in the United States and you are located in the United States, we do not claim a right to prevent you from copying, distributing, performing, displaying or creating derivative works based on the work as long as all references to Project Gutenberg are removed. Of course, we hope that you will support the Project Gutenberg™ mission of promoting free access to electronic works by freely sharing Project Gutenberg™ works in compliance with the terms of this agreement for keeping the Project Gutenberg™ name associated with the work. You can easily comply with the terms of this agreement by keeping this work in the same format with its attached full Project Gutenberg™ License when you share it without charge with others.

1.D. The copyright laws of the place where you are located also govern what you can do with this work. Copyright laws in most countries are in a constant state of change. If you are outside the United States, check the laws of your country in addition to the terms of this agreement before downloading, copying, displaying, performing, distributing or creating derivative works based on this work or any other Project Gutenberg™ work. The Foundation makes no representations concerning the copyright status of any work in any country other than the United States.

1.E. Unless you have removed all references to Project Gutenberg:

1.E.1. The following sentence, with active links to, or other immediate access to, the full Project Gutenberg™ License must appear prominently whenever any copy of a Project Gutenberg™ work (any work on which the phrase “Project Gutenberg” appears, or with which the phrase “Project Gutenberg” is associated) is accessed, displayed, performed, viewed, copied or distributed:

> This eBook is for the use of anyone anywhere in the United States and most other parts of the world at no cost and with almost no restrictions whatsoever. You may copy it, give it away or re-use it under the terms of the Project Gutenberg License included with this eBook or online at www.gutenberg.org. If you are not located in the United States, you will have to check the laws of the country where you are located before using this eBook.

1.E.2. If an individual Project Gutenberg™ electronic work is derived from texts not protected by U.S. copyright law (does not contain a notice indicating that it is posted with permission of the copyright holder), the work can be copied and distributed to anyone in the United States without paying any fees or charges. If you are redistributing or providing access to a work with the phrase “Project Gutenberg” associated with or appearing on the work, you must comply either with the requirements of paragraphs 1.E.1 through 1.E.7 or obtain permission for the use of the work and the Project Gutenberg™ trademark as set forth in paragraphs 1.E.8 or 1.E.9.

1.E.3. If an individual Project Gutenberg™ electronic work is posted with the permission of the copyright holder, your use and distribution must comply with both paragraphs 1.E.1 through 1.E.7 and any additional terms imposed by the copyright holder. Additional terms will be linked to the Project Gutenberg™ License for all works posted with the permission of the copyright holder found at the beginning of this work.

1.E.4. Do not unlink or detach or remove the full Project Gutenberg™ License terms from this work, or any files containing a part of this work or any other work associated with Project Gutenberg™.

1.E.5. Do not copy, display, perform, distribute or redistribute this electronic work, or any part of this electronic work, without prominently displaying the sentence set forth in paragraph 1.E.1 with active links or immediate access to the full terms of the Project Gutenberg™ License.

1.E.6. You may convert to and distribute this work in any binary, compressed, marked up, nonproprietary or proprietary form, including any word processing or hypertext form. However, if you provide access to or distribute copies of a Project Gutenberg™ work in a format other than “Plain Vanilla ASCII” or other format used in the official version posted on the official Project Gutenberg™ website (www.gutenberg.org), you must, at no additional cost, fee or expense to the user, provide a copy, a means of exporting a copy, or a means of obtaining a copy upon request,

of the work in its original “Plain Vanilla ASCII” or other form. Any alternate format must include the full Project Gutenberg™ License as specified in paragraph 1.E.1.

1.E.7. Do not charge a fee for access to, viewing, displaying, performing, copying or distributing any Project Gutenberg™ works unless you comply with paragraph 1.E.8 or 1.E.9.

1.E.8. You may charge a reasonable fee for copies of or providing access to or distributing Project Gutenberg™ electronic works provided that:

- You pay a royalty fee of 20% of the gross profits you derive from the use of Project Gutenberg™ works calculated using the method you already use to calculate your applicable taxes. The fee is owed to the owner of the Project Gutenberg™ trademark, but he has agreed to donate royalties under this paragraph to the Project Gutenberg Literary Archive Foundation. Royalty payments must be paid within 60 days following each date on which you prepare (or are legally required to prepare) your periodic tax returns. Royalty payments should be clearly marked as such and sent to the Project Gutenberg Literary Archive Foundation at the address specified in Section 4, “Information about donations to the Project Gutenberg Literary Archive Foundation.”
- You provide a full refund of any money paid by a user who notifies you in writing (or by e-mail) within 30 days of receipt that s/he does not agree to the terms of the full Project Gutenberg™ License. You must require such a user to return or destroy all copies of the works possessed in a physical medium and discontinue all use of and all access to other copies of Project Gutenberg™ works.
- You provide, in accordance with paragraph 1.F.3, a full refund of any money paid for a work or a replacement copy, if a defect in the electronic work is discovered and reported to you within 90 days of receipt of the work.
- You comply with all other terms of this agreement for free distribution of Project Gutenberg™ works.

1.E.9. If you wish to charge a fee or distribute a Project Gutenberg™ electronic work or group of works on different terms than are set forth in this agreement, you must obtain permission in writing from the Project Gutenberg Literary Archive Foundation, the manager of the Project Gutenberg™ trademark. Contact the Foundation as set forth in Section 3 below.

1.F.

1.F.1. Project Gutenberg volunteers and employees expend considerable effort to identify, do copyright research on, transcribe and proofread works not protected by U.S. copyright law in creating the Project Gutenberg™ collection. Despite these efforts, Project Gutenberg™ electronic works, and the medium on which they may be stored, may contain “Defects,” such as, but not limited to, incomplete, inaccurate or corrupt data, transcription errors, a copyright or other intellectual property infringement, a defective or damaged disk or other medium, a computer virus, or computer codes that damage or cannot be read by your equipment.

1.F.2. LIMITED WARRANTY, DISCLAIMER OF DAMAGES - Except for the “Right of Replacement or Refund” described in paragraph 1.F.3, the Project Gutenberg Literary Archive Foundation, the owner of the Project Gutenberg™ trademark, and any other party distributing a Project Gutenberg™ electronic work under this agreement, disclaim all liability to you for damages, costs and expenses, including legal fees. YOU AGREE THAT YOU HAVE NO REMEDIES FOR NEGLIGENCE, STRICT LIABILITY, BREACH OF WARRANTY OR BREACH OF CONTRACT EXCEPT THOSE PROVIDED IN PARAGRAPH 1.F.3. YOU AGREE THAT THE FOUNDATION, THE TRADEMARK OWNER, AND ANY DISTRIBUTOR UNDER THIS AGREEMENT WILL NOT BE LIABLE TO YOU FOR ACTUAL, DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE OR INCIDENTAL DAMAGES EVEN IF YOU GIVE NOTICE OF THE POSSIBILITY OF SUCH DAMAGE.

1.F.3. LIMITED RIGHT OF REPLACEMENT OR REFUND - If you discover a defect in this electronic work within 90 days of receiving it, you can receive a refund of the money (if any) you paid for it by sending a written explanation to the person you received the work from. If you received the work on a physical medium, you must return the medium with your written explanation. The person or entity that provided you with the defective work may elect to provide a replacement copy in lieu of a refund. If you received the work electronically, the person or entity providing it to you may choose to give you a second opportunity to receive the work electronically in lieu of a refund. If the second copy is also defective, you may demand a refund in writing without further opportunities to fix the problem.

1.F.4. Except for the limited right of replacement or refund set forth in paragraph 1.F.3, this work is provided to you ‘AS-IS’, WITH NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE.

1.F.5. Some states do not allow disclaimers of certain implied warranties or the exclusion or limitation of certain types of damages. If any disclaimer or limitation set forth in this agreement violates the law of the state applicable to this agreement, the agreement shall be interpreted to make the maximum disclaimer or limitation permitted by the applicable state law. The invalidity or unenforceability of any provision of this agreement shall not void the remaining provisions.

1.F.6. INDEMNITY - You agree to indemnify and hold the Foundation, the trademark owner, any agent or employee of the Foundation, anyone providing copies of Project Gutenberg™ electronic works in accordance with this agreement, and any volunteers associated with the production, promotion and distribution of Project Gutenberg™ electronic works, harmless from all liability, costs and expenses, including legal fees, that arise directly or indirectly from any of the following which you do or cause to occur: (a) distribution of this or any Project Gutenberg™ work, (b) alteration, modification, or additions or deletions to any Project Gutenberg™ work, and (c) any Defect you cause.

Section 2. Information about the Mission of Project Gutenberg™

Project Gutenberg™ is synonymous with the free distribution of electronic works in formats readable by the widest variety of computers including obsolete, old, middle-aged and new computers. It exists because of the efforts of hundreds of volunteers and donations from people in all walks of life.

Volunteers and financial support to provide volunteers with the assistance they need are critical to reaching Project Gutenberg™'s goals and ensuring that the Project Gutenberg™ collection will remain freely available for generations to come. In 2001, the Project Gutenberg Literary Archive Foundation was created to provide a secure and permanent future for Project Gutenberg™ and future generations. To learn more about the Project Gutenberg Literary Archive Foundation and how your efforts and donations can help, see Sections 3 and 4 and the Foundation information page at www.gutenberg.org.

Section 3. Information about the Project Gutenberg Literary Archive Foundation

The Project Gutenberg Literary Archive Foundation is a non-profit 501(c)(3) educational corporation organized under the laws of the state of Mississippi and granted tax exempt status by the Internal Revenue Service. The Foundation's EIN or federal tax identification number is 64-6221541. Contributions to the Project Gutenberg Literary Archive Foundation are tax deductible to the full extent permitted by U.S. federal laws and your state's laws.

The Foundation's business office is located at 809 North 1500 West, Salt Lake City, UT 84116, (801) 596-1887. Email contact links and up to date contact information can be found at the Foundation's website and official page at www.gutenberg.org/contact

Section 4. Information about Donations to the Project Gutenberg Literary Archive Foundation

Project Gutenberg™ depends upon and cannot survive without widespread public support and donations to carry out its mission of increasing the number of public domain and licensed works that can be freely distributed in machine-readable form accessible by the widest array of equipment including outdated equipment. Many small donations ($1 to $5,000) are particularly important to maintaining tax exempt status with the IRS.

The Foundation is committed to complying with the laws regulating charities and charitable donations in all 50 states of the United States. Compliance requirements are not uniform and it takes a considerable effort, much paperwork and many fees to meet and keep up with these requirements. We do not solicit donations in locations where we have not received written confirmation of compliance. To SEND DONATIONS or determine the status of compliance for any particular state visit www.gutenberg.org/donate.

While we cannot and do not solicit contributions from states where we have not met the solicitation requirements, we know of no prohibition against accepting unsolicited donations from donors in such states who approach us with offers to donate.

International donations are gratefully accepted, but we cannot make any statements concerning tax treatment of donations received from outside the United States. U.S. laws alone swamp our small staff.

Please check the Project Gutenberg web pages for current donation methods and addresses. Donations are accepted in a number of other ways including checks, online payments and credit card donations. To donate, please visit: www.gutenberg.org/donate

Section 5. General Information About Project Gutenberg™ electronic works

Professor Michael S. Hart was the originator of the Project Gutenberg™ concept of a library of electronic works that could be freely shared with anyone. For forty years, he produced and distributed Project Gutenberg™ eBooks with only a loose network of volunteer support.

Project Gutenberg™ eBooks are often created from several printed editions, all of which are confirmed as not protected by copyright in the U.S. unless a copyright notice is included. Thus, we do not necessarily keep eBooks in compliance with any particular paper edition.

Most people start at our website which has the main PG search facility: www.gutenberg.org.

This website includes information about Project Gutenberg™, including how to make donations to the Project Gutenberg Literary Archive Foundation, how to help produce our new eBooks, and how to subscribe to our email newsletter to hear about new eBooks.