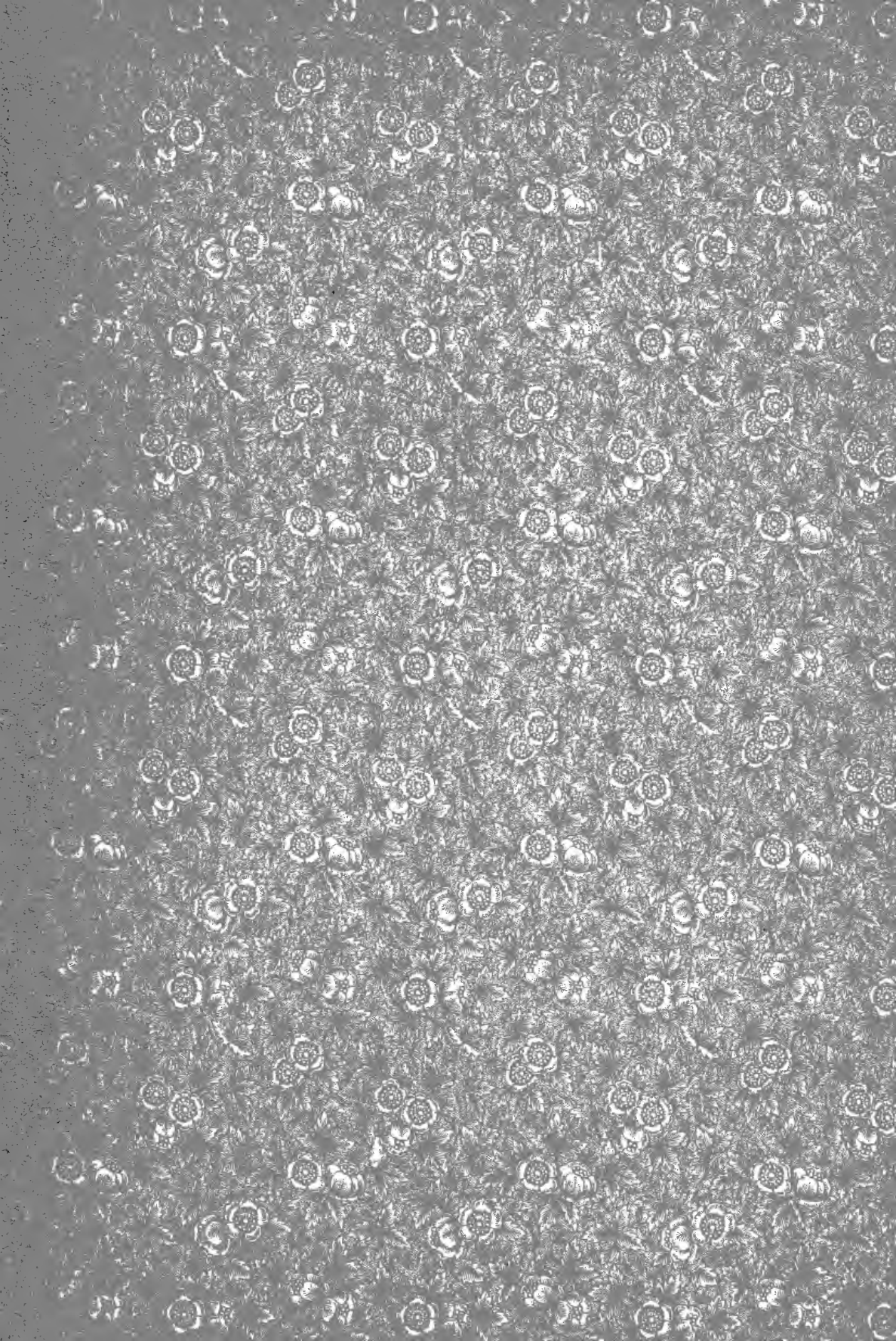




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MECHANICS AND FAITH

A STUDY
OF
SPIRITUAL TRUTH IN NATURE

BY

CHARLES TALBOT PORTER



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How exquisitely the individual mind
(And the progressive powers perhaps no less
Of the whole species) to the external world
Is fitted :—And how exquisitely, too,
Theme this but little heard of among men,
The external world is fitted to the mind.

—WORDSWORTH.

PREFACE.

What is known to us as matter, in its various forms and states, is commonly conceived of as something quite distinct from force. In this inquiry, matter will be considered to be force itself, manifested in endless diversity of adaptation to our nature and wants.

The exposition of this view will not, however, be reached until an advanced stage of the discussion. Until then it will be necessary to conform the language employed to the prevailing idea of a distinction between matter and force. Otherwise the truths which are presented in the earlier papers would not be conveyed with clearness.

This conception of the identity of matter with force must be regarded as fundamental in true philosophy. In every department of thought there is to be observed a reluctance to recognize the fact that we are surrounded by mysteries. While in reality all things pass the limit of our understanding, there are not wanting minds which refuse to confess that any thing does so.

Instructors generally feel called upon to explain every thing. In order that they may seem to do this, they assume imaginary starting-points, which, having been devised either by themselves or by their instructors, are of course quite within their comprehension.

The great starting-point is the material atom. The belief in the existence of the material atom, in the large extent to which this gross conception still continues to be held, is the present bane of philosophy. This belief gives to physical science its materialistic tendency. It provides a limit at which thought can be arrested. It opens the door to the revival of the heathen conception of the atom, as self-existent and possessed of inherent activities. Many minds seem inclined to rest upon this conception of the material atom, as something that can be comprehended, and beyond which they feel no impulse or inclination to look.

Much vagueness of thought prevails respecting the nature and functions of "the reason," Metaphysicians have described the reason to be that faculty by which the mind intuitively apprehends universal and necessary truths. The process of reasoning is devolved upon another imaginary faculty, which is distinguished as the understanding. Since those faculties have no existence, except that which the metaphysicians have given them, it would seem as if these authorities ought to be able to fix their respective functions. But this distinction between the reason and the understanding does not make its way into popular use. For example, in our English version of St. Mark's Gospel, the Christ says: "Are ye so without understanding also? Do ye not perceive?" Then follows a statement of a necessary and universal truth as a subject of apprehension by the understanding. On the other hand, the popular mind can never accept the idea that the reason is not employed in reasoning. "Understanding" is a term which is now little used; but we hear continually of the reason, which, at least in popular estimation, is clothed with a vague and boundless authority.

The distinction between these terms seems to be merely a difference about words. It will be the purpose here to fix attention upon realities. The activity of the mind, in its unity, in reasoning, will be put in the place of these objective terms. Our view will be made distinct, and it is believed also correct, if we shall conceive of all that has been embraced under either of these terms as being the exercise of the mind, in the judicial modes of its activity.

With the exception of abstract or ideal truths we discover nothing by the process of reasoning. In reasoning we trace relations, discriminate, generalize, conclude, and so determine our belief. These judgments we are forming continually, and we always must be forming them, on the basis of what appear to us as facts in consciousness.

Here arises the liability to error. This liability to error is of two kinds. In the first place, there is probably no one who is not, in a greater or lesser degree, affected by preconceptions or erroneous habits of thought, usually the result of education, so as to be liable to arrive at conclusions which are not warranted by the facts observed. And, secondly, it is obvious that, in order to form a correct conclusion by the judicial activity of the mind, there must be present in consciousness all the facts, and nothing else. Otherwise, the possession of a perfectly judicial mind, or a mind capable of giving to every fact seen in consciousness its due weight, would be of no avail.

Force, Truth, Beauty, and Love are the four spiritual realities which, in their unity, interpenetrate, if indeed they do not constitute, all material forms of being. Of these, love will be found to be the single primary reality, although, on account of its underlying position, it must be the last to be reached in any investigation. Force, truth, and beauty, in nature, are the manifestations or expressions of love.

These spiritual realities are revealed directly to the spirit of man, while the forms within which they are contained are made known to him through his physical organs of perception.

For the sake of clearness, our perceptions may be conceived of as being of two kinds, namely, those through which we are made aware of the existence of what are termed material forms of being, and those through which we are made aware of the existence of the spiritual realities which are manifested to us through these forms, or of which these forms are to us the sensible expression.

If these spiritual realities in fact exist, then it is evident that they must all be apprehended by us, equally at least with the physical forms, which then appear only as the media for their manifestation, or the concrete mode of their expression, adapted to our physical nature, if we would avoid forming partial and superficial conclusions.

It is through the recognition of the truths above expressed that the mind becomes able to perceive the harmony that exists between reason and faith.

I have endeavored to reach these truths and to show this harmony by the aid, primarily, of mechanical science and the analogies which this science affords. As such an effort, these papers are submitted to the judgment of sincere men.

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INTRODUCTORY.

AT first view, mechanics and faith would seem to most persons, perhaps to every one, to express the opposite extremes of thought. Their association would appear to be the bringing together of subjects which are quite incongruous, between which no relations can exist.

A little reflection, however, will enable us to perceive that this view cannot be the correct one, but must be only an effect of our conventional habits of thought—habits that have been formed by a false education.

No incongruities are to be discovered in nature, but everywhere harmonies instead. No unrelated things exist, but all things are seen to be bound together by innumerable relations. If, then, mechanics and faith are realities, if one or the other of them be not a mere figment of the brain, it is certain that they cannot be incongruous and unrelated, and it is possible that harmonies and relations of the most perfect and intimate nature may exist between them.

There is also another line of thought on which we are impelled to the same *a priori* conclusion. This reasoning, briefly stated, is as follows:

Faith is held by the Christian to be the highest spiritual attainment of man, and an attainment that is ultimately to be reached by all men on the earth. This he believes to be the purpose of God. If this be so, every thing must

have a direct relation to this supreme result. It is not supposable that any thing can in reality antagonize this result. No incongruity can exist between faith and any other reality whatever. On the contrary, it must of necessity be assumed that, in the universal scheme of things, every thing has been adapted to promote the growth of faith in the soul of man. Whenever the real nature and legitimate influence of any part of this scheme comes to be perceived, and just in the degree that this nature and influence are perceived, we should expect this supreme adaptation to appear, and to grow in distinctness and prominence.

In these papers the attempt will be made to show the existence of such a relation between mechanics and faith, —a relation which, however we may have been taught to disregard it, is one which the foregoing considerations make it evident that we ought to look for, and which we may find to be of the greatest consequence.

In a book of travel in England by an American scholar, published a few years ago, a book of singular interest on account of the charm of association with which every spot is invested, a quotation is made from an address delivered by Robert Stephenson, on the completion of the central towers of the Britannia Tubular Bridge, across the Menai Straits, as follows :

“Mr. Stephenson said: ‘Let them not, any more than himself, and all who have been connected with this great work, forget that, whatever may have been, or whatever may be, the ability, science, intelligence and zeal brought to bear on the creature’s work, it is to the Creator that we should give praise and thanksgiving ; for without His blessing on our works how can we expect them to prosper?’ He fully believed that Providence had been

pleased to smile on the undertaking, and he hoped that they all with him would endeavor to obtain those smiles."

Upon this our author remarks: "It is pleasant to see so simple a faith in a mind devoted to so material a science as mechanics."

This amiable comment, so far as it characterizes mechanical science, may, without doubt, be taken to represent the manner in which this science has generally been regarded, or, it would be more correct to say, has been disregarded, by men who are ranked as thinkers. They, whom the world delights to honor with this name, however widely they may differ on other points, would doubtless be found to agree in regarding mechanics as a science altogether material, devotion to which is especially unfavorable to the growth of faith.

And yet no view could be more erroneous. Our teachers, from causes which we will not stop to seek for now, have here overlooked what was especially entitled to their attention. They have committed the common mistake, and one of which they would consider themselves above all men to be incapable, of looking only at the outside of things, of permitting the thought to rest on that which meets the senses. This error of arresting the thought is one of degree, and in one degree or another it is more general than is commonly imagined. It lies at the bottom of materialism, and hides God from the sight of men.

Mechanical science deals with matter, although, as we shall see, not primarily; but it is not itself material. On the contrary, it is spiritual in its nature and in all its influences. And precisely on account of this singular duality, because while spiritual in itself, it deals with matter in all its states and forms, mechanical science is

also singularly practical, and so is adapted to correct the tendency to erroneous habits of thought and visionary speculations, of what character soever these may be.

The adaptation of mechanical science to meet the fallacies of materialism is so admirable, that the complete eradication of this noxious weed from the fields of philosophic thought may be regarded as its special office.

The effect of mechanical science on our physical well-being, great and beneficent as this is, shall be surpassed in intrinsic importance by its healthful influence on thought, on belief, on morals, and generally on the spiritual nature of man. Indeed, this influence has been widely felt already, although hitherto various causes have combined to prevent its distinct recognition.

This influence of mechanical science is far-reaching. It is of a nature to aid directly in establishing in the mind the solid foundation of faith. Its immediate tendency is to dispel the idea of antagonism between reason and faith, to show that antagonism exists only between reason and credulity, and to vindicate the authority of faith over its own vast region. It shows that faith is consistent with the highest intelligence, that all true philosophy leads up to faith, and that the larger and more complete the comprehension of truth becomes, the more absolute faith must become.

These statements, on their bare presentation, will naturally be received with more or less incredulity by most educated persons, whose studies and habits of thought have generally been on lines far removed from those which they are now asked to follow. In presenting them the full burden of proof is necessarily assumed.

In the following papers I have attempted to maintain these propositions, and to show the practical application of mechanical science to this higher use. I have endeav-

ored to exhibit the intimate connection that exists between those forms of truth which are known as spiritual truth and those forms of truth which are embraced in the term "mechanical truth," or rather to show the essential unity of these varied modes of expression of universal truth. I am, however, deeply sensible of the contrast between the greatness of the subject and the necessarily limited character of my treatment of it.

THE UNSEEN.

ABOVE all other employments of a secular character, the study of mechanical science, using the term in its largest meaning, operates to familiarize the mind with the reality and the controlling nature of unseen things.

In this respect mechanical science occupies a peculiar position. On the one hand, it differs from the other physical sciences, in that these terminate in observations on matter itself; on the other hand, it differs from pure mathematics, in that this contemplates abstract or ideal conditions only. When physical science is extended to the consideration of the laws which govern the action of matter, and when mathematics is considered in its material applications, then the two unite, and constitute the various branches of mechanical science.

This science deals, primarily, not with matter, but with force,—as these are commonly distinguished from each other,—with the unseen and the eternal; and in its study and its practice it is with this first spiritual reality that men are brought into habitual association.

Among the things which are earliest taught to the student in any branch of mechanics is, to put down on paper imaginary points and lines, which are called centres and centre lines. These are not seen in any construction, but they are the fundamental elements of every construction. They are the points in which forces are properly

conceived to be gathered, and the lines along which forces act—in which these are transmitted or resisted. Mechanical structures and movements are primarily represented by diagrams consisting only of centres and centre lines, to which, in the case of moving machines or bodies, there are added lines of motion, which represent the successive positions of the centres or of the bodies to which motion is imparted.

These points and lines are objects of purely mental perception. They have no material existence. But in the mind of the designer of any machine or mechanical structure they must always precede the idea of matter, and determine the order of its distribution or arrangement.

A familiar illustration of this requirement is afforded in the eccentric crank, by which the valves of steam-engines are commonly actuated. No eye ever saw the centre of an eccentric, nor the circular path in which this centre moves. Both the centre and its path are hidden in the solid interior of the shaft. But in every diagram of movements derived from an eccentric, the centre and its path are the essential things, the only things pertaining to the eccentric itself which need to be represented.

Following upon these purely ideal points and lines, there comes the study of mechanical laws, in obedience to which force centres in these points, and is exerted or is transmitted along these lines.

These laws, as they are termed for the sake of brevity, are merely the statements or expressions of the effects which force is observed invariably to produce upon matter, under given conditions. We have conferred upon us the ability to ascertain these laws, to determine their existence as invariable modes of action. We are thus enabled to conform our own purposes to them, and so to

make matter, in its various forms in which force resides, minister to our ends.

The investigation of these laws, or of the observed effects that are produced by the action of force upon matter, under the endlessly varied conditions which are found to exist, constitutes the sciences of statics and dynamics, or of the laws of force at rest and of force in motion; including the subdivisions of these sciences which treat of the effects of force at rest and in motion upon matter in its fluid and gaseous states.¹

The observation is an obvious one respecting these mechanical laws, that they are universal. They stand calm in eternal unchangeableness. Man is free to obey or to disregard them at his will. At the same time perfect obedience to every one, so far as it may be involved in his particular work, is the condition of his success, and this condition he cannot evade in any way nor in the least degree.

Considering these uniformities in the action or effects of force as laws, we may say, not only that they must be obeyed by us, but that God has imposed them equally upon Himself. Precisely as our work must be, so we find all His works to be, conformable to the requirements of physical law. Whether we consider the sublime mechanism of the universe, or the structure of the most minute organism, or the action of any natural agency, we everywhere behold the perfect illustration of those principles of construction and operation which must be illustrated also in our own work.

But the mind which has received a development in any degree symmetrical, in which the spiritual sense or insight has been cultivated, or, rather, in which this has not been

¹ The term "dynamics" is used here in its limited and more familiar sense.

obscured, cannot rest here upon the idea of law. Such a mind perceives that to do this would be to remain satisfied with an entirely superficial view of the subject. It can affix no intelligible meaning to the term "natural law," or "law of nature," until it has arrived at the truth, that what we for convenience express by this phrase is in reality nothing less than the changeless will of God—the uniform mode of the Divine activity,—and the mode in which we also must act, unless either ignorantly or purposely we attempt to resist the will of God in the physical modes of its expression, when our purposes must fail—our efforts come to naught. Matter obeys our will, unless we require it to disobey the Supreme Will. To this Will, therefore, in order that we shall accomplish any thing whatever by the use or employment of matter, our will must be perfectly conformed, so far at least as the occasion calls for its exercise.

The recognition of the great truth, that the so-termed laws of nature are modes of Divine activity, has been hindered by the fact that this truth does not consist with the false traditional conception of the Deity; which has represented Him as a passive Being, existing above nature, and superior to law, governing the world through intermediate agencies, which the heathen call inferior divinities, and theologians call second causes. Moreover, the idea of uniformity of action, in the absolute sense in which this is to be observed in nature, has been regarded as something not conceivable in a Being possessing freedom of will, and supposed to be influenced by a special motive in each particular case of His dealings with men.

It has been the uniform experience, that physical discoveries show our previous notions respecting the subject-matter of such discoveries to have been both mistaken

and inadequate. In no other case is this effect of physical discovery exhibited in so striking a manner as it is in the correction and enlargement of our conception of God, which has been compelled by the growth of mechanical science. This conception, so far as the present connection calls for its statement, is that of a Being whose universal presence fills all things, who is infinitely near to every creature, *in* whom, as expressed in language which we intuitively recognise to be inspired, "we live, and move, and have our being," and whose dealings with men must be marked by the same universal and eternal uniformity of motive and conduct which is manifested in nature. The conception of God, of which the above is a partial statement, underlies modern religious thought, and contributes principally to its healthful growth.

Let it be repeated, that the mind in its healthy development demands here something to rest upon more substantial than empty conventional expressions, and it cannot be satisfied until it has arrived at this sublime truth, that the physical laws which we must obey are the changeless modes of the Divine activity.

Now here is a wonderful thing. Here is a sense in which God lifts us up to Himself, in which we are admitted to share His thoughts, and to give effect to our free wills, by harmonizing them with His will. In every successful mechanical work there is a unity of purpose between ourselves and our Maker. In the production of all these we become co-workers with Him,—yea, the voluntary agents by whom He accomplishes His purposes.

When Kepler reflected on the laws of planetary motion which he had discovered or demonstrated, he was overcome with awe, and exclaimed: "Now, O God, think I Thy thoughts after Thee." But certainly the same reflection is pertinent in the case of every universal truth

discovered by, or, correctly speaking, revealed to man. That such a reflection is not always made is only because we are not possessed of Kepler's reverent spirit.

Here, then, at the outset we find a close and vital connection existing between man and the Infinite Engineer of the universe, and we discover one respect or particular in which, beyond question, God has created man in His own image.

We have, thus, in a very general manner, considered two subjects—namely, centres and lines of force and motion, and physical law; but we have not yet contemplated any reality. We have only observed modes of action. We are now to be brought face to face with the first reality, and we shall perceive it to be entirely spiritual.

Within all the forms of what we call matter, the first reality which our spiritual sense perceives is force. In some unknown way force acts upon matter, as the medium of its manifestation. But what force is, how it acts upon matter, or manifests itself through matter, what is the nature of the connection between them, or what is the essential nature of matter itself, all these are questions to which we can give no answer. We only know that matter, in the various states and forms in which we are acquainted with it, behaves, under the action of force, in a manner that is invariable under the same conditions.

Thus we are confronted with a mystery. The very first reality, the existence of which we are compelled to acknowledge, about which our minds cannot admit a doubt, is something of a nature not capable of being perceived through our physical organs. We are made aware of its existence only through a spiritual sense. We may indulge in speculations concerning the nature of force, but we can *know* nothing about it, beyond the fact of its existence, thus revealed to us.

Upon this reality the attention of the engineer must continually be fixed. He is always in its presence, but he cannot behold it. It serves him faithfully, but when he would question it it is dumb. To the engineer force is at once the most familiar of all things, and the mystery of mysteries. With this omnipresent energy, which eludes his senses, and is seen only in its effects, he has to deal continually. Matter has significance for him only as the habitation of force. He is accustomed and required habitually to look within all material forms, and to consider only the forces, in their action and counteraction, which either abide in or are transmitted through these material forms, in their states of rest or of motion.

A familiar illustration of the extent to which engineers have become able to dispense with matter, and yet to secure the forces which alone they require, is furnished in the construction of modern railway bridges.

In these structures the requirement is, that the heaviest trains, moving at the most rapid speeds, and thus transferring their weight rapidly from one point of the structure to another, shall cross spans which often need to be of considerable length, and also that such trains, coming from opposite directions, and moving at these speeds, shall pass each other upon these bridges, and that the stresses and shocks thus produced shall be repeated incessantly, and yet the bridges shall remain entirely safe.

We glide over them, and they are so firm that the change in the reverberation from that which is heard when the train is moving over the solid ground is hardly observable, but when we look at the structures, we see that, as compared with bridges of former times, which were intended to bear only insignificant weights, in addition to their own, they seem almost like spiders' webs.

In the construction of these bridges, every stress that

can come upon them is exactly known, and is met in the most advantageous practicable direction, and with a resistance equal to several times its greatest possible intensity. That material is employed in which the resisting force is known to be contained in the highest degree, and this material is so disposed that not a pound of it is wasted. Each member of the structure has its special function, and is designed and proportioned in such a manner, that the amount of resisting force residing in every part of it bears a uniform ratio to the amount of stress that can come upon such part.

The history of the growth of engineering skill, and of the advance in our knowledge of the action of force, and of the means and methods of employing and resisting it, which have made such structures possible, is more wonderful than the stories in the Arabian Nights; and this because we have always to realize the amazing fact that this history is true, and its truth constitutes that supreme element of wonderfulness, which in the tales of Oriental imagination is lacking.

The most comprehensive definition of force that men have been able to frame, and one which seems inclusive of all its observed effects, is, a cause producing or tending to produce motion. Although this appears to be the utmost that we can know about it, still its effects have been made the subject of grand generalizations.

It has been established that force is capable of a great variety of manifestations. These manifestations of force through matter are known as energy. They appear as statical or potential, and as dynamical energy, as light, as heat, as electricity and magnetism, and as chemical and vegetable and vital activity, all of which are forms of energy. Energy has been shown to be indestructible, and to exist in a total degree or amount that is not capable of

variation. No existing energy can ever cease to manifest itself in some way. It passes freely from one form of manifestation to another; its disappearance in any one form being attended by its appearance, in precisely equal amounts, in other forms.

Force is the sole cause of physical phenomena. All rest of matter, and all uniform motion—which is rest in its true sense of undisturbed condition,—result from the equilibrium of counteracting forces; while changes from a state of rest to one of motion, or from one degree of motion to another, are produced by disturbances of this equilibrium, and tend towards its restoration.

The beginning of the cultivation of mechanics, in its various branches, as the science of force, marked an era of peculiar importance in the progress that mankind is making in civilization. The recognition of force, as a spiritual reality, manifested through the medium of physical forms, which is the characteristic of mechanics, required a certain degree of spiritual insight, and constituted the first advance made by men from that primitive perceptive condition, in which thought is limited to the material forms themselves, as these are disclosed to us through our organs of sense.

Thus the recognition of force was the first step toward the scientific recognition of all spiritual realities, which are manifested to us through the same physical medium, and of the Infinite Being in whom all these consist. And because it was the first step in this advance toward the perception of all spiritual realities in their unity, it was by far the most important one, as upon it all succeeding steps depend. It was also the step which was most slowly and gradually taken, and which it was necessary should be dwelt upon for a considerable time, in order that

the mind might be prepared for those which were to follow it, in the natural progress of thought. Thus by mechanical science a wide door has been opened into the realm of the unseen.

At present, scientific thinkers generally are accustomed to stop with the contemplation of force. In point of fact, as will be shown, force is not to be generically distinguished from the other spiritual realities of truth, beauty, and love, which are equally manifested to us through the same universal medium of the physical creation, and of whose existence we are made aware through a similar mode of revelation. But from the point of view to which men are now by their education generally confined, force appears to be the only spiritual reality that is manifested to us in this way. It is the only one with which we are conceived to be immediately and practically concerned, and so it is to-day imagined to be scientific to limit the attention altogether to force.

This marks the stage of mental or spiritual growth at which mankind have arrived. In this stage scientific thought is quite occupied with this first unseen reality, to the contemplation of which, in its grander features, men are only beginning to be accustomed, and which must be relied upon by us in all the activity of our lives. In reality, our connection with force, and our dependence upon it, are not any more close or more absolute than are our connection with, and our dependence upon, all other spiritual realities; but our relations to it have hitherto seemed more palpable than those relations do which require for their discernment a still more spiritual vision.

Generalizing from the observed uniformity of the action of force, men have formulated the expression, "*natural law*." In returning to this subject, the object is to call attention more pointedly to the disposition, now com-

monly to be observed, not merely to rest upon this mere phrase, but to give to this phrase in some sort an objective character, to regard it as if it expressed some substantive reality; when in fact it expresses and can express nothing except the uniform mode of action of a Being.

This disposition presents an instructive phenomenon. Scientific minds are sometimes said to be destitute of imagination, but it will be difficult to find another work of the human imagination that is worthy to be ranked with this creation. The worship of law is scientific idolatry; or, the adoration of an image created by men themselves, to satisfy an instinctive want.

We begin here to observe the relation that the physical creation bears to the human race as its educator. Its office as our teacher respecting all material forms of being, and also in the development of our senses, and of all our physical and mental powers and activities, which are employed in the acquisition of the knowledge of these forms of being, and in the utilization of them which we have evidently been intended to make,—all this is of course obvious. But beyond this, we already perceive that it is from the manifestations of it in the physical creation that we obtain our knowledge of force, and receive the prodigious increase in our spiritual development that this knowledge brings to us. This may be termed “the ministry of force.” As we advance in this discussion, higher and higher exhibitions will appear of the educational work which the universe by which we are surrounded has been adapted to perform. These educational influences we shall find to be addressed to, and to employ and develop, every mode of our spiritual activity.

An important lesson may here be noted. The argument from analogy rests upon the unity between spiritual

and physical being, as proceeding from a common source. Upon the assumption of the existence of this unity, and upon the evident fact that spirit is a higher order of being than matter, the physical creation affords strong presumptive evidence of the immortality of the soul.

A remarkable identity is observed between matter and force in this, that the former is, like the latter, indestructible. While subject, like force, to endless changes of state and form, no particle of matter can cease to exist. This is established by universal and familiar proofs. Then, *a fortiori*, the soul of man, though likewise changing its state, cannot cease to exist.

While to uninstructed minds the constantly present phenomena of the decay and disappearance of matter suggest by association the idea that our conscious being may cease in like manner, it is deeply interesting to observe that, on the very first step towards a knowledge of physical truth, this suggestion vanishes, and the true analogies of immortality appear in its place.

Thus from a consideration of the known harmonies of the creation the conclusion is compelled, that the idea of the cessation of our being in annihilation, that idea which fills us with distress, from which we instinctively recoil, is, like a mistaken mechanical conception, only a figment of the brain, which represents no reality, a shade that vanishes at the first dawn of light; and that the opposite idea of our immortality, the idea to which we instinctively cling, which fills the healthy soul with gladness, which is the balm for all wounds, and in which is found the solution of all mysteries that would otherwise darken our earthly being, is true. It cannot be that the conscious spirit perishes, and matter and force endure.

THE CRITERION OF TRUTH.

IN the preceding paper, I have attempted to give a brief exposition of the nature of mechanical science. We are next led to consider, in the same general manner, the character of the influence which this science is adapted to exert.

It will be found, on making proper inquiry, that mechanical science constitutes the most important auxiliary to verbal revelation, in disclosing to mankind the real criterion of truth. In this work, two things are necessary. Not only must the criterion of truth be shown to men, but in addition to this the minds of men must be prepared to admit it. Men must be educated to recognize, to accept, and to appeal to this criterion, as the sole and infallible test of all truth whatever.

For the attainment of this result, much more, indeed, is required than mere education, as this term is commonly understood. A radical change, the character of which will be indicated presently, needs to be effected in the tendency and disposition of our nature. This change requires for its accomplishment a strong agency, operating through a long period of time, and producing its effects in an almost imperceptible manner. Mechanical science is such an agency. This change in the character and direction of thought is, in an eminent degree, the work of the science of force.

The problem of the ages has been this: How is truth to be distinguished from error? What test shall be applied to the notions that men form in their minds, in order to determine whether or not there exist any realities to which these notions correspond? How is it to be determined what we shall, and what we shall not believe?

With respect to all beliefs, to those of a physical and those of a spiritual nature alike, if we except the geometry and mechanics that were known to them, and the influence of which we have reason to believe was very limited, the ancient heathen world knew of no criterion except human authority. The same is true of modern heathen races. We limit our view to the most intellectual of all. In the teachings of the great minds of the Grecian race, there is presented a curious medley of inspired truths, mistaken conceptions and frivolous absurdities, all which were received by the disciples of the philosopher with the same implicit belief, on his authority alone. *Ipse dixit* was the only proposition that needed to be proved.

Under the conditions of heathen society, this reliance on human authority was a logical necessity. No inquiry had been instituted respecting the source of truth. Human thought had not ventured so far as this. The human mind was the only source of beliefs. These were wholly derived from human teaching. So it will be perceived that human authority afforded the only criterion of their correctness. The mind must always be satisfied by an appeal to the source of its belief. Beyond this there can be no appeal.

Any departure from this established usage involved a radical change in the mode and direction of thought. Such a change must be effected by some means, as the essential prerequisite to a true civilization.

This change is from that habit of thought in which the

mind is satisfied by an appeal to the source of its belief, whatever, as the result of previous influences, that source may happen to be, to that contrary habit of thought, in which the mind seeks for and recognizes the single source of truth, which then becomes the only source of its belief, and to which, in all cases, its appeal is directly made. We shall see that the source of truth, thus either consciously or unconsciously recognized, can be nothing less than the Infinite Being.

This change in the habit of thought is still far from being completely accomplished. It is resisted by subtle and powerful influences. It advances so slowly that it seems sometimes to retrograde. On the whole, its progress has been so partial that, when one contemplates the extent of that which is yet to be made, it seems to be only just begun.

The various influences which oppose this transition from the one to the other of these modes of thought all have their root in a common weakness of our nature, which manifests itself in two apparently opposite ways. These are a disposition to assume, and a disposition to submit to, human authority in matters of belief. These are essentially the same disposition, the direction of its exhibition being determined by accidental conditions. Whichever of these forms this disposition may take, it shows its identity by appearing continually in both forms and in equal degree in the same individual. The severity with which submission is exacted from inferiors always corresponds precisely with the servility with which it is rendered to superiors.

However this weakness may manifest itself in any individual, or in any organization, whether in the disposition to assume authority over belief, or in the disposition to submit to such authority, in either case alike it

involves an inability to perceive that, since the human mind cannot be the source of any truth, so it cannot be the legitimate authority for any belief.

When, however, this fundamental truth *has* been apprehended, then it at once becomes evident that in matters of belief all men stand on an equality, and have, in this respect of authority and submission, no relations towards one another, but the relations of each individual are immediately and directly with the source of truth. It also becomes evident that in this respect no distinction is to be drawn between physical and spiritual truths. The relations of the individual to the Infinite source of all truth are just as direct, and the absence of all relations towards his fellow-men is just as complete, in the case of spiritual truth as they obviously are in the case of physical truth.

The clear perception of the immediate and exclusive relation of each individual to the source of truth renders it impossible for men either to assume or to submit to authority in any matters of belief, for it is then obvious that all assumption by man of authority over either the physical or the spiritual belief of his fellow-men is absurd, and the exercise of such authority is a usurpation.

This fundamental change in the mode and habit of thought has been, and still is, and must continue to be until such change has been completely made, dependent for its accomplishment very largely on the influence of mechanical science.

The peculiar adaptation of mechanics to the task of delivering the mind from bondage to human authority, and of making the assumption of such authority ridiculous in the sight of all men, becomes manifest when we consider the nature of its methods. These methods are simply experiment and observation. In common with all

true science, mechanical science has this characteristic, that its conclusions are derived from and are brought directly to the tests of experiment and observation, and are open to free criticism.

Repeated experiment and observation constitute the only mode in which the teachings of mechanical science can be either established or assailed. The names of eminent discoverers or inventors are held in peculiar honor, it is true, but this is only because the truth and the value of their discoveries and inventions have been confirmed by every fresh investigation or application of them. For this reason alone these have secured the acceptance, and the minds through which they have been revealed have received the homage, of mankind.

All experiments in mechanical science have for their object to determine the action of force under given conditions, or, the behavior of some form of matter under the action of force. The essential nature of these acts of experiment and observation seems hardly to have been realized. It is of the first importance that their real character should be clearly apprehended.

They are, in reality, nothing less than appeals made in the only possible way, and in the way obviously appointed, directly to the source of truth, to the Divine Being, who through this method reveals to man the changeless modes of his own beneficent activity, and also the modes in which man may coöperate with this activity.¹ Through ways of human devising the ancient augurs vainly pretended to inquire the will of imaginary divinities respecting particular human affairs. Now, employing in all sincerity the methods of divine provision, man seeks to learn the

¹ Those who cannot see experiment and observation to be such appeals to the Deity will, nevertheless, agree in regarding them as appeals made directly to nature herself. But this is an expression of which the only intelligible meaning is the one given in the text.

will of God, in its uniform physical operation, and how he may direct his own will in conformity with it. The knowledge gained by these methods constitutes mechanical science. In the light of the present day, it is clearly seen that the intrusion of human authority here would be a profanation.

But this has not been the case very long. This is a mental illumination, at which the civilized portion of the human race has only quite recently arrived. Until mechanical science had its birth, only two or three centuries ago, human authority continued to be the sole arbiter in all matters of physical belief. No other criterion of physical truth had been so much as imagined. From all antiquity submission to human authority in matters of physical belief had been the unquestioned habit of the unlearned and the learned alike.

The consequences of this error have been far reaching. In contemplating them, we first observe the intimate nature of the connection that exists between physical and spiritual truth, a connection more intimate than any mind is probably able to conceive. In the darkness of the middle ages, the same deep obscurity rested upon both. While the real source of physical truth remained undisclosed, the growing tendency of human thought was to hide also the real source of spiritual truth. While submission to human authority was universal with respect to physical belief, it was not possible that the contrary teaching of the Bible respecting spiritual belief could be comprehended. Opposite habits of thought respecting these two classes of truth could not coëxist. In this fact, in which once lay the despair, now lies the hope, of the world.

The habit of servile acceptance of the dictates of recognized human authority inevitably extended from physical

to spiritual beliefs. In this habit is found the fundamental reason, why the teachings of the Christ came, through century after century, to be more and more buried under human traditions and requirements, why the ultimate appeal came more and more to be made to human authorities, on all questions both of faith and of conduct, and why at last the Christian Church came to repeat the phenomenon of Judaism in the Messianic age, and to present the almost complete extinguishment of Divine truth in human defilement ; as human authority became more outrageous in its exactions, and submission to it became more degraded in its servility.

Obtaining the position of general spiritual supremacy in Western Europe, and maintaining this position for many centuries, under these conditions of thought respecting physical beliefs, and when the source of physical truth was utterly unrecognized, it was unavoidable that the Church of Rome should come to hide, also, the real source of spiritual truth, and should limit appeal to human authority in matters of spiritual belief. Thus this amazing development of human authority over the consciences of men followed as the necessary consequence of the universal error of submission to human authority in respect to physical belief.

It is true respecting most great movements that their origin is obscure. Fundamental causes must be in operation for a long time before their effects begin to appear with distinctness. Mechanical science is probably to be regarded as one fruit of the Reformation, yet Galileo owned allegiance to the Church of Rome. History affords few sights more affecting than that of the spirit of free inquiry, embodied in Galileo, in the grasp of that power, the fundamental principle of which was, and is, unquestioning submission in every thing to constituted

human authority. The spiritual awakening from this degradation was abrupt, and brought conflict and desolation in its train, and was followed by a strong and thus far a permanent reaction. The mechanical awakening was gradual, but has been steady and full of benefactions.

The vital question common to both was, whether human or Divine authority should receive the submission of the human mind. A century after Luther and Zwingli, the issue was at last distinctly joined between the dictum of Aristotle and the demonstration of Galileo, on the physical question, whether the velocity of a falling body did or did not vary according to the weight of the body. When this issue had been decided, submission to human authority respecting physical truth was at an end. By the same event, also, the enormous and hoary structure of spiritual pretension was undermined, and the work of emancipation from all forms of human authority was really begun. Such is the unity that connects physical and spiritual truth.

The decision of this issue between human authority and the appeal by experiment marks the beginning of the great transition in the mode and direction of thought, so far as relates immediately to physical belief. It was more than an event. It was a prophecy. It foretold the time when thought shall be free, when human authority shall be driven out of the temple of spiritual truth, as well as out of the temple of physical truth; when, universally and forever, for the knowledge of all truth, whether in its physical or in its spiritual forms, man, in his individual freedom, shall appeal to God alone.

Even yet, however, such is the influence of conventional modes of education, men are not ready to recognize the unity of all truth, nor the common source of all well founded belief. Immature science and theology slowly

emerging from gross mediæval conceptions, mutually acting and reacting upon each other, have united to form the thought of the present age. On the one hand, students of science, confining their view to incomplete data, are unable, in what is termed matter, to see the principal thing, to behold the revelation of God. On the other hand, theologians fail to recognize the equal sacredness of all truth, as truth, whatever its form may be, and so they too are unable, in any proper sense, to behold in all physical being the Infinite and Universal Presence. Both have apparently yet to learn, or at least to realize, the great fact, that religion and philosophy are manifestations of the same truth, expressions of the nature of the same Being, between whom and each individual the relation and connection are immediate and direct.

Meanwhile the insidious disposition to assert and to submit to human authority is still seen, and its despotism is felt, in a greater or lesser degree, in all human systems of thought, and especially in religious systems. Its presence in the latter reveals the admixture of the human element, and pretty accurately indicates its proportion.

It may be well to dwell somewhat longer upon the methods of scientific inquiry. The more familiar the mind becomes with these methods, the better prepared it will be to give proper consideration to the views which have already been presented, and especially to those which are to follow.

Before proceeding further, however, attention should be drawn to the distinction which exists between the real nature of scientific methods, as this has been exhibited, and the grand consequences that have followed from the adoption of these methods, and that must still more largely attend their employment in the future, on the one

hand, and, on the other hand, the frequently limited purposes, and even the contrary disposition, of individual inquirers. These often fail to recognize, they even deny, the existence of the God to whom, in fact, they continually appeal. This distinction is an obvious one, and cannot fail to be observed by every candid reader.

All true science must be destitute of the reverential spirit, in the sense in which this term is commonly used. If a belief is venerable, that fact tends to raise the presumption that it is unfounded, since the beliefs of more ignorant ages have generally been found to be so. The authority of Scripture is excluded, and this with evident propriety; for the subject of inquiry is some form of physical truth, and, on any statement contained in the Scriptures that comes fairly within the scope of physical inquiry, their claim to be the Word of God is itself on trial. Before this test of agreement with the facts in nature, every religious system of human origin has gone down, and must inevitably do so, since these systems are sure to teach, as essential portions of their creeds, some things that are proven by science to be false.

Science is not less destructive of human creations in her ministers than in her methods. Here is no priesthood, nor ordination, nor privilege, but a pure democracy, where the right of private judgment is exercised without restraint, and admission to the mysteries is open to all on the same conditions.

The observations and experiments by which knowledge is advanced are repeated by independent inquirers, under varied conditions and by all known methods, before the results can be accepted as established facts. In this way, from age to age, experimental science in all its branches makes its slow but certain progress. The discoveries of one generation become the familiar truths of the next,

are taught to children, are turned to account in the arts and industries, and so are continually adding to the occupations, to the comforts, and to the intelligence of mankind.

The discoveries and inventions, or, properly speaking, the revelations, which together constitute mechanical science, may be grouped under four general heads. These are :

- 1st.—The laws of force and of motion ;
- 2d.—The operation of these laws, in their application to matter in its various forms and states ;
- 3d.—The forms and properties of matter itself ; and
- 4th.—The conception of the modes in which all these, in the infinite variety of their combinations, are found to be practically applied in nature, and in which they can be practically applied by man.

The weight or pressure of the atmosphere, or the mutual attraction of the earth and the atmosphere for each other, and the amount or degree of this attraction, constitute a phenomenon that belongs to the second of these groups. The discovery of this attraction was one of the earliest discoveries in modern mechanical science. A brief account of it will fitly illustrate the method in which the facts of this science have been established ; or the form and mode of the appeal that, in all experiments of a mechanical nature, whether these are successful or unsuccessful, is made to the Infinite Source of truth ; and the manner in which the revelation of physical truth is given, in answer to such appeal.

So far as we have any knowledge, the idea that the atmosphere might have weight or exert a pressure never occurred to the philosophers of antiquity. During the earlier period of the revival of learning in Europe, the question was occasionally discussed, and was always de-

cided in the negative. No such pressure could be felt. All experience and sensation seemed to be opposed to the idea of its existence.

Men were everywhere using their rude devices for raising water in pumps, without the least idea of what they were doing. The action that was taking place before their eyes never entered into their comprehension. If any one had told them that, in raising a pump bucket, they were lifting a portion of the weight of the atmosphere from the water under the bucket, so that the excess of this pressure, exerted on the surface of the water in the well, would force the column of water in the pump barrel up after the bucket, there were centuries when such a teacher would have been in danger of being burned up.

This, with all similar phenomena, was explained by the dictum, that nature abhors a vacuum. This nonsense passed for science through many an age. It is interesting to recall the long period during which this was assumed as an axiom that no one dared to question. But are there not now conventional absurdities, from which we must ourselves become free before we can be entitled to smile at that one? And are we not ourselves surrounded by truths, which in reality are as manifest as that of the weight of the atmosphere, and which are of unspeakably greater consequence than that, but which our eyes have not yet been opened to see?

The raising of the question, whether the atmosphere might have weight, was itself a notable event, as marking the beginning of scientific inquiry. But an experiment was tried, which was long regarded among the learned as settling this question in the negative. This experiment consisted in weighing a bladder, when distended with air, and when empty. No difference in the weight could ever be detected.

The power of observation, which was to be developed only by the study of nature, did not then exist, that would enable men to detect the fallacy in this experiment. This fallacy lay in the unobserved fact, that the bladder was filled with and immersed in the same fluid. Whether full or approximately empty, it always displaced, in addition to its own proper bulk, very nearly the same weight of air that it contained. A similar experiment would just as well prove water, or even mercury, to be without weight. So this great fact was yet hidden from men. Copernicus, Galileo, died without the sight.

In endeavoring to raise water from a deep well in Florence, it was found possible to lift it only about thirty-two feet, which led Galileo to observe that nature, evidently, did not abhor a vacuum above thirty-two feet. Dying, Galileo commended the investigation of this subject to his pupil and successor, Torricelli. The reflections of Torricelli led him to the conviction that the atmosphere must have weight, and that it must be by its pressure that the water was caused to rise in the pump barrel. In considering how this question might be tested, he at last thought of mercury. This substance, being between thirteen and fourteen times heavier than water, would be caused by the same pressure, if it existed, to rise only about thirty inches. So he reasoned that, by the employment of mercury, the existence or non-existence of this pressure might be shown in a glass tube.

It is interesting to imagine the feelings of this philosopher when preparing for this experiment, which was so remarkable at once for its simplicity, its conclusiveness, and its importance. It was almost as simple as that of standing the egg on its end, yet no other finite mind had conceived it. Was it with trembling expectation, or in the calmness of conscious strength, that he filled with

mercury his glass tube, four feet in length, sealed at one end, placed his finger over the open end, inverted the tube, plunged the open end in a vessel half filled with mercury, and then—removed his finger?

What were the emotions with which he saw the column of mercury fall, and, after completing the oscillations produced by its momentum, stand at a height of between twenty-nine and thirty inches, in equilibrium with the pressure of the atmosphere on the same area of surface of the mercury in the vessel; or with which he realized the fact that the glass tube above the column of mercury enclosed the absolute void, then first obtained by man, since only approximations to it could be reached in the pump barrel, and which was ever after to be known as the Torricellian Vacuum! And what would his emotions have been, if he could have imagined, what, indeed, no one can adequately conceive, the influence that this discovery was to exert, in promoting the industries and the civilization of his race!¹

The discovery of the pressure of the atmosphere is one of those discoveries by which the boundary of human knowledge has been enlarged in a remarkable degree. It was a radical discovery, and out of it there have sprung an endless series of discoveries and inventions, which, while they have contributed in an incalculable measure to the material welfare of man, have at the same time added still further to the extent of his knowledge and the power of his understanding.

The supreme influence which mechanical science is adapted to exert, and which it is exerting, on thought

¹ Belief in nature's horror of a vacuum died hard, however. The account of the repetition of Torricelli's experiment by Pascal, and his correspondence on this subject with Jesuit Fathers, in the 4th volume of his works, Paris ed., 1819, is delightful reading.

and belief, as well as on human character, will form the primary subject of these papers. If we seek for the ultimate ground of this influence, we shall find this ground in the facts, now assumed, but which I shall endeavor in the proper place to establish, that in this science man, in his conscious ignorance, and with a sense of entire dependence, makes his appeal immediately to the Infinite Source of truth ; that the methods of experiment and observation are the divinely appointed way in which this appeal is made and the revelation of physical truth is received ; and that this mode of revelation is such that the mind cannot entertain a doubt respecting the certainty or the reality of the truths revealed.

While, as has been already stated, the supreme truth of a changeless God, whose mode of action is invariable, as this truth is revealed by mechanical science, underlies and gives direction to modern religious thought, it will be observed that the ground on which this thought ultimately reposes is confidence in the method by which this truth is established.

SUPERSTITION.

MECHANICAL science is the angel whose spear has vanquished the demon of superstition. The source of this power in mechanical science is no secret. It is the science which penetrates to the causes of phenomena. Force, in the various forms of its manifestation, is, as has been observed already, the cause of all phenomena whatever. But force is unseen. It is hidden from the apprehension of rude and ignorant races. To them nature is full of mysteries. Their minds are without guidance in their imaginative or form-constructing activity. Every phantom becomes to them a reality. They people the earth and air with spiritual representations of their own dispositions, and tremble before their conceptions of natures like their own invested with unlimited power. Their minds become the abodes of superstition and credulity.

The dawn of light on this darkness is the development of the knowledge of force, in its unvarying and beneficent activity. This is not the full light ; it is only the dawn.

Mechanical science is a science that diffuses itself, and exerts a wholesome influence throughout the masses of every civilized society, even where the very term "science" is unknown. It is the foundation of what is called "common-sense," which is an orderly habit of thought, and a disposition to look for natural and reasonable causes of phenomena.

Confining our attention to the most enlightened nations of the world, we observe that, before the general cultivation of mechanical science, unlimited credulity made men everywhere the victims of ghostly authority. In mediæval Europe we see superstitions and delusions, which differed only in kind from those of preceding pagan times, controlling even the most cultivated minds, and, springing out of these, we see irrational and erratic habits of thought prevailing, with little check or guide.

Although there is still an abundance of all this to be seen, showing at once the incompleteness and the need of the work of mechanical science, still the influence already exerted by this science, and the results accomplished by it, in substituting, in place of all such vagaries, reasonable and correct methods of inquiry, and habits of thought based upon and guided by fixed principles and laws, have already been greater and more important than can be adequately conceived. Illustrations like the following indicate both the extent and the fundamental nature of this influence, which has coöperated, in a degree that has not hitherto been realized, with other influences of the highest nature, in delivering the human mind from every form of bondage.

Institutions of learning do not now esteem relics as their most precious possessions. Men of science do not now make a business of calculating nativities. Courts of justice do not now gravely engage in the trial of witches. But when mechanical science had its birth, in the age of Galileo and his successors, they did all these things. These and like absurdities, which only about two centuries ago were regarded as so serious, mankind has outgrown wherever mechanical science has been cultivated, and largely through its influence.

The word "superstition" is capable of a meaning more

extended than is commonly attached to it. It is properly employed to express any unfounded belief, and the disposition that accepts such beliefs with readiness is properly called superstitious. Superstition in this modified form is more generally recognized under the term "credulity." The practical way in which mechanical science goes about the work of destroying this monster, wherever it finds it, is readily shown.

Whatever be the particular direction that thought may take, human nature always manifests itself in essentially the same way. So it is the case in mechanics, as well as in other branches of science, and in speculative philosophy, that vagaries, more or less visionary, are appearing continually. In all these departments of thought alike, absurdities are continually being urged upon the attention of men. This is a general manifestation of the perverse tendency of thinkers, so-called, to be captivated by the work of their own imagination, and to proclaim this as the truth.

But there is a wide difference in the credence that these mechanical and philosophical speculations command. Mechanical science possesses the important advantage of being able to bring all conceits that appear in her realm sharply to the test of experiment. "How will it work?" is the pitiless question, and but little interest can be aroused in any supposed invention until this question has been satisfactorily answered.

One occasionally hears of a person who is cherishing a pet mechanical conceit. It is opposed to mechanical principles; but he is quite innocent of these, and, as they antagonize his supposed invention, he cannot admit them into his mind. He is sure of the soundness of his plan. It takes complete possession of him. Some one is induced, or more probably a number of persons combine, to con-

struct a machine which shall at the same time demonstrate the invention, and show the inventor to the world.

A trial is made, and lo!—as was the case a few years ago with a propelling apparatus that was constructed on what was represented to be a new principle, and which, when it came to be tried, was found to produce no effect in moving the boat in any direction,—the whole thing vanishes into thin air. The reflection of the thoughtful observer is: “What a pity that the same disposition cannot be as quickly and effectually made of the vain speculations which, under the name of philosophy, are continually wearying the ear.” Here, for want of checks that can be promptly applied, we see advocates of all sorts of theories doing serious harm by confident assertions and plausible reasonings, which one experiment, if only it could be fairly tried, would dissipate forever.

Mechanical science operates powerfully, however, to reach absurdities of the latter character also, by its indirect influence, and by the general habit of thought that it develops. It thus becomes, in the largest sense, an important educator, and one the influence of which is felt throughout the masses of society.

Men, who in any department of mechanics with which they are acquainted observe continually the natural adaptation of means to ends, become accustomed to the uniform operation of unvarying laws, and see idle conceits, formed in contravention of these laws, continually exposed and thrown aside. In this way they insensibly acquire a stability of character and correct habits of thought, and are not likely to be led away by delusions of any sort.

They observe that in mechanics there exist fundamental principles which must be regarded, and they naturally look everywhere else also for general requirements of a corresponding nature. They become accustomed to rea-

soning with some degree of precision, so that vague generalities have little or no effect upon their minds. They consider, correctly enough, that absurdities are quite as likely to arise in other departments of thought as they are in mechanics ; and they come to be on their guard against specious novelties, in whatever form these may be presented.

In a later paper the opportunity will be found for giving to this line of thought a more particular direction. We may properly observe here, that, at the present day, when free thought is coming to be more and more general, and the minds of the masses of mankind are awakening to an increased activity, it is certainly a gratifying feature of the case, calling for sincere congratulation, that there exists a conservative influence or power so strong, and at the same time so all-pervading, as mechanical science has shown itself to be.

It is difficult to draw a line between the destructive and the constructive forces of mechanical science ; just as it is difficult to distinguish between the effects of light in dissipating the phantoms and chimeras that filled the darkness, and in revealing the world around us in its reality. So also the direct and the indirect influences which are exerted by this science blend insensibly with one another. It must be sufficient, therefore, merely to call attention to those distinctions, without attempting to observe them strictly in our argument. These being borne in mind, all the beneficent influences of mechanical science may properly be considered together.

THE JUDICIAL SPIRIT.

IN a former paper I have endeavored to show the influence of mechanical science, in combating one weakness that is common to men—namely, the disposition to assume and to submit to authority in matters of belief. We have now to observe another influence of an equally healthful character, which is exerted by mechanics with equal force, in resisting another weakness more subtle and, if possible, more dangerous than that.

Here as there the work of mechanical science will be found to be, not negative merely, but affirmative as well. In both alike it tears down only that it may build up. There we found this science establishing individual freedom of thought, and direct access to the Infinite Source of truth. Here it will be found developing that spirit or disposition by which only it is possible for truth to be apprehended.

Many minds are found, even among men of intellectual power and influence, who are accustomed in a greater or lesser degree to look within themselves for the criterion of truth—who seem irresistibly inclined to believe that because any thing appears to them to be true, therefore it *is* true. They would hesitate to declare this in so many words. Indeed they would most likely be offended if their real mental operations were exposed, even to themselves. But in reality they can never see that, although

a certain idea may appear to them to be true, that fact in itself does not afford any reason for concluding that it is true. They cannot perceive that truth must be established wholly by evidence existing outside of their own minds,—that in balancing the reasons for and against any belief, the belief itself, even though it be held by themselves, ought to weigh nothing.¹

This weakness is exhibited by different minds in various degrees. Indeed, it is doubtful if there lives a man who is entirely free from it, who in examining a question about which he already holds a belief can in all cases bring to the consideration of that question a perfectly judicial spirit, can distinguish absolutely between the proper evidence and his own prepossessions, and form an unbiassed judgment. Many men, it is true, are found capable of forming singularly impersonal judgments on many questions, but we shall catch them somewhere. On some side of their minds prejudice is sure to appear. The necessity for ignoring all prepossessions if the truth is to be seen, if the idea formed in the mind is to conform to the reality, is obvious; but who is there that can always do this? Who is able, in every case, to free himself from the pleasing conceit, that what he believes must be true?

There are cases in which this weakness appears in its extremest form; in which it is obvious that, habitually, the necessity is not perceived for bestowing much attention upon external evidence, and still less for giving weight to the views of others, but the mind is satisfied with the short train of reasoning already stated; the individual being probably unconscious of his weakness, nay, willingly blind to it.

It is interesting to consider what must be the major

¹ It will, of course, be understood that reference is not made here to self-evident truths.

premise of the syllogism, from which a conclusion of this sort can be drawn. This is, that, so far at least as relates to the question at issue, my knowledge is infinite, all things in reality are just as they appear to me to be. It is only on this general assumption, that any one can say or can feel: this appears to me to be true, therefore I am satisfied that it is true.

The fact of this common weakness of our nature explains why so little progress towards the establishment of truth is usually made by discussions, and why the curious result is almost always observed to follow from these, that each side is more firmly fixed in its own belief than it was before.

This infirmity is one of the principal causes of sectarianism in religion. The division of the Protestant Christian world into sects presents a most interesting phenomenon. A survey of the multitude of religious sects that have appeared since the Reformation, shows that, at the bottom, modern sectarianism has been a natural extreme reaction from the bondage to spiritual authority, and to enforced uniformity of belief, which had been the condition for many centuries. At the same time the tendencies to superadd human inventions upon divine truth, to express that truth in formulas which reflect the limited and perverted conceptions of it that are formed by men, and to exercise and submit to spiritual despotism, have shown their universal characters, by appearing also in degrees more or less marked in every Protestant organization.

The sectarian feeling is that disposition which seeks after distinctive peculiarities of belief, and which cherishes these points of difference with especial zeal. Sometimes this feeling finds its excuse in attributing undue importance to particular truths. Sometimes it is seen in attachment

to a cherished notion, which in reality is immaterial or even unwarranted. Most Christian sects show the enduring impress of some commanding but necessarily imperfect mind, which for its adherents in some degree takes the place of and hides the Christ. There are cases in which the distinctive peculiarity of the sect, about which its members are strenuous above all other things, is something very whimsical.

Sectarian feelings are the opposite of Christian feelings. Sectarianism is directly at variance with the unity which the Christ so earnestly prayed might exist among his disciples. The observations which are suggested by sectarianism are therefore not observations upon Christianity, but upon its opposite.

When once a religious sect has been formed, multiplied and sometimes extensive associations and interests become involved in the maintenance of its separate existence. These interests and associations are, of course, quite distinct from any logical reason for the separate existence of such a sect. Nevertheless, they sometimes become the principal motives for its continuance.

These interests and associations impel to strenuous, and in some cases to extreme, defences of the distinctive tenets of the sect, although these tenets may have been formulated under conditions of thought which are now obviously imperfect, and which, in developing to a rounder and fuller spiritual life, Christians have outgrown, or are outgrowing.

Upon a comprehensive view of this subject it becomes apparent that sectarianism belongs to the period of spiritual childhood. It presents every characteristic of this age. In this earlier period of spiritual growth, out of the conditions of which it sprang, and to which it has been, and still is, although in a continually diminishing degree,

adapted, sectarianism has had its essential mission to fulfil. It has been the necessarily limited form, under which, in these earlier stages of the spiritual life of the race, religious zeal and devotion have found their expression.

Sectarianism exists, however, only as a step to something higher. Antagonism, which is of the earth, earthly, must pass into concord, which is from heaven. The human must give place to the divine. Mature spiritual life rises far above many trifles, which, in our infantile and contentious age, have appeared of such solemn importance.

The tendency to sectarian division has passed its culminating point. The current of Christian feeling is now clearly in the opposite direction. The antagonisms of former times are something that Christians at the present day can only with difficulty form an idea of. The period of Christian unity is evidently approaching. All the novel influences by which men are now surrounded, and of which they are only partly conscious, are insensibly operating to bring the minds of individuals, in the exercise of their free activity, into a state of charity and harmony with regard to spiritual truth.

Among the influences which are tending to liberate the mind from bondage to all the inventions of men, those exerted by mechanical science must be accorded a prominent place. That which may be termed the external influence of this science, or that influence which it exerts in breaking down the barriers that have separated and isolated the various races of mankind, and in ameliorating their conditions, with the immediate effect of destroying prejudices, enlarging the range of thought, multiplying human relations, and broadening human sympathies,—all this work of mechanical science is of course obvious.

But deeper than this is its influence upon thought. Not only has it contributed to make thought free, but its

influence is exerted even more strongly to give to free thought its proper direction. Anticipating in some degree the conclusions of subsequent papers, we may observe here that mechanical science gives precision and definiteness to the use of language, substitutes ideas of uniformity in place of those of caprice, and destroys the delusion that truth is to be arrived at by speculative methods.

There are no sects in mechanics. No warring schools contend here, as in medicine. No conflicting views are put forth and battled for in mechanics. And why? Because mechanical science appeals at once to the infallible criterion of truth. "Thus saith the Lord" is the only declaration to which it yields its assent. For the most part unconsciously, but none the less really on that account, and none the less trustingly, the engineer listens for the voice of God. Whenever this voice is clearly heard declaring physical truth, it is recognized with gladness, and thus we have MECHANICAL SCIENCE.

The power of mechanical science in correcting false methods of thought lies partly in the fact that all its conclusions *must* be based on evidence which exists wholly outside the individual. It appears, indeed, to the superficial observer, as if the very weaknesses, the nature of which has just been exposed, were especially liable to appear in mechanics. This, however, is because in mechanics absurdities are always detected, and are shown in their true light. In other departments of thought these often pass for wisdom.

Before the tests of truth which mechanical science employs, all preconceptions and prejudices, all influence of association, or of education, or of habits of thought, all mere words, which, however established by usage, or imposed by dogmatic authority, in reality mean nothing, all pride of opinion or of place, all conceit as to any thing

that for any reason may strike the mind favorably,—all these things that so darken the understanding, and render it incapable of apprehending truth, or of giving to different truths their proper relative importance, are at once and forever swept away.

The individual may, and often does, cling to mechanical delusions, in which case he also disappears. The practical application of an idea in a working machine frequently destroys in an hour the cherished fancies of years. From this crucial test no inventor can escape. It searches, not only his work, but also himself. It reveals at once his genius, his knowledge, and his disposition. The latter is generally the real thing, or at least it indicates the possession or the want of the real thing.

No one who conceives of himself as already knowing any thing that he has not profoundly and experimentally studied, no one who brings to his work the disposition that has been described in this paper, can ever either produce any thing or learn any thing in mechanics. He exemplifies the proverb: "Though thou shouldst bray a fool in a mortar among wheat with a pestle, yet will not his foolishness depart from him."

A good illustration of this disposition recently came under my observation. A legal gentleman of an unusually acute and discriminating mind, but who had of course been trained to see the truth only in his side of a controversy, conceived himself to be an inventor, and, of all the foolishness in the world, he hit upon that of making railway cars to run upon skates, instead of on wheels. He actually obtained a patent for this invention, and then proceeded to urge it upon the attention of engineers.

The case was an interesting one from a psychological point of view. Argument was wasted on him. He was asked: "How will your skates slide on the greased rails

when, as will happen directly, these become covered with dust adhering to them?" "That, gentlemen," he replied with an air of triumph, as if he were destroying the effect of the question on the mind of a court, "is something for you to provide against."

The conversation then took this form: He was asked, "Did you ever hear of the mechanical device termed the wheel and axle?"

"Oh, most certainly, gentlemen; you cannot teach me any thing about that."

"You know, then, that one of its offices is to reduce the waste of power that is suffered in overcoming friction; that it accomplishes this object by diminishing, very greatly, the amount of sliding motion of one surface upon another, transforming that which is so got rid of into rolling motion of the periphery of the wheel on the road or the rail; and that the small surfaces, in the axle and box, that still slide on each other are certainly lubricated and protected from dust."

"Gentlemen," he replied with energy, "I have absolute confidence in the value of my invention. All that I require is capital to enable me to demonstrate it."

"You will need for that purpose," his interlocutors answered, "about twenty-five dollars. With this sum you will make a little model, on which the difference can be shown at once between the power required to move, say, five pounds, along a line of rails, when set on skates, and when carried on wheels."

The suggestion was resented, as trifling with his invention.

This example illustrates the character of mind that truth cannot enter,—a mind that is already completely occupied with its own prepossessions. Yet such a mind is not wholly self-deceived. While loudly proclaiming the cer-

tainty of its belief, it is careful to avoid a fair test of it. Minds of this character prefer, generally, some department of thought, in which their dogmas cannot be brought to the test of an observation. This is the disposition that controversy develops, and by which in turn controversy is perpetuated. It is the disposition which is in all respects the opposite of that which mechanical science demands, and which all the influences of this science combine to produce.

Let us now, by way of contrast, suppose a disposition of the latter kind, and approximations to which are by no means rare, in the case of a real inventor, who is possessed of that choice gift, a judicial spirit; a spirit humble, teachable, and honest, both with itself and others. Such a man conceives of something new, and which appears to him to be practicable. In reflecting on his idea, he finds after a while that he has reached a point, from which he can make no further progress by thinking. His invention has been matured in his mind, so far as he can go.

He now proceeds to construct his machine, or apparatus, or whatever the device may be, according to the light he has. Then he puts it into operation, sits down before it like a little child, opens his mind wide to receive instruction, and lets the invention itself teach him, by its practical working.

His spirit being entirely receptive, he is sure to receive the revelation. This revelation may be, it often is, that his scheme is radically defective, that his idea is a delusion, that there is nothing in it.

He recognizes the infallible character of the criterion to which he has appealed, and perceives the demonstration of the unwelcome truth in its full force. It costs him a pang and a tear, but, as he sees his dreams melt away, he feels that he has learned something, that he has been to

the fountain of knowledge and has received instruction, and that he is capable of better things than he was capable of before.

Instead of total condemnation, the disclosure may be that something he never thought of, just in the last place he would have expected, is wrong or wanting. Sometimes defects will appear that puzzle him, and the nature of which can be discovered only by long study. Perhaps, again, the revelation may be—if the scheme is a radically new one it is pretty sure to be,—that extensive changes must be made, before the invention can be fairly judged. All real inventions are slowly reached through just such discouraging revelations.

A fact here confronts us, that is well suited to command our attention. In every attempt made by man to produce any thing of a novel character, something is sure to be wrong. No finite intelligence ever, on the first attempt, produced or conceived of even the simplest thing, in the form that was finally found to be correct and satisfactory. This is a fact of human experience. One who imagines that he would form an exception to this law would be the last of all to approximate to initial excellence.

An individual may, from a knowledge of general principles, and from familiarity with like attempts, be able to say, in any particular case, what will *not* answer; to detect, perhaps at a glance, defects that are hidden from others; but whenever *he* attempts to produce any thing new, even in the field with which he is most familiar, something will certainly escape him, until it is revealed by experiment. The variety of possible conditions and combinations is so great, and the range of our thought is so closely limited to our previous experience, that successful inventors always come to be astonished at the crudity of their first attempts.

It should be observed, that the word "new" is rarely employed in an absolute sense. In the comparative use of this word, there are endless degrees of novelty. Generally, in mechanics the word "new" is employed to mean merely new arrangements, or the application to new uses, of devices which are familiar. In some of the more simple of these novel combinations of familiar devices it occasionally happens that a person of experience in their use, by careful study, succeeds in his first attempt. But, on the other hand, for any finite mind to enter upon that which is new in mechanics, in any thing like the absolute sense of that term, is like entering an unknown sea, whose extent and every indentation of whose shores must be learned by observation.

The fact is an obvious one to every candid mind, and is one which all experience impresses more deeply, that only an infinite intelligence can comprehend beforehand, and can embrace in its view, all the conditions and requirements that will manifest themselves in the operation of a new device. Man must grope his way through darkness into the light.

The following general conclusions seem to be warranted, as the clear teaching of mechanical science respecting physical truth :

First.—Although the mind may be wholly unconscious with whom it has communed, physical truth is to be found only through a direct appeal to the Infinite Source of truth ; and

Second.—Only the teachable spirit, completely emptied of self, can recognize the existence of the source of truth, or can receive from it the revelation which is always ready to be imparted.

These conclusions are here limited to physical truth.

As we advance in this discussion their universal nature will appear, even before we come to observe the unity, or rather the identity, of physical and spiritual truth. The fruitless nature of the attempts, that have been and are still being made, to find the criterion of truth anywhere, except in the Deity himself, or to learn truth by any means, except by direct appeal to Him, ought, it would seem, so far at least as respects the physical modes of its expression, to be sufficiently obvious.

The importance of the preceding discussion will also become more apparent as we advance in our argument. When we get down to the root of the matter, we shall invariably find that the disposition of men to look within themselves for the criterion of truth, to bring infinite truth within the narrow limits of their understanding, and to read revelation, both natural and verbal, in the light of their own dispositions and fixed habits of thought, has been the fruitful source both of philosophical and of religious error,—of false systems of thought and belief and education.

On the other hand, we shall find that the truly philosophic disposition, the disposition to look for the criterion of truth wholly outside ourselves, in the infinite perfection of God, is the only disposition that can find the cure for all these absurdities, that can discover the sure criterion of truth, and can permit this to exert its legitimate influence on thought, on the emotional nature, and on human conduct. It is by the methods and the direct revelations and the certain analogies of mechanical science that men are slowly becoming educated to the willingness, nay, even to the ability, thus to look away from themselves to the infinite and changeless God.

THE UNITY OF THE MIND.

IN reflecting upon the general subject of these papers, and on the mode in which the views maintained in them could be presented with clearness, I found myself embarrassed by the term "faculty," and the meaning that is affixed to this term, comprehending, as it is made to do, certain functions and activities of the mind, to the exclusion of others. I was still more embarrassed by the sharp distinction that is drawn between our intellectual and our moral natures, and the influence of this distinction upon thought and instruction.

Although recent philosophy has come to admit the unity of the mind, still this truth must be said as yet to be only recognized, rather than properly taught. It is not accorded that prominence which its supreme importance deserves. On the contrary, the influence of earlier and crude conceptions continues with little diminution. The term "faculty" is retained, and continues to serve its old purpose. This is said to be done for convenience in classifying mental operations. The effect of its retention is effectually to prevent the adequate apprehension by the learner of the truth of the unity of the mind, and to prevent this truth from being followed out to its legitimate results, or from exerting its legitimate influence. The popular mind, and to a large extent the educated mind as well, remains even ignorant of its existence.

For all the benefit that is to be derived from that general recognition of the unity of the mind which is made in our later systems of philosophy, and for any aid that can be afforded by it to a discussion such as the present one, this recognition might as well not have been made. The argument to be presented in these papers requires that this really fundamental truth should be distinctly apprehended. This argument will in fact be found ultimately to rest upon the underlying truth that the mind is a unit. Before proceeding further, this truth must be established.

From time immemorial the human mind has been divided and subdivided after different fashions, and these divisions have been classified and arranged into systems, and such methods or analyses have been taught by teachers who had themselves been taught them, just as if these divisions of the mind, instead of being wholly imaginary, were as real and substantial as are the physical divisions of the globe.

Thus according to accepted systems we possess the faculties of the reason and the understanding, the perceptive faculties, the faculty of the will, the faculties of the memory and the imagination, the æsthetic faculty, and the faculty by which we distinguish between right and wrong. To these some theologians have added the faith faculty.

On the other hand, the emotional nature is represented as being without faculties. Nothing is admitted to be a faculty that does not come within the category of what are termed the intellectual powers. We can, therefore, have no faculties with which we rejoice or grieve, or love or hate. We do all these things, but we do them without the employment of any faculties.

In opposition to all this imaginary machinery, stands

the simple truth that the spirit is a unit. What have been termed faculties, as well as the operations of what is distinguished as the emotional nature, are only the different modes of our spiritual activity; into each form of which activity, as this form is determined by the occasion, the spirit directs its whole power.

The spirit is a unit. It is the same conscious self that perceives, and thinks, and feels, that performs every mental operation, and is sensitive to every moral and emotional impulse.

It is the one self-conscious indivisible being, that successively observes and remembers, that reflects upon the images that it has formed in consciousness by observing, and which it retains or recalls there by remembering, that judges, that decides, that resolves, that impels to speech or to bodily activity, that constructs imaginary forms, that grieves or rejoices, that loves or hates, that is true or deceitful.

It is the conscious intellectual, moral, and emotional unit, in its completeness, that as such unit exercises itself in all of these different ways, as the occasion calls for such exercise, and in each one according to its development in power and in disposition.

As the sunlight, though manifold in its composition, is a unit, and as all life which it calls into being would be different in some respect, if the constitution of the sunlight were in any particular different, so every act that we perform, every thought to which we give shape, and every emotion that we feel would be in some respect a different act, or thought, or emotion, if our whole combined intellectual, moral, and emotional nature were in any particular different from what it is. Every act, and thought, and feeling is the act, or thought, or feeling of our spiritual being as a whole.

No intelligible meaning can be affixed to the term "faculty," except "a mode of exercise," "a form of spiritual activity." In the ordinary substantive sense of this term, if indeed any one can define this sense, there are no such things as faculties.

The incorrectness of saying that we possess faculties is abundantly exposed by the fact, that when we are once accustomed to admit this form of expression, we do not perceive the absurdity of proceeding further, and saying that we possess minds, or even that we possess souls. The fact is, we *are* minds, and what have been termed the faculties of our minds are in reality only *some* of the various forms or modes of our spiritual activity.

It is a curious and instructive study to trace the origin of this arbitrary division of the mind into these imaginary distinct and unrelated faculties. These divisions were obviously the product of a rude process of thought, similar to that which evolved the system of polytheism.

In earlier ages men observed the various divisions of natural objects, but had no conception of the unity in which these divisions are combined. They created, therefore, in their imaginations a separate divinity over each one of them. Then, observing in the same isolated fashion their own different occupations and interests, they imagined other divinities, also, presiding over each one of these. The tendency of the heathen mind has always been to multiply these imaginary deities.

The conception of one God is the most sublime of all possible conceptions. Science has shown the unity of the creation, a unity comprehending the universe, and which is expressed by its name. It has thus demonstrated the truth of this conception of one Supreme Being.

We are taught that this great truth of the divine unity was imparted to mankind by direct revelation. The ob-

servation of the uniform tendency of the mind in the opposite direction, or to the multiplication of divinities, as illustrated in all pagan history, affords strong confirmation of this doctrine. If, however, any doubt remains that a direct revelation was necessary in order that the truth of one God should enter the human mind, that doubt must be removed when one considers the persistent tendency of our thought to division, as that tendency has been manifested in Mental Philosophy.

Precisely as men reasoned, if indeed the term "reason" can be employed in such a connection, in creating their separate divinities, so they have reasoned in imagining separate mental faculties.

They observed the members and organs of their bodies, and saw that each one of these had a separate and distinct office to perform, which it was expressly fitted for performing; as, for example, the eyes for seeing, and the limbs for walking. From such observations, men were led to conceive of their minds, as being also composed of members, or organs, each of which was expressly adapted to the performance of separate and distinct functions. These several mental operations were arranged in classes, or divisions, without much regard to the unity that comprehends them, and a member or faculty of the mind was imagined, adapted to perform each one of these classes of operations. So these imaginary faculties receive from the philosopher's, just as the divinities did from the poet's pen, their "names and habitations."

The description and classification of these imaginary faculties, and the definition of the boundaries allotted to each one, or of its especial function, is called Mental Philosophy.

In this operation of cutting up the mind, a difficulty was encountered when the dissectors came to the acts of

rejoicing and sorrowing, of loving and hating, and of speaking or acting truly or falsely. It was evident that these must be the acts of the spirit in its unity. No ingenuity could contrive separate members to which the performance of these acts could be committed.

The difficulty was met after the heroic or Alexandrine fashion. What were regarded as the moral and emotional parts of our nature were denied the possession of faculties. Moreover, being destitute of these appendages, it was obvious to the philosophic mind that this supposed separate department of our spiritual being was not entitled to scientific consideration, in any such sense as that in which this consideration was bestowed on the intellect, which was held to be blest with the exclusive possession of faculties.

Philosophers, essentially repeating one another, have been blind to the fact that, in assuming the reality of this artificial and wholly imaginary system, they have ignored the supreme element of spiritual existence, and the highest form of activity in their own nature, in a degree that is fatal to any conception of truth in its unity, or to the conception of the real nature of truth; which, we shall see, requires for its apprehension every mode of activity of which our spirits are capable.

Now, it is submitted that it is time that all this work of imagination should follow the classical deities, which, in the conceptions of their adorers, were once so real that they could not be spoken against, but which have not now a worshipper; and that the recognition of the supreme truth of one God should be supplemented by the recognition of the truth of the unity of the human mind.

The importance of the latter truth, and the necessity for its recognition, if any progress is to be made in the

apprehension of spiritual realities, will become abundantly evident in the course of this discussion. Moreover, it will be seen that practical consequences of a most serious and injurious nature follow from this doctrine of divisions of the mind, a doctrine which has been universally accepted, as if these divisions really existed, instead of being imaginary parts of the spirit of man, which in reality is indivisible. The artificial and mistaken habit of thought which has thus been engendered affects disastrously both our systems of education and our religious conceptions.

It is hoped that this exposition of the unity of the mind, with the applications of it which will be presented, may assist in rendering this great truth a familiar one.

MECHANICAL SCIENCE AND RATIONALISM.

WE have now reached a position from which we may observe more closely the reason or ground of the healthful influence that mechanical science is adapted to exert on thought, in its higher or spiritual sphere.

In the progress of mental development, and of reaction from a state of spiritual bondage, it became necessary that mankind should pass through a period, in which, in the case of many minds, this reaction would take the form of rebellion against all modes whatever of what appeared to be spiritual domination. In such a period the tendency would appear to assert the ability of the mind itself to ascertain the truth, in all those forms of it which are not obviously the subjects of empirical determination. It was unavoidable that the door should thus be thrown open to every extravagance of independent and unguided thought.

The various sects of Protestant Christians became alive to the danger, and they endeavored, according to the light of the age, to fix, and really though not purposely to limit and confine, religious belief. This they did, for the most part, by substituting, in place of the rejected dogmas of the Roman Church, written creeds or interpretations of Scripture, that derived their authority from the consent of those who were to be governed by them; while not the least rigid or enduring was the unwritten

creed of those whose boast it has been that they have no creed. These creeds went far beyond the single requirement of Christianity, which is the union of man with Christ, or the attainment by man of the spirit of Christ, and in various degrees they demanded the acceptance of dogmas which can only be termed the inventions of men.

From that period to the present there has appeared in all Protestant denominations of Christians a continual spiritual growth or development, and an increased depth of spiritual perception. The religious mind has steadily tended towards emancipation from bondage to the letter that killeth,—to that true freedom which is the fruit of the life-giving spirit.

While Christian sects were insisting upon the reception of every proposition in their dogmatic theologies, under the penalty of eternal damnation, free-thinkers were indulging in the extravagant defiances of English deism and French atheism. The present age shows, on both sides, a tendency to the abandonment of these extreme positions, and a softening of the asperities by which they were marked. While conflicting views in great number are still held, there is to be observed a growing neglect, on the one hand, of the more obviously human element in religious dogmas, and on the other hand, of the extreme denials that were contained in the old forms of infidelity.

In this progress the Christian sees, truly enough, the operation of the Spirit of God. But God works through means which are adapted to bring about the results observed. The dependence of metaphysical knowledge upon physical science has been uniformly recognized. In the growth of physical science, and especially in the growth of mechanical science, is to be found the fundamental and efficient cause of the enlargement of thought, which has only just begun, and to which there can be no

limit. This advance has already rendered impossible to enlightened minds the narrow conceptions which once were universal, and is gradually enabling mankind to distinguish with certainty between the human and the divine.

Modern free thought is seen generally to take on some one of the forms of what is known as rationalism. In one sense rationalism admits of a definition. It claims for the unaided human reason absolute authority in matters of faith. It declares that reason must be the final arbiter respecting spiritual belief. When, however, we come to ask, what has the reason established as entitled to belief? the number of different answers that we get to this question is limited only by the number of rationalists. No two of these will be found to agree in every shade of their belief, unless we admit agreement among the agnostics, who deny that reason has shown any thing to be entitled to belief.

Rationalists are found scattered throughout the wilderness of free thought. Every rationalist believes that which seems right in his own eyes. In rationalism we witness the fullest development of the disposition to look, as far as possible, within one's self for the criterion of truth.

Rationalistic speculation starts from the assertion of the so-called psychological principle, that what it terms the reason intuitively perceives universal and necessary truth. From these truths it passes, by what it asserts to be logical processes of thought, to every caprice and conceit that speculation has thus far been able to imagine; these speculations, by a curious law, becoming continually more vague, indefinite, and dreamy.

The rationalistic schools of thought have exerted and still exert a subtle and widespread influence. This influence is wholly pernicious. Under it the mind becomes

lost in endless mazes of error. The more brilliant the will o' the wisp that allures into the vagaries of rationalism, the more hopeless the entanglement becomes. Confidence in the conclusions of the unaided reason is a delusion that is all the more fascinating and dangerous, because it flatters the pride of intellect, which, like "the fatal gift of beauty" often turns the heads of its possessors to their ruin.

Mechanical science possesses the power to expose the error that is contained in the fundamental assumptions of rationalism. This science shows the falsity of the claims: that the unaided human reason is able to decide correctly, and has therefore the right to decide, in matters of faith; that it is the natural and proper arbiter with respect to spiritual belief; and, finally, that it intuitively perceives all universal and necessary truth. Mechanical science assumes, equally with rationalism, that all truth is addressed to the mind, and that nothing can be known to be a truth, unless it is recognized as such, and adjudged to be such, by the mind in its judicial activity. But it discovers the vital error in the assumptions of rationalism to consist in this, that this philosophy assumes respecting the human mind that which can be predicated only of a complete, a perfect, or, in other words, of the Infinite Mind. It shows, by a conclusive analogy, that only the all-comprehending mind can be entitled to rely upon its own intuitive perception of truth, in any of its forms, whether universal or particular. It shows that the finite mind, while capable of being developed, possibly to the comprehension of any truth whatever, cannot itself distinguish between truth and error, except just in the degree that it has been taught, but must rely entirely on the instruction that it receives from the Infinite Mind; and this is revelation.

This lesson, of the absurdity of the reliance of a finite mind on its own unaided judgment, of our complete dependence on revelation, and of the closeness of our relation to the Infinite Source and Revealer of truth, is taught by mechanical science in such a conclusive manner, and its instruction goes so completely to the root of the matter, that it becomes of the first importance that this instruction shall be distinctly apprehended and its force be realized.

The general fact that is disclosed by mechanical science, and that constitutes the teaching of that science on this point, has been pretty fully presented, in preceding papers, and the reader may be presumed to have become somewhat familiar with it. Its importance requires, however, that it shall be stated again with emphasis. In mechanics, every step that is taken upon untrodden ground is sure to be taken, in some degree at least, in a wrong direction, and the mind possesses within itself no power to correct the error, nor even to determine whether or not the step is an error.

Notions of a novel character, which, from all the thought that can be given to them, even by experienced persons, seem most certain to be correct, turn out in the large majority of cases to be delusions. The experience of inventors in every branch of mechanics, as well as that of explorers in those branches of physics that are not strictly mechanical, will confirm this statement. The most comprehensive knowledge fails when it finds itself confronted by a single unfamiliar feature. The tyro is always confident, but the utmost that the man of experience will permit himself to affirm respecting a new device or new operation, even in those rare cases in which he can detect nothing which is at variance with truth already established, is, that it seems to be worth trying.

One of the greatest of living inventors once said to me: "There can't be any more mistakes, I have made them all." Professor Tyndall relates that, in entering upon his investigations respecting the power of the atmosphere to arrest radiant heat, he assumed that the aqueous vapor contained in the atmosphere, being so minute a proportion of the whole, at the most only about one quarter of one per cent., might be disregarded. He was perplexed by the varying character of the results obtained, until he began to suspect that the varying degrees of humidity of the atmosphere might have something to do with these results. The final outcome of his exhaustive researches, as is well known, was the discovery of the important fact, that dry air has almost no power to arrest radiant heat, and that the aqueous vapor contained in the atmosphere, which for a long time he could not see that he should pay any attention to, affords the only protection to the earth, to prevent the immediate loss, by radiation into space, of the heat received from the sun.

Such candor as is exhibited in these confessions marks the true seer into nature. Through such minds only can physical truth be revealed to men. And it is only by effort on the part of such men, sincere, patient, and persevering in a degree beyond ordinary comprehension, that the clouds and darkness which are round about every form of physical truth can be penetrated.

Thus that science in which the conclusions of the unaided human reason are brought to practical tests, and its unreliability is made apparent to the gaze of all men, renders to philosophy the important service of showing the complete dependence of the human mind on revelation for its knowledge of truth. It is certain that in mechanics all attempts to ascertain truth by mere reasoning infallibly lead men astray. Active minds create

legions of phantoms, all of which need, not to be discussed and argued about, but to be mercilessly exposed. In mechanics we see clearly enough, that the employment of "the unaided human reason" is merely reasoning, or pretending to do so, without any properly established data, which here at least would obviously be the work of fools.

But, it will be asked, and the question is a natural one, does not the reason or the understanding itself perform all this work of invention and discovery?—does it not conceive, direct, and supervise all experiment and observation, and itself determine the certainty or the inconclusiveness of the results? The answer to this question is, that the mind certainly does all this, but that this is the necessary mode in which man coöperates in receiving these revelations. The subject of our necessary coöperation in the revelation of truth will become prominent in this discussion. When the nature of this coöperation on our part is apprehended, it will be seen to furnish the answer to the above question. But we may observe here, that obviously these revelations could not be made to man at all if he did not possess the intelligence to receive them, they cannot be made to him any further than his receptive intelligence has been developed, and we cannot conceive any other method or means so well adapted for their effectual revelation to him as is just that mental activity on his part which he is called upon to put forth. Attention must not be diverted from the fact, that in physics, where only an obvious test can be applied to them, our mental speculations need to have their errors corrected at every step.

We must stop here, to rid our minds of that creation of our imagination, "the reason." In popular conception, a glamour surrounds this "shape that shape has none"

that seems to render correct reasoning extremely difficult. When, however, we are able to see clearly that the only reality that can be expressed by this term is the mental process, by which the spirit of man, in its unity, discusses the appearances which are given in consciousness, then the first position has been gained. It is important that we should see that "the reason" is, itself, one of those unwarranted conceptions that the spirit, in its form-constructing activity, is continually creating. When we are fairly rid of this conception, and are able instead of it to consider the act of reasoning, as above defined, then it becomes evident that the subject-matter of reasoning must first be given, and the distinction between reasoning and observing becomes an obvious one.

Mechanical science guides the feet in the path of true philosophy, by maintaining, in its own sphere, this fundamental distinction between reasoning and observing, and by insisting on the supreme importance of experiment and observation, which are man's coöperative acts in receiving the revelation of mechanical truth.

The act of observing, including the verification of the reality and the truth of the image formed in consciousness, is an exceedingly complex act. It calls into exercise every form of our spiritual activity, and it manifests all the qualities which in their aggregate constitute character. It is not proposed to present here an analysis of this act, but only to point out that the appeal for the exposure of the falsity, or the verification of the truth, of the mental conception, must always be made to a criterion existing wholly outside the mind itself.

It is interesting to consider the light that is thrown by mathematics upon this distinction between observing and reasoning. The processes of mathematical reasoning are certain. They are of a nature that excludes doubt. But

in the physical applications of mathematics, that is, in the application of mathematical reasoning to any purpose whatever, the correctness of the result depends entirely upon the correctness and the sufficiency of the data, and these data mathematics does not provide, nor does it primarily contribute in the least degree to their provision.

The fault is not an uncommon one among mathematicians of neglecting proper verification of their data, or proper assurance that all essential data have been given them. The mathematical mind, just in the degree that it is exclusively mathematical, seems inclined to be wrapped up in its processes, and to be satisfied with *their* certainty, so as to be incapable of appreciating the anxious observation that must be exercised in ascertaining the data on which its calculations are to be based. In this respect, a similarity appears between mathematicians and rationalists, that is precisely what one would expect.

I once witnessed an incident that illustrates the uncertainty which attends all physical applications of mathematics, in cases where the necessary data have not been well established. At a meeting of the American Association for the Advancement of Science, held in the city of Albany some twenty-five years ago, in the Physical Section, presided over by Professor Henry, a paper on a subject in mixed mathematics was presented by Professor Pierce, of Harvard. When the reading of the paper had been concluded, Professor Alexander, of Princeton, arose and requested that the discussion of it might be postponed till the next day, as he expected then to present a paper on the same subject, in which, by a different course of reasoning, he had arrived at precisely the opposite conclusion. Some different elements had entered into the problem, as it had been attacked by each of these eminent mathematicians.

The discovery of the planet Neptune is often cited as a prominent and striking instance of the ascertaining of a fact by the mere exercise of the reasoning powers, through a purely mathematical process. No event has ever been more misapprehended, for there is none that places the distinction between observation and reasoning in a stronger light, or that exhibits in a more remarkable manner the dependence of reasoning upon careful and exact observation for the correctness of its results.

The power of the analysis that could locate the unseen planet, and the strength with which this mighty weapon was wielded by the young English and French mathematicians, whose names are forever associated with this discovery, command the admiration of men. The basis on which this analysis proceeded was, the accumulating irregularities in the orbit of the planet Uranus. This orbit had been computed, as it would be determined by the influence of all known attractions; but, to the surprise of astronomers, Uranus did not move in this orbit. The degree of its departure from it was ascertained by observation, and this obviously could not be learned in any other way. If these observations had not been exact, or if they had been insufficient, in either case the mathematicians would have been misled, the result reached by the mathematical process would have been wrong, the planet would have been looked for in the wrong place, and would not have been found.

But it has been reserved for mechanical science to afford the most convincing demonstration both of the dependence of reasoning upon data otherwise ascertained, and of the tendency to error in all mental processes, which tendency can be shown and corrected only by observation and experiment.

This peculiar power of mechanical science has already

been abundantly shown. We may, however, in conclusion, refer to the application of mathematical reasoning to mechanics. Engineers know very well that it will not do, in practice, to conform to any deductions of mathematics, unless these deductions have been founded on exhaustive experiments. All such deductions made in disregard of this requirement, and it may be added that the name of these is legion, are presumably worthless. Some factor is certain to be omitted; some requirement, often of great consequence, is sure to be under-estimated, or even entirely overlooked. The result of every experiment is always in some respect a surprise. Something is revealed that was not anticipated. The great structure of mechanical science has been reared by mathematical investigation, upon the foundation of experiment; or, to change the figure, experiment has been the plumb and the level and the square, the application of which to this structure has been necessary at every point in its rise.

In mechanics we are confronted by two facts, which are as familiar as any facts of human experience can be. The first of these facts is, that, in the search after physical truth, the mind is, to the last degree, fallible, and liable to error. Where, out of all possible images that we can form in consciousness, there can be only one that corresponds with the reality, we are equally liable, instead of this, to form any one of the endless number of images that would represent nothing, and to accept this phantom of our brain as representing a reality. We have within ourselves no power to distinguish the true from the false. In advancing even one step beyond what is already established and familiar, we find ourselves in absolute need of a guide, who will arrest our tendency to error, and will set our feet in the right path on solid ground.

The second fact is that this infallible guide has appeared,

surrounding man on every side, precisely adapted to this service, demanding his recognition, and his absolute submission to its control and guidance ; and that it is by the aid of this guide that all progress in physical knowledge has been made.

It is the familiar teaching of mechanical science, respecting the means by which we have arrived at our present knowledge of physical truth, and by which all further knowledge of this nature is to be attained, that this knowledge is imparted to us, and verified to us, wholly from without, beyond, and above ourselves.

Now, this is a fact of supreme consequence, not only in itself, but still more on account of the deductions which appear naturally, and indeed necessarily, to be drawn from it. For there seems to be no way of escape from the conclusion, that this truth, which is so certain with respect to the facts of mechanical science, and, it should be added, of all science as well, must in reality be a universal truth, of which these practical illustrations or applications are, to our present apprehension, merely the most obvious and unmistakable expression.

The following propositions seem to be self-evident :

First.—If the unaided human mind cannot be relied upon for the ascertainment of any physical truth, this is a direct intimation that we are not to rely upon it for the ascertainment of any other form of truth. If, as is obviously the case, our mental powers are not given us to be employed as the means for arriving, by any mere unguided exercise of them, at the knowledge of physical truth, we have no right to rely upon their unaided power or activity as the means of arriving at higher forms of truth. If at every step toward physical knowledge we need an infallible guide, it is a reasonable presumption that we require such a guide everywhere.

Second.—If such a guide is found to have been provided here, it would be unreasonable to suppose that mankind have been left helpless in any other respect. On the contrary, the presumption is exceedingly strong, that if, in his search after physical truth, man finds at his hand the very aid he needs, without which he must have remained in helpless ignorance, in a state in which every creation of his imagination would appear to him as a reality, but by the employment of which he may hope to reach the heights of physical knowledge, so he must be able, if he will, to find aid equally available and equally efficient as well as indispensable, in his efforts to reach the more elevated heights of spiritual truth.

Finally.—If this guide to physical truth can be of no service to man, except as he seeks for it, voluntarily employs it, recognizes its infallible nature, holds his constructive and his reasoning powers entirely subordinate to it, yea, humbles and prostrates himself before it, it is a reasonable conclusion that he must deal in precisely the same manner with the guide that shall lead him to the knowledge of any truth whatever.

Such a unity pervades all truth, physical and spiritual, and this unity is so obvious to us, that the force of this argument from analogy cannot be either disregarded or resisted. The criterion of all truth, spiritual as well as physical, to which the appeal must always be made, is to be found only at its source, and the universal guide to it is revelation.

The various forms of speculative error which are grouped under the general name of rationalism are best met by the assertion of the great and comprehensive truth, that ALL knowledge is imparted to the human mind by revelation. For the demonstration of this truth mankind will primarily be indebted to mechanical science.

REVELATION.

IN the preceding paper I have endeavored to point out some of the analogies afforded by mechanical science, which seem to lead to the conclusion that *all* truth must be communicated to the human mind from the Infinite Mind—that is, by revelation. In this and subsequent papers I shall present some considerations which tend directly to confirm this conclusion.

However inclined the reader may now be to question this proposition, in the general form in which it is stated, I hope, if he will accompany me in my attempt to present the reasons on which the proposition is rested, he will in the end be prepared to give to it his assent. If it be the fact that we cannot arrive at the knowledge of any truth, except as this knowledge is thus imparted to us, then, clearly, it is of the first importance that this fact should be universally recognized.

Our minds must first be disabused of an unfavorable prepossession. The term “revelation” has been used in a restricted sense. It has been customary to employ this term to express only the verbal mode in which the highest of all forms of truth has been communicated to man; and which particular form of truth it is obvious could not have been imparted to him in any other way.

It is claimed that this limitation is unwarranted, and also that it is unfortunate, in that it has served to hide

the essential unity of all truth, by assuming a radical distinction between the modes in which the knowledge of its different forms or manifestations is conveyed to us; a distinction that in reality has no existence. All forms of truth proceed from one source, and are intimately related to each other, and are associated with each other in their relations to man. The essential unity between physical and spiritual truth will form the subject of a separate paper. At present we will only observe, that this unity enables the latter class of truths to be presented under the forms of the former class; that both alike involve deep mysteries; that truths of either class are capable of being apprehended only by the humble and teachable spirit *which has been prepared for their reception*; and that, within the limited extent to which the knowledge of either physical or spiritual truths is possible for us, there are degrees in the apprehension of either, which are proportionate to the fitness of the mind to receive the truth, and to the earnestness of the search for it. These close analogies or likenesses point clearly to a common source, from which the knowledge of both these forms of truth is imparted to us. If this indication be correct, then the term "revelation" ought to be employed in a general, or rather in a universal, sense.

In point of fact, all truths are equally revealed to men, only the mode of revelation differs, as the nature of each truth requires. We shall find that different classes of truths are revealed to us in different ways, as is made necessary by their varied nature. Each one of the several modes of revelation will be seen to be the only way in which, as we are constituted, the particular class of truths which is revealed to us in that way could be made known to us.

Attention is first invited to some general considerations

which serve to indicate very clearly that *all* truth must be directly revealed to man.

With respect to mechanical truth, the correctness of this proposition has been abundantly shown. But a general survey of the history of human thought will discover evidence of its universal character. It will be observed that, just as the unguided imagination becomes filled with false mechanical conceptions, in precisely the same manner out of the unguided activity of the mind there have proceeded all false religions, all false morality, and all false philosophy, of whatever form.

Of this an instructive example is afforded in the Hindoo cosmogony. This example is selected, not for its especial absurdity, but because our education has been of a nature to make us more alive to its absurdity than we can be to the equal absurdity of beliefs with which we are more familiar, which perhaps we ourselves have been taught.

All perversions of both physical and spiritual truth have sprung from within the human spirit. In every field of thought alike, men have constructed images which represented no realities, and have treated these vain fancies as if they were true.

Thus all experience appears to confirm the deductions of analogy. The liability to error, the need of a guide, which is so manifest in exploring the regions of physical truth, is equally apparent in every other field of thought. In all alike, whenever the mind acts independently of direction from the source of truth, it is equally liable to fall into error. We are able to affirm that this tendency to error is not by any means confined to mechanical truth, but is a universal one, and its invariable presence in the former relation, which experience renders so obvious, merely serves to open our eyes to its universal existence. Indeed, in the light that is shed on this subject from all these sources, we seem warranted in the *α*

priori conclusion, that whatever has its origin in the human mind, and receives its development from the unguided operation of that mind alone, must of necessity be false. It would seem as if there could be no escape from the conclusion that all truth must come to us from the infinite; that an intelligence which is less than infinite can attain to the knowledge of any truth only as it is taught. The distinction which has been universally drawn between what man discovers and what God reveals then disappears. God reveals every thing.

If this be the case, we are shut up to revelation. It must be by revelation alone that we can receive any certain knowledge. The source and the test of *all* truth must be wholly from above ourselves. We must submit to receive every thing from the Almighty hand.

I have used the expression "shut up to revelation." This may convey a false impression. In reality, our minds must be opened to revelation. We cannot conceive of its abundance or its variety. Spiritual as well as physical revelation fills the earth and the heavens. It is infinite. The fulness of our own being is limited only by the wideness with which that being is voluntarily opened to receive the universal revelation.

The question now presents itself: In what manner is this revelation made to us? The answer to this question is given in the nature of things. To our spiritual being as a unit, and in a degree that is limited only by our capacity to receive, every revelation of physical and of spiritual truth is made to the same consciousness through appropriate senses, with all which we have been endowed for the obvious purpose of receiving these revelations. This truth will, I think, be rendered obvious, if, beginning at the lowest form of revelation, we examine its various modes somewhat in detail. Such an examination will be attempted in succeeding papers.

THE REVELATION OF OBJECTS OF SENSE.

WE begin our review with the external or sensible creation. This is certainly revealed to us. We cannot form in our minds a correct preconception of any thing. If in any case we permit ourselves to form a preconception, this vanishes in the presence of the reality. The single obvious duty of every original inquirer is, to form a correct image in the mind by observation of the reality, and in no other way. We are endowed with a variety of physical senses, which are adapted to the observation of every quality of external objects, and which will convey to the mind true and, so far as they go, complete ideas of them. We thus obtain all the knowledge that we need to have, and all that we were evidently intended to have, concerning these objects.

We should observe here the variety of our senses. One sense alone may be deceived—indeed it often is so. But others are always at hand to detect the imposition. I once visited Eton Hall, the seat of the Duke, at that time the Marquis, of Westminster. On being admitted to the grand entrance hall, the appearance of magnificence was very impressive. But I rapped on one of the supposed marble columns, and it was wood. The artist had done his imitative work wonderfully well; it deceived the eye, but it could not deceive the sense of touch or of hearing.

Universally, we find ourselves provided, in our various

senses, with the means for verifying the reality of the objects themselves, as distinguished from the images of them that are formed in our minds, and also for verifying the correctness of these images, as the counterparts of the objects, which are presented through our senses for our mental apprehension. The completeness of the adaptation of our senses to both these functions, and the manner in which one sense supplements another, and all combine to give to the mind full assurance on both these points, are calculated to fill us with admiration and wonder.

Thus we find the beginning of human knowledge to be received into the mind by revelation, which is made in the mode and through the senses that are appropriate to the character of this knowledge. We need not here enter further into the philosophy of perception. It is necessary only to emphasize the fact that the single obvious duty of man in this relation is to observe. This, clearly, is the only function of the mind that he is now called upon to exercise. The objects of sense are not created by the mind. Their nature and condition are not in any way affected by its action. They are merely shown to it, and perceived by it. Man becomes a conscious, voluntary and active agent in receiving knowledge of this character merely by observing.

But a mind is conceivable that refuses to receive knowledge in this way—that declines to submit to any such test of the correctness of its preconceptions—that insists that all these appearances are contrary to reason. Instances of such refusal are common enough where the facts have been observed by others. An example of this was furnished a few years ago by some German geographers, who had constructed a map of the interior of Africa as they concluded it necessarily must be, and who declared the reports of certain discoveries, when first announced,

to be untrue, because the lakes and rivers discovered had not been so laid down on their map.

But we are supposing the case of a man who rejects, as unreasonable, facts that are being continually verified by the general observation of mankind. Common-sense, however, recognizes the conclusiveness of the tests employed, and the fitness of the physical senses for this work of observation and verification.

The argument which I wish to urge is made very strong by the fact that there is no such person. No sane man ever thought of any thing so obviously absurd, as in this field to set the conclusions of any process of reasoning above the facts established by observation.

But such a misdirection of our mental activities would be no more ridiculous than are those misapplications of them that we are accustomed to see in the opposite direction. We behold continual attempts made to establish imagined spiritual realities or truths by processes of reasoning, when it is evident that reasoning is not the means of spiritual revelation, any more than it is the means of physical revelation.

The present consideration of the subject of perception will be concluded with two observations :

First.—Perception through our physical senses is obviously the only way in which external objects could be revealed to us. Language could convey no idea of them. These senses are expressly adapted to receive the images of these forms of truth, and to present these images and verify them to our consciousness.

Second.—We shall find this to be the universal law. Every fact and truth, physical and spiritual, from the lowest to the highest, is, in like manner, revealed to man, in the only possible way,—through corresponding senses, which are expressly adapted to receive it, and to present it and verify it to consciousness.

We come now to consider the revelation of the facts of natural science. Here an interesting distinction presents itself. The ordinary objects of sense, when these are first beheld by any individual who is capable of reflection, are viewed with the consciousness that, while new to him, they are familiar to others, and have been so to all generations of men. But in the case of a fact in science there is always a discoverer, to whom the fact is first disclosed, and by whom it is viewed, as Galileo beheld the planet Venus crescent like the moon, or the satellites revolving about Jupiter, or as recently the satellites of Mars were seen by Hall, with the consciousness that he is the first of mortals to behold it, and that through him the knowledge of it is to be conveyed to the minds of his race.

In all cases, however, there is the certainty that the fact itself is not new. There is an intelligence to whom it has always been familiar, while it is not unreasonable to suppose that there may also be an infinity of intelligences, to whom it was known before. In most cases, as in that of the pressure of the atmosphere, we find that the fact, while it was yet all unknown to man, had its myriad uses. When once the fact has been disclosed to us, these uses are found to come within our comprehension, and to be in immediate connection with our own daily life, just as multitudes of facts doubtless are, of the nature of which we still remain in ignorance. We then discover that all nature had been adapted to this fact, that in the infinite complications as it appears to us, but what in reality is the harmonious interrelation of all created things, this fact was essential to the performance of innumerable functions by other agencies; that in the beginning it had formed a necessary feature in the plan of the creation.

In natural science, discoveries are made only by the activity of the mind in observing—the same mode in

which the mind exercises itself in forming images of any objects in nature. The difference lies only in the closeness of the observation, in the degree of attention that is given and of discrimination that is made. Between these different degrees of spiritual application no line of separation can be drawn. We pass by insensible steps from one extreme of care and power in observation to the other. From the discovery of our own hands in infancy, up through familiarity with all things as they are presented to us, still up until we reach what are known as elemental forms of matter, still up until the trained and penetrating intelligence is able to affirm the constitution of suns and nebulae, and further still through all physical discoveries yet to be made, we find our progress to be possible only by directing our spiritual being into the same form of activity, with reference to different ends, by the aid of different helps, and in each case with the concentration, often long continued, of our entire power of mental activity upon a single object.

In all these cases alike, we deal with those manifestations of force which are familiarly known as matter, and for the apprehension of which by us these manifestations and our physical senses are mutually adapted. In all alike, the mind, in order to be fit for the reception of the true image, must be absolutely free from preconceptions, so as to be able, with just discrimination, to estimate all appearances at their true value.

Moreover, every mind must be at liberty to point out the oversights or the misconceptions of any other mind, so that, through many independent observers, every form of personal error may be detected and corrected. In this way the true idea, corresponding to the reality, is finally determined.

It will be observed that discoveries in science are made

by the faithful employment of all the powers and means of observation that are either directly given to man, or that he is endowed with the ability to produce. This is the way in which the facts in physical science are revealed to us, and, as was observed with respect to the ordinary objects of perception, it is obviously, as we are constituted, the only way in which these facts could be revealed. From the complete adaptation of our physical senses to this work of perception and verification, we have the same right to conclude that they were expressly designed by their Maker for this obvious and necessary use, that we have to conclude that the instruments that we employ to aid us in these researches were expressly designed for this purpose by *their* makers.

It is a fact well worthy of observation, that it has never occurred to any one to say: If we possessed an additional sense, we would then be able to apply an additional test of the reality of external objects, or of the correctness of the images of these objects that we form in our minds. This has never occurred to any one, and it never can occur to any one, because we do not feel any such want. Up to the point which we find to be the present limit of our knowledge, we perceive our equipment for both these purposes to be complete. Within this limit, we cannot conceive of any use for another sense. We cannot imagine a test additional to those which we are now able to apply. With respect both to the reality of the object and the correctness of the image of it which we form, the employment of the senses that we have brings entire conviction and satisfaction to our minds.

We note here already the appearance of the universal law of hungering and thirsting. The pearls of science are not cast before swine. Physical truth can be imparted only to those minds which have been prepared to receive

it, which are devoted to the search after it, and which prize it above rubies. Minds that are in any degree indifferent to it must, just in that degree, remain dead to its existence. And, on the other hand, the completeness of the preparation, and the earnestness of the search, measure the degree in which this form of truth, like every other, is or, properly speaking, can be imparted to man.

In concluding these remarks upon the revelation of the physical creation, I desire to call special attention to the fact, that this revelation is always inclusive of the *verification* both of the reality of objects, and of the truth of the images of them that we see in consciousness. No question can arise here about the criterion of truth. The evidence is conclusive to the mind that is prepared to receive the truth at all. The inquirer has been to the highest source of knowledge that he can conceive of—in fact, he has been to a higher source than he can conceive, and he is satisfied. This we shall find to be the case universally. Every form of revelation is of such a nature as to be conclusive of its own truth, to minds which are prepared for its reception.

COÖPERATION.

A DIFFICULTY has doubtless already occurred to the reader, in the way of admitting the truth, that we obtain all our knowledge by revelation. This apparent difficulty lies in the fact, that knowledge is so obviously acquired by our own exertion. In the mere work of perception, already first considered, we are required to employ our senses, and to bring our spiritual being into a state of activity; and in the higher departments the mental effort by which knowledge is acquired is still more serious, being in most cases the utmost of which we are capable. How, then, can knowledge be said to be revealed to us? Before proceeding further, it is necessary that this question be answered.

The same difficulty comes in the way of our understanding the truth, that all our possessions are given to us, when, apparently, we get them ourselves. These possessions are the direct fruit of our own exertions, unless we have obtained those which are the fruit of the exertions of somebody else. In the same manner, all achievement is the result of properly directed and adequate effort, and cannot be reached in any other way.

The truth about all this matter was fitly illustrated by the Christ, in the declaration that our Heavenly Father feeds the fowls of the air, although we have the evidence of our senses that they feed themselves. When, how-

ever, we consider the matter, we observe that the series of acts which are necessary to sustain the existence of the fowls of the air is long and interrelated far beyond our power to trace. Of all these acts, the conscious and voluntary performance of one only is committed to the fowls themselves. They have merely to take the food and drink that they find provided for them, and adapted to their sustenance. We observe further, that this single intermediate act is the only act for the support of their existence that the fowls have the ability to perform. The power is given them to do that which is required of them, and which is committed to them to be done, and no more.

This is precisely the case with man. All difficulty disappears from this subject, when we consider how many things are necessary to be done, in order that any revelation may be received, or any result be accomplished, by man; and, out of this inconceivable number and variety of acts, how few have been committed to man himself. Almost every thing is done for him. It is especially noteworthy that, as in the case of the fowls, so also in that of man, the little that is left for him to do is all that he can do. In its nature and its extent it is precisely adapted to his powers. It fully employs them. He is called upon to exert himself to the full extent of his ability. There is nothing, above that which man enjoys in common with inanimate nature, that he can receive without his own voluntary coöperative effort. From the supply of his lowest bodily wants, up to the satisfying of the highest longings of his spiritual being, his own active coöperation is the condition essential to every gift. We are able to perceive that this must be the case, in the very nature of things. The desire and the receptive power or condition must exist on the part of man. There obviously cannot be such a thing as the passive reception by man of any

good, above that which, as already stated, he shares in common with inanimate nature.

We shall, in a later paper, have occasion to observe the fact, that all the apparently independent agencies in nature are working together in harmony, coöperating with each other in ceaseless activity and to the full extent of their efficiency, for a single immediate purpose, and that this purpose is the well-being and happiness of man. We have now presented to us the further fact, that man, on his part, must join in this harmonious activity ; that in order to become the recipient of any good whatever, from the lowest up to the highest conceivable, he must perform his appointed part. All agencies of which we have any knowledge are working for him, and we may naturally suppose that this beneficent activity extends also to agencies which it is beyond our power to discern ; yet all must be to no purpose, without the voluntary coöperation of man himself.

This law of coöperation is a most important one. A clear apprehension of its universal and necessary nature will aid us to the understanding of much that for the want of such apprehension is often obscured. I shall here limit myself to a single illustration of this law, drawn from the primary labor of man. While thus observed only in its first and most simple application, its universal nature will be obvious. Then, when we resume the line of thought, now interrupted, we shall see the fact continually manifested, that man's voluntary coöperative activity is the essential condition of the communication to him, or reception by him, of any gift, or any revelation, and may properly be considered as the mode in which these are imparted to him.

It is assumed as obvious that there must be an Infinite Giver, from whom we receive every thing, including our

existence. Beyond this gift of existence, there are only four things that we obviously receive without our own coöperation, which, in a sense more or less absolute, may be termed voluntary. These are light, warmth, air, and water.

Light fills the universe, and enters our open organs of sight. We may say that no act on our part, either voluntary or involuntary, is required in order that light shall enter these organs, and there form the images of external objects. Indeed, we must close our eyes in order to keep the light and the images out. So also from the same source, the sun, we are warmed without any act on our part.

After these first gifts of light and warmth, it is interesting to observe the gradual manner in which our acts, upon which the reception of all other gifts depends, assume a voluntary character. At first the act is compelled by a sensation of want. It becomes truly voluntary only when choice has become free.

With respect to air, we have our being at the bottom of an atmospheric ocean, in which both the earth and all things and beings upon it are immersed, and out of which no animal or vegetable could exist. To receive the air into our bodies, there to perform its amazing functions, we have only to breathe. The act of breathing can hardly be called voluntary in any sense. The necessity is urgent, the supply is instant, and the act is performed with equal regularity in our conscious and our unconscious states.

Water, the next universal necessity, universally provided, we must drink. This is only a semi-voluntary act. It is performed under the pressure of an impulse, which, if not sooner yielded to, grows to be irresistible.

It is to be observed that we share these four gifts with

all organic being, vegetable as well as animal. The existence of all alike is dependent upon them ; and in each one of these, and in the relations that each one sustains to all being, there are involved infinite wonders, to which the mind that is in the least degree thoughtful cannot, even by constant familiarity, be rendered insensible.

But we now pass beyond these. The vegetable creation has only to expose itself to the warmth and the light of the sun, to breathe and to drink. Animals must also eat. But for every creature except man its food also is provided, to be eaten in the state in which it is found. Man only feels the need, and possesses the intelligence, to till the ground and to make a fire. These are acts, additional to the single one required of the animal, for which man's intelligence was obviously given to him, and which he is left to perform. In the nature of things, a command is laid upon him to perform these acts, and this command he must obey.

Here, in the work of supplying his lowest physical wants, man's voluntary coöperative agency begins, never to cease. And even here we cannot fail to be struck with the relative insignificance of the part that is committed to man, essential though that part be. The earth to be tilled and the grain to be sown are provided for him. With this provision he certainly had nothing to do. And now in faith and trust, not in the sunshine nor the rain, but, whether consciously or unconsciously it matters not, in reality, faith and trust in the infinite goodness which is manifested in the sunshine and the rain, and in the assurance of that power, whether heard or felt it matters not, that in the sweat of his face he shall eat his bread, he tills the ground and buries the seed out of his sight. In this simple act his appointed work is done. His part is performed. Now he has only to wait and won-

der, while the sun shines and the rains descend, and the earth yields her increase. The seed springs and grows, he knows not how, and multiplies and ripens for the harvest.

It will not be necessary to pursue this subject further as a separate topic. The analogy which the mind naturally perceives renders the general conclusion sufficiently obvious from this single illustration, that, at least in the present stage of our existence, our own coöperation must be a universal requirement. The correctness of this conclusion all observation of human affairs confirms. We are prepared to recognize all human activity as the different modes of man's coöperative work. We repeat that there cannot be such a thing as the passive reception by us of any good, above that which we enjoy in common with all animate and inanimate nature. The receptive state of man is a state of activity. Accordingly, throughout the diverse modes of revelation, varying as these do with the varied nature of the truths revealed, we shall find running, precisely as analogy would lead us to expect, the unity of man's coöperation.

THE REVELATION OF MECHANICAL TRUTH.

THE subject of revelation will now be resumed, by contemplating briefly the revelation of mechanical truth. I do not propose to view mechanical truth here in its largest aspect; but merely to present some considerations suggested by the practical applications of this form of truth which are made by man.

We mark at this point the first important transition. In a preceding paper we had our attention occupied by the revelation of the forms of matter, or the sensible manifestations of force. Now, we are brought into immediate contact with the unseen. From what we term things, which, indeed, are only embodied thoughts, but which are not often so regarded by us, because our attention is commonly arrested by the object itself, we pass to the direct contemplation of thought, and of those embodiments of thought that have been committed to us.

In mechanical science we find ourselves to have been placed between two creations, the seen and the unseen, as the agents for the embodiment of thought. Beyond that provision for our existence which we share with the animal creation, we discover a boundless preparation which has been made for our welfare and happiness, and the employment or the utilization of which has been committed to our hands. The transition that we make here is not in reality so great as at first it seems to be. It is

only from those thoughts which have been completely embodied for us to those which, in a great multitude of their applications, have been left to be embodied by us.

For the purpose of this embodiment, these thoughts must be communicated to us. The common idea is that mechanical discoveries and inventions are made by men, and there we are accustomed to stop. But the properly developed mind cannot rest upon this idea. We have already dwelt upon the character of minds by which alone mechanical truth can be originally apprehended, and upon the process through which such minds must pass, in order to arrive at the completed, or, as we say, the matured, thought of any invention or discovery. To a mind that is prepared to receive it a mechanical truth is disclosed gradually. Seen dimly at first, through close and often protracted application, and by submission to constant practical correction, the thought grows in distinctness, until at last it appears clear and self-luminous.

The fact has already been assumed, that these thoughts, in their completeness, are imparted to the mind by direct revelation, and that this laborious search is our necessary coöperative act, or the mode in which these revelations are made to us. It is now proposed to examine more closely the grounds on which our acceptance of this important truth is to be rested.

When we reflect on the subject, one confirmation of this truth presents itself after another. We cannot conceive of thought except as existing in a mind. Indeed, we know nothing of thought except as a function of mind. We note, concerning the thought of any mechanical construction, as was observed concerning the facts of natural science, and the thoughts which are embodied in them, that the thought itself is not new. It is certain that there must be a Supreme Intelligence to whom this thought has

always been known, a Mind in which it has always existed; and as with physical truth, so here also, we may rationally suppose inferior intelligences to exist, in infinite number, to whom it was known before. In fact we cannot draw the line between physical and mechanical truth. These are intimately associated with each other. We pass from one to the other by insensible steps. We see physical truth everywhere underlying mechanical truth. Moreover, we find throughout nature, especially in animal structures, embodiments of mechanical thought, which we recognize as being essentially the same as our own. Physical and mechanical truths cannot be essentially distinguished from each other. Their common origin is apparent. Whether, therefore, mechanical thoughts are completed in their embodiment by the Creator, or are in any part committed for this purpose to man, the truth of their eternal existence in the Infinite Mind, in all their completeness, however great may be the mystery that it involves, is one that we find ourselves compelled to assent to, as much as to the eternity of physical thought.

Of the latter class of thoughts, Columbus was penetrated with one, namely, the thought that the earth is round. But clearly this thought had existed in the Infinite Mind since the earth assumed its form. Of the former class, let us consider some of the grander thoughts to which mechanical science has given embodiment, and which have thus become important agencies in the civilization of our race. These are thoughts of the varied applications of steam and electricity, which, in annihilating space and time in so large a degree, point unmistakably to a state of being in which our existence shall be wholly independent of these conditions.

It is not possible that any of these thoughts can be new, in the absolute sense of that term; for they constitute

agencies of an essential character in the work of human development, and they must, therefore, have held a corresponding place in the scheme of that development. Neither is it conceivable that these thoughts could have been originated by man independently without having been imparted to him directly by the Divine Intelligence. The mode in which they are reached by us forbids such a conception.

The divine ordering of human affairs involves, of necessity, the communication of mechanical truths to man, as he becomes prepared for their reception. Rightly viewed, then, the idea of the direct revelation of these truths is seen to be not only the natural, but the necessary idea. No other case is conceivable, unless belief in the Infinite Mind be rejected altogether.

But if the foreordering and the communication to man of the most general mechanical thoughts be admitted, then this admission must extend to the most minute as well. There is no place where a line of separation can be drawn. Every part of any mechanical structure, however inconsiderable it may be, has its own especial function, that must be performed, and which it only can perform. It constitutes an essential feature of the complete conception. In the Eternal Mind thought is always complete. The minuteness of its detail is infinite. This is illustrated everywhere in nature. So, when fully revealed to man, mechanical thought must be revealed in all its completeness.

This subject may be considered also from another point of view, and such consideration, it seems to me, can hardly fail to fix more firmly in the mind the conviction of the direct revelation of mechanical truth.

All forms of matter have evidently been prepared with reference to such revelation. Matter, in a large degree, exists for the embodiment of thoughts by man. This is

its great use. For many of its forms it is the only apparent use. The completeness of the adaptation of matter to this use is the subject of ever growing wonder. Matter has waited through inconceivable duration for these uses to appear, for these thoughts to be formed in human minds. During this period it has passed through successive changes, and its various forms have entered into multiplied combinations, the uniform result of which has been to adapt it for varied uses, to which in many cases it was not adapted in its original condition. We naturally conclude, therefore, that adaptation to these uses was the purpose of these changes.

The absolute dependence of man upon matter for the embodiment or realization of his mechanical conceptions, and the complete fitness of matter for this purpose, constitute one of those amazing correspondences with which nature is everywhere filled. The fundamental thought which, precedent to any activity, is always formed in the mind, is a thought of something to be done, of some end to be accomplished. The thoughts which succeed to this primary thought relate entirely to matter, as affording the means for the accomplishment of this purpose. These thoughts group themselves under two heads. The first is, the selection of the material suitable for the purpose. The second is, the mode of the application of this material to the purpose. The relation between thought and matter is, therefore, obvious. Matter exists for the embodiment of thought. Each is necessary to the other. Each is complementary to the other. The two are coördinate parts of one whole.

We cannot, then, stop short of the evident truth, that thought and matter are from the same source ; that, as man cannot create matter, so neither can he originate thought ; that, as the forms of matter are shown to man

through his physical organs of perception, so also every true mechanical thought is revealed immediately to his mind; and that, with reference to his work universally, he receives the command that Moses received, and which, from the very constitution of his being he must obey, "See that thou make all things according to the pattern shewed to thee in the mount."

We must not overlook the threefold unity of thought, matter, and man, which is apparent through their mutual adaptations. In the great scheme, the part assigned to man is the material embodiment of thought. The purpose that man conceives to-day is new to him, but, if it be in accordance with realities, it has existed, and matter has been prepared for its realization, from the beginning. It is now shown to him, and so he shares the thought, and becomes, through his free and yet obedient activity, the agent to execute the will, and accomplish the purpose, of the Infinite Mind.

The impressive truth now appears, that these purposes are all purposes of good to man himself. There can be no escape from this obvious fact. Man is employed as the active agent in promoting his own happiness, in effecting his own civilization. This is the beneficent end, to the accomplishment of which matter in its innumerable forms is adapted, and for which all thoughts which relate to matter and its uses have been, and are continually being, imparted to man.

We see clearly enough that mechanical thoughts and uses for matter are fundamental requisites to the civilization of our race. Civilization appears only as these thoughts are disclosed to man. To the Indian few and simple were the thoughts revealed, and so for him the forests decayed unused, and the marble and the ore lay unsunned. The revelation of mechanical thoughts has been made to

man very gradually, one thought at a time, and in the order in which he has become prepared to receive them. Sometimes these revelations have been separated by long intervals, and at other times they have come crowded thickly together. They have appeared in grander and yet grander procession since free thought began, in the pure worship of Him "in whom are hid all the treasures of wisdom and knowledge."

The question presents itself respecting the multitude of erroneous mechanical ideas, mistaken notions, false conceptions, which first present themselves in the mind, whence do all these come? The only answer to this question is, that we do not know. We *do* know the fact, although we are ignorant why it is so, that every thing requires its opposite. As there cannot be height without depth, or the right-hand direction without the left, so, under the present limited conditions of our being, there can be no truth without corresponding error. Moreover, while truth is single, error is legion. Here we encounter this law of opposites, and within ourselves we find not only an inability to choose correctly, to distinguish between the true and the false, but that almost always some form of error is the first to appear, which we feel the inclination to accept and follow as the truth. We find also that from without, and involved in the very nature and method of the revelation, a test appears, that we at once recognize to be infallible, by which we shall know the true thought that is eternal, that alone inhabits the Infinite Mind, that forms a part of the universal harmony, and shall be able to distinguish this from every form of error. Then no place remains for the latter, but as the truth grows brighter in the mind error vanishes away.

The mode in which mechanical truth is revealed to man suggests the reflection that inventions form no exception

to the rule, that mankind must receive all their blessings through trial and suffering. Here, as everywhere else, this appears to be the appointed way. How wonderful is our mechanical inheritance! Few persons ever attempt, what is far beyond the power of any, to imagine its extent. Every real invention has been produced for the benefit of the human race forever. Many of these, indeed, pass into oblivion, but not until they have served as steps to something higher. What a history of endurance and weariness do inventions represent! the forgotten ones, the real germs, out of which the trees, perhaps long after, grew, often costing most of all.

The remarks presented in this paper are intended to apply especially to mechanical inventions. Respecting mechanical laws, or the uniform modes in which forces act, or in which matter behaves under the action of force, as well as respecting the properties of matter which adapt it for mechanical uses, it does not seem necessary to make these the subject of separate discussion. The train of thought already followed applies to them directly. It is evident that if any thing of a physical nature is communicated to man by revelation, these must be.

THE REVELATION OF IDEAL TRUTH.

LEAVING now this mixed subject of thought and matter in their relations to each other, we advance to consider the revelation of ideal truth,—of ideal quantities, magnitudes and numbers, and the relations of these to each other, which constitute the science of pure mathematics.

One may say : “ Surely these thoughts cannot be said to be revealed to us, for they are arrived at as the result of mental processes, and they cannot be reached by us in any other way.” There are, however, two things that place this subject before us in a different light. The first is, that these thoughts did not originate in any finite intelligence, and do not depend for their existence on any finite apprehension of them. They existed before they were conceived of by man, and if there be an Infinite Mind, these *must* have existed eternally in that Mind. The second thing is, that these thoughts are realities, and this in a sense far higher than that in which any objects in nature can be said to be realities. They are wholly objective to us. They are merely shown to us, and observed by us ; but they cannot be modified or affected in any way by the action of our minds in observing them. Ideal thoughts or truths become objects of our perception precisely as material forms do. The images of them are held in our mental view, and are there contemplated by

us in the same manner in which the images of sensible objects are.

The revelation is, then, as certain and necessary in the one case as it is in the other. The difference between the two cases lies wholly in the mode of the revelation. This mode differs only as is made necessary by the different natures of the objects revealed; but the result, in bringing the image of the object within our consciousness, is the same in each case.

Concerning the revelation of ideal thoughts, precisely as concerning the revelation of objects of sense, we note three things:

First.—The mode in which this revelation is given is the only mode in which, as we are constituted, it could be given to us. Our power of mental perception must be developed by exercise. Out of the infinity of ideal truths, which to superior intelligences must stand equally self-evident in their own light, probably as parts of one whole, only a limited number are reached by us, and by most persons only a very few, through slow and laborious processes. Then those which have been so reached are seen by us also in the same clear light. This is obviously the necessary mode of the revelation of ideal truth to man, and the way in which man must coöperate in receiving this revelation.

Second.—This revelation of ideal truths, like the revelation of objects of sense, is inclusive, first, of the reality of the objects revealed, and, second, of the correctness of our images or conceptions of them. This form of verification we call demonstration. It is always satisfactory to our minds. We cannot conceive of any additional test, the application of which would render our conviction more certain on either of these points. We see these thoughts to be necessarily true.

Third.—We observe the complete adaptation of our minds for discerning this class of objects without the aid of the physical organs of perception. These objects are purely spiritual, and are beheld by our spirits directly. In order that external or material objects may be beheld by us, images of them must be formed in consciousness, through the medium of our senses. But we form images of these spiritual objects without such aids.

The following distinction appears to exist between material objects and these ideal objects. While in the case of material objects the essential nature of each one is shrouded in equal mystery, mystery appears to be predicable of ideal objects only when these are regarded as parts of one whole. This whole is infinitely divisible. The various individual objects, or ideal truths, when regarded separately, are of widely different natures, and are adapted to be apprehended by very different orders of human intelligence or development. To the intelligence perceiving it, each separate ideal truth is devoid of mystery. The mind that comprehends any such truth sees it in its universal and necessary character. Such a mind can observe the practical applications of this thought in the works of the Creator, and can itself intelligently make practical applications of it in its own work.

We may observe here how close are our relations with the infinite, and also how confused are the common ideas of men respecting the real and the unreal. When we have taught a child to comprehend that one and one make two, which is the most simple ideal truth, we have shown to that child a changeless reality, which had no beginning and can have no end, which is universal or omnipresent, and which transcends both space and time; a truth, moreover, which exists as a reality, quite independent of any material object to which it can be applied, or

of any finite mind by which it can be comprehended. And yet we do not apply the term "real" to this and similar objects, but we reserve this term for objects of sense, which change their forms, and as such objects perish in a moment.

In our relations to what we call material objects, and thus far also in our relations to objects of mental perception, we observe a fact which, by necessary analogy, we conclude to be universal. This fact is, that we are capable of perceiving these objects only in a small degree of detail or completeness, dependent on our own powers. In the former case we are able, to a certain extent, to augment our perceptive powers artificially; and in the latter case these powers are capable of different degrees of development in different individuals.

Thus, the limitation to the sights we can see, or the sounds we can hear, is found in the limited sensibility of our organs of sight and hearing. These organs are sensitive to the vibrations or pulsations of light and air only within certain limits. Matter may become completely invisible to us: a fact of which air, water, and glass, as well as the disappearance of many substances in solution, afford familiar examples. Perhaps the limitation of our senses is most impressively shown when we come to employ the higher powers of the microscope. Objects then appear to us merely as they would do if they were, in one plane, just so much larger than they really are; and not the least progress is made towards a knowledge of the constitution of matter. For illustration, we may magnify a diatom, say, twenty-five hundred diameters, which gives a superficial enlargement of more than six million times, and the illumination of the object and the definition of our instrument may be such, that the object is seen with brilliant distinctness; but, when viewed by

reflected light, the minute portion of the surface that is seen appears as substantial as the surface of a shell in our cabinet. So, also, the germs of all living things and beings, of all vegetable and animal life, although these must differ from each other so extremely, appear to us absolutely the same. Until their growth and development have reached a stage at which their distinctive features come within the range of our assisted vision, the microscope reveals nothing by which we can distinguish between them. In observing such objects we cannot avoid a sensation of awe, as we realize that infinity is before us, that it is before us everywhere, and that all the operations of nature are carried on in recesses, into which it is not possible that, while in the body, we shall ever penetrate.

So, also, with respect to ideal truth, considered as a whole. Our perception of this varies in degree, according to the development of our perceptive powers in this direction. I understand, we will suppose, a little of geometry. I can see clearly enough that the three interior angles of any possible triangle are equal to two right angles. Many propositions equally simple are plain to me. I perceive their necessary character. If, however, one talks to me in the language of fluxions, he speaks in an unknown tongue. No corresponding images present themselves in my consciousness. But since the time of Newton there have been discovered still higher methods of mathematical analysis, which the mighty mind that developed fluxions did not reach. It is well understood that there is in reality no limit to the science of mathematics; but that for us such a limit exists in the limited power of our minds.

We conclude this paper with the following observations:

First.—Two modes of revelation have now been considered, one through our physical senses, the other to the spirit directly, without the employment of any media for this purpose. These two modes of revelation are quite distinct from each other. Each is directly adapted to the nature of the objects which are revealed through it. Both alike result in producing in consciousness distinct images of the objects, so far as the revelation of them is made to us.

Second.—Acquaintance, in any degree, with the first of these two classes of objects does not give the power to affirm any thing whatever respecting objects of the second class. The attempt to do so would be regarded as an absurd presumption. No one ever thought of such a thing as to assume that his skill in perceiving material things could give him a warrant for saying, or for believing, that any ideal or spiritual object had no existence, because he could not see it.

Third.—The complete reality of all things, whatever be their nature, is something far beyond our power to comprehend. In other words, whatever may be the mode in which these realities are revealed, such revelation is made to us, or can be received by us, only in a partial degree, a degree ample, indeed, for all our possible uses, and ample also for the employment of all our powers, but, in every case, bearing only a small relation to the unrevealed reality.

Fourth.—The perception or the realization of the partial nature of this revelation comes to the mind gradually, as it progresses in development. In every case this perception is most clear to those whose acquaintance with the particular subject is most profound.

None will question the correctness of these statements. Each is sufficiently obvious. The second one especially

may be regarded as an axiom. The importance of all of them will appear in subsequent papers. We shall have occasion to observe their application to subjects of the highest nature; applications which, when the universal character of these propositions comes to be apprehended, the mind naturally, and indeed necessarily, makes.

MATERIALISM.

THE subject of materialism lies here right in our way, and demands attention before we advance to consider the revelation of the spiritual realities of force, truth, beauty, and love. Materialism is the manifestation of the blindness of physical science to the real nature of the very truth which it cultivates,—a nature which is wholly spiritual. Materialism is indeed strongly resisted by many scientific observers, in whom zeal and eminence in various paths of experimental research are found united with deep spirituality. In spite, however, of the growing influence of such minds, scientific thought still remains to a large extent materialistic. There are several reasons why this was to be expected.

Materialism consists essentially in limiting thought, more or less closely, to objects of sense, that first arrest the attention. Our relations with the physical creation are so intimate, the changes that matter has undergone in time past, and those which it undergoes under our observation, and under our own hands, are of such immediate and practical importance, and the useful properties of its innumerable forms are so varied, and so essential to our wants, that attention is naturally first drawn to, and occupied by, these more obvious features, before it can penetrate to the spiritual realities which are manifested through them.

Then, again, the study of the phenomena which nature presents in its many scrolls, forever being unrolled, demands minute observation and long-continued fixedness of thought; and so the tendency of this study is, especially at first, to render the mind indisposed, and in some cases positively unable, to look with any concern beyond a field which it sees to be so important and so boundless.

Undoubtedly the chief reason for the present abnormal influence of scientific pursuits is their novelty. Physical science is the birth of yesterday. We are in the midst of its discoveries. The attitude of the scientific mind is to a great degree that of the learner, absorbed in details, and to whom as yet these details are every thing.

So it results that the legitimate spiritual influence of the physical creation is often felt the least by those who are especially devoted to its study. On the one hand, the tendency of all such investigations is to cultivate a devotion to truth for its own sake, to develop a spirit of dispassionate inquiry and conscientious fidelity, and to form habits of close discrimination. But, on the other hand, the necessity for following nature into deeper and deeper recesses exercises the mind in considering the minute rather than the great, the particular rather than the universal, in analyzing rather than in combining; and so the tendency is to fix the attention upon what appear as material things, which address the mind through the organs of sense, and which can be measured and weighed, as if these things were themselves the ultimate subjects of thought.

Thus there comes to be shown still by many devotees of physical science a remarkable willingness to grind in the prison-house of phenomena. Hence also comes the disposition to ignore, as subjects for scientific inquiry, the spiritual realities that are manifested through all physical

forms of being, and also the spiritual perception through which those realities are made known to us. There are, however, many indications that a decided change in this respect is imminent.

Respecting the essential nature of what we call matter, we are wholly ignorant. Taking its forms, as these are presented to our senses, we have resolved combination after combination, until our means of analysis have failed; and in this way we have arrived at what we term "elements." Observing the reverse of this process, as it goes on in nature, we find these supposed elements combining with one another in invariable modes, and then we see the compounds thus formed combining with each other, or separating, so that their constituents may enter into different combinations; all in obedience to forces which are revealed only in these effects. Thus there is presented to us a wide diversity of forms and properties of matter, within what we term the inorganic creation.

Then, under the power of another class of forces, more mysterious still, we see these elements and their compounds entering into new combinations of a far more complicated nature, and in these combinations exhibiting forms and properties far more varied and remarkable. Now there appear organisms, activities some of which come within the reach of our observation, growth, and reproduction, followed, after a longer or a shorter period, by decomposition and a return to inorganic forms of being.

In this stage we witness the united and concurrent action of all physical agencies, as light, including rays that do not affect our visual organs, heat, the gases which compose and which are contained in the atmosphere, water, and mineral forms of matter, each one performing its necessary function, and all harmoniously coöperating

in the work of clothing the earth with the varied forms of vegetable life.

And now there is seen a greater wonder. When matter has reached these higher combinations, and has become organized under the action of the vegetative forces, then, and not until then, it becomes endowed with the power to sustain animal life; and in its more highly organized forms, as, for example, the fruit and not the wood, the grain and not the stalk, the flesh and not the bone or the hide, it is adapted to support the life of man.

In thus sustaining animal existence, matter yields obedience to a still higher class of forces, and enters into additional combinations of a still more complicated nature, and organisms of a different and higher character appear. Now there come forth beings, with consciousness and mental activities and purposes and character.

As in vegetable life, so here also, the submission that matter yields to the higher forces is only temporary, and a constant tendency appears to return to inorganic forms. In animal life we witness again the successive phenomena of growth and decay of the individual, while the species is perpetuated by reproduction.

It is to be observed that in animate being there are manifested two distinct orders of force. The first of these consists of the merely vital forces, which sustain animal existence, independently of volition and even of consciousness. The second comprises the conscious and voluntary activities which supervene to the merely animal existence. The latter forces are of a nature higher than the former, as those are higher than the vegetative forces, and as those in turn are higher than the forces that are manifested in inorganic being. Thus we have presented to us four distinct classes or orders of force, which together constitute a series, ascending by high and abrupt steps. But all

alike manifest themselves only through matter. And, so far as we are yet able to discover, the same elements reside in each of the forms of being, and constitute the rock, and the tree, and the bird, and man endowed with intelligence to observe them all.

One would expect that, surrounded by these wonders, himself the crowning wonder, man would be profoundly impressed with a sense of the superficial character of the little that he can know, and of the infinite depth of that knowledge which is hidden from him. Upon many minds, indeed, this effect is produced in different degrees, but it is remarkable how many thinking men exhibit an inclination, more or less decided, to rest satisfied with that which they imagine they can understand, and with repeating the very words they have been taught, and to make these the boundary of their thought and interest. Inquire of such a person, for example, respecting that mystery, the cause that determines the colors of bodies, and he will explain to you, as it has been explained to him, that each body absorbs the other rays of light, and reflects only rays of the color which it appears to have. His own questioning is satisfied, and so he supposes that he has told all about it. In the present state of knowledge this is, indeed, all that can be said; but how can any one imagine that, in saying this, he has said any thing, compared with what would be a full explanation of these phenomena?

The atomic theory constitutes the present bulwark of materialism. This theory, proposed by Dr. Dalton, in the early part of the present century, as explanatory of chemical action, is the work of a comprehensive mind, and constitutes a great step in advance of the previous condition of science. It has accounted, or has appeared to do so, for all observed phenomena, with one important exception. This is, the change of properties, or the appearance

of new properties, that takes place when different substances combine with each other. Up to this point only, the claim is true, that this "is the only theory which has as yet succeeded in giving an intelligible explanation of the facts."

As held at the present day, this theory is, briefly, that each one of the assumed elemental forms of matter consists of material atoms, of definite forms and dimensions, indestructible and indivisible, and that these atoms are separated from each other, even in the most dense substances, by mensurable distances, which are fixed by an equilibrium of attracting and repelling forces; that between the atoms of many different substances there exist attractions, varying greatly in degree, but which are always the same between the atoms of the same two elements; that when the atoms of different elements are brought together, under conditions favorable to their union, these atoms exercise selection and choice, and those which have the strongest affinity for each other unite in definite proportions, and so form what are termed molecules, which in their aggregation appear as compound substances; and finally, that these molecules also combine with one another in endlessly varied ways, and that by these combinations of atoms and molecules the whole inorganic and organic creation is constituted.

The atoms must be exceedingly minute, so minute, indeed, that even those molecules which comprise the greatest number of atoms, as, for example, those which constitute the most highly organized forms of matter, are themselves so small, as to be, not merely beyond the power of the microscope to discover them, but beyond its power to make any sensible progress toward their discovery.

The atoms were at one time described as being infinitely

small, whatever that might mean. Latterly some definiteness has been attempted respecting their dimensions. For example, the smallest drop of water that can be distinguished in the microscope is about $\frac{1}{80000}$ of an inch in diameter, and it is said that each one of these drops of water contains about 8,000 millions of molecules. The molecules are believed, moreover, to be small relatively to the spaces which separate them, and in these spaces to be in a state of ceaseless vibration. These vibrations are considered to be the cause of the phenomenon which we term heat. It is supposed that the force or amplitude of the vibrations determines the degree of heat, and that the complete cessation of them would be the absolute cold. These are the leading features of this celebrated theory. The manner in which it seems to account for the phenomena of heat, both sensible and latent, has been regarded as affording strong confirmation of its truth.

Our advance in knowledge is, of necessity, made one step at a time. These steps must often be separated by long intervals, and each one, when taken, naturally appears to many minds to be the last. The atomic theory was a great step, and the philosophic mind has rested upon it for a time proportionately long. But the world is now prepared for another step. This theory does not get beyond mechanical divisibility. It encourages, and probably grew out of, the disposition to contemplate the atom rather than the force. In the material atom it fixes a point of beginning, which, though far removed from our sight, is quite within our comprehension, for it is our own conception.

An amusing illustration of the limitation of philosophic thought to the material atom, and of the satisfaction which our education enables us to derive from what is in reality utterly unsatisfying, is afforded in those numerous

cases, in which the same element or compound constitutes two or more substances, which have entirely different characters. Chemists tell us that in these different substances the atoms or the molecules are differently arranged, so as to constitute geometric figures of different forms, and they suppose, or at least appear to do so, that they have thus explained the whole matter. It is obvious that on the assumed data of material atoms, and of the formation of all substances by the assembling together of these atoms, or of the molecules formed by their union, this is the only thing there is to be said ; and it is equally obvious that this bold guesswork affords no explanation at all, and that these phenomena point to something far beyond the limits of our present knowledge, as their cause.

All analogies are opposed to the doctrine of material atoms. Let us first apply to this doctrine the analogies that are furnished by mechanical science. This science teaches us to look with extreme distrust upon any thing that is the creation of our own minds. Whenever, in the progress of mechanical development, our conceptions are brought to the test of actual experiment and observation, we have seen that they are almost invariably shown to be illusions. In almost every case, we find that we had not reached the bottom of the subject. The history of mechanical progress is a history of surprises and disenchantments. This experience in mechanics is so nearly a uniform one, that the engineer is compelled to reason in this way with respect to the notion of material atoms: "Is this a conception formed respecting that which lies wholly beyond the reach of our observation? Yes. Then there is no reasonable probability that it can be true. Unknown conditions are sure to exist, and these, if known, would almost certainly show the conception to be an idle one."

We are in fact mere tyros in knowledge. How absurd

then to suppose that we can form a correct conception of the ultimate condition of what we call matter. In every research, we soon arrive at a point where our powers fail. It is a general observation that, as the path of knowledge widens, it grows fainter also, until it becomes lost in mystery unfathomable.

Chemists have found sixty-six substances that they cannot resolve, and so it has generally been assumed that these cannot be resolved, but are the elemental forms of matter, constituting a good solid foundation of all things,—substantial starting-points in the search after physical truth.

One cannot help being reminded of Fahrenheit, who first constructed a mercury thermometer, about one hundred and fifty years ago, and who, as is supposed, himself believed, and at any rate induced scientific men of that day to accept the idea, that he had found the absolute cold, which point he named zero. This fitly illustrates the absurdity of assuming as absolute, points which really mark nothing except the present limitation of our knowledge.

There is in truth no warrant for the belief that we have arrived at any primal element. It is unphilosophical to suppose that the process of combination, which we behold extended to such extreme complexity, with the manifestation at each successive step of properties more and more astonishing, actually begins at a definite point which we have ascertained, and that the ultimate forms of all things are thus brought within our comprehension.

In fact the philosophic mind is already showing signs of outgrowing this belief. We seem likely to pass through this to a higher stage of knowledge before very long. Inquirers are beginning to search after the unit atom, with a strong probability that the inquiry will lead, as many a one has done before, to results of a nature quite unex-

pected. The resolution of any supposed principal element would be a blow to the atomic theory; not that the belief in material atoms could not be extended so as to embrace such new conditions, but the confidence of philosophers in all such assumptions would be lost, as unquestionably it ought to be.

We have considered the existence of the atom, or of the ultimate indivisible unit of matter, to be an assumption. It is, however, rather a conclusion from another assumption. This latter assumption is, that force can be exerted only between bodies. Men had observed that the earth attracts falling bodies, that the magnet attracts particles of iron, and that the non-conductor, when electrically excited, attracts or repels the feather, and they naturally extended this idea, so as to embrace a similar action far removed from their sight. They assume that there also some material thing must exist, to attract and to be attracted. This analogy is still clung to, and men profess to be satisfied with it, although it is obvious that the phenomena which are presented in chemical action are only suggested in the most general way by attractions which act through sensible distances.

With respect to this subject, it is to be observed, that three phenomena are known, namely, force, choice, which is termed by chemists elective affinity, and uniformity of action. To these there must be added the properties that are exhibited by the supposed elemental forms of matter, and by their various combinations. These properties, which vary with each elemental or compound substance, are evidently designed. They are in all cases essential to subsequent effects produced. Each one contributes to some ultimate result. They cannot, therefore, be conceived to be accidental. Only one alternative remains. They indicate a purpose.

Four realities, then, certainly exist. These are force, choice, uniformity of action, and a purpose that directs every act. The first three of these reveal themselves directly. Indeed they are assumed in the argument for the existence of the atom. The last one we have seen to be manifested no less certainly. Now these four realities are not only certain; they are also sufficient. The material atom is superfluous. Faraday's definition of the atom, as a point of force, has the merit of not assuming the creation of our own fancy to be a reality. The fact that we are not able to form a definite conception of a point of force increases the probability that the expression may contain the truth.

The belief in the existence of the material atom has, in fact, no other basis than our education and habit of thought, or rather, our habit of not thinking. This belief is pretty strongly intrenched in authority. The general idea of atoms, as self-existent entities, is derived from heathen philosophy, and mankind have been more or less familiar with it for twenty-three hundred years. Science, however, pays no regard to human authority, and if this be disregarded, the case stands thus: In the behavior of what we call matter, we observe *only* force, choice, uniformity of action, and purpose. These four realities are established by conclusive evidence. They are manifested through all material forms of being. From them men deduce diametrically opposite conclusions. They are viewed by each mind in the light that is determined by the general direction of its own thought.

On the one hand, the materialist, who insists upon limiting his thought, as closely as possible, to that which is immediately disclosed to him through his physical organs of perception—which he can measure or weigh, and which he tries to believe that he can under-

stand,—carries on his subdivision of matter to the atom. Here he rests. This imaginary thing becomes for him the ultimate and the only reality. Force, choice, and uniformity of action, all which he admits, are viewed by him merely as incidents of the atom. These realities, which even to his own mind are fully established, yet, simply because they cannot in their nature be seen and handled, be measured or weighed, are regarded by him as only incidental to that, of the existence of which he has no evidence at all, which he only imagines to exist. Purpose is something that the materialist finds it difficult to attribute to the atom, and so he shuts his eyes to it. He can see properties of matter. He is compelled, moreover, to admit that all physical results are dependent upon the possession by different forms of matter of these distinguishing properties. But he can't see any purpose; and this for no reason except that he cannot attribute purpose to the atom.

Singularly enough, while the attention of this class of physicists has been fixed on material atoms so long, that it has come to be all the same as if they saw them, while these atoms are as real to them as witches are to Africans, they are in reality an impertinence in the atomic theory itself, as far as this theory is scientific. The only fact that is established by observation is, that substances combine with one another in multiple proportions. All beyond this is guesswork, or the opposite of science. It must in fairness be stated, that this is all that it is claimed to be. We have the *law* of multiple proportions, and on this law is based the *theory* of material atoms.

So much for the attitude of the materialist. On the other hand, those inquirers who in observing employ also their spiritual apprehension, whose perceptions are not limited to sensible forms, but who are able also to see the

spiritual realities which are contained within and are manifested through these forms, perceive, clearly enough, that we cannot rationally conceive of force, or choice, or uniformity of action, any more than we can conceive of purpose, as any thing less than attributes of a Being. They reason from their own consciousness. Respecting purpose and choice, they see at once that these are equally functions of mind ; and that neither one, and one no more than the other, can be conceived to be a property of matter. Uniformity of action is seen by them to be nothing less than uniformity of purpose, joined with absolute power of accomplishment. Force, when exerted by ourselves, is the expression of our wills ; and so the only conception of force in nature that can be formed by such minds is, that it is the manifestation of a will.

As, therefore, the phenomena of nature are contemplated by minds which are capable of this spiritual insight, the presence and activity of an infinite and changeless Being appears as the demonstrated truth. All those things which they observe reveal the attributes of such a Being. There is no point at which such minds can rest, at which their questionings can find intelligible answers, until they rest in the conception of such a personal Being. This is the view towards which leaders of scientific thought appear now to be generally tending.

In "The New Chemistry" Cooke says : "The theories by which we attempt to explain these facts, and group them in our scientific systems, are, at the best, only guesses at truth." "Everywhere in nature there seems to be a Presence, which not only imparts power to these particles, but also directs each particle to its appointed place." And again he remarks : "I have been called a blind partisan of the atomic theory, but I wish to declare my be-

lief that the atomic theory, beautiful and consistent as it appears, is only a temporary expedient for representing the facts of chemistry to the mind. I have the conviction that it is the temporary scaffolding around the imperfect building, which will be removed as soon as its usefulness is passed."

"The development of the mind, to whose illumined sight the universal presence of God in nature becomes obvious, will be considered in a subsequent paper, when this subject shall be reached in the orderly sequence of our thought. Such a spiritual insight is, however, assumed to be possessed by the reader, at least in some degree, in the remarks with which this paper will be concluded.

The theory of material atoms has been a real help, in the progress of the human mind toward its full development. This theory has served as the necessary step, by which men may mount, from the gross ideas of matter, up to the position from which they can reach forward to the truth. By the contemplation of these imaginary things, far removed from our sight, we have become, or are becoming, gradually prepared for the reception of the awe-inspiring truth, of what has so aptly been termed "the Divine immanence" in nature, or the infinite mode of the Divine omnipresence.

This truth requires for its complete apprehension only the full development of that spiritual perception which, however unconsciously, we begin to employ in the apprehension of force. This same spiritual apprehension will enable us to see, that the universe of what we call matter is the infinitely varied manifestation, not of force only, but of all spiritual realities, in their unity, and of the Infinite Being in whom these inhere; and that the creation has its chief value and significance for us as such manifestation.

It would appear safe to say that if, at the commencement of the Christian era, our present knowledge of physical truth had been possessed by mankind, the Church would not have lost, as, under the combined influences of paganism and barbarism, it did for so many centuries utterly lose, this vital conception of the Divine immanence or indwelling, both in nature and in the soul of man; a conception that lies at the bottom of all right belief, whether this belief be termed scientific or religious. This truth seems to have been held with much clearness in the earliest Eastern churches. Religious thought is now slowly and painfully returning to it. The human mind is gradually approaching nearer to the perception of the universal and infinite presence of God.¹

True science cannot impose a limit to thought, nor tolerate an impediment to its progress. The following propositions must become the axioms of liberated science :

All spiritual realities are revealed to man, equally with physical realities ;

This revelation is made in every manner that is best adapted to the supply of man's physical and spiritual wants, and to the development of his physical and his spiritual nature ;

An equal apprehension of all spiritual realities is essential to a correct conception even of physical truth ;

Of these spiritual realities, force is the first that compels our attention, but all alike are the manifestations of a personal and present God.

In the educational work that shall prepare the mind for the reception of this true philosophy, mechanical science must bear a leading part. In other branches of physics students may allow their minds to dwell on the fiction of material atoms, and may even regard these as ultimate

¹ The expression "the Divine immanence" is occasionally heard among theologians, but the ideas attached to it are vague and utterly inadequate.

subjects of thought. But mechanical science leads the mind directly to force. Mechanics is the first of the sciences to arrive at the distinct recognition of this manifestation of the universal presence; and it must operate powerfully to make, not force merely, but the other spiritual realities, which we shall see to be intimately associated with force, controlling elements in determining the future direction of thought.

Confining our attention for the present to force, we perceive at once the necessity that the forces, which it is intended we should employ, shall be manifested to us in ways that will enable us to employ them. Now from the very constitution of our being we could know nothing about any forces, except through just such concrete embodiments of them as those which have actually been given to us. The inconceivably varied ways in which forces are manifested are all adapted to our nature, and to the service of our wills and the accomplishment of our purposes. The adaptation of man and these manifestations of force to each other is mutual and complete.

If only we are able to overcome the influence of false education, and the habit of using expressions ready made in the place of thoughts, we shall find it quite as easy to conceive all bodies to be, what undoubtedly they really are, manifestations of force, in modes adapted to our constitution and wants, as it is to conceive them to be aggregations of invisible material atoms held together *by* force. The real nature of all things with which we are so familiar is certainly wrapped in profoundest mystery.

When, however, we extend our view, by the method hereafter to be presented, it will become apparent that force is only one of the spiritual realities by which we are environed. It is believed that it is not too much to say that the universe, as it is now shown to us, presents the

complete manifestation of all spiritual realities, or the full revelation of the Infinite Being. This may at first appear to be an overstatement, but I am inclined to think that it is the true one, and that there are considerations which, if due weight be given to them, will appear conclusive of its truth.

If the revelation of God be made in the creation, it seems inconceivable that it should be partially, incompletely or imperfectly made. The divine nature must be a unit, a whole, incapable of division in its expression; so that, if God is revealed in the creation at all, it seems a necessary conclusion that he must be completely revealed.

But not to us. Alas! not to us. The knowledge of God, that *we* derive from this revelation, or the degree of this revelation to *us*, must of necessity be limited by the capacity of each individual to receive it. A limit to our perception is formed by the imperfect development of our nature in likeness to the nature of God. Our natures may be in a condition completely abnormal, so as to repel this revelation, instead of admitting it in even the least degree. From this state up to that entirely receptive condition of the soul—that perfectly harmonious nature—to which the presence of God in the universe could be imparted fully, or in an infinite degree, the change must be one wholly in our own nature, and not in the least a change in the revelation itself.

In accordance with the universal law of spiritual perception, by which like can be revealed only to like, we are able to perceive the being of God, and his presence in the universe, only in that degree in which our natures become like to his own. Here is found the natural explanation of the fact to which attention was called in an earlier paper, that, of the various manifestations of the divine presence which are made in the creation, men are ready enough to

recognize those which they can conceive of independently, which they do not feel compelled to regard as such manifestations of God ; while multitudes remain insensible to those other manifestations of his presence which, in point of fact, are equally obvious and equally universal, as well as equally necessary to us, our association with which is just as close, and our dependence upon which is just as absolute, but which, by the exercise of all our ingenuity, we cannot separate from the idea of a personal and omnipresent Deity.

Between these two classes of manifestations of the Infinite Being, namely, those which can be dissociated from Him in our thought, and those which cannot be so separated from Him, physical science, in the present stage of its growth, has assumed to draw a line, and to limit its view exclusively to force.

Our subject, however, has only its beginning here. We shall enter the door that mechanical science opens so widely, and within which lies the whole realm of truth in its unity.

In presenting the views above expressed, it has been necessary, in some degree, to anticipate conclusions which will be reached in subsequent papers. This is to be regretted, but it seemed unavoidable. If the reader now has difficulty in yielding assent to some expressions, I hope that as he proceeds he may find those difficulties disappear.

THE REVELATION OF FORCE.

THE subject of force, as revealed in its effects, has already been considered. With the effects of force physical science is concerned, but not with the nature of force itself. Science defines force to be *something* that produces or tends to produce motion. It does not inquire what this something is. This is a question about which it feels no interest. The inquiries of physical science are directed entirely to the modes and degrees of the manifestations of force.

But there are other questions respecting force that are to be asked and answered. The first of these questions is: How do we get our notion or idea of force? We see, for example, water lifted and water falling; we see vehicles and cars and boats put in motion, and kept in motion, by animals, by the wind, and by steam; and with these phenomena, as well as with many others, we associate in our minds the idea of force being exerted. How do we get this idea?

Our conception of force is derived entirely from our own consciousness. I am conscious of the exertion of force myself, in a great number of ways. I observe the effect, in imparting motion to some object which is evidently produced by each of these exertions of force, and which effect it was my intention to produce by such exertion.

I am conscious, also, of resistance which, in different

degrees, is opposed by objects to my exertion of force; and which renders it necessary for me to exert my force in corresponding degrees, in order to overcome it, and produce the motions that I wish to impart.

Then I observe around me effects being produced, in imparting motion to bodies, that are similar to the effects which I produce by the exertion of my own force. When contemplating these effects I am conscious of sensations similar to those which I experience when exerting force myself. Especially if these effects are the same, both in kind and degree, as those that I have produced, the identity of the sensation is very noticeable.

For example, by working the handle of a pump I am able, with a certain exertion of force, to lift a column of water with a given velocity from a given depth. I see another person doing the same thing. Of course, I at once recognize the fact that he is making the same effort that I was making. Then I see the same thing being done by a windmill, or by animal power, or by an air-engine, or steam-engine. In either case, by the same association, and by an equal necessity, I recognize the fact that a force is being exerted by the wind, or the animal, or the heated air, or the steam, identical with that which I had exerted myself.

For another example: I am taught that the atmosphere exerts a pressure of about 14.7 lbs. on each square inch of the surface of every object immersed in it. But if I try myself to lift a partially exhausted receiver I get an impression of this fact far more vivid than any words could give to me. I compare this pressure with other resistances which I am accustomed to overcome by my own exertion of force.

These illustrations are sufficient to show the fact, that our perception of force is an act of recognition. We

observe an effect, and we feel the same sensation that we felt when we have produced a similar effect ourselves; and so we recognize the same force as being exerted. It follows, that a person not capable of exerting force, or who had in fact never made such exertion, would not be able to form an idea of force. This is undoubtedly true. One, for example, who had never lifted any thing could not form a conception of weight. No conception of weight, or of the exertion of force to overcome it, has, by our supposition, ever been formed in his consciousness, that could be recalled or revived by any effect observed. He would not recognize the exertion of force, and would be entirely unconscious of either force or resistance. His perception would be wholly limited to the motion that he sees. This is, in fact, continually the case with every one. Few persons, for example, can form any notion, from the movements of a steam-engine, whether any force is being exerted through it or not. This cannot be known even by an expert, unless he observes some particular part of the engine where to his eye the amount of power transmitted is indicated.¹

In the manner above described, we form our primary conception of force. We conceive of it as an effort, applied to overcome a resistance, or an opposing force; such an effort as we are conscious of making ourselves. But for this sensation in consciousness, corresponding

¹ It has been already observed, that the perception of force requires a certain degree of spiritual insight. Corroboration of this is found in the fact that rude races have no proper idea of weight. They cannot penetrate beneath the external appearance. For example, on the coast of Africa tobacco is to-day sold at wholesale entirely by the size of the hogshead. The prime object of the traders is, to seem to fill the hogsheads with the least possible weight of tobacco. By ingenious packing they sometimes succeed so well, as to make 1,200 or 1,300 pounds of tobacco appear to fill a hogshead that is capable of containing 1,800 pounds. It is only recently that we ourselves have recognized weight as forming the true measure of quantity in the case of grain.

with that which we have felt when we have put forth the exertion of force ourselves, and which sensation is revived or reproduced when we witness similar effects, we could have no idea of force, as exerted by other men, by animals, or by any natural agencies, nor of the resistances which these forces are exerted to overcome. Enveloped in a universe of forces, a being who had never himself made a conscious exertion of force could not recognize them, and so could form no notion of them, and could have no knowledge of their existence.

This determination of the mode of our perception of force is one of primary importance. This mode of perception is not limited to force. It is the invariable mode of spiritual perception. We shall find that all other spiritual realities are, like force, perceived by recognition, and that we are dead to the existence of those of which we are not ourselves capable.

It was observed respecting the perception of sensible objects and also of abstract truths, that the modes of these perceptions are precisely adapted to the natures of the objects revealed; that in each case the mode of revelation employed is the only mode in which the revelation of that class of objects could be made to us, and that this mode of revelation, *to the mind prepared to receive it*, is conclusive as to the reality of the object revealed, and also as to the correctness of the mind's apprehension of it.

Attention is now called to the fact that the same thing is true of the revelation of force to us by recognition. This is obviously the only way in which we could receive this revelation, and it is conclusive to our minds. No doubt as to the reality of force, or as to the correctness of our notion of it, ever occurs, or ever can occur, to any one.

We note further that, as it would be absurd for one

who could not form in his mind an image or conception of an abstract truth to deny its existence, so it would be as manifestly absurd for one who had no conscious experience of the exertion of force to deny the existence of force.

Our first question, How do we get our notion or idea of force? is now answered, and we pass to the second question: What is force? This is a question of a still more serious nature, but it is one that admits of a definite and certain answer.

Force constitutes one of the quarternion of spiritual realities. Truth, Beauty, and Love form the remaining sides of the four-square city. Force is, however, distinguished from truth, beauty, and love in two respects. First, it has no opposite, and so it has in itself no moral quality. Second, while each of these realities is capable of different degrees of manifestation, force is the only one, the degrees of which are comparable and measurable with precision by man. We are conscious of different amounts or degrees of force, as exerted by ourselves. Starting from these, we are able, by mere multiplication or division, to express force in amounts which, on the one hand, are exceedingly minute, and, on the other hand, surpass our own powers to any extent whatever; and we are able to state and, within moderate limits, to demonstrate these relative degrees of force with exactness.

Forming our idea of force in the manner above described, which is obviously the only possible manner, we cannot, except by violence, dissociate in our minds the conception of force from the conception of a being, by whom the force is exerted, and whose purpose is accomplished in its exertion. Of this being force must be one form of manifestation. Every exertion of it must be a direct expression of his nature. This we are conscious is

the case in every exertion of force that is made by ourselves, and we see it to be the case in every exertion of force that is made by other men and by animals. There is no exertion of force by men or animals that we do not recognize to be the manifestation of spiritual qualities, or of a disposition.

Concerning force as exerted by ourselves, we observe that it is not self-active, nor self-directed. It acts indifferently in any direction, for the accomplishment of any purpose, and as the manifestation of any disposition. In order that it shall be exerted at all, there must exist a mind, having a purpose to be accomplished, and a disposition to be manifested.

It is customary to say that force, as exerted by ourselves, is directed by the will, and there to stop, as if a full explanation had been given. A prominent example, perhaps the most prominent one, of thought arrested at the will, is afforded by the Westminster Assembly's Catechism. Take, for example, its definition of the decrees: "The decrees of God are his eternal purpose, according to the counsel of his will, whereby, for his own glory, he hath foreordained whatsoever comes to pass." This is remarkable for its outspoken character in this respect, as well as for the assent which it has received.

When we look closely to find out what is meant by this expression, that force is directed by the will, we find that it does not mean any thing. If we search to discover how much progress we have made towards learning what it is that calls our force into exercise, and determines the direction in which it shall be exerted, we cannot find that we have made any progress. If we have done any thing more than to substitute in the place of force another word that, so far as this inquiry is concerned, means the same thing, it will be found a very difficult matter to show what this is.

The will is just as indifferent as force. It needs to be called into activity, and to have the direction of its activity determined, precisely as force does. Indeed, force, as exerted by man, is nothing but the physical expression of his will. Just as man receives his knowledge of the outer world through his physical senses, so he impresses his will upon the outer world primarily through his physical strength. In the case of a being who does not act through physical organs, will and force certainly may be, and so far as we can see they must be, one and the same thing. We have thus far merely found and identified, in the will, the spiritual form of force. It follows that the theology which stops at the will gets no nearer to God than does the science which stops at force.

We must go back of the will, and inquire what it is that calls the will itself into activity, and determines the mode and direction of its activity. What is it that controls and guides our conduct? It will be answered: Our conduct is determined by the purpose that we have formed. Still only words. Purpose is only another word which means the same thing. What has determined our purpose? Why have we formed this purpose, rather than the opposite one?

We are now driven back to the real and only spring of all our activity, when this activity is exercised freely. We have reached the *ego*, the very *I*. We have found that which determines all conduct, and constitutes all character. We have arrived at the affections, at the emotional nature, which is, indeed, the whole nature of every being. Here we find the motive, the self-active and self-directed power. We have penetrated to the engine-room, and have found what it is that makes everything go. Here, at last, is the reality, the free emotional nature *is* force. All that this word force has been em-

ployed to signify, and to which the application of it is commonly limited, are only those external manifestations or exertions of force which are observable by us through our senses. The self-active emotional spirit is the force itself. It will be found that there is no voluntary exertion of force, for which we are not obliged to go back to our emotional nature, to love or hatred, in order to find its primary animating cause or motive.

This truth is one of supreme importance in a religious point of view. The contrast between Christianity and many human creeds lies in the fact, that the former presents love, while the latter present mere will, as the motive to the conduct of God. The Christ declared, "*God so loved the world.*" It is doubtful whether the meaning of this familiar text has ever been apprehended. Indeed, it is certain that its full meaning never can be apprehended by a finite mind. Theologians generally would not admit the truth which it contains, if that truth could be stated.

In the light which is shed upon this declaration by mechanical science, we see clearly enough that it cannot be a declaration of a special motive determining a single act, however important that act may be ; but that it is the declaration of a universal motive, which expresses itself alike in the work of human redemption, and in all the other conduct of God. The advance in religious thought which is now in progress, consists essentially in the passage, or rather in the penetration, from will to love, as the recognized motive to all the Divine conduct. This transition is by far the most important one that it is possible for the human mind to make. In order that the love of God shall be rightly apprehended, this love must be seen, not only infinite in its intensity, but also in its changeless universality, embracing alike every human being, precisely as the at-

traction of gravitation embraces all matter. This advance in religious thought causes the once important subject of the freedom of the will to disappear, as a subject of practical moment. It has, in time past, been necessary to contend earnestly for this freedom, against the doctrine of fatalism. Now man's free moral agency is regarded as a thing of course. The state of the emotional nature is now more clearly seen to be the single object of concern. The quickening into life of healthy or normal spiritual sensibilities is felt to be the essential thing. Just in the degree that this is done, must choice, purpose, the exercise of the will, all the activities of our nature, receive their true direction.

Returning, now, to resume the consideration of force in its physical aspects, it is obvious, from the line of thought already followed, that any conception of force in nature which dissociates it from the idea of a Being is wrong. Such a conception is just what it claims to be—that is, no conception at all. It merely declares force to be *something*, known only in its effects. If any definite or intelligible idea of force in nature is to be found, it must be that it is the manifestation of the nature of a Being. We repeat the appeal to our own consciousness. We are compelled to say, that force, when exerted by ourselves, is the outward expression of the real force within us, which is found in our affections. These are the ultimate and real spring of every free conscious act. Then the only conception that we can form of force in nature, and the conception that we must form of it, unless we refuse to form any at all, is, that this force, in all its varied forms, is the expression of the nature of an Infinite Being.

But our analogy carries us further than this. Our own affections cannot have for their object any form of what we term matter. This spring of our activity is never animated by matter. Something beyond matter determines

every exertion of force by ourselves. Matter may often be very closely associated with this outward manifestation of our spiritual activity, but it is always employed only as a means, never as an end in itself. The real object which calls our spiritual force into exercise, and so determines the outward expression of it, is always a being, either ourselves or another. Our own activity always terminates on a being, and every free, conscious act is performed with immediate or ultimate reference to a being, but for which being there would be no impulse to its performance, and it would not be performed. An inquiry as to the motive to any act will show this to be the case.

We are obliged to complete our conception of force in nature in the same manner, and to regard it not merely as the expression of the nature of an Infinite Being, but, moreover, as the expression of such a nature with reference either to Himself or to other beings. And this is conduct. The fundamental importance of this truth is perceived at once. It changes the impersonal view of force in nature into a personal conception.

I shall not enter further into this subject here, but in subsequent papers shall endeavor to approach the same great centre from other directions.

At the commencement of the Civil War in America, the causes of it were discussed in England in essays and addresses, in which allusion to the institution of slavery was carefully avoided. These discussions were humorously and happily likened to the play of Hamlet with the part of Hamlet left out. So physical science, with its objective methods, like a child whose thought does not get beyond what it can see and handle, endeavors to comprehend creation with the Creator left out. Science is, however, compelled to admit the existence of one reality, force, which is not revealed to us through our physical or-

gans of perception. Having arbitrarily severed force from its necessary connection with a Being, science is obliged to admit that it cannot form any conception of it at all.

It is interesting to observe, how the very occupation, to which the materialist endeavors to confine himself, of weighing matter, of the existence of which only he is certain, which he can see and handle, is after all nothing else than comparing the degrees of this first spiritual reality—the mystery of force.

THE UNITY OF PHYSICAL AND SPIRITUAL TRUTH.

Thus far mechanics has been considered as the science of force. It is more than this. It is also the science of truth. We have seen its power to free the mind from all forms of authority over thought and belief, and to lead the inquirer after truth directly to its source. Now we have to observe its influence in a somewhat different respect. It will be shown to render valuable aid, perhaps it should be regarded as indispensable aid, towards the true and healthy development of our spiritual being. It does this by disclosing the essential unity of physical and spiritual truth, and rendering it obvious that truth in its unity can be apprehended correctly only by the spirit in *its* unity.

In introducing this subject, it seems necessary to anticipate, in a single particular, the general subject of a subsequent paper, by calling attention here to the harmony that appears between the physical and the verbal forms of revelation, in this respect of truth.

The law of truth stands written in the human conscience, but the consistent observance of it is beyond the reach of human nature. This law has been inculcated by all sages, and it underlies the legislation of every age and every race. It commands the involuntary homage of men. But, practically, how fearful is the disregard of it!

One great want of the human race is the recognition of a high and unchangeable standard of truth. The need of the influence of such a recognized standard, rising before men in the midst of the daily affairs of life, inherent in all the associations by which they are surrounded, and continually presented to their gaze, is painfully apparent, not only in the history, but also in the present life, of our race. The difficulty does not lie in the actual want of such a standard. The standards of truth exist, fully meeting these requirements, and entirely harmonious with each other. But these are not regarded by men. The human spirit is not opened to their influence. As far as possible, it refuses to recognize their existence. They present a perpetual and everywhere present reproach, the sight of which men cannot endure.

First. The Bible unites with conscience, in erecting the standard of absolute, transparent, uncompromising truth. It is of the highest consequence, as well as interest, to observe that, while the several books of the Bible were written at intervals, extending certainly over more than fifteen hundred years, and by men of great diversity of character, under a great variety of circumstances, and in every different form of composition, this fundamental unity of truth, associated with other unities of a remarkable nature, runs through it from the beginning to the end. Everywhere simple, downright truth is demanded, and that in terms expressing the most exalted conception of it, as the foundation of character, on which alone it is possible for the structure of spiritual life to be erected ; as the fundamental element of the harmony which, in the normal condition of the human soul, would exist between it and the Divine author of its being, whose first attribute is declared to be truth that endureth to all generations.

Second. We are now to observe how the physical modes

of revelation, the nature of things by which we are environed, harmonize with the Bible in this respect, how one law of truth runs through the spiritual and the physical modes of being, and especially how mechanical science helps us to perceive and realize this identity.

If we analyze our conception of truth in moral beings, we shall find that this conception involves two wholly distinct ideas. The primary or underlying idea is that of uniformity of action or conduct. We always know what the absolutely truthful man will do under given circumstances. There can be no doubt or uncertainty about it. We know what to rely upon. This is the first idea. The second is the idea of justice. This man will do exactly what is right, as he views the right. Here the element of human fallibility comes in. He may be mistaken in his view, but what he holds to be right, that he will do. His conduct will be guided by the highest and best motives of which he is capable. This is our conception of truth in moral beings. First, uniformity of action; second, justice in action.

Let us at first confine our attention to the primary or fundamental idea of truth, which is, uniformity of action. In this respect at least, one who comes to engage in the study of mechanical science finds that he has entered the region of eternal truth. Here nothing can by any possibility deceive or mislead or fail him. He can rest with absolute certainty in the confidence that, precisely as force is seen by him to act to-day, so under the same conditions it always has acted, and invariably and forever will act. This is a fact of unspeakable consequence. Not the student of engineering alone, but the whole race of man, in all its relations and employments, relies implicitly upon uniformity of action in nature. This reliance constitutes the foundation of the peace, and the encouragement to

the activity, of every creature. Thus we find the primary idea, of uniformity of action, that idea which underlies our conception of truth in moral beings, exhibited in its complete and absolute realization everywhere in nature.

It is difficult to conceive of uniformity of action even, without a moral purpose of some character, either good or bad, beneficent or injurious, loving or hateful, kind or unkind. That is to say, it is difficult to conceive of action without an actor. Or rather, it would be difficult to form such a conception, if we had not from our infancy been carefully educated to do it. Materialistic science, encouraged by the false religious conception of a remote God, has taken our education in hand, and has seen to it that we should be taught, in observing this uniformity of action in nature, to form an absolutely impersonal conception of it. We have been brought up on the laws of nature. Truth in nature we have been taught to regard as uniformity of action, secured by obedience to law. All idea of a Being, or of a moral quality, in any act seen in nature, has been carefully excluded from the mind. Curiously enough, the very uniformity of action, which is the fundamental element of moral truth, which is the first thing we have to look for in the conduct of a perfect moral Being, the absence of which would prove at once the non-existence of such a Being,—this very uniformity of action is itself made use of to hide this Being from our sight.

But in reality, nature presents to us far more than uniformity of action merely. In nature the moral element and the Infinite Being are manifested in the clearest manner. Nature exhibits everywhere, not a partial, but the complete idea of truth. It shows us, not uniformity of action merely, but also the motive by which this action is directed. If we take a comprehensive survey of the

subject, we can hardly fail to perceive everywhere a uniform and obvious purpose. We shall see force in nature to be directed to a single end, and to be wholly beneficent. In this single beneficent end the infinite diversity of the manifestations of force have their unity.

Let us commence our survey with the earth itself. We observe first of all that, as the earth flies through space, rotating on its axis, revolving about the sun, and attending him in his grander orbit, by its attraction it holds both man and all his works, and all objects upon it, securely to its bosom. This is not a fanciful expression. It is a plain statement of the fact. From a contemplation of this supreme care, we may pass to consider, in a comprehensive view, the multiplied and varied operations of all natural agencies. As here we contemplate the harmonious coöperation that we behold everywhere manifested, we cannot fail to perceive that every thing is fulfilling its appointed office within a plan. Whether we attempt to comprehend this plan as a whole, or endeavor to explore any separate detail of it, in either case we find our power of observation and of thought transcended. Its grandeur and its minuteness alike overwhelm us.

We are able, however, to apprehend this plan sufficiently well to perceive it to be animated by a central purpose, to the final achievement of which all subordinate results, in their own accomplishment, are obviously intended to contribute. We behold the earth, the air, water, light, and heat, with all manifestations of force, together with the inferior creations of both vegetable and animal life, in one grand harmony, ministering to the service of man. All these agencies combine, to sustain his being, to develop his powers and capabilities, to provide employment for both his physical and his mental activities, and furnish incentives to their exercise, to supply

the means for the accomplishment of his purposes, to delight his senses, and to call into exercise all the highest forms of his spiritual activity and satisfy their longings. Thus, in ways endless in their variety, all things minister to support, to illuminate, and to gladden the existence of man. There can be no question about this fact. Every increase in his knowledge, every improvement in his culture, each enlargement of his powers of observation and of feeling, enables man to see the fact with increased distinctness, and in a continually higher sense, that his own being and happiness is the immediate end of the creation over which he finds himself to be the lord, whom both things and inferior beings serve. This combined physical, intellectual, and emotional existence of achievement and joy in man is the single and obvious end of the unvarying activity that is to be observed in nature.

From any candid consideration of this scheme, above all ideas of power and of wisdom that it conveys, the mind that is itself in any degree beneficent must just in that degree be impressed with a sense of the beneficence that is manifested in it. We say only that the beneficent mind must receive this impression, because, just as beauty can be revealed only to beauty, so beneficence can be recognized only by beneficence. And so, generally, whenever references are made to moral qualities, it must be assumed that these qualities are possessed in some degree by the reader. If they were not, the language could convey no meaning to him.

We note that the grander the intellectual power of the observer of nature, the more he becomes amazed in the contemplation of the mighty plan; and, on the other hand, the more highly his own beneficent disposition is developed, the more deeply he is affected by the consideration of the beneficent spirit by which this plan is ani-

mated. We seem, then, to be warranted in the conclusion that both wisdom and beneficence are combined in this plan, in degree beyond our power to recognize, and that the limit to our apprehension of either is found in the imperfect development of wisdom and beneficence in ourselves.

The reflections thus far made point to the conclusion, that truth in nature is something more than uniformity of action; that it is uniformity of action with a beneficent purpose. But purpose and beneficence are both attributes of a being. We are thus brought to the necessity of admitting, what the spirit of man in its healthy development recognizes with exultation and rapture, the existence of an Infinite Being, whose ceaseless beneficence is manifested throughout the material creation, and of which beneficence man is himself the supreme object. Like the Sabbath, all things were made for man.¹ At a later stage of our argument we shall reach a still higher unity, in the adaptation of all things to a higher purpose.

Such is the definition of truth in nature;—uniform beneficent activity. The same definition holds good, also, of truth among men, with an apparent, though not a real, modification, that exists in the nature of things. Beneficence implies relations of superiority and dependence. There cannot be beneficence between equals. Here, evi-

¹ In the interpretation of nature, the blind seem thus far to have had it pretty much their own way. We have been taught to repeat absurd expressions, founded upon supposed exceptions to infinite beneficence, as if these were the rule. Men have been captivated by such senseless raving of morbid poets as, "Nature, red in tooth and claw." The earth exerts the inconceivable benefit of its uniform attraction, and the blind try to fix our attention on somebody falling from a precipice. The sun warms all being into glad existence, and the blind see a man sunstruck. The vital air supports all life, imparts joy with every breath, and brings health upon its gales, and the blind point us to cyclones, and so on to the end of the chapter. It is as if we gazed upon a glorious picture, and could see nothing but fly specks on it. The apparent exceptions to infinite beneficence, however, demand thoughtful consideration.

dently, the moral quality of truth is justice. Among men, various kinds and degrees of dependence are observed to exist. When considered alone, these differences of condition often seem to be extreme; but when we take a more comprehensive view, we discover that in reality the range of this inequality is very limited indeed. One human being cannot be conceived to be dependent on the beneficence of another in any such sense as this, that, without the active exercise of that beneficence each instant, and in an infinite multitude and variety of ways, he could not exist. But this is precisely the sense, or the degree, in which every creature alike is dependent on that beneficence which is uniformly manifested throughout the physical creation. Compared with this dependence of every being on the infinite beneficence, the beneficence and the dependence that are possible to exist between man and man very nearly disappear.

Beneficence and justice are, however, essentially the same thing. These are words that characterize the outward act, rather than the inward sentiment or motive. The acts of beneficence and justice have their common source and motive in love. This is the supreme active principle. Its manifestations differ in form, as required by the varied relations of the beings in whom it exists. Thus love, the moral quality of truth, which between equals manifests itself in act as justice, assumes the form of beneficence on the one hand, and of gratitude on the other, just in the degree that these practical manifestations of it are called for by the existence of the relations of superiority and dependence. These are all the natural expressions of the same sentiment or feeling of love, in different ways, as required by different conditions or relations. These differences of manifestation may even exist in our consciousness, but all these sentiments, if sincerely

felt, are in reality one. The sentiment of love to his neighbor impels the true man to be just, or generous, or grateful to him, as these expressions of his love are demanded by the relations that he sustains. Beneficence and gratitude are reciprocally due, and the former equally with the latter, from man to man, when the relations of superiority and dependence exist between them. In this way, as in every other, love impels to the hearty rendering of that which is due. Thus all manifestations of love, in outward act, are properly embraced under the term "justice." This comprehensive idea of justice extends, it is true, far beyond the requirements of human laws, and far also beyond our ordinary habits of thought; but it is clearly seen to be the true one. The term "justice" properly comprehends every form of the outward expression of love; the rendering of which expression affords, to the spirit in which the sentiment itself exists, and just in the degree in which the spirit is animated by this sentiment, the same joy that is kindled by the reception of it. Truth universal we thus find to be reciprocal just action between moral beings. It is the expression of love and the source of joy.

Love is thus seen to be the normal motive of conduct, and justice, in some one of its forms, to be its outward expression, in all cases alike, whether in the case of equality, or in the case of infinite dependence on the one hand and infinite care on the other.

In the divine nature, the eternal changlessness of which mechanical science is educating mankind to form a conception of, it is thus obvious that no schism can exist between love and justice. Justice is a mode of action. It has only one opposite, and that is injustice. Injustice is sin, that shocks the harmony of the universe.

In considering the subject of truth between man and

man, viewed as equals, or the practical application of the principles that have just been dwelt upon, in the daily intercourse of men, it becomes necessary to distinguish carefully between facts and ideals; or, in other words, between truth as realized, and the ideal of truth. For common and familiar illustrations of this necessity, we may take our commercial measures, the pound, the yard, the bushel. Persons who are accustomed to accuracy know very well that neither of these ideals could be absolutely given in any reality. But the faithful representation of them, in quantities of things merchantable, with the closest attainable approach to accuracy, is honesty. Here we at once recognize justice to be the essential moral element in truth, and also the fact that every act of a being must possess a moral quality. Uniformity of action in giving short weight or measure is the opposite of truth.

The ideal, as above illustrated, underlies all material realities. Through these realities, as the only possible way, the mind is continually endeavoring to reach the expression of its ideals. Thus the mechanic has in his mind the ideals of mechanical truth, as of the true line, the true plane, the true cylinder, the true angle or division of a circle, the true divisions of force, of space, and of time, truth of form, and of construction, and of mechanical function. It becomes his highest aim to realize these ideals in sensible form, or, as it may be termed, in concrete expression. To this end he exhausts his ingenuity in devising methods, and his skill in the application of them.

The question naturally presents itself: Where is the moral quality found in this form of truth? The answer to this question lies on the surface, as much so as in the case of the true pound, or yard, or bushel, which, indeed,

are some of the very ideals that the mechanic endeavors to realize and embody with exactness. In these, and in all other cases, men are dependent on the mechanic for the means of measurement. Upon his ingenuity and skill, directed to the realization of his ideals, in such ways that the expression of them can be uniformly repeated, all men rely, throughout their varied intercourse, and in their search after every form of knowledge of a physical nature. All other men are dependent upon the mechanic for the means by which to express, in reality, with the utmost attainable exactness, the ideal physical truths existing in *their* minds, and to discover those which exist in nature. The mechanic is thus called upon to perform a service of fundamental importance, and in undertaking this service he assumes a relation towards his fellow-men, in which justice demands from him the exercise of the most anxious fidelity.

But we need not look so far as this. We may suppose that these uses for his labor are beyond his thought, and that his attention is limited to the truth itself; that he is endeavoring to realize this truth entirely for its own sake. In what he is doing he has now, by our supposition, no conscious relation with his fellow-men, but only with his own conception of the mechanical truth that he is seeking to realize or to express. Here the moral quality appears in fidelity to his ideal. It is obvious that he can be faithful or faithless to this, in the same sense in which he can be faithful or faithless to his fellow-men. There exists a moral quality in every possible act of man. He sustains always a relation of some kind, and whatever this relation may be, his conduct must be either true or false, just or unjust, right or wrong.

The moral quality of truth among men is not, however, here at all in question. This is universally recognized. It

is the moral quality of truth in nature that I am endeavoring to make clear, and the above elucidation of the general subject of truth is important only in its bearing on this demonstration, as it enables us to see in nature the presence of the Infinite Moral Being with more distinctness. The moral quality of truth may properly be expressed by the word "faithfulness." Now the faithfulness of God in nature, as it seems to me, must be deeply impressed upon the mind that is capable of just sentiments, when it is considered what the consequences would be, if uniformity of action in nature could ever fail.

These consequences, although unspeakably transcending them in degree, would be of the same character as those which follow from deceit, misrepresentation, or unfaithfulness in man. Imagination could not conceive the effect upon the human race of a general loss of confidence in the uniformity of action in nature; a confidence that is so absolute, and upon which all human affairs depend. When we reflect upon this view of the subject, we feel, indeed, that the expression "uniformity of action" is inadequate, even to mockery; and that the only rational conception of truth in nature is that of faithfulness on the part of the Infinite God.

Nothing is more instructive, and nothing can be more fascinating to the ingenuous mind, than the contemplation of this faithfulness, as it is manifested in the unvarying uniformity of constitution and operation of all things in nature, and the realization of our own helpless dependence on this fidelity. From the multitude of illustrations, of this faithfulness on the one hand, and of our dependence upon it on the other, which crowd upon our attention, two, taken almost at random, must suffice.

The first illustration is this: The constitution of the atmosphere, in the proportions of the two gases, oxygen

and nitrogen, which compose it, is invariable over all the earth. Now of all the forms of matter that exist, or that can exist, in the gaseous state, and of all their combinations, it has been shown that this particular combination of oxygen and nitrogen is the only one that can sustain animal life. Not only in this the case, but, moreover, it is found that the least change from the existing proportions of these two gases, even though so trifling that all the analytical skill of the chemist is taxed to discover it, would produce injurious effects on every creature that breathes. Our admiration and awe are increased when we consider the fact, that no chemical union or combination takes place between these two gases in the atmosphere, but they exist together merely as a mechanical mixture. A great reason has been found why this needs to be so, a reason which will be stated in its proper connection by and by. But the mystery which strikes us dumb is, how these indispensable proportions are preserved. If a chemical union took place, then we might imagine that we understood it. But what determines and maintains those proportions in a mere mechanical mixture? This is something that we know nothing about. We can perceive or imagine no necessity, we are shut up to faith that these proportions will be preserved.

The second illustration is this: The earth is not a perfect sphere, but its equatorial diameter is 26.48 miles greater than its polar diameter. This excess of matter at the equator is the effect of the centrifugal force that is developed by the revolution of the earth on its axis. This centrifugal force sustains over all the globe a spherical crescent. The points of this crescent are at the poles. From these it gradually increases in thickness, until at the equator it reaches around the whole circle of the globe the depth of 13.24 miles. That portion of the

earth's surface which is now solid, having assumed this general form when in a fluid state, might possibly retain this form, although some change had taken place in the forces by which it was originally determined. This, however, could not be the case with the fluid portion. The surface of the ocean is held at this elevation at the equator by this centrifugal force. Both on the equator, and at every other point of their surfaces, the oceans stand at the height that is determined by the equilibrium of the two counteracting forces, namely, the attraction of the earth and the centrifugal force developed by its revolution. A change of one minute in the period of the earth's rotation, or in the length of the day, would produce a change of 196 feet in the relative heights of the ocean at the poles and at the equator. Should the day become shortened by this amount, a wave sufficient to produce this change would leave the equator on all sides of the earth and flow towards the poles.

But we may sleep in peace, and go about our daily avocations undisturbed. Eternal faithfulness knows no relaxation. Unhindered motion continues uniform forever. It is certain that since geologic time began the relative elevations of land and water on the surface of the globe have not suffered any changes other than those of a local character, and referable to local causes. Even these changes have proceeded so gradually as to become sensible only after long periods of time. There have been no alterations of a general nature, such as would indicate a sensible change in the rate of the earth's rotation.

Thus mechanical science, using the term in its largest signification, as the science of force, shows us to be environed with truth; and, moreover, it habituates us to the continual association with truth, in the multiplied forms of its physical expression. In all these forms we have to

deal with it continually. The influence of this environment of truth has already been largely felt, although as yet attention has been but little directed to it. Men have been mostly unconscious of its influence. This has been silently but none the less powerfully exerted. From the education that will, directly and indirectly, be afforded by mechanical science, it must result, that mankind generally will come to be more conscious of the manifestations of truth by which they are surrounded. The all-pervading presence of the Deity will come to be more generally felt, and will exert more and more its legitimate influence on human character. The ultimate extent of this influence will undoubtedly be greater and more beneficent than we are at present able to imagine.

In an earlier paper allusion has been made to the relation that the creation bears to us as our educator. Attention was there called to what was termed the ministry of force. We have now been considering a higher form of this educational influence, which the physical creation is adapted, and was evidently intended, to exert on the character of man, and which we may term the ministry of truth.

The observer of nature has the fact impressed upon his mind, more and more deeply, that the primary law of the universe is truth—uniformity of action, directed by love. He learns also the only way in which a moral being, endowed with a free will, can come to be in harmony with this universal law of truth. This must be established, also, as the law of his own voluntary activity, by the perfect development of its motive ; so that it becomes the only manner in which it is possible for his volition to act. The necessity for this standard of truth in his own being is not at all affected by the fact, that he finds it too high, not only for his attainment, but even for his comprehen-

sion. The attainment of it is clearly the only way in which truth in human beings can be made to conform to truth as this is set before us in the physical creation.

So long, however, as physical truth continues to be falsely apprehended, it can exert but a feeble influence upon the spiritual nature of man, compared with the mighty benefit that should be received from it. Philosophers consider it scientific to exclude the Creator from his works. Metaphysicians until quite recently have taught that the mind is composed of separate and unrelated faculties; and the mental activity by which the moral quality in nature can be recognized we are to this day forbidden to exercise for that purpose.

In all systems of education, a wide distinction is still made between physical and moral truth, as being essentially different, and as being apprehended by us through different faculties or senses. We are taught that physical truth relates to things, and is apprehended by us fully and completely by the exercise of our intellectual faculties; while moral truth relates to moral beings, and is apprehended by us through our moral sense. We are taught that, by the employment of our purely intellectual powers we comprehend physical science in all its departments; and with this science moral truth and moral sentiments and the emotional nature have nothing whatever to do. We are taught that between the laws of the physical universe and the conduct of moral beings, as between the mental faculties by which the former are apprehended, and the moral sentiments that direct the latter, there exists absolutely no relation. By most persons this would be laid down as an axiom, too obvious for discussion, needing only to be stated. To this height of absurdity have we been brought by a false system of education.

All this elaborate artificial classification has already

been shown to be wholly imaginary—as much the idle creation of the mind as is any system of idolatry. Here we find mankind lost in a morass of falsehood, out of which nothing can extricate us, except the recognition of the absolute unity of truth in its physical and its spiritual forms of manifestation, and also of the unity of the human spirit by which this truth is to be apprehended.

Science would shut us up to the contemplation of law; the highest conception possible to be formed by what it terms the intellect; the imaginary God of this imaginary member or organ of the human spirit. But the considerations which have been presented leave no room for doubt that the spiritual element is the fundamental element in physical truth, and that the idea of physical truth that does not embrace this feature of it is incomplete in a vital respect, and therefore is misleading in its influence. We are now able to affirm that every physical phenomenon is the act of an Infinite Being, performed with reference, either direct or ultimate, to inferior and dependent beings.

Physical truth is then properly defined to be the conduct of God. It is the mode in which God deals with man, and works with reference to man. So, in its essential nature, as well as in the mode of its revelation to us, or of its apprehension by us, it is not to be distinguished from the conduct of men, or the mode in which they deal with one another.

The recognition of force in the universe, without the recognition of the moral quality in every manifestation of force, as the act of a Being, is as if we should confine our attention to the mere exertions of force by men, without reference to the motives by which these were prompted and directed. The latter is something that the mind refuses to do. We know, our own consciousness assures us, that every act of man is directed by a motive. Then our

only possible conclusion is that every act of God is directed by a motive; and the imaginary distinction between physical and moral science, and the modes of their apprehension, vanishes away.

Attention has already been called to the fact, that this distinction, which has been made fundamental in our systems of thought, and the effect of which is so unfortunate, is in reality only a distinction between those truths which *can* be considered without reference to a Being, and those which cannot be separated from a Being in our thought. All phenomena which men *could* consider separately from the idea of a Being they have so considered. They have formed such partial conceptions of them as they could do when thus cut off from their source, and these conceptions constitute physical science.

The work of "the understanding," about which we hear continually, is, in all the field of physical science, merely the activity of the mind in tracing relations, in distinguishing, combining, and concluding, based on a partial apprehension of the facts; when the facts of paramount significance are not present in consciousness.

This partial philosophy receives but little check in those departments of science, in which the physical organs of perception are wholly relied upon, in which observation terminates on material forms, and in which it is possible for the thought of spiritual realities to be avoided. But mechanical science, which brings us into immediate contact with the omnipresent reality of force, and exhibits to us, in uniformity of action, the underlying and primary element of moral truth, contains a power that aids us materially in the discernment of all spiritual realities.

In a former paper we have considered the unity of the human spirit. Our present discussion enables us to affirm the unity of truth. There is only one kind of truth, as

there is only one spirit in man to apprehend it. Truth in the physical creation is the conduct of God. Science is the knowledge of the conduct of God. Truth in man is conduct like the conduct of God. All truth involves spiritual being as an essential element of the conception, and requires for its correct apprehension the exercise by the human spirit of every form of its activity.

THE PERCEPTION OF SPIRITUAL REALITIES BY RECOGNITION.

GOD in nature is the supreme fact of science. Then, of course, He ought to be so regarded. But He is not generally so regarded. There must be a reason for this refusal, and a reason which, when we come to perceive it, will appear to us adequate to account for the fact. This phenomenon, like all others, must have its complete explanation. It is only necessary that such explanation shall be pointed out. This will be attempted in the present paper and in succeeding papers.

The real cause of the failure of the mind to perceive God in nature seems to lie in the mode of revelation, by which the knowledge of all spiritual realities is conveyed to us. It has been shown already respecting force, that this first spiritual reality is perceived by recognition. We become aware of the existence of force only as we recognize it. Through similarity of effects produced, we recognize force as the act of a being; an act similar to efforts which we are conscious of having made ourselves. It seemed obvious that one who was not himself capable of exerting force could not form any idea of force. It is not necessary to repeat here the exposition of this undoubted fact.

We now note that the other spiritual realities, truth, beauty, and love, are revealed to our minds in the same

way, or by recognition. Like force, they are of a nature incapable of being apprehended through our physical organs of perception merely. Still, like force again, they are revealed to us in some way. In some way, and in some degree, we certainly become aware of their existence. How do we come to have such cognitions? We obtain them in a manner similar to that in which we obtain our knowledge of force. Through similarity of manifestation, in outward act, or visible or audible expression, we recognize that which we are conscious of experiencing ourselves.

This is the only way in which such conceptions can be formed, in which the images of truth, or beauty, or love can be seen by us in consciousness. We recognize that which is like to our conscious selves. In addition to this, we also recognize that which is like to our ideal; that is, which is like in kind, only transcending in degree, that of which we are capable ourselves.

As one incapable of exerting force can form no conception of force, so one incapable of truth or love can form no conception of truth or love. Any expression or manifestation of these realities in others cannot suggest any corresponding sensations to him. He has no experience that would enable him to recognize them. They revive no images in his consciousness. The same is true, also, of beauty; although we cannot well consider the case of beauty until we shall have seen its true nature, and the identity of physical with spiritual beauty, which will form the subject of a later paper.

This mode of perception of spiritual realities is not essentially different from that of the perception of objects of sense. In both perceptions alike an image is formed in consciousness. In the one case this image is like some external object. In the other case it is like some previous

sensation. In each case it is only the image that is contemplated, and that is referred by us to the object, or to the being. For illustration, we attribute whiteness to an object and purity to a soul by mental processes similar to each other, and which are founded upon images that in the two cases alike we have formed in our minds.

The identity of these mental operations ought to be made entirely clear. In physical perception the likeness always stands to us in place of the reality. The purpose of all care in observation is to form this likeness correctly, and all errors arise from the failure to do so. Every sense is often called into exercise to verify the correct image in our minds.

So, precisely, we observe the conduct of other persons, and we form images or conceptions of the motives that have actuated them to such conduct, or of the sentiments or feelings that are manifested by it. These images or conceptions we can form in only one way. We recognize the fact, that by similar conduct we should ourselves manifest or express such motives or sentiments or feelings. The images of them are revived in consciousness, and we attribute or refer these motives or sentiments or feelings to the person whose conduct we observe. This accounts for the fact, that ordinarily it is not possible for men to conceive of other men as being actuated to any particular conduct by motives different from those which they are conscious would impel themselves to the same conduct.

Another result follows from this mode of spiritual perception. In advance of any conduct observed, it is the spontaneous impulse of the mind to perceive in every other mind the reflection of its own conscious self. We naturally refer the sensations and emotions of which we are conscious to other minds, precisely as we do to our

own. Thus we intuitively expect from others the same conduct, or outward expression of the spiritual state, that would be natural to ourselves.

Among spiritual beings in their normal condition, and for such beings this mode of perception of spiritual realities was evidently designed, this expectation respecting the conduct of each other could never be disappointed. The conduct would invariably manifest the existence of love, and consequently of truth, in every one in equal degree, and complete harmony and sympathy would be the necessary result.

But among men the realities of truth and love are developed in very different degrees, and these degrees at the best limited; moreover, each one of these has its corresponding opposite, in falsehood and hatred, and these opposites are also developed in endless diversity of degree. These two classes of opposites, in their various combinations, constitute the varieties of human character.

Under these abnormal conditions, the spontaneous inclination still exists in each individual, to see in others only the reflection of his own conscious nature, to attribute to others the motives and sentiments which alone he is able to conceive, and to reconcile all conduct observed with such motives and feelings.

This tendency, which is now a mistaken one, is in some degree corrected by experience, in proportion as the judicial spirit is possessed. It is only by the exercise of this spirit that we are able to attribute conduct that is of a character more elevated than we ourselves are capable of to motives which we cannot comprehend, or of which we are not conscious.

It is obvious that the complete want of the normal spiritual realities of truth and love, and still more the possession of their opposites, must of necessity render the in-

dividual insensible to the existence of the former in other beings. He cannot recognize them. He cannot perceive their existence, in the only possible mode of such perception. For him they have no existence. He is necessarily dead to them. This affords the explanation of the fact, which has already been stated, that like can be revealed only *to* like, beauty to beauty, truth to truth, love to love.

The subject of ideals of truth and love, and consequently, as we shall see hereafter, of beauty, is an interesting and important one. Ideals of these realities are images of them which are perceived by us more or less vaguely, because in degree they transcend our own experience, and so exceed our power to form images of them distinctly. It is to be observed, that our power to form these ideals, or indistinct conceptions of degrees of truth and love that transcend our own experience, increases with each increase of our conscious possession of these realities, or in other words, of our ability to form distinct conceptions of them. The higher the actual attainment, the higher becomes the ideal.

This is in accordance with what is to be observed universally. In looking at any object of sense, for example, the ignorant man is quite incapable of realizing that there is any thing before him that he cannot see. To the instructed mind, on the contrary, just in proportion to the depth of its own real insight will be its further apprehension of the existence of that which is beyond its power to discern. So precisely in the case of these spiritual realities. The greater the degree in which these are really possessed, the more capable the spirit becomes of realizing the facts, of their infinite nature, and of the limited extent to which it can form distinct images or conceptions of them, or become distinctly conscious of their existence.

When we shall come to consider the combined manifestation of all normal spiritual realities in their harmony, which is beauty, the occasion will present itself for viewing this general subject of spiritual recognition somewhat more in detail. The observations already made seem to be sufficient, to show this recognition to be the necessary mode of the revelation of these realities.

THE REVELATION OF GOD.

IN the preceding paper a brief exposition was given of the mode in which all spiritual realities are revealed to man. It would seem to follow, necessarily, that the supreme spiritual reality, the Infinite Being, in whom force, truth, beauty, and love inhere, from whom these proceed, of whom they are the manifestation, can Himself be revealed only in the same way, or, by recognition, as our ultimate and adored ideal. The importance of this subject, and the radical error underlying the view of it which is commonly held, and which has become fixed by our education, demand for it, however, a separate and full discussion. It is undoubtedly necessary that the application to the revelation of God, of this law of spiritual perception by recognition, should be distinctly shown.

When, in another stage of being, our eyes shall be opened, or our power of spiritual recognition shall be enlarged, the overwhelming fact will burst upon us, that God had been before us every instant of our existence, and had been revealed in every possible way ; that all things had combined to show the supreme truth of his presence ; and that, while the few had faintly and dimly realized the enrapturing revelation, the mass of mankind, through inability to recognize infinite and universal love, had been stone-blind to it all. Amazement will fill the soul, as it recalls, in every activity of nature, the ceaseless revelation of God.

The mistaken views and confusion of thought that prevail on this subject, of our apprehension of the being of God, have their roots in the artificial imaginary divisions of the human spirit, and the arbitrary allotment of separate functions to its supposed organs. Thus it is assumed that the emotional nature has no perceptive power. It is taken as an axiom, that I cannot love, except as first I have an intellectual apprehension of the being that I am to love. The fact that love only can recognize love, that it is only through such recognition that the spirit in its unity obtains its knowledge of the existence of this principle, or emotion, or motive to action, in another spirit, and of God, who is love, is a fact that has not itself been generally recognized. Hence this confusion.

The first step toward a right understanding of this important matter must be to disabuse our minds of the idea that the being of God is, or can be made, in any degree the subject of our intellectual apprehension. This proposition will, of course, seem a very strange one to the reader who assumes our intellectual apprehension to be our only mode of apprehension. The error lies in this very assumption, the unfounded nature of which I shall endeavor to show.

A disposition still exists among theologians, although less strongly marked than it has formerly been, to exalt the reason, and in some vague way to rely upon it as a source of spiritual knowledge. In this theologians have only followed the prevailing philosophy. They have perseveringly tried to find in the reason the means of reaching the unseen, of attaining a knowledge of what has been called the supernatural. In this they have repeated the folly of the builders of Babel, apparently comprehending as little as they the nature of the structure that shall "reach unto heaven." Mechanical science has made clear

the futility of all such efforts. It shows us that the mental processes, which, in common parlance, men call the exercise of the understanding, do not afford the means of arriving at any truth except in the region of pure mathematics; that, with the exception of these ideal truths, all realities, both those of a physical and those of a spiritual nature, are revealed to us in other ways. It shows us still more than this, namely, that respecting all realities of a physical nature, our reasoning needs to have its errors corrected by observation at every step. Now, the speculative mind loves to get far away from these physical fields, into regions where it is secure from these tests of observation. But the analogies of mechanical science follow it there. There is no escape from the searching question: If in things with which we are most familiar, and where the truth is well established, it is not possible for the mind to advance one step alone without the certainty of falling into error, what confidence is it possible for us, as reasonable beings, to put in speculations of the understanding, or so-called intuitions of the reason, where our vagaries cannot be corrected? In these highest departments of truth also it is evident that we must seek for, and recognize, and submit to, the guidance of revelation, if we would have our belief here rested on the same secure foundation, on which we have rested our belief of physical truth. The mode of revelation of the highest spiritual truth becomes, then, the subject of supreme interest.

It occurs at once to one educated in the prevailing philosophy, and whose thought is bounded by its formulas, who cannot receive into his mind the truth of the exclusive perceptive power of love in its own province, to ask: "How can I love God, unless I first have a belief in his being, which belief I arrive at by the exercise of my reason or intelligence?" This question appears unan-

swerable to those who have been educated to regard love as a mere sentiment, and to rely on what they call their intellectual faculties as the only means of knowledge. According to this philosophy, the knowledge must exist first, obtained in some other way, before the sentiment can have any object for its exercise.

We observe that this question assumes belief in the being of God to be one thing, and love for him to be quite another and a subsequent thing. Such a conception of the subject is apparently fortified by the fact, that the existence of God is confessed by very many persons, who yet profess to feel little or no regard for Him. The answer to this question is, that the imaginary being, of whom men can form an intellectual idea, is not God. The understanding leads men astray here as completely as we have seen it to do in the search after physical truth. The God of the understanding is the work of men's imagination. He is not their Creator, but their creature. They have created him, and have made him a being like themselves, and so quite within their comprehension; only greater than they, just as the forces manifested in nature are greater than those which they can exert. It is evident on reflection that the mental process by which this imaginary deity is formed is not to be distinguished from the process by which men create idols, and attribute their own qualities to them. The utmost that our God-makers do, or can do, is to select their own good qualities or ideals, or those which they believe to be such, and in which belief they are always in a greater or lesser degree mistaken, and to invest their handiwork with these. Each person has his own ideal, and so makes his own God, about whom his conceptions are generally pretty definite. In the study of all things in nature we are directly lost in mysteries. We may, perhaps, make as much progress toward a com-

plete understanding of common objects of sense, as a miner makes toward reaching the centre of the earth. But when we approach the infinite mystery of the being of God, we are content to create in imagination a being adequate to make and to do what we observe to be made and done, and to say: "This is God." This is the work of what we call the intellect, by which we mean here the imagination. As if conscious, however, of the imposition, men are inspired by this imaginary deity to no act of worship, or feeling of love, or exercise of faith. They recognize no personal relation between themselves and their handiwork.

A chief cause of the error here is to be found in the influence of human analogies, which, when pressed too far, are always misleading. We observe concerning our fellow-beings, that in order that we shall love them, we must first obtain through our senses evidence of their existence. We form images of them in our consciousness, which images are determined by the reality before us, and with which images we then proceed to associate conduct observed, and sentiments and feelings, which we attribute to them, and which are limited by our own. Thus we naturally get a corresponding idea respecting our knowledge of God, that we must first form an image of God in our minds in some way, and afterwards come to love Him. It is necessary that we should be completely freed from the influence of these misleading analogies. Then when we come to look for the process of, first, the intellectual apprehension of God, and, second, the awakening of the feeling of love for the Being thus intellectually apprehended, we find there is no such process; but our only possible apprehension of God that is true, in the degree that we are able to form it, is the apprehension which is formed by the recognition of love alone.

Science affirms God to be the unknowable and the unthinkable. In this declaration science is right. Its error lies in paying no regard to the real mode of spiritual perception, by which the revelation of God is in fact made to us, and which is the only possible mode of such revelation. But this conclusion of science, that the human intellect is incapable of arriving at any knowledge of God, is not new. It was anticipated long ago. "Who hath known the mind of the Lord?" "Canst thou by searching find out God?" "The heavens are higher than the earth, so are my ways higher than your ways, and my thoughts than your thoughts." The living force of this language, and of other expressions of similar import in the Bible, and the infinite depth of meaning that these possess, contrast in a striking manner with the lifeless formulas of philosophic construction. The latter mark the hopeless end of philosophic thought. The former are the sublime beginning of revelation.

But while ignorant of the true mode of this revelation, we cry: "If God be, indeed, the unknowable and the unthinkable, then he has *not* everywhere revealed himself to us." "Then it is not true that our whole being, with all its powers, has been adapted to the supreme purpose of beholding him." Peace, troubled soul! How should the infinite be revealed to the finite? A very slight exercise of the understanding would seem sufficient to show how futile the search after God must be, that is conducted within the limits of human processes of thought. If man were only a reasoning machine, then mere uniformity of action expressed as law would be his ultimate conception. Then it is certain that not God alone, but all spiritual realities, would be hidden from him. For him they would have no significance. He would be without power to recognize their existence.

In accordance with the law of all spiritual perception, and, indeed, in accordance with the law of perception universally, we perceive the being of God only through the spontaneous and necessary recognition of him by the spirit in its activity of love. As all the manifestations of God, in the modes of force and truth and beauty, have their unity in love, as love is the essence of the divine nature, and the motive to all divine conduct, so also the affections constitute the whole spiritual nature of man, and the motive to all his activity. If these are in their normal state, then they are in harmony with the nature of God, and the spirit necessarily recognizes His universal presence. If the spiritual nature of man is not in complete harmony with the divine nature, as indeed it cannot be, then it can recognize God only in a degree, in such degree as it *is* able to form the image or ideal of Him. If it does not spontaneously form such image or ideal in any degree, then it must be dead to his existence.

For the correct apprehension of this, the only possible mode of the divine revelation, it is necessary at first that we should consider man, not as in fact he is, but as he would be in his normal state; a state in which universal love is the ceaseless animating force, in which every thought is suggested by love, and every act is the expression of love. In this normal state, man would necessarily be conscious, above all other things, of his environment of universal love, and this is God.

The being and the love of God are convertible terms. This was true of the divine man. It would also be true of man universally in his normal state, which we are now supposing. In this state, love in man would differ from love in God only in degree, according to the capacity of his nature, love in God being infinite. In this normal state, man would receive the revelation of God, in becom-

ing conscious of the universal reciprocity to his own love. He forms no conception. He only loves. Every other being is equally the object of his love. He is conscious of love in return from every other being. Above all he is conscious of an environing Being, who is infinite love. The latter recognition becomes necessary from the fact that in this state man has been made in the spiritual image of God, and must recognize his own likeness or ideal. He feels the spontaneous and supreme impulse to love, and also the corresponding longing for love. In the complete satisfying of this longing he recognizes infinite love, and becomes aware of the harmony of which he forms a part. The conscious particular recognizes its universal.

In this normal state, the spirit *must* see God, precisely as the open eye must see objects in nature, or as the mind must recognize familiar truths, and that for the same reason, namely, that this recognition, and consequent communion and joy, are the very purposes for which man's spiritual nature, with its power of perception, was given him, the end which it was especially adapted, and which it was evidently intended to serve.¹

God having been first revealed in the spirit, the universe is then seen to be the manifestation of his love, and becomes animate with his presence. Every thing then appears in its true character, as a mode of the endlessly varied activity of infinite love; and the spirit rejoices, with rapture unspeakable, as a being receiving, and responding to, and so communing in that love.

This recognition of the soul is, then, the mode of the revelation of God. But to us, in our abnormal state, this revelation is, of necessity, dim and obscure, even at the

¹ For the remarkable proof of this necessary recognition that is afforded by the analogies of mechanical science, see pages 199-201.

best. The direct and immediate recognition of God by the soul is feeble, on account of the feeble degree in which universal love is developed in our nature. The external perception of His presence is necessarily imperfect in the same degree, for we can see or can recognize, without, only those spiritual realities that we have already felt within. Among men, therefore, the revelation of God, or the spontaneous recognition of God in the soul, must be a matter of degree, according to the development in this respect of each spiritual being. In this degree, and in this degree only, every physical sense becomes a medium, through which the sympathizing spirit recognizes its own image or ideal, and so in part beholds the activity of universal love.

It should be observed that, while to man in his normal state the recognition of God must be complete up to the full capacity of his nature, still this recognition can never become complete, in any thing like the absolute sense of that term. The true conception of perfect beings must doubtless be that of endless growth, with always an adoring consciousness of depths unfathomed in the love of God.

The idea is a prevalent one, that love to God may result as an effect or consequence of the purely intellectual study of his works. This is the same error that has already been exposed, only modified in its mode of statement. Strange as it may at first seem, the fact is, that where love to God, or, correctly speaking, that love by the spontaneous activity of which God is recognized or revealed, does not already exist, in some degree at least, the effect of the study of His works is invariably to hide Him more and more from us.

On reflection, the necessity for this result becomes apparent, and it affords a full demonstration of the cor-

rectness of the view of spiritual revelation that is here taken. In the case supposed there exists, if not a positive antagonism, at least a complete want of sympathy or harmony, between the soul and God; and therefore the spirit cannot perceive Him, has no power to recognize His existence.

In its merely intellectual activity the spirit of man works mechanically. This mechanism itself feels no interest, forms no purpose, provides no impulse. It works in any direction indifferently, as impelled and guided by the emotional nature, by the *I*, by love or hate, in the degree of its development, either to build or to destroy. Even in the study of nature for the very purpose of finding evidences of design requiring a designer, when the thought is arrested here, the mind is as indifferent as is the eye to the shape of an image that is formed within it, or the hand to the purpose for which its muscular power is being exerted.

Thus it is clearly shown that the recognition of the being of God does not wait, or in any manner depend, upon the manifestation of God to our senses. On the contrary, this recognition must have been made by the spirit already, in the only possible way, namely, by the spontaneous action of similar love existing in the soul, responding to the universal environment of divine love, in order that the sensible expressions of the love of God shall be discerned at all. Otherwise the spirit is dead to them.

This is a fact of ordinary experience. That all the common and familiar operations in nature are in reality the manifestations of the infinite love of God, in its ceaseless activity, is an idea that no man, whose nature is not, at least in some degree, in harmony with the divine nature, is able to entertain for an instant. That all force

is the personal act of the omnipresent God, extending not only to the most common and minute things, but, moreover, in every thing extending to where minuteness becomes lost in infinity, this to such a mind is foolishness. A remarkable feature of the case appears in the fact, to which reference has already been made, that the unvarying uniformity of all natural operations, that very characteristic of them which is fundamental in our idea of truth in moral beings, which is the necessary expression of eternal faithfulness, is the feature that operates most effectually to hide God from the sight of men. They could recognize superior power in exceptional phenomena ; but the changeless love that shines in the life-giving sun, this they cannot see. The very constancy of the beneficent conduct of God thus absolutely forms a barrier to his recognition.

Again, wherever God has not already been spiritually recognized, the perfection manifested in every part of the creation, and the harmony that pervades all natural operations, produce on the mind the same blinding effect. While the illumined spirit, united with God in the harmony of universal love, rejoices in the manifest glory of the Infinite Father, the merely philosophic mind, according to the present limited use of this term, or the mind that is shut up to merely intellectual processes, sees only the ordinary and regular operations of nature. With this absolutely impersonal and therefore meaningless expression, what is now called the philosophic mind rests quite satisfied. Beyond this it feels no interest, and therefore it can discover nothing.

If, then, we can only be freed from the influence of a false education, which has itself been directed by blind philosophy, we shall be able to perceive clearly enough, that our belief in, or knowledge of, the true and living

God cannot precede, but must wholly consist in, the spiritual recognition of the soul in love ; and that the effect of this sympathetic union with God is, that the mind becomes illumined to see that which was before invisible, to which it had been completely insensible, and that now, under the impulse of normally awakened affections, the thought can no longer stop nor be arrested, until it has penetrated into the universal presence of God, and contemplates in all things the working of his infinite love.

The truth of the view that has been here presented is shown in its power to clear away the cloud of difficulties with which this subject has been darkened, and which has produced a disastrous effect on many minds that have been earnestly seeking for the light.

It has been taught, and generally assumed, that the God of nature, or God as revealed in nature, is intellectually apprehended by us. We are indebted for this idea to what is known as the science of Natural Theology. Now, our argument has certainly advanced far enough to expose the absurd falsity of such a proposition. The God of nature is certainly identical with the God of grace.

Then the difficulty has always been felt to be a serious one of connecting this supposed God of nature with the infinitely loving, merciful, forgiving Father who is revealed in the Bible. A chasm has seemed to separate the two. And well it may have done. For the supposed God, thus intellectually apprehended, has no existence. This is another of the fictions of the human mind. There is no such Being. The living and true God is not intellectually apprehended. It suits human pride to assume that the intellect of man must have something to do with our perception of God ; but human pride is itself the great obstacle to this perception. All truth must be sought in the deepest humility. This is preëminently the

case with the highest truth of all. It is God dwelling in us, actually present in our consciousness, whom we recognize. The Apostle John expressed the truth exactly when he said: "He that loveth not knoweth not God, for God is love."

The spontaneous activity of the spirit in love is to be observed in little children. All that the conscious spirit does, before it can reflect or understand, and prior to any experience, is to love and trust. The latter act rests upon the assumption of universal love like its own. Manifestations of these feelings of love and trust constitute the child's first signs of recognition. That love and trust are natural and intuitive is shown in the universal fact, that the child is delighted by manifestations of responsive love, and is grieved at the want of them.

We are inspired with new admiration when we observe that, as it is the most important of all things that we should have this knowledge of God, or this power to recognize Him, so the activity of the spirit in love, by which activity, just in the degree that it assumes a universal form, God becomes spontaneously recognized, is the earliest of all spiritual activities to be developed and exercised. So also all the endearing relations of life are symbols of the far closer relation of the soul of God. As these relations appear in succession from the opening to the close of our earthly existence, unsealing successive fountains of happiness, they are adapted and evidently intended to preserve the love and trust of infancy unblighted, and to lead it to the recognition of God as its supreme object. Here we recognize the meaning of the command of the Christ, that we must become as little children. We see this, like all the commands of the Bible, to be merely the expression of a command that exists in the nature of things. Care and trust are the reciprocal

expressions of the love, respectively, of protecting and dependent beings. The former expression of love actually does exist, the latter is possible to exist, between God and man in infinite degree.

In concluding these observations, attention is called to the fact that the revelation of God, like the revelations of inferior truths, is of a nature adapted to bring to the spirit receiving it full and entire conviction. The spirit rests in this sure belief. This contrast is to be noted between this revelation and all superstitious beliefs, that when the revelation of God has been received in this manner, then the more comprehensive the knowledge, and the more profound the intelligence, the more certain becomes the perception of its truth.

It is further to be observed, that we can never rise above the analogies that are afforded by mechanical science. As in that science, so here also, experiment is the only source of knowledge. Here as there, men can only idly pretend to reason about that which they have not experimentally established. The personal relation of the soul of man with God is something that can only be known experimentally. It is obviously impossible for the mind that has not received the knowledge of God by the recognition of his infinite and universal love to know any thing about Him. And for such a mind to deny the existence of God, or to discuss the subject of his being, or to entertain any opinion whatever concerning it, or respecting the relations between man and God, is clearly just as absurd, as we have seen it to be for one to reason about the existence of objects which are not revealed to us through a process of reasoning, or, on the other hand, for one who knows only about objects that are revealed through the physical senses to express an opinion respecting ideal truths.

THE VERBAL REVELATION.

WE have now finished our brief and necessarily very general survey of the physical and spiritual modes of revelation. These modes have been seen to vary, as is rendered necessary by the varied nature of the truths revealed. We have observed that every bodily sense, and every mode of activity of the spirit, are called into exercise, to serve as media for the revelation to man of physical and spiritual truth, and that each one of these in its office, and the spirit in its unity, are adapted for the transmission and the reception or apprehension of every form of truth. This adaptation includes, of course, historical truth, which has not yet been considered.

There remains an auxiliary to these means for the communication to us of revelation in its varied forms, and that is the gift of language. Verbal revelation of the highest spiritual truth is what we should naturally look for. If all truth is revealed to man, and every thing is employed as a means of imparting this revelation, and our senses and our mental powers have their supreme use as the media for its reception, all which we have seen to be the case, then it is at least a reasonable inference that the gift of language must also be employed for the same great purpose.

Language has this supreme use, that it is adapted for the communication of truths of the highest consequence,

which, being historical, could not be imparted to us in any other way, as well as of those truths, to the perpetual revelation of which in nature we are, in our abnormal state, nearly or quite insensible.

We have that which claims our acceptance as such verbal revelation. We have a book, which purports to be the actual employment, by the Giver of language Himself, of this highest physical gift for its highest possible use. The question presents itself: Is this book to be accepted as true? Written by men, as necessarily it must have been, did the Bible, nevertheless, emanate from the Infinite Mind, the source of all truth? In its essential teachings is the Bible the word of God? For the determination of this question, our present subject suggests a line of inquiry that seems to be fundamental and searching. It suggests the question: Is this book in harmony with the physical revelation? Is its language the verbal expression of truth, as this is found to exist in nature? Do its commands call for the conduct that would be natural to moral beings in their normal condition? In brief, is the God of nature also the God of the Bible?

The God of nature is seen to be a Being of infinite, universal, and changeless love. Having first been spiritually recognized, He is then seen to fill all things. These are then apprehended as the universal manifestation to man of the being and nature of God. Is the same manifestation contained also in the Book?

When we approach this subject, the fact that first presents itself is, that the Bible alone declares the existence of one God; not of a divided sovereignty, nor of inferior divinities, but of one Jehovah. Nature declares this to be the truth. The unity and harmony everywhere observable forbid any other supposition. Science has been truly said to be the grave of polytheism. At the outset, we find this

fundamental agreement between the Bible and physical revelation.

Again, the Bible declares God to be a spirit, whom no power has been given us to discern, admitting of no manner of similitude, of whom our spirits, in their form-constructing activity, can create no image; but with whom we have relations far more close than we are able to conceive, and with whom, moreover, our spirits may have immediate personal communion, the intimacy of which has no limit except that which is imposed by the imperfect nature of our love, or, in other words, by the limited degree of this form of our spiritual activity.

On this point, the corroboration afforded by nature, so far as it extends, is remarkable. Nature, by all its teachings, prepares us to recognize and admit the fact, that spiritual being is entirely removed from the sphere of our sense perceptions, without having our belief in the reality of spiritual being impaired thereby in the least degree. It does this by showing the exceedingly limited range of our perceptions even of physical forms of being. When we know that all matter passes into forms and states in which it disappears before our eyes, and that the sensibility of our organs of sight and of hearing exists only within narrow limits, then we realize that, while we possess the full extent and degree of perceptive power that are required for all our uses, still, considered absolutely, this extent and degree are very limited indeed, even with respect to what appears to us as material things. *A fortiori*, then, spiritual being must be deeply hidden from our sight. The direct tendency and effect of physical research is, to check human presumption, and to induce an humble and reverent spirit, in view of the exceedingly narrow limits of our powers and our knowledge, and the infinity of even physical truth, and, above all, in view of our helpless dependence

upon the unseen environment of our being, whatever, in that unity to which all its manifestations point, this environment may be. We are thus prepared to accept, as in strict consonance with the nature of things, the declaration that God is and must be very far removed even from our conception, while we retain the absolute certainty of his omnipresent being, and recognize the sublime truth of that descriptive exclamation in the Psalms: "Who coverest thyself with light, as with a garment," light being the only thing that we know to fill the universe.

With respect to the eternal self-existence and omnipresence of God, nature and the Bible are in full accord. Both alike also represent God as a Being of infinite and unchangeable truth. The harmony between the Bible and nature in this respect of truth has been set forth in an earlier paper.

Although many expressions in the Bible can be wrested, and have been wrested, by men to an opposite sense, still the totality of its teaching unquestionably represents God to be a Being of universal and unchangeable love. Indeed, the love of God toward the whole race of man is taught and exhibited in the Bible in such a remarkable manner, that the mass of Christians, in contemplating these teachings and these exhibitions, even when they strive to confine infinite love within the limits of their comprehension, and while they cloud it by imputing to God the vindictiveness of their own dispositions, are still habituated to overlook, for the most part, the harmonious exhibition of that love, by which they are surrounded. The beauty and the glory of the divine love, as revealed in the Bible, render Christians in a large degree blind to the necessarily equal beauty and glory of the same love, as revealed in nature.¹

¹ One who cannot see—what physical science as hitherto limited does not teach—the love of God, as this love is manifested in nature, misses the grand

The foregoing points of agreement may be summed up in the pregnant statement, that the revelation of God made in the Bible is in every respect fully adequate to the revelation of Him that is made in His works. In these respects the Bible stands alone, in striking contrast with all other recorded thought. No other composition meets any of these demands, except so far as such compositions have obviously been derived from the Bible itself.

It is next to be noted that, although the Bible was completed long before the beginning of scientific inquiry, still the discoveries of science have not rendered it obsolete. On the contrary, these discoveries have enabled the meaning and force of much of its language to be better understood. It is hardly possible at the present day to conceive the ignorance of physical truth, or the false conceptions respecting physical phenomena, or the limited range of thought concerning all this class of subjects, that existed universally during all the period within which the several books of the Bible were written. The form of the earth had not even become a subject of inquiry. Respecting its size, curiosity did not anywhere extend beyond the small portion of it that was known. Its age was supposed, by the few who had any thought about it, to be measured by a few generations of men. The speculations of Pythagoras were, apparently, without appreciable influence, and aside from these, the only conception respecting the earth that was held with any degree of distinctness was, that it

fundamental feature of the harmony between the two modes of revelation. Science is progressive. Its tendency is in the direction of comprehensiveness and spirituality, towards the recognition of the fact that spiritual truth is fundamental also in nature. But it would obviously be irrational to look for entire harmony between religion and science in its present stage, in which this recognition has not been reached; and it would be still more irrational to assume as standards of comparison between religion and science scientific hypotheses, which are considered by the highest scientific authorities to be only guesses at truth. When science in its completeness, not of attainment but of purpose, shall appear by the side of religion in its purity, lo! so far as science extends, these will be seen to be one.

formed the centre of all things, and that a solid firmament, in which the sun and moon and stars were set, revolved around it every day. The whole Bible was written under these infantile conditions, of mistaken conceptions and extreme limitation of thought.

Since that time, on the one hand we have learned the obscure rank of the earth among the hosts of heaven, and on the other hand the thoughts of men have become enlarged, until human conceptions are lost in the infinities of space and time. But we have not outgrown the Bible. There appears to be a remarkable likeness between this Book and the nature of things in this respect: The meaning that is conveyed to our minds by the Bible, in all its allusions to physical phenomena, expands just in the degree in which our conceptions of the phenomena expand. It seems as if both the description and the phenomena were limited to us in the same way, namely, by our capacity to comprehend them. The unique character of the language of the Bible in this respect also becomes strikingly evident, when this Book is contrasted with any other writing.

The Bible contains one apparently distinct expression of the ignorance of physical truth, and disposition to fable, of the age in which it was written. This is the account of the sun and moon standing still at the command of Joshua. Our argument unquestionably requires that the difficulty in the way of accepting the Bible as the inspired Word of God, which is presented to many sincere minds by this account, should be removed. The correct interpretation of the passage seems to be sufficient for this purpose.

Until quite recently, the Christian world and the sceptical world have agreed in holding to the literal reading of this account. The Roman Church denounced the Coper-

nican theory of the solar system, and compelled its first great advocate, Galileo, whether by torture or by threat of torture is unknown and is immaterial, to abjure it as a heresy; because this theory would render necessary the cessation of the rotation of the earth on its axis, in order that the sun should have stood still upon Gibeon, and the moon in the valley of Ajalon.

The position respecting this passage, which, almost to the present time, has been held by all Christian teachers, has been well expressed by one who still holds fast to the lessons of his infancy, as follows: "Believing that the Creator of a system can arrest the operation of laws imposed upon it by Himself, I see no necessity to doubt the truth of the Scripture record."

On the other hand, Professor Tyndall has called attention to the obvious and striking irreconcilability of such an inconceivable waste of energy, as is involved in the literal interpretation of this passage, with the uniform economy of nature. On this well-founded criticism of this single account, taken literally, he has rested his objection to the general credibility of miracles. He has not told us why he selected this account. The reason is, however, evident. No other one would answer the purpose. No account of a miracle in the Bible, this being left out of view, is open to this criticism. On the contrary, this account presents in this respect a remarkable contrast to every record of a miracle. In these the general feature is the production of effects by the employment of apparently *insufficient* means. The case was a singularly unfavorable one for deducing a general conclusion from a single observation. The account selected for observation is obviously exceptional.

Modern criticism has shed a new light upon this passage which has given to our literal and prosaic minds such a

world of trouble. That the view to be presented may be clearly seen, it is only necessary to bear in mind that the account contains these words: "Is not this written in the book of Jasher?" These words declare the origin of the account, and they also declare, what is of conclusive value, that it did not form a part of the contemporaneous record of the event.

I learn from an eminent Oriental scholar, Rev. James Douglas, that this description, of the sun and moon standing still at the command of Joshua, is considered by scholars, who are familiar with the new department of Biblical interpretation known as Orientalism, to be nothing more than a hyperbole of Oriental imagery, a highly poetical way of saying that they had a long day of slaughter; that, as such poetical description, it was at a later day introduced into the narrative; and that the Oriental mind never attached to it a literal meaning, any more than it did to the declaration that the stars in their courses fought against Sisera.

A view substantially similar has been expressed by the Rev. W. P. Breed, D.D. Dr. Breed says: "I am inclined to think that the book of Jasher was a book of national songs, and this is simply a quotation from it, expressing, in a highly wrought imaginative lyric, the fact that by the aid of Heaven as much was done by Israel in one day as otherwise would have required at least two days." A similar view is adopted by the best modern German commentators. Lange says: "We have to consider here an inserted passage." "The standing still of the sun and moon is no more to be understood literally than is the fighting of the stars, the melting of mountains, rending the heavens, skipping of mountains, or bowing the heavens. It is the language of poetry that we have to interpret, and poetry, too, of the most figurative and vehement kind, which

honors and celebrates Joshua's confidence in God in the midst of the strife, and his assurance of victory."

This natural interpretation of this language, as merely a bold poetic figure of speech, seems certain in the end to be accepted as the correct one. All lovers of truth must come ultimately to rejoice that the truth has been determined in this instance. Meantime it is natural to expect that the extinguishment of this passage as a literal description will be lamented and contested by two extremely different classes—by those Christians who have loved to dwell upon such a supposed stupendous instance of Almighty interposition, and by the whole race of sceptics, who see their great gun silenced.

It is to be observed, that in the Bible the subject of physical phenomena is not avoided, but on the contrary, and especially in the poetical portions, these phenomena are frequently dwelt upon, and that in language that is correct, and is of a character always so elevated, and often so sublime, as to stand in marked contrast with all other compositions, even to the present day. I wish here to revert to the fact, and to dwell more particularly upon it, that the discoveries of science, and the consequent enlargement of the conceptions and comprehension of men, have been required, before the real meaning and force of much of this language in the Bible could, in any proper degree, be apprehended. Science thus compels us to declare respecting this language, that it could not have had its real origin in the minds of men.

The fact is one that commands our attention, that the most exalted intellect can find no language so fit as that of the Bible, in which to express the emotions that are kindled by the contemplation of these overwhelming physical truths. This language has been found uniformly consistent with, and expressive of, the highest conceptions

that men can form, respecting the physical creation, as well as respecting God as its Creator. In each of these respects the language of the Bible is beyond all measure above that of any other composition.

There is yet a deeper reason for the satisfaction that is derived from the language of the Bible, in its references to physical phenomena. The Bible is the only book in which these phenomena are referred directly to God, and are described as being His personal acts. All other books are written in phenomenal language. Apparently they must be so. We seem to be shut up to the philosophy of appearances, and to be under the necessity of describing all operations and events in nature, as if they were self-directed. We have, however, intuitive feelings that rebel against this necessity. These feelings have doubtless led to the fiction of nature and her works. The real satisfaction that is felt in reading the language of the Bible, in which God is himself presented to us as the everywhere-present actor in physical phenomena, arises, undoubtedly, in a great degree, from our recognition of its truth in this respect.

An obvious, and at the same time an impressive, instance of identical truth in its spiritual and its physical applications, and one also that affords a notable illustration of the general fact, that the commands of the Bible are verbal expressions of natural commands, is afforded in the command to obedience.

In the Bible, implicit obedience to the commands of God, absolute submission to his will, is everywhere enjoined, as the primary duty of man. Under the relations which exist between man and God, obedience is obviously the necessary mode of expression, in conduct, of love on the part of man. Thus the Christ said: "If ye love me, keep my commandments." Man is declared in the Bible

to have fallen by disobedience, and to have been redeemed by him who "became obedient unto death."

So, too, obedience is the law of the physical world. It would seem as if, from his education and habits of thought, the engineer ought to have an especially clear apprehension of what obedience to the commands of God and submission to his will really mean, and a vivid perception of the absolute and necessary sense in which these expressions are to be understood. This subject was touched upon at the commencement of these papers. We then observed the complete accordance that is demanded between the will and purpose of one who attempts any physical work whatever, and the fixed and eternal purpose of God. To the extent called for by the work proposed, absolute harmony with the nature of God must exist in the spirit of man. Attention is now recalled to this fact, as affording a prominent illustration of the identity between the commands of the Bible and the commands which exist in the nature of things.

Again, the same harmony is to be observed between the spiritual and the physical dependence of man upon God, as the former is taught in the Bible, and the latter is observed in nature. In both these respects this dependence is absolute or infinite. The Bible teaches that eternal life, which it defines to consist in a unity of the nature of man with God, is the free gift of God, which every human being may receive as fully as he will.

So in nature we observe that every thing is the free gift of God. Our being, and every thing by which that being is supported, all knowledge and the capacity for knowing, our affections and all objects for their exercise, every thing, is a free gift to us from some source. We cannot conceive of ourselves as possessed of any thing, save only our depraved nature, that we have not received from an infinitely beneficent source.

The foregoing observations would appear sufficiently to exhibit the singular agreement between the Bible and truth as observed in nature. We trace between them this harmony. The Bible teaches truth in its spiritual relations. Nature exhibits truth in its physical expression. It will be the office of science, in its full development, to unfold truth universal in the harmonies of its physical manifestations.

We now pass to the consideration of another phase of the general harmony between the Bible and those expressions of truth which are presented to us in nature and in the human conscience.

Mankind have not only advanced in knowledge since the Bible was written, they have also made progress in humanity. The Israelites represented fully the best development of the race in this respect in their day. But they were originally a semi-barbarous and cruel people. The *lex talionis* was their unwritten law, precisely as it was among the North American Indians. Revenge was their cardinal virtue. The amelioration of this law of vengeance was one object of their great lawgiver.

It is startling to read, in the earliest writings of this people, the question recorded as asked by God himself, of the first man related to have been born into the world ; a question that searches out the fundamental principles of human relations, and the meaning of which we are only now beginning to realize. Our wonder is increased when we read the command, that at the very first was given to the selfish and contentious Israelites, evidently not for themselves alone, but through them to the human race forever, "Thou shalt love thy neighbor as thyself." And in order that no place should be left for doubt as to the meaning of these words "thy neighbor," that no excuse should be found for treating them as words of limitation,

the commands were added: "Love ye therefore the stranger." "The stranger that dwelleth with you shall be as one born among you, and thou shalt love him as thyself; for ye were strangers in the land of Egypt."

This command, addressed directly to the motive to all right action, the general and comprehensive command, out of which all particular commands, to govern the conduct of men in all their relations and intercourse, proceed, as necessary corollaries, was thus given to men long before they could feel or sympathize with its spirit. Many centuries were to pass before the great expounder and exemplar of this command should arise, to enforce and to illustrate it. And even then, after so long a time, how little advance in humanity had been made by men, compared with that which yet remained to be accomplished. Even since the advent of the Christ, the leaven has worked very slowly, so that it would be absurd to say that, at this present day, the most Christian nations, as a whole, have made much progress towards the full obedience to the command, "love ye the stranger as thyself."

There remained, however, a height of spiritual beneficent activity above this, that was to be revealed by the Christ, in the further command, "Love your enemies." This is a natural command. By a natural command is meant one that is inherent in the nature of things, and which spiritual beings, in their normal state, spontaneously and necessarily obey. With natural commands of a physical nature we are familiar. These are commands to use our various senses and organs for the purposes for which each one was given us. We obey these commands in seeing, hearing, walking, and so on through the whole circle of our activities. In like manner the command to universal love is a command that the spirit in its normal condition was formed to obey, precisely as it was formed to see. Love

is the response that such a spirit makes to any antagonism, whatever may be the form of its expression ; or rather, it is the uniform mode of normal spiritual activity, that cannot be affected by external conditions. Obedience to this command to universal love, the expression of normal spiritual activity, was to be shown in the life and death of Him by whom the command was given. The manifestation in the Christ of that nature to which this is a natural command remains an example to the human race forever.

Now every one, in the depths of his consciousness, recognizes the fact that the command to universal love, given in the Bible, is the verbal expression of natural law. It agrees with physical law, or with the uniform conduct of God, which is the manifestation of his love to all creatures alike, to the just and the unjust, to the evil and the good. The Bible alone presents this harmony. We perceive that it must have been given to men by the same Being, from whom the natural command to universal love proceeded, and in whose conduct it is illustrated. This law needed to be declared to men. God only could declare it. Therefore the Book in which it is declared is the Word of God.

We come now to a still higher test respecting the divine origin of the Bible. This book has been seen to declare the true relation existing between man and man, and to reveal the motive that in their normal spiritual state would govern the conduct of men toward their fellow-men. But if the Bible be from God, it must also declare the relation between man and God. Here we encounter evidence of the divine origin of the Bible that is of a singularly impressive character. We have seen that the Bible is in harmony with nature in declaring the existence of one unseen God. But it does far more than this. It declares the attributes of God, which are found, first, to be in har-

mony with his attributes as exhibited in nature, although men had been blind to this exhibition of them; and, secondly, to be directly opposed to the universal and fanatical belief of the Jews themselves. God is declared to be the universal Father, infinite in love, and, therefore, in the same degree which is beyond degree, in mercy and forgiveness; and with whom every soul, throughout all the nations of the earth, has the same intimate relations. Out of these relations there springs one single natural command. To this command the Bible, if it be the Word of God, must give expression. That command which man, in his normal state, would naturally obey, as the free and spontaneous act of his rejoicing being, just as he obeys every command that grows out of his relation to the physical creation, by putting forth his activity in every form for which his organs were given to him, that supreme command must also have its expression here.

We ask for it, and the answer comes: "Thou shalt love the Lord thy God, with all thy heart, and with all thy soul, and with all thy might."¹ We bow our heads, for we know that we are listening to the voice of the God of nature. Expressing the relation that really exists between man and his Maker, but which was never conceived of by him, as existing between himself and any deity of his own creation; and given with a comprehensiveness and an energy of repetition that befit its transcendent consequence, and exceed that of any other form of words that ever was uttered in the ear of man, this command, that seems to ring through the earth and the heavens, could have come only from Him who created man in His own image.

But even another test remains. What would the God of nature, the Being of infinite and universal and change-

¹ Deut. vi., 5.

less love, do with respect to man in his abnormal condition? Would the God that gives the sunshine and the rain leave man in the condition in which, however he reached it, he is incapable of recognizing the existence of the Being whose perfection he does not share, and so cannot conceive,—that condition in which he feels no impulse to obey, but on the contrary feels every impulse to disobey, the command to universal love,—that condition in which, to consider it merely in its negative aspect, which cannot be disputed, he is dead to all the happiness that flows from communion with infinite love? Is there any way of rescuing man from the fearful plight of a perverted nature, and of making his hateful spirit lovely, which the God who cares for his physical being with such inconceivable provision could hesitate to adopt?

The crowning evidence that the Bible is the Word of the God of nature is found in the answer which it makes to this question. In the supreme revelation there given of the love of God to man, in the purpose that is declared in the sacrifice on the cross, and in the change in the nature of our race, proceeding in the gradual manner that marks all the operations of God, which change we witness in its progress, obviously as the consequence of that sacrifice, and in the accomplishment of that purpose, we recognize again, and in its highest manifestation, the harmony between the verbal and the physical revelations of God.

It is sometimes made a ground of objection to the Bible, that it contains many mysteries. If it were a merely human production this would not be the case. In this feature we find another respect in which a close likeness appears between the Bible and the physical creation. Both have depths that we cannot explore. Just here we would naturally look in the Bible, if we assume it to be

true, to find a special likeness to nature. We observe that in nature, however little may be revealed to us, still that little is just what we need to know, and is all that we need to know. However much is hidden from us, still nothing is hidden, the knowledge of which is essential, or could contribute, to our present uses and happiness. We would expect to find the same to be the case with the Bible. This expectation will not be disappointed. All the mysteries, and these are many and deep, which are presented to us in the Bible, are for us only matters of curious speculation. All truth that is necessary to be known and received by us, that can in any way affect our present and future welfare and happiness, is set before us in clear and strong light. This fact is not affected by the disposition of men to contend about the former, and to neglect the latter because these afford no opportunity for contention.

A part of the universal analogy between the mysteries of the Bible and those of nature has been well stated by a recent writer, as follows: "Modern experience and more thorough thought have shown how speedily we strike on the transcendent, which we can neither elude nor solve, as soon as we handle the simplest problem in exact science. It seems to suggest, as no previous age had suggested, that in the spiritual and ethical spheres, which are no less 'exact' than the physical one, there is the transcendent in the Trinity, the Incarnation, the Atonement, which calls us to bow to revelation about them with a humility never before seen to be so natural, so reasonable, so right."¹

Referring again to the remarkable character of the language of the Bible, it is to be observed, that the language which is most surely recognized by the Christian as

¹From an address delivered before the Alumni Association of Union Theological Seminary, on "Modern Safeguards of Orthodoxy," by Mancius H. Hutton, D.D. Pulpit Treasury, July, 1885.

being the very words of God, is that which expresses, under so many forms, the supreme truths, of the infinite tenderness of the love of God to all men, of the personal relation that exists between the soul of man and God, and of the possible and ultimate complete unity of the human with the divine nature. As it was observed with respect to the physical descriptions and allusions in the Bible, that their meaning grows with each increase of our knowledge, and each enlargement of our conceptions, so, in an eminent degree, is it the case with the language that we are now considering. The comprehension and enjoyment of this language by us depends entirely for its degree upon the development of universal love in our own souls. This language has no interest or meaning for the human spirit in its abnormal state. It grows more expressive just as the spirit becomes more responsive to infinite love. It is equal to every demand. In it every longing finds its satisfaction, and trust its complete expression.

I cannot avoid repeating, as especially applicable to this subject, the thought with which the last paper was concluded. The absurdity of any expression of opinion respecting the language of the Bible by those who can see nothing in it, and of opposing any argument whatever against the experiential knowledge of its preciousness, ought to be sufficiently obvious.

Other features of the harmony between the Bible and nature will present themselves, when we come to consider the subjects of faith and suffering and prayer. The facts already observed, however, sufficiently warrant the conclusion, that the Bible is in harmony with the revelations made in the physical creation, and that it supplements these revelations; that to the soul that is able to receive it, and just in the degree in which the soul is able to receive it, the Bible completes and consummates the revelation of the infinite love of God.

PERFECTION.

THE purpose of the last paper was to point out some features of the harmony that exists between the Bible and the physical revelation, or what may be embraced in the general expression, "the nature of things." An additional illustration of this harmony is afforded in the standard of conduct that is common to both. The fitness of mechanical science for exhibiting this harmony is also illustrated here. A common standard of conduct which transcends human experience, affords another and a very impressive proof, that the Bible has proceeded from the same Infinite Being who is manifested in the nature of things.

In mechanical science there has been revealed to man the actual standard of excellence, which is perfection. From the very nature of the case, this is the only standard that can be recognized in mechanics; for if it be not, then where, on the sliding scale of imperfection, shall the standard be set? This standard is, to be sure, a purely theoretical one, unattainable by man in practice. None are so deeply conscious of this as they whose efforts have enabled them to approach most nearly to it. The more highly educated the mechanical sense becomes, the more obvious the fact appears, that perfection is the only standard that can in reality exist. This standard admits of no compromise with imperfection. Its claims admit of

no argument in their support. To the mind that is capable of perceiving them they are self-evident.

It is to be observed, also, that this standard in mechanics could not have been originated by man. Man has needed to be educated up to it, by the slow process of mechanical revelation. This bare statement would doubtless be disputed by some. It forms an important link in my argument. It is therefore necessary that its correctness shall be established. The fact is, those who would question this statement would do so only because they do not know what it means. In advance of any mechanical education, men generally will say, honestly enough, that every one ought to aim at perfection in mechanical work. But they mean by this word something that is attainable, and often easily attainable, and with which they would be completely satisfied. They do not mean the real standard of excellence, but only their own imaginary standard, the best they can themselves form an idea of. It would be idle to talk to them about any thing more exacting. They would only reply: "What do you want of any thing any better than that?"

It is difficult to realize how gradually the idea of mechanical truth has grown in the minds of men, as the result of education. I saw in practical use in the city of Oporto, a few years ago, the following method then employed in that city for signalling each day the hour of noon. A cannon was planted in an opening in the tower of a church. The hammer was held up by a string. As the rays of the sun appeared past an angle of the wall, they were focalized on the string by a lens and burned it in two, when the hammer fell and the gun was fired. Should this apparatus operate perfectly, it would give solar time, as given by the sundial. If it were a cloudy day, or if for any reason the cannon failed to be fired within a

reasonable time, it was the duty of a priest to go up the church-tower and cut the string, or make the hammer to strike by hand. I saw nothing produced in the same city that appeared to be more nearly round than the wheels of the carts, which were hewn out of planks with the axe.

Thus a consideration of what the mechanically uneducated or partially educated mind intends, when it employs the term "perfection" in a mechanical sense establishes the truth of our proposition. It is now obvious enough, that in its real sense of absolute truth unattainable by finite endeavor, perfection is a standard that has needed to be revealed to man, and that by slow degrees.

The educated mechanic stands amazed when he beholds everywhere in nature the actual realization of this ideal perfection. This great subject can only be alluded to here. In the following paper it will be briefly considered, and a few of its innumerable lessons presented.

One who has become familiar with the existence of this necessary standard of mechanical excellence reads with a peculiar sensation the blazing command of the Christ: "Be ye therefore perfect, even as your Father which is in heaven is perfect." Here the same unattainable standard is set. The mere command: "Be ye therefore perfect," if it stopped there, would have left every one to set his own imaginary standard, and to be satisfied with his own attainment. But it would not have declared the true standard, the only real standard of conduct. This is set beyond all doubt or cavil in the added words, "even as your Father which is in heaven is perfect." We observe with gladness that this was not a new command, first uttered by the Christ, although it was given by him with more unmistakable distinctness and emphasis than it had received before; but, as in the case of the command to love our neighbor, this also had been declared of old.

Now the mind to whom the real standard of mechanical excellence has been revealed cannot fail to see, and to realize vividly, the fact, that this command to spiritual excellence is not, and could not be from man. To such a mind this command appears to be the expression of the universal standard of absolute truth, in its application to spiritual beings; the very same command that the mechanic hears in its physical applications.

An essential unity pervades all physical and spiritual existence. There is one law for both. Truth is a universal quality, that in the nature of things is demanded in both these forms of being alike. Indeed, truth in physical expression is only the manifestation of truth previously existing in spiritual being. The degree of approach to the former is determined entirely by the degree of conformity to absolute truth that has been reached by the latter. This every engineer understands full well. In the declaration of this standard of spiritual excellence, he recognizes, therefore, the voice of the giver of all being. In the command itself he recognizes a universal expression. "As your Father in heaven is perfect" is the only real standard of all excellence. This is illustrated in all the works of creation. It is revealed to man as the standard by which all his physical work is to be measured. And now in the only possible way, through human language in the Word of God, it is declared in its application to the conduct of moral beings.

Thus perfection is presented to us everywhere, and in all ways, as the essence of the divine nature, and as the law of all worthy activity, the goal of all human endeavor, both in our relations to physical and to spiritual being. As there could be no other physical standard, so there could be no other spiritual standard. But neither the one nor the other could have been originated by man.

Man could not give expression to a standard of spiritual excellence, any more than he could express a standard of physical excellence, which is beyond his power to conceive. Both these must have proceeded from the same infinite source.

NATURAL RELIGION.

I HAVE endeavored to show that the being of God is a fact that can be revealed only as love, and can be recognized only by love ; that this highest of all truths cannot be reached by inferior modes of our spiritual activity, but demands for its apprehension the exercise of the highest of all the forms of this activity. If I have been successful in this endeavor, then it will be obvious that it is a misnomer to call Natural Theology a science. This so-called science claims to be a method of demonstrating to the understanding the existence of God, by evidence drawn from His works. In other words, it is an attempt to do that which in the nature of things cannot be done. This "science" is in fact only a human contrivance, designed on wrong or imaginary principles, and therefore one which must be mischievous in its operation.

If we will imagine the children of a watch-maker studying a watch, in order to find evidence of the existence of their father, who has been before their eyes and treating them with unspeakable tenderness all their lives, we will have the case exactly. If we will conceive that, while all this has been true respecting the father, still the children, under the influence of some strange spell, remain in ignorance of his being ; that while, in helpless dependence upon him, they are carried in his bosom, and are the objects of his love and care in an inconceivable degree, still all the

knowledge they can get respecting him is that he made that watch, and a great many other mechanical contrivances, we will have the sum of what can be found out about God by the intellectual method of natural theology, or by following the poet's advice, and endeavoring to "look through nature up to nature's God."

This so-called science was a natural product of the mind at a certain stage of its growth. There has been a long period, now happily past, during which all the relations of the soul of man to God have been regarded as being primarily the subjects of the human understanding. Our emotional nature, our real spiritual being, has in former days been treated by theologians with but little more regard than it has been by men of science. The highest form of our mental or spiritual activity has been neglected, and its great office, as the direct and exclusive medium for the revelation to us of the highest truth, has been ignored. The clear light of infinite truth has moreover been obscured and distorted by transmission through human media. The words of men have been substituted in place of the revelation of God to an almost incredible extent. Prominence, in some cases almost exclusive, has been given to every form of doctrine that could be made to harmonize most nearly with the narrow and selfish and vindictive natures of men, and that could hide most effectually the infinite and universal and changeless love of God, as this love is revealed in the Bible and in nature.

The imagined omnipotent faculty of the reason has been exalted as the infallible guide to truth. Theologians have been trained to rely on severe processes of thought, and the fact that these processes led different minds to contradictory conclusions was powerless to show them the absurdity of this reliance. The religious mind was fitted into various systems of human contriving, and was fed on

formulas and propositions and demonstrations and deductions, the confidence of men in which only showed the narrowness of their conceptions. Every thing else was made subordinate to those questions on which men differed, and about which, therefore, they could contend.

All this naturally culminated in the supposition that the being and nature of God Himself come so far within the grasp of our comprehension, as properly to be made the subjects of human reasoning. On these points of doctrine warring views were held, and men gratified their ferocious propensities by killing each other for holding them. What rivers of blood have been caused to flow, because men, while agreeing in the fundamental error of holding God to be the subject of human comprehension, have differed in their conclusions respecting Him !

Minds that were educated in such schools of thought could of course have no perception of the absurdity of the system of natural theology. Its deductions were of a nature essentially similar to those to which they were accustomed. These deductions were reached by methods of the same exclusively intellectual character, as the processes of thought in the use of which they had been educated. Both arrived at the conception of a purely imaginary divinity. The living God, the God of the Bible and of nature, who can be fully revealed only to the spirit that loves its neighbor as itself, was equally hidden from those who sought him through either of these intellectual methods.

By a process quite insensible, and aided by influences which, like force, are discernible only in their effects, the mind of the more advanced portions of our race has for a long time been outgrowing this infantile stage. The true nature of religion is coming to be better perceived. Harmony of the natures of individual men with the nature of

God, in love, is seen, more and more distinctly, to constitute its sole essence.

The merely intellectual nature, with its beliefs about what is utterly beyond its comprehension, is being dethroned from its usurped supremacy; and the emotional nature, and the conduct as determined by the affections, are coming to be accorded their rightful place.

The real progress of civilization and Christianization, which in their essence are one and the same thing, is seen in the greater relative importance that men attach to those deeper verities about which it is not possible for them to contend.

Under these changing conditions of religious life, it is not at all a matter of surprise that the methods and the deductions of natural theology should, at the present day, receive far less attention than they once commanded. Their unsatisfactory nature is, in fact, very generally felt, even by those to whom this science has been carefully taught. This is a cheering indication. It is, indeed, quite time that natural theology, which seeks in nature for evidences of the being of God whom the soul has not "spiritually discerned," should give place to *natural religion*, which in every thing in nature recognizes with adoration the active manifestation of that love which has been revealed through its likeness to the image formed in the spirit; which sees exhibited all about it, in an infinite degree, the universal love that it feels. It is time that the works of God should be studied again in the spirit of the Psalms. The disposition of religious thought, that even yet prevails under the benumbing influence of our scientific education, to regard with little concern the mighty religious influences by which we are in fact enveloped, is matter for profound astonishment.

When God has been revealed within the spirit, in the

only possible way, by the recognition of love, and is then seen to fill the universe with his presence ; when the glad soul, in its freedom, finds itself a participant in the harmony of the creation, in which nothing exists for itself, but all things are in ceaseless activity for beneficent purposes ; then, indeed, the study of the love of God in its physical manifestations, so far as our limited powers enable us to pursue it, becomes, next after the contemplation of the same love as shown in the work of human redemption, the most satisfactory of mental occupations.

In this study we are not seeking after evidences of the being of God. Far from it. The spirit has already found rest and peace in the certain recognition of this supreme truth. No question respecting the being of God can disturb it, or can even enter its consciousness. But the spirit delights to come more consciously into the presence of God, to see his glory revealed to it, so far as it can endure the sight, and, while lost in wonder at the wisdom and the skill that his works display, to adore the love which it beholds animating and directing the whole. In this study we admire, also, the evidence that God has created us in His own image. He has given to us the intelligence by which we are, in some degree, however small, able to understand the divine methods of operation, and ourselves, though at so great a distance, to employ similar methods, and to exercise similar skill. This is a fact which affords corroborative evidence of the strongest character in support of the truth, of the perception of all spiritual realities by recognition. To this evidence attention will shortly be invited.

Although, in any proper view of the works of God, the wisdom and skill which these works display are obscured by the brighter light of the Divine love, or, to drop the figure, although the former can have little of real interest

for us, except in the degree in which the latter is revealed, and then the beneficent purpose manifest in every thing must occupy the supreme place in the thought, still it will conduce to clearness of apprehension, if we separate these in our mind for a little time, and observe the former alone, so far as possible without regard to the omnipresent motive.

We have been so constituted that, when once the Infinite Mind has been recognized, we perceive intuitively that the creation must have emanated from that mind, and must be the manifestation or expression of it. The philosophy of this perception is very simple. We reason from ourselves. We observe our own process of mechanical construction. In a subordinate sense, man is himself a creator. His creation has a uniform order, from which no variation is conceivable. That order is this: First, he forms in his mind the idea. This mental conception is for him a real spiritual entity, which he beholds in his "mind's eye" as distinctly as though it were sensible to his touch. Afterwards he produces its material counterpart, which cannot vary from the original in his thought, "even by the estimation of a hair." The thought grows or changes in his mind. Corresponding development or change is demanded in the visible duplicate or representation of it. When completed, his work stands before him merely as his embodied thought. Whatever the nature of his creation may be, and whether it be simple or complicated in any degree, in all cases alike the form, the adaptation to its use, the function of every part, the relations of the several parts to each other,—all these together, constitute the material realization of his idea, the expression of his purpose, the visible representation of his thoughts, of his whole spiritual nature, so far as the work affords opportunity for such representation to be made. Thus in our

own creative work we find that all possibility of material existence is determined and limited by the pre-existent thought and purpose in our minds. This uniform order of creation is familiar in all our experience. We cannot conceive of any other. Analogy compels us, from this uniform experience, to draw the universal conclusion : First in the order of being must be a mind. In this mind the thought must be perfected. Afterwards only can material existence come to be, as the embodiment of such thought.

This uniform order of creation is to be observed in every thing. The voice cannot even produce a tone, until this tone has been formed in the mind, and has been heard by the mental ear ; and just as this mental tone is true or untrue, firm or uncertain, so precisely will its audible counterpart be. But this order finds its most complete illustration in the endlessly varied applications of mechanical science to the uses of man. These applications constitute one of the distinguishing glories of civilization. Since every thing in nature has more than a single use, and often multiplied uses for the same thing are known to us, it is a reasonable supposition that mechanical science has also its uses, beyond and above all these material applications. A leading object of these papers has been to trace some of these spiritual uses. We now find ourselves face to face with another and an important one. Mechanical science exhibits the whole philosophy of the perception of spiritual realities by recognition. It shows how it is possible for us to have any realities, that are not of a nature to be revealed to us through our physical organs merely, placed before our very eyes continually, obvious to those who can recognize them by their resemblance to images already formed in their consciousness, but absolutely hidden from those who can form no such recognition, and

also beyond the power of words to convey the knowledge of them, except so far as the words can revive in consciousness images that had been previously formed.

In a moving machine the uninstructed mind sees parts in motion merely, and this is all that it can see. The mechanically instructed mind, on the contrary, in a degree precisely proportionate to the depth of its own insight, sees that which produces and determines every motion, and the object and effect of every motion, and the forces, static and dynamic, that are exerted, or that are developed, in every part of the machine, to produce or resist motion. This perception varies with each individual, and no finite mind ever possessed that complete insight that would enable it to recognize every force that is exerted in even the most simple moving machine.

Thus we find it to be the case respecting force, in these various modes of its manifestation, that if images corresponding sufficiently to these modes of manifestation have not already been formed in our consciousness, then we cannot recognize these manifestations of force, we are dead to their existence. But if these are already familiar objects to us, then we look within the material forms, and recognize their presence.

So, if we were not ourselves capable of mechanical construction, we could not recognize mechanical construction in the works of God. If we possessed no mechanical skill ourselves, mechanical skill in the universe would be shown to us in vain. All things would possess no more significance for us than, except to a very few scholars, the cuneiform inscriptions do. We would see only shapes that had no meaning. These shapes become informed for us with thoughts, only because we ourselves can inform material shapes with thoughts.

It is also to be observed that if the likeness of any spir-

itual reality that is shown to us exists already in our consciousness, we *must* recognize it. If our own consciousness furnishes an analogous reality, then the manifestation of the constructive thought, purpose, and skill cannot be presented to us without their instant recognition. We at once look within the material form, and behold the spiritual reality.

Thus mechanical science gives us the key to all spiritual perception. Beyond mere material forms, we see without only that which we recognize, because the same thing already exists within ourselves. If we are ourselves skilled workmen, and nothing else, then we can see in the physical universe only the skilled workman. If we are chemists and nothing more, creation is for us the universal laboratory of the infinite chemist. If we are merely mathematicians, we can form no conception associated with any thing that we see except a mathematical conception. So far as they go, these conceptions would all be correct. The fault with them is that they are only partial and subordinate conceptions. But every moral being is capable of something more than being a skilled workman, or a chemist, or a mathematician. He is capable, also, of the feeling of love in endless degree of development, and of perceiving the fact, that this feeling of love is the sole foundation of all worthy character and conduct. Just in the degree that this feeling exists, the universe is seen to be animated by love. This is God, and thus only through the necessary recognition of love can God be revealed to man.

A little incident, that became invested with both a sweet and a mournful interest, will perhaps help us to see more clearly the line between the revelation of God and the deductions of natural theology. In the summer of 1882, travelling one evening on the steamboat *Bristol*, I

spent a few minutes in looking through the window in the saloon at the engine. While thus occupied, I heard an exclamation of delight near me, and turning I saw a girl of seventeen or eighteen years, attended by a gentleman, and gazing with rapture on the ponderous machinery. I was instantly arrested by her appearance, and thought I had never seen so spiritual an expression. Her face was luminous, and riveted my sight. After watching the movements of the great engine in silence for some time, she slowly exclaimed, as if to herself, unconscious of any other presence, "only to think of the *mind*—that could plan all that!" The next morning I read in a Boston journal the telegraphic announcement of the death of Erastus W. Smith, the designer of the engines of the *Bristol*, and so the last one of the long line of discoverers and inventors and designers, whose minds had successively helped to "plan all that."

Here the intelligence of this remarkable young person had penetrated to, and her whole thought was absorbed by, the only spirituality that the case could present to her, and that was, the mind that could plan what was to her so wonderful. A mechanical expert would, of course, see much more than this. In a degree corresponding with the degree of his own skill and experience, he would see the functions of the various parts of the mechanism, and the adaptation of each part to its purpose. He would perceive the expansive energy of the steam, and the operations that must go on out of sight, in order that visible action should take place. Each of these things, and many others, would be recognized by the expert, just so far as corresponding images had previously been formed in his mind, and no further.

All this was, of course, entirely beyond the girl's perception. She had never had formed in her consciousness

images that would enable her to recognize any of these features. She had only a vague and wondering idea of the intelligence that would enable a mind to "plan all that." About this mind two things are to be noted: First, the conclusion is not warranted that it could do any thing else except this. Probably it could not do any other thing so well. Secondly, the perception of this mind does not suggest the idea of any personal relation whatever between itself and the admirer of its work. No thought or feeling arises of love or faith or worship. The suggestion of such sentiments is seen to be utterly incongruous.

This illustrates the failure of natural theology, and reveals its cause. This mis-called science employs a wrong method, or rather it *is* a wrong method. It is as if a man should begin at the top to build a house. The method of natural theology is utterly powerless to create in the spirit the activity of universal love. It can therefore give to us no perception of God, the Being animated by infinite love, and with whom we have the closest personal relations. The Bible teaches us that the activity of universal love, that form of our spiritual activity by which we are able to recognize God, is a divine gift. Natural theology, on the contrary, assumes that without the employment of this gift, the knowledge of God can be attained by a process of reasoning. It is a human method, in opposition to the divine method.

I have insensibly been led back to the further discussion of natural theology; but will now endeavor to adhere to the especial line of observation that I have proposed, and to present in a brief form a few illustrations of the wisdom and skill that fill the universe.

When God has been revealed in the spirit, then it is true that all education is a help, and a very great help, to the recognition of his presence. There are two obser-

vations of a general nature that are calculated to make an especially deep impression on the mind of the engineer, on account of the education that he has received. The first of these observations is—creation without a mistake! This overwhelming fact cannot arrest the attention of others in the same degree. Indeed the mass of mankind are inclined rather to pass it idly by, as a thing of course. But the engineer becomes acquainted with the slow and painful growth of mechanical thoughts in finite minds. He is familiar with the constant mistakes that mark the progress of every mechanical invention from its rude inception to its successful use. He knows, moreover, that perfection is never reached by man; that the detection of defects in any human work is only a question of depth of insight. He is aware that, while any single mind always finds its resources exhausted, and for that reason can often see nothing wanting in its work, still improvements perpetually suggest themselves to fresh explorers. Words cannot convey an idea of the indescribable sensation of awe with which such a mind contemplates the perfection that it sees exhibited throughout the mechanism of the creation.

The second of these observations is this: In human mechanical constructions simplicity is found to be a prime necessity. This feature is the constant aim of every successful designer. Moreover, when the parts of any machine are numerous, the disposition of them, so that they may operate without interfering with each other, is always a serious problem, and often it is one involving grave difficulties. Now, when a mind familiar with this experience contemplates what appears to it as the appalling complications which are involved in all the structural works of the Creator, complications which, commencing with the disposition and movements of the heavenly bodies, extend throughout all being, and seem greatest

of all in the structure of the most minute organisms, and when he beholds everywhere perfect harmony of structure and of operation, he cannot fail again to be impressed by the sight in a degree that is not possible in another mind not possessed of the same practical knowledge. He sees that in the works of God it is not necessary to sacrifice any thing to simplicity. While in each individual organization the number and the variety of functions to be performed seem endless, the most direct means for performing each one are always provided, nothing is wanting that is required for any use, and nothing is found to exist except for a use, and, however massed together, every member of each separate system performs its functions without interference from any others.

Although observations on this subject that are possible here must be very superficial, since a lifetime may be devoted to the study of a single organism, and even to a single member or feature of an organism, still, even upon such a general view, we cannot fail everywhere to behold infinite intelligence in its omnipresent activity.

A few illustrations will be given, drawn from the circulations in nature. The first two of these have been selected because they present familiar examples of what, to my own mind, has been especially impressive, namely, the adaptation which is everywhere to be observed of a single agency to a variety of uses, and also the harmonious coöperation of various distinct agencies for the accomplishment of a single end. The third illustration is chosen on account of its mechanical interest.

The first of these illustrations will be found in

THE CIRCULATION OF WATER.

Water presents the only form or combination of matter in the fluid state that can support either vegetable or

animal life. The structure of every organism is adapted to receive it, and every one is dependent upon it. Every animal and every vegetable must drink or perish. The presence and purity of this universal necessity are secured by a continuous circulation, in which water, rising in an invisible state from the whole surface of the earth, is borne in the air, either in this state or in the form of clouds, until, under certain as yet unknown conditions, it is returned to the earth in rain or snow.

For the existence of water we are indebted to the pressure of the atmosphere. Indeed, if the atmosphere exerted no pressure there could be no organic being. Organic being is dependent upon water, and water exists in a fluid state only under pressure. Under the pressure of the atmosphere, and at ordinary temperatures, water passes gradually into the gaseous state. As the vapor that is formed by this evaporation becomes cooled in the upper regions of the atmosphere, a portion of it is condensed and forms clouds. Here phenomena appear which science has not yet attempted to explain.

By this condensation minute drops of water are formed. There is no intermediate state of this substance between water and the invisible elastic gas known as vapor or steam. Clouds differ from lakes only in the minute subdivision, and separation of the particles, of the water that composes both alike. At the ordinary mean elevation of clouds each one of the drops of water of which they consist is about one thousand times heavier than the air that it displaces, and yet it does not fall, not even when frozen, which is very often the case. By some means, also, the particles of water in a cloud are kept at a uniform distance from each other. When, under some unknown change of conditions, these become united in larger drops, the water descends to the earth to perform its innumerable functions.

Concerning the nature of the forces, which operate to determine the size of the minute particles of water that are formed by the condensation of a portion of the uniformly diffused vapor, which keep those particles at a distance from each other, and which prevent them from falling directly to the earth—the forces to the action of which we are indebted for the formation of clouds,—we are as yet ignorant. We are in equal ignorance, also, of the forces which determine the varied forms and dispositions of the clouds themselves. No plausible theory even, of a definite nature, has been advanced respecting the causes of any of these phenomena.¹

Rising from the earth purified and invisible, revealing itself in the heavens in forms of beauty, and thence descending to renew all life, water presents to us a perpetual symbol.

A general survey of some of the functions that water performs and has performed will show the important part that was allotted to this familiar fluid in the scheme of the world. By its means the earth has been made habitable. Infinite pains have been taken to transform the original chaos of jagged igneous rocks, broken and heaped by contraction and protrusion, into the beautiful world on which we dwell; and water has been the medium, or the essential agent, employed in doing the whole work. The extent of this work, and the time during which it has been in progress, are shown in the facts, that, with the exception of occasional ejected masses, there remains no original igneous rock on the surface of the earth, and the strata of formations that have been effected through the agency of water reach to the known depth of twenty miles. Water has carried in suspension, or has contained

¹ Recent experiments on the condensation of metallic vapors strengthen the presumption that these causes may be of an electrical nature.

in solution, has separated and pulverized by its motion, and has compacted by its pressure, this entire mass of the crust of the earth. It has been essential also to every combining and cementing and crystallizing process. Moreover, the alluvium in all its forms, gravel, clay, loam, and sand, desert and fertile ground alike, is the effect of the action of water.

Water dissolves out of the soil all mineral substances that are required in the growth of plants. In this state of solution these substances are absorbed by the roots of plants, and are conducted upward to their leaves, there to enter into the combination with carbon, by which the earth becomes clothed with the varied forms of vegetable life. This union of mineral substances in solution with carbon forms the basis of all organic being, of which being in all its forms, both vegetable and animal, water constitutes also by far the larger part.

As water is the medium employed by the Infinite Intelligence by which nearly all chemical and physical changes on the earth have been and are now being made, so also we find it to be the medium given to man, to be employed by him, in both its fluid and its gaseous states, for the conversion of heat into every form of useful energy.

The ministry of water never ceases. Its change of state is only change of use. When mingled with the atmosphere as an invisible vapor it has a new service allotted to it. Now it wraps the earth with a protecting mantle, to prevent the too rapid loss, by radiation into space, of the heat received from the sun. The value of this service is shown by the condition of lofty mountains, where the action of the aqueous vapor in preventing this loss of heat becomes less efficient. The mountain-tops are covered with eternal snow, in spite of the fact that the heat received by them from the sun is far greater than the

amount that is able to penetrate the invisible envelope and reach to the level of the sea. This action of water affords a striking example of the general truth, of which fresh illustrations reward investigation in every department of physics, that Infinite Wisdom has anticipated and provided for every requirement.

Our second illustration is afforded by

THE CIRCULATION OF CARBON.

After water, carbon forms one of the principal constituents of both vegetable and animal organisms. Its circulation, which involves the ceaseless destruction and renewal of physical life, is crowded with activities, of which only the more general features come within the range of our observation.

Carbon is not soluble in any known substance. It exists separately only in the solid state. From this it passes directly, without intermediate fluidity, into the gaseous state, by combining with oxygen, from which it has not yet been dissociated so as to be obtained as a separate gas. Carbonic-acid gas, the familiar compound thus formed, is diffused in a minute proportion throughout the atmosphere, forming one twenty-fifth of one per cent. of its volume, and from this source the vegetable kingdom, and thence the animal kingdom also, derives its entire supply of carbon.

We witness here a phenomenon of a wonderful character, but which is only a type of a class of phenomena that are to be observed universally. This is the coöperative action of separate and remote agencies, for the accomplishment of a single end or purpose. In the leaves of plants, as already stated, the two constituents of their being meet. These are mineral substances, brought by water from the soil, and carbon, borne in the air. Other

remarkable features are also to be noted. If carbon were soluble in water, or if mineral substances were not so, in either case, the vegetable and animal creations, as these are constituted, could not exist. It is only in the leaves of plants that sunlight exerts any influence to dissociate carbon from its union with oxygen.

In some of its vegetable combinations, carbon is adapted to the nutritive organs of animals, and being received by them in these combinations, it becomes, next after water and its elements, the chief constituent of the organic portions of their bodies.

From both these associations or uses, vegetable and animal, carbon returns directly to its combination with oxygen. All combustion, and all decay, of either vegetable or animal tissues, is this recombination, in rapid or in gradual progress, which is also the chief terrestrial source of heat. In animals, this return of carbon to its chemical union with oxygen goes on continually throughout the organism, and is the source of animal heat. The carbonic-acid gas, which is formed in this manner, is brought by the blood from every part of the body to the lungs, and is discharged into the atmosphere at each expiration, while the blood returns charged continually with fresh oxygen, by which the process is continued.

A remarkable provision is here to be noted, by which this recombination of carbon with the oxygen of the atmosphere is rendered possible. Oxygen has an almost universal affinity for other substances, except nitrogen, the gas with which it is mingled in the atmosphere. By reason of this general and strong greediness of oxygen for combination with other forms of matter, it has resulted, that this gas forms the larger component of nearly all compound substances, both in their solid and fluid, as well as their gaseous states. Oxygen combines with hydrogen

to form water, and it combines with various bases to form all the rocks and clays of the globe. All these combinations are of a permanent character. In the first one the two gases assume the liquid state under the ordinary conditions of heat and pressure. In all the combinations of the second class, oxygen becomes a solid. In contrast with all others of its almost universal combinations, stands the case of the union of oxygen with carbon. Here oxygen retains its gaseous form, and the solid carbon becomes a gas. This exceptional action brings carbon into the state in which it is adapted to re-commence its endless circuit, in the development of plant-life. Sufficient evidence is afforded here of a special purpose, in establishing the peculiar nature of the combination of oxygen with carbon. This is, however, only a prominent illustration of an innumerable number of cases, in which special provision is obviously made for special uses. Indeed, the cases in which the special purpose is evident to us are so numerous, that we are warranted in the important conclusion, that a special purpose determines every combination or association of matter.

But we have been led away from what is perhaps the most remarkable feature of the case. Not only does oxygen retain its gaseous form, and the solid carbon become a gas in this combination, but in order that this shall take place at all, there must be precisely what is found to exist, namely, that complete want of affinity of oxygen for nitrogen which has just been mentioned. There is no chemical bond or attraction between these constituents of the atmosphere that would need to be broken, before the union of oxygen with carbon could take place. Oxygen has no attraction whatever for nitrogen, but these exist together in a merely mechanical mixture. Nitrogen acts, however, as a diluent of the oxygen, and prevents its too rapid

union with carbon. It thus renders a most important service. The affinity of oxygen for carbon is so strong, that, were the oxygen undiluted by nitrogen, their union would be destructive of life in all its forms.

These examples illustrate the dependence of all physical being, and of the various effects that are obviously intended in nature, upon the presence of matter, in precisely the states and forms and proportions that are observed, and also upon the possession by each separate form of matter of the precise qualities that it is seen to have. The sincere mind cannot contemplate without emotion the perfect adaptation to its office of each one of the innumerable agencies, on whose harmonious activity all physical being depends.

Our third illustration will be drawn from

THE CIRCULATION OF THE BLOOD IN ANIMALS.

This has a peculiar interest, because it shows a remarkable provision for avoiding mechanical difficulties.

There are two features of the circulation of the blood, which, until recently, have escaped the attention of physiologists. If, in the provision for animal existence, these had also escaped the attention of the Creator, the animal creation would have been a failure, the mechanism would not have worked.

Since the discovery of the circulation of the blood, it has until within a few years been supposed or assumed that the flow of the blood, through the channels provided for it, was produced entirely by the action of the heart. It was obvious that this powerful muscle acts as a pump, first by its expansion, admitting the blood into its cavities, and then, by its contraction, impelling it through the arteries, capillaries, and veins. With this evident action investigators were for a long time satisfied, and inquired no

further. This action, however, considered as the only action that takes place, involves two difficulties that did not suggest themselves, until they were made apparent by the analogies that are afforded in mechanical experience.

The first of these difficulties is found in the hydrostatic column. In any system of pipes filled with water, either at rest or in motion, the pressure of water at the base is greater than it is at a line six feet above the base, by two and five eighths pounds on each square inch of area. Blood being about six per cent. heavier than water, if its circulation were produced by the action of the heart alone, a difference, amounting, on the average of individuals, to about two pounds on the square inch, would exist between the pressures of blood in the head and in the feet, when the body is in the erect position, and this difference would disappear on lying down. Now we know that, in fact, no such difference exist. Under normal or healthy conditions the pressure of the blood is uniform throughout our bodies, and is unaffected by change of position. In some way this difficulty has been completely avoided.

The second difficulty is of a nature, if possible, still more serious. It consists in the disposition of fluids in motion to take the shortest road. This is a very obstinate disposition. In the experience of men with their own constructions, it has been found invariably, that, when alternative passages between two points are provided for a fluid, a very little difference in the length or the directness of these passages is sufficient to cause the fluid to choose the shorter or more direct route, passing entirely through this channel, and standing quite motionless in the other.

Now in this respect the different routes that are traversed by the blood present extreme contrasts. Through some of the arteries and veins the communication, from the

side of the heart from which the blood is discharged around to the opposite side, at which it re-enters it, is short and comparatively direct, while through others it is many times longer and more tortuous. But the hydraulic engineer beholds with wonder the fact, that the current of the blood flows through all these alike. The action of the blood, in conveying nutriment to the most remote parts of the body, and in bringing away the effete matter from them, is precisely as efficient as it is in those parts that lie nearest to the heart. By some means this difficulty also has been surmounted. How have these two results, which are impossible with man, been effected?

Among recent discoveries in animal physiology is the following important one, which affords the principal answer to this question. The powerful contractile action of the heart has been discovered to be the commencement of a muscular contractile wave, that passes from the heart along every artery. What we feel in the pulse was long supposed to be the swelling of the artery under the pressure of the current driven along by the contraction of the heart. This supposition involved another difficulty, to which no attention was paid. The supposed swelling of the artery would involve a resistance to the passage of the blood, and there would be a consequent loss of pressure at every point, by the amount expended in overcoming this resistance. Now it is known that the pulse is not such a swelling of the artery, but is the passage of this muscular contractile wave. Each one of these waves sends before it, in each artery, a volume of blood precisely proportioned to its capacity, and independent of the distance or direction of the flow, and maintains a uniform pressure to every extremity of the body. That wonderful action affords the only conceivable solution of this complicated mechanical problem.

The next remarkable feature is, that the various arteries and their branches are nicely proportioned in area and strength to the extent of the regions which are to be supplied with blood through them. By this careful adaptation, under the uniform wave pressure, every part of the body receives its equal nutriment, and we have symmetry of form. A muscular action, similar to the wave action in the arteries, is to be observed, impelling each swallow of water *upwards* along the neck of the horse and some other animals while drinking.

This glance at a few features, taken almost at random, and which are no more remarkable than is every thing else in nature, of which many examples will suggest themselves to the intelligent reader, will be concluded with a brief reference to a few of the relations or adaptations of widely different things to each other, which are everywhere found. These adaptations are so familiar, that they fail to impress us. We are liable to become as insensible to them as the ruler of the synagogue was to the present divinity, whose presence there, indeed, was not, in reality, any more manifest than it is always and everywhere, but which was so involuntarily confessed by him when he said : " There are six days in which men ought to work ; in them, therefore, come and *be healed*."

These adaptations are such, as that of the sun, at such a vast distance, to varied forms of matter on the earth, so as by its heat and light to quicken them into those activities, out of which both vegetable and animal life are developed, and by which these are supported ; as the structure of the lungs of animals, with reference to the vital interchange, by the blood, of carbonic-acid gas for oxygen, which is perpetually being effected within them ; as the adaptation of the eye to light, and of both the eye and light, on the one hand, to the objects that are to be

revealed by their joint agency, and, on the other hand, to the spirit to whom the revelation of these objects is to be made ; as the adaptation of the wings of birds to the air, and to the weight of the body that in each case is to be supported in it, and to their further office of impelling this body through it ; and so universally the adaptation of each member of every organism, not only to its function, but also to those natural agencies which coöperate with it in the performance of that function. This list might be extended indefinitely. These examples are sufficient to indicate an instructive line of observation and thought.

An impressive instance of the adaptation of physical to spiritual being, as well as of the performance of different functions by a single agency, is seen in the case of the atmosphere. Besides being the supporter of combustion and of animal and vegetable life, and performing a variety of familiar functions, by its pressure and otherwise, the atmosphere is the medium for the conduction of sound, or, speaking correctly, for communicating the vibrations of other bodies to the ears of animals.

All matter is capable of being put into a state of vibration. The variety of these vibrations is infinite. Each one is communicated to the omnipresent air, which is in close contact with all bodies, under pressure. The atmosphere repeats and transmits all these vibrations by corresponding pulsations. It, moreover, repeats and transmits simultaneously all different vibrations that may be communicated to it, however numerous these may be, without any one being modified or affected in any manner by the others. The ears of animals are adapted to receive and repeat, in their turn, the vibrations which are communicated to them by the atmosphere. Thus in some unknown way the mind forms the notion of sound. Sound is wholly a mental conception. The vibrations of matter

are silent. The waves of the air also are as noiseless as the unbroken waves of the ocean. We have no idea how the sensation of sound is produced. Anatomy traces the most delicate and curious structure. But all observation of which we seem to be capable ends where it begins, on the silent vibrations of matter.

Through the medium of the atmosphere our spirits communicate with one another. For this purpose we employ the gift of speech. This also is produced by organs which have been designed with express reference to the atmosphere. Like every other organ of our frames, the organs of speech, to our limited understanding, appear complicated, and in much of their extent obscure. We find in them, as everywhere else, every thing adapted in fact, however little we may be able to understand it, to the accomplishment of the perfect result; which in this case is unlimited capability of expression.

Here, indeed, where the material and the spiritual connect, is something passing wonder. There is not a sentiment or feeling or emotion of the soul, existing in any degree whatever, that the voice is not adapted to express. And, what is more than this, the voice does spontaneously express it. And as the ear receives the pulsations thus communicated to the air, the listening spirit recognizes the sentiment or feeling or emotion. Thus, all human sympathies are interchanged, soul communicating with soul, through the amazing mechanisms of the vocal organs and the ear, and the pulsations of the silent air.

In reviewing these wonders of creative skill, we have followed the conventional fashion, and have described them as if we were viewing a machine. But the spirit that has received the revelation of the ever-living God chafes under this impersonality. Through all nature it

sees his presence and his activity. It knows the motive of this infinite pains. It sees the love of God, shining in every ray of light, falling in every drop of rain, smiling in every flower, ripening every grain, imparting life in every breath. Love is the unity that runs throughout and connects the endless diversity. This love is manifested in all practical ways, in all common things. From its very nature, it must be in a state of ceaseless beneficent activity, in ways adapted to every want of every creature, especially to every want of man, from the very lowest up to the very highest.

It is a remarkable fact, that similar conduct, or practical manifestation of love, constitutes the test that was given by the Christ, to determine the existence of love in the human spirit: "I was hungry and ye gave me meat, I was thirsty and ye gave me drink." We at once recognize this conduct, in the case of man, as affording the real evidence of the existence of love. We see it to be its necessary expression.

Here, also, is found the real solution of the painful problems of sociology. All human devices resting on any other foundation, must come to naught. The divine provision is the simple and radical one,—*universal love, as the animating spring of human, as it is of the divine, conduct.*

The varied agencies for the promotion of human welfare, which have more or less recently commenced their beneficent work, and which are now from time time coming into being, can be useful only in the degree in which they really *are* agencies, not of man, but of God, representing in this supreme respect their Infinite Principal.

Of the divine love, as revealed in nature, we can, at the best, at present form in our minds only faint and distorted conceptions. The same love must become developed in ourselves in an unspeakably increased degree, before these conceptions can become clear and true.

The view of the manifestation of God in nature which is attempted in these papers will doubtless be regarded by many as a very strange view. What is called education has perpetuated the influence of ruder ages. The theological mind is still filled with frightful images of the justice of God, and is taught to look in nature for little else except illustrations of the text, so little understood: "The soul that sinneth it shall die." One of the favorite theological axioms still is: "There is no mercy in nature." To look in nature for the *complete* manifestation of God is to such minds as foolish as Christianity was to the Greeks; and yet there the complete manifestation of God must be. Christians have not been taught to hear, and so they do not hear, throughout nature the yearning cries: "Come unto me," "Why *will* ye die," "What more *could* I have done to my vineyard?" and yet nature is vocal with this appeal. The formal, lifeless conceptions of a moral governor, a judge, and a system of rewards and punishments, harden the hearts of men, so that they cannot feel throughout all nature the throbbing of the love of God, manifested in infinite care, and symbolizing in all beauty and glory its infinite tenderness. The theological logician has little taste for this "sentiment," the practical character of which we are now observing, and which if mankind could participate in, they would need, even as those beings who do participate in it do need, no other revelation; that sentiment, harmony of the soul with which *is* life, antagonism to which *is* death.

For one who is fond of observing the practical ways in which the universal love of God finds its expression, the material provision that has been made for man's activity and development presents an attractive field. Our whole being consists of wants. The progress of civilization is indicated by the increase in the number, and by the eleva-

tion in the character, of our wants. For the supply of those of a physical nature we are wholly dependent on the earth. But we scarcely think of this dependence. The earth abounds with resources, adapted to every want as it arises. These we appropriate to our service, generally without a thought either of the dependence or the provision. A brief reference to a single one of these provisions may aid us to a partial realization of their varied and boundless nature.

If an individual, in ignorance of any reality, should endeavor to imagine what a Being of infinite knowledge and beneficence would be most likely to provide for man, in a single form of matter, everywhere distributed, which would be of the utmost general use to him, which he could put into shapes suitable for any purpose, which in weight and strength would meet the greatest variety of his requirements, which would be capable of combining with other forms of matter, and in these combinations would possess a variety of useful properties additional to its own, which, as his civilization advanced, he would find suited to a greater and greater number of his wants, and, as his knowledge increased, he would be able to apply to a greater and greater variety of purposes, and which, in all its forms, and in the characters that it assumes by combining with other substances, would be especially adapted to aid him in applying the agencies of nature to his use, and so in promoting his own civilization, the strongest imagination could never have conceived of the reality that we possess in IRON. No finite mind can comprehend the innumerable uses of iron, from the cultivation of the soil to the transmission of thought, nor measure its importance to the human race. But iron is only one of the multitude of provisions for our welfare, with which we are already familiar. Probably there is no form of matter without

its use, or more likely its multitude of uses, very many of which we have yet to learn. In the animal frame every part has its use. We have reason to believe that the same must be the case with every form of matter in the earth also, and that too in a higher sense, namely, in adaptation to the voluntary employment of it by man.

In earlier papers the physical creation has been presented as our educator in two respects. Attention has been directed to the ministries of force and of truth. Our complete dependence on the physical creation for our mental, as well as for our physical, sustenance and growth has been briefly referred to. We have admired the adaptation of all things by which we are surrounded to the development of our spiritual as well as our physical powers, by use and exercise. We have seen, moreover, how truth in the physical creation is adapted to promote the growth of truth in the human spirit. The latter we recognize to be a higher office than the former. The elevation of human character is an object of unspeakably greater consequence than the increase of human knowledge. The normal effect upon mankind of all physical influences should be the advance of character and knowledge hand in hand.

Now, we have presented to us another adaptation, harmonious with these, but of a higher nature still. To bring the human spirit in its emotional nature, in its essential being, into harmony with the nature of God, is an object to which all other objects must be subordinate. These must be accounted worthy or unworthy, just as they tend to promote or to hinder this supreme result. All education has its noblest use and reason in the fact, that it fits the soul of man more intelligently and more profoundly to worship God. This supreme end, of transforming the spiritual nature of man into likeness to God, is the end

that the physical creation is above all adapted, and so evidently is intended, to promote. It performs this work, first, by the constant exhibition of truth, which has already been dwelt upon, and secondly, and chiefly, by setting before mankind, perpetually, the stupendous manifestation of the infinite, the universal, and the unchangeable love of God.

We have observed that everywhere in nature there is to be seen the coöperation of many independent agencies, working together in harmony, for the accomplishment of every particular purpose. In the same manner we have these infinitely varied manifestations of the divine love in nature, evidently intended to coöperate in perfect harmony with the supreme manifestation of this love that is revealed in the Bible, for the accomplishment of the same great purpose. It is of the utmost consequence that this harmony should be recognized. Then the sacrifice of the cross must be looked upon as the necessary expression of the same love that is shown in nature. It is seen to be precisely what we ought to look for.

The adaptation of the physical creation to its *inferior* educational uses is something that we recognize at once, and turn it to full practical account. For this purpose we give all diligence to the study of nature. We derive all possible intellectual advantage from the wonders of the creation by which we are environed. But the highest of its uses, and the one which it was obviously intended above all others to serve, we are slow to perceive. We are not eager to study the love of God in nature, and to open our souls to its transforming influence. This supreme spiritual revelation we are blind to naturally, and this blindness has been deepened by our system of education.

Physical science, as at present limited, is chiefly responsible for the false education that now generally prevails.

This science exercises a controlling influence on the formation of our very habits of thought, and it supplies, to a great extent, the formulas of speech that men are accustomed to employ. Its influence in this respect is mischievous. It disregards and ignores the principal thing. It forms its conclusions on a partial view of the facts. It admits into consciousness only that knowledge to which the mind reaches in the inferior modes of its activity. To these things it insists upon confining the attention, as to the only things that can be known. The highest of all truths, that which at once unifies and vivifies the whole, the truth that is of so much greater consequence than those to which science limits its thought, that it were infinitely better that all those should perish out of human knowledge than that this one should be lost, to this truth science is dead.

It ignores, as a source of knowledge, the highest form of our spiritual activity, through which alone the revelation of the highest truth can be received. It dismisses, as undeserving of philosophic regard, the activity of love, the spring of all worthy conduct in man, and by the recognition of which only can infinite love be revealed, which is the spring of all the conduct of God. And it exalts "the reason," a fiction of its own brain, and makes the supposed conclusions of "the understanding" the limits of its belief.

This unspeakable foolishness is easily exposed. The philosopher says to one whom he looks down upon as an ignorant man, and who does not believe in his instruction: "My friend, what do you know about the matter? What right have you to express, or even to form, any opinion at all on the subject?" Ah! it is clear enough that the ignorant unbeliever has not had all the facts revealed to him; moreover, in his unprepared condition, he cannot re-

ceive the revelation of them ; they are shown to him in vain. Yet he is presuming to exercise the judicial functions of his mind on the basis of what there is in his consciousness. Of course, he is judging of matters quite beyond him, on insufficient and erroneous and imaginary data. The unbeliever is himself, however, quite unconscious of all this. He cannot see, and so he will not believe, that outside of his little horizon there can exist any thing which, if he knew it, would change all his conclusions. He insists upon the authority of what he has been taught to call his reason.

The philosopher abandons the attempt to enlighten him ; sighs as he reflects upon the process through which the uneducated mind must pass before it can stand on his more elevated plane of thought ; then turns away, and proceeds to do the very same thing. While taking no account of the two controlling facts, namely, the being of God and the endowment of man with a mode of spiritual activity, by the recognition of which he comes to a certain knowledge of that being, the philosopher assumes that *he* embraces within his consciousness every thing required as a basis for a final judgment, and he appeals to *his* reason as the final arbiter. In the view of Infinite Intelligence, very little difference will appear between the knowledge of the two individuals, or their right to rely on their own judicial findings.

At a meeting of the British Association for the Advancement of Science, held at Newcastle-on-Tyne, some twenty years ago, I remember listening to an account, given by Mr. Glaisher, of a balloon ascension that he had made for scientific observations, with Mr. Coxwell, a noted aëronaut, from a point near London. This impressive description fixed itself in my memory. Mr. Glaisher said that as they rose higher and higher, irregularities on

the surface of the earth gradually disappeared ; well-known elevations became more and more indistinct ; until at last none of these could be recognized, but the whole landscape appeared to be on one level, and that the level of the Thames. What a little way above the earth do we need to get, for its distinctions to disappear !

Science has had a surprising degree of success in rendering mankind insensible to the spiritual influences of the creation. Through the direction that it takes of our education, it is able actually to control our very modes of thought. It has taken care that no ideas beyond those of force and law shall enter the mind in its forming stage. This influence of science on the theological mind generally has far outweighed the effect of the contrary teaching of the Bible.

On the other hand, false theology has also had its influence on scientific thought. The conception of God, that removes him to a distance from his creation, and that adds a wrathful disposition to the Platonic conception of a remote passive Deity, was the conception that physical science, at its birth, found prevalent, though held with various degrees of definiteness, in the Christian world. Under the combined influence of these erroneous theological and scientific conceptions, it remains the case to this day, that pulpit instruction rarely rises above the impersonal idea, so fearfully false, of a regular constitution and order of nature, with which the Almighty only occasionally interferes. This false conception we see continually carried to the length of imagining a contrast between the God of nature and the God of grace ; a contrast that certainly exists between the true God and the imaginary being to which we arrive through an intellectual process. To the infinite presence, within all the modes and forms of His manifestation, of the God to whom it makes its supplica-

tions, the pulpit is, to a large degree, practically dead. We are spiritually bound in fetters forged by men, and may sigh for the freedom of the poet's poor Indian,

"whose untutored mind
Sees God in clouds, and hears him in the wind."

It is believed that the lines of thought which have here been faintly traced, and that for only a short distance, lead in the direction of the truth. If this belief is well founded, then the cure for honest scientific scepticism ought to be found, by following these lines into the infinite spiritual domain toward which they tend.

The being of God must be at once the fundamental and the supreme fact of philosophy, the Alpha and the Omega, the beginning and the end of all knowledge. This truth cannot be successfully disregarded. One thinker after another makes the attempt, and presents his scheme of philosophy, from which the Deity is omitted, and in which our dependence on Him for the revelation of truth is ignored. These schemes are all alike destitute of the principle of life, and so must meet the same fate. On their appearance they are often extravagantly lauded. The next generation has thinkers of its own, and their predecessors are neglected.

As God is omnipresent in nature, so He should be present in every thought of nature. If in reality every thing in nature is the expression of His love, then any conception of any thing in nature to which the love of God is not fundamental must be at least an incomplete conception. It is to be borne in mind, that science is not the knowledge of physical truth in its reality, but that its generalizations are the conceptions which men form of such truth, which is a very different thing. These conceptions are as yet limited and gross. This feature marks the earlier stage of the growth or development

of scientific thought. The study of nature necessarily begins with the observation of things, which can be measured and weighed, and of facts and phenomena, on which all knowledge of truth must be founded. Also, in accounting for phenomena the mind at first looks no further than it is obliged to. The perception of the deepest spiritual realities must be a later attainment.

It is safe to say that, when science emerges from its chrysalis state, it will no longer make it its great object to arrest man's thought at the point where his own being begins. It will not refuse to admit the highest truths into consciousness. Out of the infinity of relations that exist between what is called matter and man and God, as these relations are manifested in the physical creation, it will not select the lowest of all, or the relations between different forms of matter, as the only ones to which attention is to be directed.

The false philosophy, that divides the human mind into imaginary separate natures, and that imagines truth, as being of divers kinds, corresponding to one and the other of these different natures, and that rejects the emotional nature as a source of knowledge, lies at the bottom of our present conventional and mistaken habits of thought.

The cure, by which this condition, so disastrous in its effects, is to be remedied, must therefore be of a radical character. When this cure shall be effected, the fact will appear, most obvious and prominent, that the spiritual truth of the love of God underlies and manifests itself throughout the physical creation; and that in this manifestation or revelation of God to man creation fulfils its highest purpose. It will be in the recognition of this fact, which hitherto has not been generally recognized, by either theological or philosophical minds, that religion and science will meet.

BEAUTY.

WE are so constituted, that the appearance of the physical creation, or those manifestations of force which are observable by our senses, generally awaken within us pleasurable sensations or emotions. The feelings which are thus excited are various, both in kind and in degree. They differ with the different characters of the objects observed, and also, in degree especially, with the different characters of the minds observing them.

Those feelings may all be comprised under the term pleasurable ; and, in a like general sense, beauty may be employed to express all the qualities, by the contemplation of which these pleasurable emotions are awakened. This general sense suits our present purpose. In this sense beauty in nature is that quality that is recognized with a sensation of pleasure by the beautiful mind.

The first remarkable fact about beauty is its universality. This can hardly escape the notice of even the most superficial observer. In all the universe, with occasional exceptions obviously abnormal, every sight and sound is adapted to awaken in the mind some kind and degree of pleasurable emotion. From the glory of the starry heavens, and the indescribable splendor of the sun, throughout everything that is revealed by its light, even to the most minute organism, every appearance in nature, great and small, distant and near, in sky and earth and sea, animate

as well as inanimate, addresses itself, either in form, or color, or sound, or motion, or in one and another of these modes together, with a greater or lesser degree of impressiveness, to our feeling of sympathy with beauty, or to the beautiful in our own nature.

Beauty is, moreover, endlessly varied and ever new. The variety of its expressions may, with propriety, be described as infinite. The healthy mind never becomes weary of their contemplation, but on the contrary grows more and more enamoured of them. It hails every new manifestation of beauty with new delight, and dwells upon every familiar one with deepening awe, or with more tender affection. Whatever the meaning of it may be, beauty is all about us, enveloping us on every side. All our associations are with that which is adapted, in degree without end, to give to us delight.

But what is beauty? Why is it universal in nature? How comes it to be infinitely diversified and yet the same? Why is it that we derive pleasure from the sight and contemplation of it? Before these questions can be answered, we have to disabuse our minds completely of the conventional, artificial, and false education respecting this subject that we have received.

All progress in thought is embarrassed by the systems and contrivances of men. We are the victims of a mania for classification, by means of which all idea of the unity of truth is lost. Strong minds map out their imaginary schemes. To them and their followers these schemes stand in the place of the truth. Much of what is called education consists in the handing down of these devices from learner to learner, each generation in turn teaching to the next what it has itself been taught. When originality appears, it commonly does so in a new system, more artificial than the old. By these means, both the unity of

truth and also the unity of our own spiritual being grow continually more obscured, and the mind seems to lose, and undoubtedly it does in some degree lose, the power to apprehend them.

Beauty presents a striking instance of this perversity. In the last century, a German professor invented the æsthetic sense. This discovery supplied a long-felt want. In the division of the human mind, no place had been made for beauty. The intellectual faculties would have nothing to do with it; it could not be weighed or measured, nor made the subject of demonstration. On the other hand, ethics had no place for it; for no idea of right or wrong could be affixed to it. The intellect and the moral sense were thus defined and limited and occupied, and beauty was left out in the cold. It was obviously necessary, if mankind were to know any thing about beauty, that a special faculty should be contrived for the purpose. So all men hailed this discovery of the æsthetic sense, which was to extricate them from such a serious dilemma, just as pagans were wont to hail a new divinity. Since then, by common consent, every thing pertaining to beauty has been committed to this imaginary separate faculty; just as, in the imagination of men, the winds were once committed to the care of Æolus, and the sea to the care of Neptune.

The idea of an æsthetic sense was a natural outgrowth of the general tendency to artificial classification. It only added another to the existing list of imaginary mental faculties. These must all be swept away together. The simple truth must be recognized, that the mind is a unit, and that what have been conceived as different faculties, are only different modes of activity of the same conscious spirit, which modes of activity are combined in various degrees in every mental operation. There is, in truth, no

result or state that is reached by any mind, whether this be a perception, or a conclusion, or an emotion, that is not the effect of the coöperation of various modes of our spiritual activity, as the occasion calls for their exercise. The correct apprehension of any form of truth involves the harmonious exercise of many forms of this activity. It follows, that in order to be capable of any such apprehension, we need the symmetrical development of every potential mode of our spiritual activity. We shall find this to be true in an especial degree in the case of beauty. Instead of beauty being apprehended by us through a medium of its own, which is neither an intellectual faculty nor a moral sense, the truth is, that beauty is above all things of a nature that demands for its perception or recognition the coöperation of every form of activity of which our spirits are capable.

In the last analysis, beauty is found to be one mode of expression of the love of God. It is thus always associated with the practical expressions of the same love. Both combine to reveal the very heart of the Father. Like the love which it expresses, it exists in infinite degree. Like that love also it is revealed to us by our recognition of it. No mind can perceive beauty in nature in degree greater than its own. Only the perfect, or perfectly beautiful, spirit can perceive beauty in its full reality, or be capable of the perfect joy that its recognition inspires.

Descending from this contemplation of the very nature of beauty, we next find it to be the manifestation of excellence. The works of God, in their normal development, are perfect. Beauty is the sign of this practical perfection. In those works the mind spontaneously and necessarily recognizes that degree of beauty that it itself possesses, or that it is capable of perceiving.

The association of beauty with utility is a subject of profound interest. In nature every thing has its use or its multiplied uses. Our observation is sufficiently extensive to warrant this general conclusion. More than this, every thing in nature is in a state of activity, coöperating in harmony with every thing else for beneficent purposes. This also is a well-established conclusion. With this activity, and with all these uses, beauty is invariably and intimately associated. Indeed, this association is so uniform and so intimate, that use and beauty appear to be identical. In nature beauty may be defined to be fitness for beneficent uses. This is a true and an instructive definition. It is in entire harmony with both the definitions which have already been given. It indicates the active nature of the love which beauty represents, and also the character of the mind that is in harmony with this love, or by which it can be truly perceived. In the light of this relation between utility and beauty, the comprehensive nature of beauty, and the fact that its proper apprehension calls for the exercise of all modes of our spiritual activity, in the fulness of their symmetrical development, will become obvious.

Our proposition then is, that the beauty of any thing in nature consists in its fitness for practical beneficent uses. This undoubtedly will shock many æsthetic minds. Minds accustomed to look up to beauty and to look down upon utility will be likely to resent the attempt to bring these together in our thought. Such æsthetic sentimentality is, however, morbid and false. It is another effect of our education, which we need to get rid of. The association of utility with beauty is universal in nature. As we have seen it to be the nature of divine love to manifest itself in all practical modes of expression, so beauty in its reality cannot be divorced from practical utility. The mind that

is itself in any degree fitted for beneficent uses feels the harmony that exists between itself and such objects in nature, and they appear beautiful to it just in that degree. The spirit rejoices in the harmony that it feels.

It is customary to say that, in the harmonies of nature, fitness, so far as we have discovered it, is invariably found to be associated with beauty. This conclusion has been compelled, as the result of all observation. One step further brings us to the necessary reason of this invariable association. Both represent the same deep reality. We cannot separate them. The longer our minds dwell upon their relations, the more absolute their identity appears. For us it is strictly true that fitness *is* beauty. It is deeply interesting to trace this identity of beauty in nature with fitness for beneficent uses, even the little way that our limited knowledge of such uses enables us to perceive this identity.

We are able to perceive this fitness in the *forms* of natural objects to a much greater extent than in any other feature of them, and so it is especially in these forms that we perceive the identity of this fitness with beauty. For illustration, the outlines of fishes and of birds are lines of grace, their forms are beautiful, the observation of them gives us pleasure. But these are the outlines and the forms that adapt the fishes and the birds for moving most easily and most accurately through the water and the air, and which are indispensable to these purposes. Their movements are also always in graceful and pleasing lines; but the laws of force and motion do not permit these movements to be in any other lines, except those which are graceful and pleasing.

So, universally, we admire the proportions and the structure of every creation in the animal and the vegetable kingdoms. Every new observation of them makes a fresh

appeal to our admiration. The sight of every part as well as of the whole of every organism gives us pleasure. In most cases we are able to perceive that the form and proportions and structure that we admire are precisely those that enable each member of the organism to perform its function most perfectly. The foliage of plants, for example, is a crown of beauty. It is also the organ through which the plants breathe, where goes on that wonderful combination of mineral substances with carbon, which seems to be the first stage of the vital operations, that result in the growth and development of the plant. These all depend upon the extent of leaf surface that is presented to the sunlight and the air. The whole structure of every tree or plant is adapted to effect this extended exposure, and to maintain it against the force of storms.

Two things are here to be noted. First, the adaptation of animal and vegetable structure or form to practical beneficent uses is carried to an extreme of detail that very far transcends our powers of observation. Every new exploration discloses in these forms uses and adaptations to uses, that were unknown to us before, and in every case the completeness of this adaptation fills our minds with wonder. The deeper we go, also, the more we become impressed with the really superficial character of any observations of which we are capable. Secondly, the perception of the fitness of any form in nature for its use increases its beauty in our eyes, and deepens exceedingly the pleasure with which we regard it. The perception of its useful office is not indeed necessary to our recognition of its beauty in a degree, but it is certain that when the office of any form, and its wonderful adaptation and fitness for this office, are seen, its beauty in our sight is greatly enhanced.

We perceive that even with respect to forms in nature, our apprehension of their fitness for their uses is extremely limited, and is, for the most part, confined to their general features. When we pass from forms to the consideration of colors, we are obliged to admit that our knowledge of the uses of these is very slight indeed. It is to be observed, however, that while in detail our perception of the uses of colors is so greatly inferior to our perception of the uses of forms in nature, that, with few exceptions, we cannot be said to have any distinct idea of their uses at all, still, in a general or comprehensive view we get quite as certain a realization of the identity of beauty with utility in the case of color. All glory and all beauty of color are contained in light. And of all useful things light is, beyond comparison, the most useful. Into the infinite details of its universal work and service we have no power to penetrate. We observe, however, in nature an inconceivable number of beneficent results, which are being everywhere perpetually effected by the agency of light, although we cannot see how. There must be contained in light this multitude of adaptations to beneficent uses, that are hidden from us. To doubt, then, the identity of beauty with utility in the case of color, because we are not able to trace this identity, in the mystery of the action of light, while we are literally enveloped in its beneficent results, would clearly be absurd. On the contrary, we are warranted in concluding, in fact we cannot resist the conclusion, that what we find to be true, so far as our observation extends, is true universally,—that not only every form but also every color in nature has its beneficent use or multitude of uses, and that this is the real reason why they both appear beautiful in our sight.

We sometimes observe, too, in the case of color obvious instances of the identity of beauty with fitness. For a

prominent example, green is the general color in the vegetable clothing of the earth. It is also the color that is most grateful to our organs of sight in their healthy state, and which exerts the most healing influence upon these organs when they are impaired. This adaptation seems, however, to be only an incidental one, the green rays being those which are *not* absorbed by the leaves of plants.

In this general view, to which, except in rare cases, we appear to be limited, the utility of beauty of color seems indeed to be capable of proof approaching very nearly to demonstration, as follows: According to the best idea of it that we can form, color is only the effect that is produced on our minds, through our organs of sight, by the vibrations of the supposed luminiferous ether; just as sound is the effect on our minds, produced through our organs of hearing by the pulsations of the air, each color and shade being the effect of a particular rate of vibration. What we *call* colors, however, are these vibrations themselves. Now it is by its vibrations that the luminiferous ether produces the infinite variety of its useful effects. These vibrations constitute light; the cessation of them is darkness.

Still objecting to this view, one may ask, what utility is to be found in the beauty of sunset or sunrise or rainbow. It may be admitted that no utility is discoverable in any of these, and still the strength of our position, that beauty and utility are one and the same thing in the case of color, is not in the least impaired. Light, emanating from the sun, fills the entire space of the solar system. But of this light, that portion which impinges upon the earth, or on all the planets together, is almost inconceivably small. Moreover, of that small portion of its light which is radiated from the sun in the plane of the earth's orbit, those beams which are radiated in any given direction, only

once in a year, for the space, at the longest, of less than eight minutes, exercise their power upon the flying earth. Nevertheless, we know that all life, both vegetable and animal, as well as all motion on the earth, are dependent on the light of the sun. It is therefore evident, that while in the case of light beauty and utility are one, still, for want of an object, the utility only rarely becomes effective, but for the most part exists as potential utility.

It is to be borne in mind, that the preceding observations have been made with reference to beauty of form and color IN NATURE. In the imitative, or, speaking more correctly, the representative, works of man, beauty gives us pleasure through the law of association. It suggests to us that in nature with which our spirits are in harmony. Among the works of man, architecture affords some of the most convincing illustrations of the identity of beauty with fitness. Architecture is not strictly an imitative art, but is one in which in a subordinate sense man is himself a creator, and in which he is required to conform his work to the harmonies of nature. In architecture it has been invariably found, so that it has become an established canon of the art, that complete fitness of every part of a structure for its use, when this fitness comes to be realized, is identical with beauty.

In the perception of beauty, all the modes of our spiritual activity, so far as these are called into exercise, must harmonize, like the strings of an instrument. As already observed, it is not necessary that we should have the intellectual apprehension of the fitness of any thing for its use, in order that we shall feel the sense of harmony and regard the object as beautiful. But if in any case we do have this perception of fitness, then this perception must be satisfied, or else the object cannot appear beautiful to us.

This is a test that, of course, we are able to apply only in cases of known *unfitness* of an object for its use. Such cases cannot be found in nature. For examples of such a want of fitness, we must look to the works of men. There, indeed, unfitness, in some respect or degree, of a construction for its use constitutes the rule rather than the exception, and offends the mind that has been educated to perceive this unfitness. Architecture would afford many illustrations in point. We must confine ourselves to one of an obvious nature.

The office of the foundation of any building is to sustain the superstructure. This demands solidity and strength. These are the essential qualities of a foundation. All its features ought to suggest these qualities. Whatever would detract from its appropriate solidity and strength, or would suggest ideas inconsistent with such solidity and strength, is out of place in a foundation. Now we have seen ornamental work introduced into a foundation, with the obvious effect of weakening it, or at least of conveying ideas inconsistent with those of solidity and strength. In a suitable place those forms might give pleasure, but here their incongruity is shocking to the educated mind.

Machinery, where, as in the case of architecture, man is himself the creator, affords admirable illustrations of the same truth. Here we are able to see, also, with peculiar distinctness, the necessity for harmony through all the modes of our spiritual activity, if any thing is to appear beautiful to us. The illustrations of these truths that may be drawn from machinery possess an especial force and value, because here all uses lie within our comprehension, even more fully than they do in the case of architecture; and the fitness of every part of any machine, and of the machine as a whole, for its use can be determined in a more unmistakable manner. Every machine has its

special use. This use was proposed by its constructor, and he has made all the adaptations of the several parts, and of the whole, of the mechanism to its accomplishment, and the degree of success or failure is a matter of certain observation. To the instructed mechanical engineer no mechanical forms or proportions can appear beautiful, unless a good mechanical reason can be given for them. Those forms and proportions are always the most graceful and elegant that most completely fulfil mechanical requirements. We are able to see at once, that the pleasure that the builder of any machine can derive from the contemplation of his work, all the beauty that it can possess in his eyes, depends wholly upon his perception of its fitness, or of what he believes to be its fitness, for the use for which it was designed. The same is true also of any observer who has a knowledge of such uses.

Now with respect to this fitness, we are in reality always in a greater or lesser degree mistaken. Nothing perfectly fitted for its use was ever made by man. Still, especially in our own work, we cannot see all the imperfections. All will admit, however, that in machine construction perfection is an ideal that men may always be striving after, but can never reach. We may, however, observe that, just in the degree that we imagine ourselves to have attained a high point of excellence in any mechanical construction, just in that degree will its forms appear beautiful to us. I was once asked by a steam-engine builder, as he contemplated his own work with an expression of absolute satisfaction and delight: "Why is not that a perfect engine?" My own view was so different, that I was quite shocked by the question. Such satisfaction designers always feel, so long as they do not know any better. But when afterwards, from enlarged knowledge, probably obtained by that agreeable process known

as experience, we have come to see that our work is in fact, in some degree or respect, unsuitable for its purpose, all becomes changed. Now we look upon the same forms, but their beauty has vanished. The sight of them is no longer pleasing. They fail to satisfy our ideal. We can no longer pronounce them good.

In the earlier days of machine construction, before this construction became a science, through the study of its underlying principles, it was the custom to employ architectural forms, these being the forms with which designers of machines were already acquainted; and very beautiful these adaptations of classic and Gothic features were thought to be. As, however, the unfitness of these forms to resist and to transmit mechanical stress, and to perform the various functions which are demanded, came to be perceived, and the necessity for entirely new forms, designed to meet a new class of requirements, and for freedom in such new designs, untrammelled by the attempt to retain old forms in any degree, came to be realized, how rapidly and how utterly did all the once fancied beauty of these forms in such constructions disappear.

Illustrations of this nature show us also that beauty is the expression of *all* excellence. All modes of our spiritual activity must harmonize in the song of beauty. Here also "good" is a word of comprehensive significance. Before we can pronounce this word over any mechanical work, whether it be our own, or that of another mind, our sense of justice must above all be satisfied. We must be conscious in our own case, and must feel assured in any other, that the highest fidelity has been exercised. No product of the labor and skill, of either ourselves or another, can appear beautiful in our sight, unless we feel that it is the very best offering that we or they had been able to bring.

Reflections of this nature render it obvious that the moral quality is fundamental in beauty, as we have seen it to be in physical truth. In considering the beauty manifested in all the works of God, the spirit of man in its unity, going forth in every form of its activity, must bow in admiration and wonder before that perfection, the varied forms of which are combined to constitute this beauty, and which was pronounced by the Infinite Maker himself to be "very good."

We pass now from things to beings. Here a remarkable correspondence appears. The same qualities charm us in both. We cannot distinguish between the feelings with which we regard a beautiful landscape and those with which we regard a beautiful character. We are awed alike by grandeur of scenery and by grandeur of soul. The same harmony between ourselves and our ideal is felt in each case alike. We perceive at once the duality and the unity of the creation. It is true that the false education, that would deprive the physical creation of its supreme quality in the moral element, would hide this unity from our sight. The mind that sees God in his works will, however, discover the manifestation of moral excellence to be supremely made in the landscape.

There can be no doubt that the delight with which spiritual as well as physical beauty is regarded by us proceeds from a similar recognition. But what is it that we so spontaneously recognize? What is it that, in each of these two classes of objects alike, awakens within us emotions of pleasure, proportionate to our capacity for such recognition? There must be a reason, in some quality that is common to both physical and spiritual beauty, why any created thing or being should have power to awaken these pleasing emotions in our minds, and so should appear to us beautiful. This common quality is found in fitness for beneficent uses.

The fact that in a moral being fitness for beneficent uses is the quality the recognition of which gives pleasure to us, just in the degree that we possess this fitness ourselves, is shown quite conclusively, when we consider the opposite of this fitness, or fitness for injurious and destructive purposes. The latter is the fitness in the contemplation of which the abnormal or depraved mind rejoices. This is the fitness with which such a mind is in harmony. This awakens sensations of pleasure in such a nature. To it this is what appears beautiful. This was the mutual fitness that caused Fagan to be regarded with admiration by his pupils in crime.

Here we have shown to us a law of our nature. We derive pleasure from seeing in others our own likeness, or our ideal. We feel a harmony existing between ourselves and that in another which represents either that which we are conscious we are, or that which we would be. Toward this, whatever it may be, we are attracted, and are repelled from its opposite. The one is contemplated by us with delight. The other we regard with aversion.

So it is always to be observed, that it is only in the degree in which the spirit is itself beautiful, fit for beneficent uses, or in which it feels a longing to become so, that it can derive pleasure from the contemplation either of a beautiful character, or of the beauties of nature. Otherwise the spirit must in a greater or lesser degree be insensible to natural loveliness, and must regard a lovely character with feelings that range from indifference, through all degrees of aversion, to hatred, according to the degree of antagonism between its own nature and the nature that it observes. Perfect beauty of spirit was once seen on the earth. It aroused in malignant natures feelings that could be satisfied only by its destruction.

This law also manifests itself in another manner, which

has already been dwelt upon in a previous paper. This is the strong tendency of every mind to see in others its own likeness or ideal, whether this be good or bad. Whatever character may be presented to us, the image that, in advance of evidence or experience, and to a surprising degree in spite of evidence and experience, we form in our minds, and take to represent the reality, is our own conscious spiritual likeness. We thus naturally expect and assume that others will be governed in their conduct by the same motives that we know would determine our own; that under the same circumstances they will do that, which we know that we would do ourselves.

On the one hand, the innocent, the generous, the true, spontaneously regard all others as being like themselves. "To the pure, all things are pure." "I do not think," said Desdemona, "there is any such woman." It is hard to destroy this illusion, and the trust that attends it. When these are broken their loss brings grief to the spirit.

On the other hand, those who are in any respect or degree depraved see everywhere in humanity the reflection of their own natures. They believe all men to be at heart like themselves. All apparent excellence they look upon as hypocrisy. It is not ordinarily possible for one who is himself governed by selfish or degrading motives to believe that the conduct of any one else can be controlled by exalted and self-denying principles.

"Wisdom and goodness to the vile seem vile."

"And when Joseph's brethren saw that their father was dead, they said, Joseph will peradventure hate us, and will certainly requite us all the evil that we did unto him."

This truth is expressed in the homely proverb, "evil doers are evil deemers."

I have ventured here to return to this subject, and dwell upon it again, on account of its singular importance in this connection. It exhibits the law of all spiritual perception. It shows the manner in which we recognize all spiritual realities. Beauty is wholly spiritual. Beauty in nature is the expression of perfection in the divine conduct. It is the expression of the beauty of the divine spirit. Our recognition of the moral quality of beauty, of its true nature, is possible only in the degree in which we are ourselves in harmony with that nature. Our ability to recognize beauty at all, to derive any degree of pleasure from its contemplation, whether in nature or in human character and conduct, depends wholly upon the fitness of our own natures for beneficent uses, in the development of their lovely capabilities. We can see without only that which we feel, and which we are, within. For the perception of beauty, whether seen in the conduct of God or in the conduct of men, whether revealing the infinite love of God, or the development of the same love in the human soul, whatsoever is just, whatsoever is pure, whatsoever is true, whatsoever is lovely, in our own natures, must coöperate.¹

We now look again upon the physical creation as our educator. We behold also the ministry of beauty. We get a completer sense of the great use of all the harmonious influences by which we are surrounded. We see still more clearly the supreme beneficent purpose which these are adapted to promote. By all means, in coöperative and ceaseless activity, the nature of man is to be transformed. For this purpose, who can measure the influence of our environment of beauty?

The primary end of beauty, in its infinite manifestation

¹ This is universally recognized in the case of poetry. We derive pleasure from poetry just in the degree that we recognize in it the expression of our own feelings. If it does not express such feelings, it is meaningless to us.

in nature, is not to give delight to the spirit of man. This delight is indeed necessary, just in the degree in which the human spirit is in harmony with beauty. But precedent to this, beauty has an office to perform. In its omnipresence and its infinity it has a work to do. This office, this work, is, to aid, gradually, insensibly, in bringing the nature of man into harmony with all perfection, into fitness for its own highest use. In beauty we have another spiritual reality, another manifestation of the Infinite Being, of whom it is written that "strength and beauty are in His sanctuary," a term by which the universe is understood to be meant, and another means by the influence of which man shall ultimately be made a partaker of the nature of God.

We have now seen the coöperation in this supreme beneficent work, of force, truth, beauty, and love in the infinite variety of their physical manifestations. But for this work all these influences are not sufficient. The task is too great. More, very much more, is needed even than these. Nothing can be more obvious than is this fact. Man in his natural state is dead to all these influences. Some additional influence is needed. He can be quickened from a state of spiritual insensibility only by some transforming agency, that shall reach to the very springs of his spiritual being, and cause the dry bones to live.

Not seeking to penetrate to that mystery, the work of God's spirit, but limiting our view to the obvious means which are employed, we find this finally efficient agency in suffering.

SUFFERING.

WITH a feeling of awe, I approach the deep problems of humanity. What has mechanical science to do with these? Much every way. This is the science which gives to nature its true interpretation. The revelations which are made to man through the methods of mechanical science rise by insensible gradations from those which are individual and particular up to those which are most grand and comprehensive. This science furnishes the guiding principles, by following which we are able to penetrate deeper and deeper into the causes of phenomena, until causes assume definite forms in our minds as motives; and, finally, the mind which has within itself the ability to see that which is everywhere before it reaches the ultimate truth—that infinite and unchangeable love constitutes the primary law of nature, the supreme motive to the conduct of God. This love must supremely delight in the moral excellence of the moral beings whom it has created, and must employ all means to secure the attainment by them of this excellence, until this end is accomplished. Some of the modes of manifestation of this love, and their coöperation for this purpose, have been considered. One remains which transcends all others.

The guiding principles of thought above referred to, and which may be considered to have been ascertained, either directly, or by necessary deduction, through the

methods of mechanical science, have already been before us. It is desirable that these should be brought together here, in a general view. They may be summed up as follows :

First. The uniformity of the Divine conduct, and the eternal changelessness of the Divine purposes.

Second. The certainty of the accomplishment of all the purposes of God.

Third. The gradual manner, often nearly or quite insensible, in which the eternal purposes of God move onward to their accomplishment.

Fourth. Every Divine purpose, small as well as great, requires the coöperation of many and diverse agencies.

Fifth. All suitable agencies are uniformly observed to be in perpetual and harmonious activity, accomplishing every purpose of God.

Through all these purposes, as they are disclosed in nature, we have seen that there runs a unity. There is obviously only one ultimate purpose, which constitutes a final end in itself. Every subordinate purpose in its own accomplishment becomes a means for the accomplishment of a larger purpose. These purposes have been traced step by step, until we have found the supreme end, in the re-creation of man in the spiritual image of God. This end the combined influence of every agency is ceaselessly exerted to effect. But these influences are all spiritual and gentle. Man, in his natural debasement and insensibility and ferocity, cannot be affected by them, can know nothing about them. By some means he must be made alive to these influences, as well as to the purely spiritual manifestations of the same infinite love.

If one can read both aright—has the spirit for the perception of their harmony—it is delightful to dwell upon the supreme illustration which is afforded here of the

identity of the physical and the verbal modes of revelation. The Bible, equally with nature, makes the love of God to man its supreme message, and declares the necessary expression of this love. In its own wonderful language, language such as no man not directly inspired could have conceived, and language which every human being may equally appropriate, as addressed directly to himself, it declares the purpose of God to be, that every man shall become a partaker of the Divine nature," "a partaker of His holiness." This is the final end of all the conduct of God, as manifested in nature and in the Bible. Every influence in nature, however insufficient these alone may be, however insensible mankind may be to them, is ceaselessly exerted, to the full extent of its efficiency, to bring man into harmony with God. This is also the single declared purpose of the teaching of the Christ, and the motive to His death. This is the single object of that infinite mystery, the incarnation and the suffering of the Son of God. They who penetrate most deeply into either nature or the Bible, come at last in both to the same animating force or motive—infinite, universal, and changeless love.

To our limited vision humanity presents a confused scene ;—joy and sorrow, happiness and suffering, in their endless forms and degrees, estrangement of nature from God more or less entire, restoration to His image more or less incomplete ; all being continually, and in every different stage of their development, removed from our further observation by death. This scene and this experience raise in every mind questions, to which each one, according to the degree of its earnestness and of its doubt, craves an answer.

The complete answer to all these questions is given in the Bible. This revelation shows how, amid every form

of privation and suffering, every human being may, even in this present life, attain to perfect happiness, to exultant and triumphant joy, and the peace which passeth all understanding. The Bible declares happiness to consist in the union of the soul with God, and suffering itself to be the supreme means by which this union is to be effected. Suffering in all its forms is thus presented to us as the ultimate and efficient agency by which this eternal purpose of God is to be accomplished, and thus as the supreme manifestation or expression of His love. This is the express teaching of the Bible. Attention is called to other considerations which prove this teaching to be true.

No other change ought to interest the philosophic mind so deeply as this change in the spiritual nature of man. It is not a change of will, but a change of that which gives to will, purpose, resolve, and all activity, their direction. It is not a change of belief, except as new beliefs, or rather new intuitive perceptions and recognitions, follow necessarily from the change of disposition or character. It is a change of the most radical nature. It is eminently a practical change, or a change which must manifest itself in corresponding change of conduct. It reaches all the springs of human activity. It is a transformation of man, from a being wholly false to a being wholly true; from a being wholly selfish to a being wholly self-sacrificing; from a being wholly vindictive to a being wholly forgiving; from a being wholly hateful to a being wholly lovely;—in short, from a being in a state of complete antagonism to the nature of God to a being in a state of complete harmony with that nature, a partaker of it. It is a change so total, that it could be expressed by the Christ only under the tremendous figure of being born again. Like all the operations of God, this change is

gradual in the individual and in the race. We observe this change in its progress, and are ourselves the subjects of it. All human beings are in one degree or another affected by it. Probably none remain absolutely in the former state, as through the endless progress of eternity none can attain to the infinite holiness of the latter. Every one is familiar with natures in which such a transformation is not conceivable by us, but there can be no exception or failure in the purposes of God.

All the analogies of nature compel to these conclusions: *First*, a change so prodigious can be effected only by strong agencies, acting in many cases through long periods of time; *second*, if this is the purpose of God with respect to one human being, then it must be equally his purpose with respect to every human being; and *third*, this purpose must in every case be finally accomplished.

We recognize suffering as the supreme natural agency employed in effecting this purpose; we perceive its adaptation to this use sufficiently to enable us to form such recognition. But the philosophic mind sees in the mere fact of the existence of suffering abundant evidence that it must have been adapted and intended for this use, which all things are designed to accomplish. Suffering cannot form an exception. Suffering cannot lie outside the universal unity. Looking at human suffering from an *a priori* point of view, we are obliged to say that this must be reconcilable with the infinite and changeless love of God. The same motive must determine the infliction of suffering that determines all the other conduct of God. Suffering must be a mode of expression of His love. More than this, it must be *the* mode of expression of His love which is the necessary mode under the conditions which exist. No other supposition is conceivable by a mind which is capable of reasoning. We may be dumb in the

presence of overwhelming trial, but we cannot doubt the uniform action of the infinite love of God.

With this necessary conclusion all human experience agrees. Mankind have received all their temporal blessings as the result of the sufferings of others, and have been made capable of receiving these benefits by sufferings endured either by themselves or by those from whom they have inherited their dispositions. Vicarious suffering involves deep mysteries. The relations which give to it its efficacy are only dimly perceived by us. But we know that the entire inheritance of civilized man has been purchased by the suffering and death of those who have gone before us. There is no possession that men to-day cherish and hold precious which has not been purchased for them with this price. In the fundamental principles of civilized society, in individual freedom and protection, in every temporal good, as well as in the capacity of mankind to appreciate and enjoy these benefits, we behold the fruit of the sufferings which preceding generations have endured. Luxury and splendor have left us nothing which can operate as a present personal boon to mankind, absolutely nothing. For all these things we are indebted to the sufferers who have lived and died for those who were to follow them. Among these, too, we find the examples of every virtue that we instinctively revere, and of that conduct which it is the noblest inspiration of humanity to emulate.

We turn again to the Bible. No mind can fail to be deeply impressed by the fact there recorded, how, in conformity with the law that all blessings must be purchased for man by suffering, the Saviour of men, expected as a conqueror, came a man of sorrows, and obtained for our race its supreme blessing by His death.

The Bible teaches further, as has already been observed,

that personal suffering is the means by which men are made willing to receive, or by which they become capable of receiving, in degree without end, the boon of the new nature which has been purchased for them. It declares that the punishment of sin, its natural and unavoidable consequences, in every form of suffering, are themselves the means by which the sinful disposition is to be destroyed, by which the defiant spirit is to be broken down. Thus sin is made to work its own cure. In the parable of the prodigal son it was the starvation consequent on his own excesses that drove the prodigal back to his Father's open arms. So also all growth in spiritual life, every step of approach to the nature of God, is declared to be the effect of suffering. "Perfect through suffering," heard through the Bible as its grand undertone, swells at last into the overpowering note in which all the harmonies of revelation become absorbed.

Here again we have the confirmation of human experience. There is no one who has attained to any degree of true beauty of soul, of loving harmony with God, who does not recognize suffering as having been the principal means by which this change of nature has been effected. There is no teacher of spiritual truth who has not learned that suffering is the best, indeed obviously in many cases the necessary, preparative for its reception.

Suffering thus appears, by all testimony, and viewed in every light, as the great remedial agency. It becomes impossible to conceive of it as constituting an end in itself, as forming a single exception to the universal relation of things to a single end. It is clear that the death of the Christ presents a case in which suffering was not an end in itself. But in this respect this is necessarily the type of all suffering. If there is a single case in which it is certain that suffering was wholly a means by which

God accomplishes his remedial purpose, then suffering must be such means in every case, or the universe must cease to be.

The teaching of the Bible, that suffering is the means by which mankind are made capable of receiving the gift of eternal life, or of the Divine nature, is the belief of the whole Christian church, up to a certain point. Up to the end of this present life, suffering is recognized by all Christians as not constituting an end in itself, but as the crowning evidence of the love and faithfulness of God, the means by which he humbles the rebellious and defiant spirit of man, and brings him into submission to and reconciliation with himself. But it is conceived that at the instant of death all this is changed, that the soul which passes this point unreconciled to God never can be reconciled to him. What is termed the orthodox belief is, that at death suffering ceases to be remedial in its nature, that it no longer operates as a means for the attainment of the infinite good, but becomes thenceforth an end in itself. The disposition of God toward the individual is now reversed. Through all eternity he is to him a God of wrath and vengeance.

The doctrine of eternal punishment is not contained in the Apostles' Creed. Of all the views of Christianity which have come down to us, the most spiritual, and, therefore, presumably, the most correct, is that which was taught by Clement of Alexandria, about the end of the second century, being rather a development of the gospel and epistles of John. He taught, in a manner that leads to the belief that this was the received doctrine of the Eastern churches, that the work of Christ was continued equally after death. In the Roman Church, however, the eternal punishment of unbelievers seems to have been a prominent doctrine from the earliest times. In these

opposite views we see the philosophic mind of the Greeks, and the very different dispositions of the Romans, not capable of being disturbed by any thing so unsubstantial as philosophy, but whose minds habitually dwelt upon law, justice, and punishment. The Athanasian Creed, so-called, which originated in the west of Europe, certainly a century after the death of Athanasius, declares who shall without doubt perish everlastingly ; not those who give no meat to the hungry or drink to the thirsty or clothing to the naked, but those who refuse assent to every syllable of that creed. The doctrine of everlasting fire became, what it still continues to be, the fundamental feature of that stupendous spiritual despotism, the power of the keys. It was associated with the imagined duty, often fearfully exercised, of destroying unbelievers in this world. It is to be observed that the despotism is certainly quite as well supported as the doctrine, by a literal rendering of the words of the Christ. The Reformation left this doctrine untouched. The dispositions of men did not then regard this belief with the least aversion. Eternal damnation seemed to the Protestant as appropriate for the unbeliever, as it seemed to the Romanist for the heretic. The amazing influence of what is called education, which in this, as in so many other cases, consists in handing down and rooting into the mind the errors of ruder ages, keeps this belief alive, against the revolt of humanity and the demonstration of philosophy.

Respecting the attitude of God to man at the instant of death, there are three possible conceptions consistent with the doctrine of eternal punishment. Of these, the first is, that the purpose of God, to re-create in his own spiritual image a soul in which this work had not yet been effected, is then abandoned. The second is, that

God had no purpose respecting such a soul. The third, which is known as Calvinism, is, that God had from all eternity a purpose respecting each individual of our race ; that this eternal purpose must necessarily be accomplished, and that the end reveals what this purpose was, which is fulfilled in the eternal life, or in the eternal death, of each soul ; that the enormously greater proportion of mankind are the victims of that purpose, which from all eternity had consigned them to eternal suffering ; that “ of his mere good pleasure,” God elected some, including, of course, the believers in this doctrine, to everlasting life ; and that for these alone, the elect, Christ died.

Calvinism was the natural product of a barbarous age, when men regarded the sufferings of their fellow-beings with little concern ; when for centuries every Baron in Europe had been a freebooter, and the Church was the only sanctuary where they who had no protector could be safe ; when even in England the theft of an article exceeding in value one shilling was punished with death, and when the natural impulse of all religious zealots, to destroy those who differed from them in belief, manifested itself whenever they possessed the power.

Above all, the knowledge of the uniformity of the conduct of God, of the universal and changeless character of His motives and purposes, which has been revealed to us, was not then possessed, in even the least degree. Nature, with its priceless lessons, was as yet a sealed book. So the philosophic mind did not exist, that could perceive the absurdity of the Calvinistic position. No one was able to affirm the impossibility of an exception to the love of God. No one could then have any idea of the demonstration, declared through all nature, that the Divine love must of necessity be equal toward every moral being.

So Calvinists saw nothing incredible in their monstrous

doctrine. They saw clearly enough that no purpose of God could ever be changed, that nothing could transpire except in fulfilment of His eternal purpose, and that the redemption obtained by the death of the Christ must be effectual to the full extent for which it was intended. But they could not comprehend the universal nature of the love of God. Indeed, their disposition was to make this love quite an exceptional thing, and to confine its operation within exceedingly narrow limits.

Calvinists agreed with the Roman Church, and with Mohammedanism, in arresting thought at the will. They looked within themselves for the criterion of truth. They imagined just such a God as one of themselves would be, if only he possessed the power. Their imaginary God had merely to execute his sovereign will and vindicate his glory, and this he was supposed to do, just as any earthly conqueror then would do, by rewarding his friends and punishing his enemies, to the extent of his ability, and both with the same complacency.

The logic of Calvinism was impregnable. "Unbelievers are at death condemned to endless punishment. All things must transpire in fulfilment of the eternal purpose of God. Therefore, it was the eternal purpose of God that unbelievers should be so condemned." This syllogism was so agreeable to their own sense of justice, that Calvinists failed to see, what has been so often pointed out, that it presents a perfect example of the *reductio ad absurdum*, in which the falsity of the premise is disclosed by the absurdity of the conclusion.

Arminianism is the wild protest of humanity against this terrible logic. But Arminianism accepts the doctrine of eternal punishment, and so its protest is vain. The eternal foreordination of whatsoever comes to pass is involved in the conception of an Infinite Being. The Stoics

recognized this truth. "Out of the universe from the beginning," writes the Emperor Marcus Aurelius, "every thing which happens has been appointed and spun out to thee." Thus far the doctrine of fatalism must be accepted. The error of fatalism is on the human side. It is only when fatalism denies the freedom of the will, or the necessity of human effort, that it becomes false. The chains of Calvinism were strongly forged. The heart of humanity has swelled through its links, and blossomed into songs of love divine. But these links can be broken only by the recognition of the truth of the universal, and the changeless nature of the love of God.

Here mechanical science appears, to shed a new light upon the world and upon the pages of the verbal revelation. It shows to us the love of God as the primary law of nature, and so, like all the subordinate laws of nature, which are modes of its manifestation, uniform in its operation. It enables us to affirm, that if love determines the conduct of God toward a single individual to-day, it must determine His conduct toward every individual for ever. If the Christ died to redeem one soul, then He died to redeem every soul. If the re-creation of one soul in His own spiritual image is the purpose of God, then this purpose extends to the whole race of man, and all the means employed for effecting this purpose must continue their coöperative activity until it is accomplished. The universe rests upon the eternal uniformity of the conduct and motives of God.

When this great truth is admitted, difficulties disappear which otherwise are insurmountable. The best that believers in the doctrine of eternal punishment can do is to shut their eyes to them. We see individuals continually passing away from the earthly stage of being, at every age, and with every conceivable variety of character and

disposition, of inherited nature, of education and of opportunity. The doctrine of eternal punishment draws a hard and fast line, separating mankind at death into two classes. The Roman Church makes one of these classes to consist of those who have been baptized, and if of responsible age have acknowledged the Pope as the vicegerent of God, and had their sins forgiven by a priest. The Protestant church make this class to consist of all who believe on the Lord Jesus Christ. These are exalted to infinite and eternal joy. The rest of mankind are condemned to everlasting woe. At what point does an infant become responsible? Why are the heathen condemned, whom no priest ever appeared to baptize, and who never heard of the Christ? How is the question of responsibility for inherited viciousness to be met? At what point is any one to meet or to fall short of the only test that was ever laid down by the Christ: "I was hungry, and ye gave me meat"? Obviously mankind cannot be separated at death into these two classes. The whole course of nature is at war with such a doctrine. On any calm consideration of it, death is seen to be an incident occurring indifferently at all stages of an uncompleted process. The only conception that avoids all difficulties is the one which accords with the demonstrated truth, that the eternal and changeless love of God will after death continue to operate upon every soul according to its needs, and will bring it sooner or later into the state of everlasting joy, which consists in participation in the Divine nature.

This truth will be denounced by many Christians, as opposed to the plain teaching of the Bible. Such denunciation is readily shown to be unfounded. Men always have had, and they always must have, some general principle of interpretation, which consciously or unconsciously they follow in the study of the Bible. These principles

have been fixed in their minds generally as the result of their education. They differ very widely from each other. Those, for example, which are inculcated in the Roman Church lead their scholars to attach supreme importance to passages which Protestants disregard entirely, and *vice versa*. Now it is a remarkable fact, that mechanical science furnishes the only principles of interpretation of the Bible, as well as the only conception of the nature of God, which men have not drawn from human analogies, which they have not looked for within themselves, and found in contemplating their own dispositions. The protest of God, "Thou thoughtest that I was altogether as thyself," "My thoughts are not your thoughts, neither are your ways my ways, for as the heavens are higher than the earth so are my ways higher than your ways, and my thoughts than your thoughts," fell upon dead ears.

In fact, until the study of the truth and love of God, and the changeless nature of the Divine purposes and conduct, as revealed in nature, had made sufficient progress to furnish true guiding principles to the study of the verbal revelation, men were necessarily shut up to themselves. Reference has already been made to the very serious disadvantages in this respect under which those men labored who in various ages have assumed to formulate creeds, which have been handed down to us, and have been made in a large degree to take the place of the Bible. What could they know of the infinite meaning contained in the words, "I am the Lord, I change not!" How could they help limiting, as far as possible, language so utterly beyond their comprehension as this: "I have sworn by myself, the word is gone out of my mouth in righteousness, and shall not return, That unto me every knee shall bow, every tongue shall swear."

It does seem strange, though, that they could so com-

pletely overlook the comprehensiveness of the cry of John : " Behold the Lamb of God, which taketh away the sin of the world." In their endlessly refined speculations, concerning God and man, and their relations, it is to be observed that they paid but little regard to any thing beyond the will. Their entire conceptions were limited also by an exclusive disposition, which they had unconsciously copied from the Jews. The revelation of the infinite and uniform love of God has indeed been needed.

Attention is earnestly called to the fact, that the Bible has been interpreted under the influence of fixed ideas of a narrow and earthly nature, which humanity and science are showing to be unfounded, and not only in ignorance of, but without the capacity to receive, the sublime truths which form the guide to its correct understanding. Under these limiting conditions, it was a matter of necessity for our ancestors to pass by, as beyond their comprehension, those expressions which present eternal truth in its everlasting form, and to fix their attention instead on those expressions in which the truth is adapted to the reception of ignorant minds, to read figurative language literally, and to find interpretations which were within their comprehension, and would conform to their habits of thought.

They read, for example, the absolute declaration of the supreme truth, with which the whole creation is vocal, " God is love." It made the same impression on their minds that the statement of any thing beyond its comprehension makes on the mind of a child. They read : " God so loved the world," and, *horribile dictu*, instead of this they could write and teach : " God, having out of his mere good pleasure, from all eternity, elected some to everlasting life, did enter into a covenant of grace with *them*." They read : " For as in Adam all die, even so in Christ shall all be made alive." This of course could not be so.

St. Paul never could have meant that. So after the word "all," in the last clause, Romanists understand "the baptized," Calvinists understand "the elect," and Arminians understand "believers in this life," to be inserted. Meantime there stands the invitation, which in the nature of things must be without end, "whosoever will, let him come."

But, it will still be demanded by the Calvinists, are not the doctrines of election and of eternal punishment absolutely taught in the Bible? No, a thousand times, no. The early believers in Christ were the elect, in the same sense in which the Jews were the chosen people of God, and for a similar high purpose; that as through the Jews the knowledge and worship of God had been preserved on the earth, and a Saviour had been given to men, so through the first believers in Christ the glad tidings of His redeeming work should be carried into all the world, and proclaimed to every creature. To give to the term "the elect" any further force than this is wholly gratuitous and unwarranted, and is opposed to established canons of interpretation and construction. It was natural that the Christians, especially the Roman Christians, who were mostly slaves, should be forcibly reminded by their teachers of their exalted condition. What else could kindle their enthusiasm as would the declaration of the fact, that before time began they had been ordained to a glory that would only have had its commencement when time should end! But what warrant does this afford for the doctrine, at which all nature shudders, that Christ died only for the elect?

So with the doctrine of eternal punishment. It is clear that all the words of the Christ are to be considered together. Many of his figurative expressions and parables have been distorted in their interpretation, to make

them sustain this doctrine. When this doctrine has been abandoned, the true meaning of these passages will appear. The latter part of the twenty-fifth chapter of St. Matthew is mainly relied upon to sustain the doctrine of eternal punishment. Now it is a singular fact, that there is not a Christian church of any name which employs the test there given by the Christ. Advocates of eternal punishment take the startling imagery of that wonderful description, and give to it a literal meaning, because it thus answers their purpose, and there they stop. We have lately seen the difficulty the Protestants have had in reviving this neglected test for the benefit of Sir Moses Montefiore. Romanists had no trouble about him. They would have burned him here if they could.¹

All the tremendous figures of speech employed by the Christ are abundantly satisfied by the suffering through which alone it is possible for hardened and depraved natures after death to become changed into the image of infinite love.

On the other hand, there stand two declarations of the Christ, which are hopelessly irreconcilable with the doctrine of eternal punishment. The first of these is: "He that knew not, and did things worthy of stripes, shall be beaten with few." The Calvinists were nothing if not logical. What could have blinded their eyes to the meaning of this passage? How was it that they did not perceive that, if a single sinner was to be beaten with few stripes, the whole doctrine of endless punishment must fall to the ground?

The second declaration is, if possible, still more conclusive: "Whosoever speaketh against the Holy Ghost, it shall not be forgiven him, neither in this world, neither in

¹ Our ears are tingling yet from the out and out defence of the Inquisition, to which Monseigneur Capel has lately compelled us to listen.

the world to come." Here a single possible exception is declared to forgiveness in the world to come. It is an impressive fact that, amid all forms of blasphemy among men, blasphemy against the Holy Ghost is never heard. St. Peter, claimed to be the head of the Roman Church, did not himself believe the doctrine of eternal punishment, for he writes that Christ "went and preached to the spirits in prison."

It is remarkable that the revelations of science should carry us back to the truth as taught by the earliest uninspired teacher whose writings have come down to us, Clement of Alexandria. He taught the Divine immanence in its deep and spiritual reality,—in a sense in which the Church has almost ever since been, and still is, dead to this most profound and most precious of all truths. He taught, moreover, that "we can set no limits to the agency of the Redeemer; to redeem, to rescue, to discipline is His work, and so will He continue to operate after this life." ¹

¹ Stromata, vi., ch. 6.

FAITH.

WE have now arrived at the solid ground of faith, in the perception and acceptance of the sublime truth, of the infinite and universal love of God, and the recognition of the modes of its uniform and ceaseless activity. As revealed in nature, the love of God is without limit, or preference, or change. From the impressive teachings of mechanical science we derive all our knowledge and form all our conceptions of the changeless nature of the Divine conduct. In unvarying uniformity of action, this science discloses a fundamental law, which we at once see must be common both to the physical and the spiritual worlds; or, in other words, must determine all the conduct of God. The importance of the service thus rendered by mechanical science cannot be adequately realized. A God who was not seen to be "without variableness," upon whose brightness the possibility of turning could cast a shadow, such an imaginary God could not be the object or the inspirer of faith. As observed in the preceding paper, the whole Bible must be read in the light of this revelation.

We must not overlook here a fact, which has already been alluded to, and of which we have now a prominent example before us, and that is, the pervasive nature of mechanical science. Upon this greatest of all subjects, the Divine nature and conduct, this science is undoubtedly at the present day contributing most largely to

emancipate the human mind from bondage to traditional authority, and to form correct methods of thought, even when men are entirely unconscious of the influence to which they are indebted.

The reception of these truths, of the universal and the unvarying nature of the love of God, seems to have been, and even yet to be, the most difficult of all things for mankind to become capable of. It involves a radical change in the dispositions of men, a change that apparently could be effected only in a manner almost inconceivably gradual. This change, not less in its nature than in the long period required for its accomplishment, suggests the process in operation through geologic time, by which the void world of fire and rock became transformed into the fertile earth clad in verdure and teeming with life, and the darkness produced by the boiling and down-pour of oceans gave place to the glory of the revealed heavens and the changing beauty of the skies.

The small portion of the human family, in whose minds, as the result of a long series of teachings and judgments, the truth of one personal unseen God had finally become fixed, secure against the assaults of idolatry, held, with a degree of fanaticism now difficult to be imagined, to the belief that this God was theirs alone, to the exclusion of the rest of mankind. The numerous distinct declarations to the contrary in their own sacred writings had no power to shake this conceit. The first recorded teaching of the Christ was directed against it. This teaching consisted only in the recital of two familiar events in the Jewish history. But, for the very reason that the obvious deduction from these events, that the love of God extended equally to the Gentiles, could not be avoided, the reference to them by the Christ exasperated His hearers to such a frenzy, that they dragged Him to the brow of the

hill on which their city was built, to cast Him down headlong.

In its inception, the Christian Church was composed almost entirely of Jews. The converts to Christianity gave up their dream of the temporal dominion of their race, and accepted the Christ as a King whose kingdom was not of this world ; but that the good tidings of great joy should be to all people, that was more than Jewish jealousy could endure. So, as the gospel spread among the Gentiles, the Jews became united in rejecting it. Since then they have listened, in their synagogues every Sabbath day, to the reading of the Scriptures, in which are contained such expressions as this : “ It is a light thing that thou shouldest be my servant, to raise up the tribes of Jacob, and to restore the preserved of Israel ; I will also give thee for a light to the Gentiles, that thou mayest be my salvation unto the end of the earth ” ; and they have waited, all the same, through nineteen centuries, and are waiting still, for their exclusive Messiah, who shall restore the kingdom to Israel.

The taming of human ferocity, and the weakening of the spirit of exclusiveness, neither of which were by any means confined to the Jewish race, have advanced by such gradual steps, that their progress can be observed only by comparing the states of society at periods separated by long intervals of time ; and often it has seemed as if humanity had actually retrograded. In the belief of the Church of the middle ages the unbaptized came to take the place, that in the Jewish mind was held by the uncircumcised, of the hated of God. So lately as the sixteenth century, William of Orange was, perhaps, the only man in Europe, who seemed to realize that it was not the duty of the dominant religious sect, whatever that sect might be, to use its power for the punishment of disbelievers in its

creed. The best of men have in their turns exercised the very intolerance against which their own lives were a protest. They knew not what manner of spirit they were of. But it was the spirit of their age. This fact ought to be taken into consideration in judging of their conduct. We have no right to arraign them for having fallen short of our standard. Future generations will have quite as much reason to arraign us for having fallen short of theirs.

Respecting the present development of Christianity, the following thoughts are suggested: First, confining our view to the Protestant Church, we observe that, while intolerance seems to have pretty nearly expired, the spirit of exclusiveness still survives. We recognize the same old exclusive disposition in modified forms of expression, although it is evident that this disposition also is feeling largely the influence of more enlightened thought.

This exclusive disposition appears, not merely in sectarianism, but in the childish refusal of great bodies of Christians to commune with one another, which is harmless enough, but for the spirit that it perpetuates, and the unchristian exhibition that it makes. This disposition appears, feeble and ludicrous, in "the uncovenanted mercies" which used, more commonly than they now are, to be vouchsafed by the charity of the churchmen to those outside their fold. It appears in a much more serious form among those who still retain the Calvinistic doctrine of a limited atonement, and insist upon giving an utter perversion of meaning to the doctrine of election. This fearful interpretation of Scripture we have already seen to have been more grateful to the age from which it has been inherited than it is to ours. In the repetition by "the elect," in ancient and more especially in modern times, of the absurd conceit of the Jews, we have exhibited the tendency of poor human nature to manifest the same weak-

ness under similar conditions. A careful reading of the Bible will show that similar narrow and literal interpretations afford incomparably stronger ground for the pretensions of the Jews.

When we turn to the Roman Church, common sense, to say nothing of humanity, stands aghast at hearing eternal damnation denounced against whomsoever may dare, not only to deny the spiritual supremacy of the Pope, but also to oppose his claims to any temporal possession, and even to resist the despotism of a parish priest. How long, O Lord, must the earth continue to witness this awful farce ! As if the God whose nature we are feebly endeavoring to contemplate could have committed the eternal state of a single soul to the caprice of vindictive men. This usurpation or pretence of spiritual authority we observe to be employed for the appropriate purpose of enslaving the human conscience.

In spite of revelation, men have found many ways of creating imaginary gods after their own image. This was especially true in the Christian Church in the centuries preceding the cultivation of physical science. The analogies of a judge and of a king, pressed far beyond any warrant afforded in the Bible, have been made especially fruitful in absurdities. The familiar examples of human potentates, with the well-known characters of those who were most prominent in history, the difficulty of access and the methods and the mediums of approach to them, the capriciousness of their conduct, and the uncertainty of the result in cases of appeal to them, all these associations have exercised a most pernicious influence on the habit of religious thought. Traces of this influence still appear even among the most enlightened Christian communions, while elsewhere these human analogies now hold millions of professed Christians in practical idolatry.

But of greater power, to blind the human mind to the true conception of God, than even man's exclusiveness and intolerance, and misleading human analogies, have been the deep and lasting impressions that have been left upon the Church by paganism. From paganism the Church has, among other things, derived the priest and the sacrifice, which is a remnant not of Hebrew but of pagan rites, the worship of the queen of heaven, the canonization or semi-deification of men, the ideas of informing and of appeasing an absent and angry God, and the doctrine of purgatory. On this last superstition the Roman Church seems to have improved. The school-boy reads the original fable in his Virgil, but we do not learn that the priests of Jupiter ever thought of the stupendous account to which it could be turned.

But above all, the Church received from heathen antiquity the dogmas, that ignorance is the mother of devotion, and that reason and faith are antagonistic to each other. In their original application these dogmas were perfectly true. There could be no reconciliation between the philosophy of Greece, in the age of its maturity, and the system of classic mythology. The philosophers then realized, perhaps as clearly as we do now, that the deities who received the adoration of the vulgar, whose worship was woven into the fabrics of their domestic and social and political life, in whose temples and images art gave expression to its loftiest conceptions, the stories of whose births and deeds constituted the chief intellectual possession of the multitude, and the imposing ritual of whose service awed and held captive their imaginations, were all "airy nothings," who from the poet's pen had received their "names and habitations." So when philosophy and paganism met in the same communities, nothing could be more true than were these two dogmas. Ignorance *was*

the mother of devotion, and between reason and credulity, miscalled faith, there was complete antagonism.

As the Christian Church degenerated into a mighty system of imposture, with which it combined a system of extortion that paganism never knew, it naturally accepted and made full practical use of this legacy, the endurance of which has seemed to be one of the strange phenomena of history. The fact is, these maxims of paganism have endured, and still endure, because they are true in their application to all human substitutes for true religion. While the latter demands the exercise of the highest intelligence, every form of human counterfeit shuns its searching light. Moreover, the merely traditionary influence of those dogmas, especially of that one which declares an antagonism between reason and faith, is felt universally even to this day; and that in a degree that illustrates how difficult a thing it is for the mind to shake off the chains of a falsehood that bears the stamp of age. This dogma still exercises an insidious power, even where religion has been most cleansed from man's defilement, and over minds by whom the naked proposition, in its terms, would be instantly rejected.

But, O my friend, let us get away from these exhibitions of human infirmity, and cast off from our spirits the spell of their misleading and contracting and degrading influences, and come forth into the presence of the God of all revelation. So far, too, as we may, let us rise above the effects of familiarity with the amazing exhibitions of His love, and behold that love as, universal and changeless, it enfolds us on every side. Let us lift our eyes to the heavens, where the Almighty has written his name, and see the sun forever shining in his strength, not with partial glory, but to quicken into life and gladness alike each individual being, to reveal alike every object, to penetrate

every eye. Let us look upon the earth, that cannot forget one grain of sand. And as we behold this glory and realize this equal care, and as we feel the animating breath of the universal air, let us receive into our minds the great truth, that every thing was intended to promote the growth, and encourage the exercise, of faith toward God in the soul of man.

In endeavoring to rise to the contemplation of this theme, a definition of faith seems first to be called for. What, then, is faith? I answer, faith is a state or condition of the mind, rather than a form of spiritual activity. It is that state of trust, peace, and repose of the soul in God, which is not capable of being disturbed. Faith and love are intimately blended with one another. Love is the form of spiritual activity by which the Infinite object of faith is recognized, and of which faith is itself the result. Faith, on the other hand, is the ground out of which love springs forth. Each one works forever to intensify the other.

Faith can have no existence in the philosophic mind where there is no perception of God in His works. To the mind in which that meaningless expression, "the uniform constitution and course of nature," rises like a wall before the sight, and which feels no impulse to penetrate through this senseless jargon, to the bright region where all truth is found, nothing but darkness is possible. But to the illumined spirit, that has been re-created in the moral image of God, and so has become enabled in all the activities of nature to behold the eternal faithfulness of the Infinite Father, the unvarying activity of His love, that realizes how, in its utter helplessness, it is every moment carried in His arms, and folded to His bosom, that feels the rapture of conscious participation in His universal and infinite affection, to such a spirit faith is the natural and necessary state.

In this perception of the changeless nature of the love of God, we find, as has already been expressed, the real and only ground of faith. It is obvious that faith follows necessarily from this perception, and must exist in the soul just in the degree in which this perception itself becomes clear and distinct. The two are inseparable. Faith cannot exist where the Divine love is not recognized, and it cannot be wanting where this love is recognized. It must coëxist with the apprehension of this love, just according to the degree of such apprehension.

We conclude, therefore, that "reason" and faith must harmonize, whenever the facts on which a judgment is to be based are all present to consciousness. It will be admitted, necessarily, that, in this as in any other case, all the facts must be so present, in order that the mind, in its judicial activity, may arrive at a correct conclusion. This harmony, it is evident, must become more complete, as the spiritual comprehension grows larger, and as the conceptions which are formed, or the recognitions which are made, by the highest mode of our spiritual activity become more distinct.

As this symmetrical intellectual and emotional development of our nature goes on, we must perceive more and more clearly the analogies with which the creation is filled, which illustrate the relation of the soul of man to God. All things combine to tell us, with continually more clear and delightful voice, the everlasting story of our Father's love. As we know that the earth will not fly away and leave us desolate in space, so we know that nothing can ever separate us from the Infinite Being, between whom and us there exists the attraction of love.

Two results follow from the development of faith; or rather, two things attend this development, and grow in degree with it. The first of these is the perception or

realization of the truth, that the state of harmony of the soul with the nature of God is the only real good, and the want of this harmony is the only real evil; that all other seeming good or ill is good or ill in reality, and is to be desired or to be dreaded, only as it will promote, or will hinder, the attainment of this state of harmony; which becomes the object of supreme and exclusive longing, just in the degree that the spirit has already attained to it. The individual of necessity in the same degree rises superior to the vicissitudes of time. External conditions have less and less power to affect his repose. He becomes able to glory in tribulations. He knows that trials and distresses are the crowning assurance of the love of the Father, who by these means draws the soul more closely to himself.

The second result is intimately connected with the first. The spirit has found the source of joy. There is no pessimism now, no repinings seek for expression now. The spirit sees in all around it the reflection of its own gladness. It rejoices in the realization of the truth that this is a good world, that it is the very best world that Almighty Goodness could make, that every thing in the earth and the heavens is intended to minister to universal gladness, that the normal, healthy state of every being is a state of joy. The spirit rejoices in all the influences which tend to enlarge its powers and capabilities, and quicken it into every form of healthful activity. It rejoices especially in every thing that helps it to form the grand conception of the universal and necessary nature of the truth and love of God, that infinite and changeless reality, of which the whole nature of things is the mighty manifestation.

Let us turn again to the Bible. Is this book in harmony with nature here? Yes, emphatically yes. This

dependence, this care, this trust, this joy,—the Bible is luminous with all these. In these respects, also, the Bible appears as the verbal expression of truth, as this exists in the nature of things. About this expression it is also to be observed, that it is not such an expression as could be made by any finite mind. It always transcends our power of comprehension. The expressions of these truths which are employed in the Bible are always of a nature requiring spiritual discernment, and calculated continually to raise the mind which is capable of such discernment to a fuller apprehension of them.

Moreover, that apprehension which is the deepest and the fullest finds the language of the Bible satisfying, and more than satisfying. This language is still stimulating. It conveys to the mind, as this becomes capable of receiving it, a sense of a degree of care and trust and joy to which there is no limit. This is especially true of the words of the Christ. When we reflect upon the character of the expressions that are employed by the Christ for the presentation and illustration of these themes, we cannot fail to perceive that the language applies to realities which are infinite in their nature, and that these realities are completely apprehended by the mind from which the language proceeds.

PRAAYER.

I SHOULD not have presumed to touch this high theme, if it had not appeared to me that the true view of the nature and office of prayer grew directly out of the preceding line of thought; and that, therefore, the presentation of that view in this connection would tend to remove doubts respecting the efficacy of prayer, which exist in minds to whom these papers are especially addressed. These doubts have been encouraged by criticism from high scientific authority, criticism that was imagined to be based on scientific grounds, but which, in reality, proceeded from an entire misconception of the subject.

The question is a common one: "How is prayer to God to be reconciled with the idea of his changeless nature?" "If the purposes of God move on eternally to their accomplishment, like the earth in its orbit, how are these purposes to be modified or the events to be affected, in the least degree, by prayer?"

This question is not to be answered directly, but it disappears, as a reasonable expression, as soon as we have got a correct idea of the nature of prayer.

The common idea of prayer, and the idea which gives apparent point to the above question, has been in a large degree derived from human analogies, which here, as everywhere else, are inadequate and misleading. A petition addressed to an earthly potentate or tribunal or

parent is always designed to influence the party addressed. It is intended, first, to furnish information that such party did not before possess, and secondly, to incline him favorably towards some object, either from a previous state of indifference, or from a contrary inclination. The design of the petition is to induce the earthly superior to form or to change a purpose, and the result is always uncertain. All these notions, derived from human analogies, underlie and contribute more or less to influence or to form the common idea of prayer to God, so far as this idea has any definiteness. It may be added that this idea of prayer is naturally formed by minds which have no experimental knowledge of its true nature. Moreover, such minds may often be disposed to insist on this conception, as being the only one possible to be imagined, because it is the only one which they themselves can form. The true nature of prayer is, however, very far removed from any such conception.

Prayer is the highest form of coöperative action required on the part of man. It is that coöperative action on his part upon which the reception of the highest good has been made dependent. The general truth has been established, that our own coöperation, to the full extent of our ability, is essential to the obtaining of any good whatever. It has been shown that there are various modes of this coöperation, that these modes of necessity differ according to the nature of the benefit sought, but that in all cases alike the faithful putting forth of our own coöperative effort is the condition upon which we receive the benefit. We observed that in each case there is comparatively little of the work which has to be done that we have been made capable of doing, that the doing of that little requires the exertion of our utmost efforts, and that it must always be done.

We are not to inquire why this is so. Our observation and our conscious experience both teach us the fact that the requirement is a universal one. We cannot imagine an exception to it. Our own coöperative effort is always necessary, and, other things being equal, we receive every thing in the degree that is proportionate to the earnestness and fidelity with which we do our part.

Now the highest possible good of every human being is not any thing of an external or of a temporary character, neither does such highest good consist in knowledge or in intellectual power. The highest benefit that can be conferred upon any individual is the transformation of his nature. The object that is supremely to be desired by every rational being is, that his own nature shall be brought into a state of harmony with the nature of God, or, in the stronger and deeper language of the Bible, that he shall be made a "*partaker* of the Divine nature."

It cannot be conceived that in the case of this supreme good an exception should exist to the otherwise universal law; that man should have this blessing alone thrust upon him without any coöperative act on his part. Neither can it be conceived that, while in all other cases the receptive state of our being is an active state, in this case only it is a passive one. In some way, then, man must actively coöperate in the work of receiving this blessing. There must be something that he can do, and that he must do, with all the energy of his nature. There is only one thing that he can do.

This is to pray. When an individual recognizes at once his need and his helplessness, in this supreme respect of the radical and complete transformation of his nature, he intuitively cries out: "Create in me a clean heart, O Lord." Just in the degree in which one perceives this need and this helplessness, in which their reality is dis-

closed to him, just in that degree, of necessity, will his supplication be earnest and persevering. Thus it has been with sincere men in all ages and among all people, according to the light that each one has possessed. It is affecting to read the prayer of Socrates, as recorded by Plato: "O friendly Pan" (that is the All, the Universal Being), "as well as all other gods, as many as are in this place, give to me inmost beauty of soul."¹

The fact must be stated again, that the only thing which man can do toward obtaining this supreme good, this gradual transformation of his nature into the likeness of Christ, is to make this supplication. This is the form of coöperative effort that is demanded from man, as the condition on which alone he can receive this gift, between which and all inferior gifts there can be no comparison. Prayer is the mode of effort that is adapted to the nature of the purely spiritual good that is sought by it; precisely as labor and study are the modes of effort that are adapted to the various forms of inferior good that are sought by them.

Between all these modes of effort there exists a likeness that may not at first be perceived. Both labor and study are the practical modes of asking for the benefits that are obtained by those means respectively. In employing them, we express our desire for those benefits in the only practical way, namely, by putting our minds into a receptive condition, and making use of the obvious means for obtaining them. So also in prayer, man puts his mind into the only condition in which it is capable of receiving this spiritual good, and employs the only and obvious

¹Ω φίλε Πάν τε καὶ ἄλλοι ὅσοι τῇδε θεοί, δόιτέ μοι καλῶ γενέσθαι τᾶνδοθεν.
Phaedrus, p. 279 st.

A Latin note interprets this prayer as follows: "Quod enim orat, ut intus in pectore gerat pulcritudinem."

means of obtaining it. By the obvious means is meant the means that, to the mind filled with the desire after holiness, suggests itself as naturally and necessarily as the suitable means for obtaining any forms of inferior good suggest themselves to the mind that is filled with a desire after them. So labor and study and prayer are the practical expressions of these different desires, in modes adapted to the nature of each one.

But the objector may say: "Still, prayer is an effort to change a result, that, from all eternity, has been fixed in the purpose of God."

The reply to this objection, which at once exposes its superficial nature, and reveals the fact that it is founded upon our own ignorance and limited power of thought, is this: The objection lies equally against every other form of coöperative effort on the part of man, or against all human activity whatever.

It is true respecting this spiritual benefit, and equally true respecting all other benefits, that they are alike of necessity fixed in the eternal purpose, and that at the same time they are made dependent on our own exertions. But men do not raise this difficulty in other cases. They are not at all troubled about the fact that if they do not sow they will not reap, if they do not observe and study they will not learn, or if they do not put forth the adequate effort they will not accomplish any result whatever. They never think of inquiring what the fixed purpose of God may be in these respects, or of looking upon their exertions as attempts to change the Divine purpose. In all these cases men inquire only what there is for them to do, and they gird up their loins, and apply themselves in earnest to do it. So we have no more right, and it is no more natural to sincere men, to be troubled about the dependence of spiritual blessing upon the employment by us of the means of prayer.

The observation is a familiar one, and is applicable to our work and study and prayer alike, that the means must be ordained just as absolutely as the result. We can, however, hardly pretend to explain the mystery in which the whole subject is involved, and which is only one of the wilderness of mysteries within which we have our being. It is very certain, however, that such questions should give us no more concern, and should have no more effect upon our action, in the case of prayer, than they do respecting any other form of our mental or physical activity.

A special objection is often urged against prayer, which is, that no connection can be perceived by us between prayer and the answer to it, as there can be between labor or study and their results. The inference that the objector would like to have drawn is, that because such connection cannot be perceived by us, therefore such connection cannot exist. In an earlier paper attention has been called to the major premise of the syllogism, from which such a conclusion would follow.

In truth, however, when we attempt to enter upon the subject of the relation between cause and effect, we at once find ourselves beyond our depth. We know nothing beyond uniformly observed sequences. The nature of the connection between the precedent and the consequent acts is hidden from us in all cases alike. A familiar illustration may make this limitation of our knowledge more obvious. In crossing the bay, one looks upon a vessel that is being towed by means of a line, and then looks at the moon. He observes that he can see what compels the vessel to follow the tug, but cannot see what holds the moon to the earth. One looking more deeply, however, will perceive that he cannot discover the compelling force any more in the one case than he can in the other.

What we term the attraction of cohesion, by which the rope is held together, is in reality as much a mystery to us as the attraction of gravitation is. So also, and in a sense that is no more absolute, the sequence between prayer and its answer, as well as that which exists between labor and its reward, are both alike among "the secret things" that "belong unto the Lord our God."

Prayer is the real desire of the soul. Whatever in its depths the soul longs for above all other things, that is the object of its prayer. When this longing of the soul is after the state of holiness, for itself, for others, for all mankind, then, just in the degree in which this desire takes possession of the soul, and all other objects are lost sight of in the realization of the incomparable value of this good, just in that degree does the soul coöperate with God in this supreme sense.

The line of thought which has been followed seems necessarily to lead to the conclusion that prayer is the natural and spontaneous act of the spirit to which God has in some degree been revealed, and that it is the mode of man's coöperation with God in the work of his own exaltation to a state of holiness, or to a condition of harmony of nature with God; that supreme work, to which our environment of force and truth and beauty, and underneath all of love, in the physical creation is designed to contribute, as its ultimate purpose; that work for which the supreme manifestation of infinite love in the great mystery of the crucified Christ was given; and finally that work which all human suffering, also, is adapted, and so evidently is designed, to aid in accomplishing.

Let us now turn to the teaching of the Bible on this subject. Here, as everywhere, we shall find the Bible to harmonize with and complete the teaching of nature. The Bible gives to this teaching distinct expression. It

is its audible voice. In the Bible this natural command to the coöperative activity of prayer, like all other natural commands, finds living and adequate utterance.

For our first illustration we turn to the Lord's prayer, which is the only form of petition taught and enjoined by the Christ. Here the following features are first to be noted: This prayer is to be addressed by every individual directly to God. No supplication is to be made to any other being, not even to the Christ, as distinct from the Father. All intermediate aid is excluded. No creature is to come between the soul and its Father in Heaven. The very ideas of representation, or of the removal of God to a distance from the individual suppliant, would seem to be made impossible. Instead of all this, the language of this prayer assumes the fact that everywhere and at all times each individual soul is already and continually in the immediate presence of God. In all these things we recognize what we know to be the truth with respect to the God of nature.

We come now to the prayer itself. That which is the supreme object of desire naturally rises first of all for expression, and is longest dwelt upon. So, after the fond address, expressive of the endearing relations existing between the soul and God, there comes first the prayer for the coming of God's kingdom, or, in other words, for the restoration of all mankind to the state of holiness. This petition is repeated three times, in words which, though very different, mean in reality the same thing. This three-fold repetition shows the earnestness with which the recovered soul dwells upon this supreme object.

While the accomplishment of this triune petition involves and depends wholly upon the restoration of mankind to a sinless state,—while this is the work, and the only work, to be done in answer to these petitions, still in their

form these petitions present the glory of God as the supreme object of desire, and do not, except by necessary implication, refer to man at all. This, it is evident, is the form in which adoring love must of necessity frame its supplications.

Besides that which is directly expressed in this three-fold prayer, there are implied in its language two things which are of the deepest interest. The first of these is, that there exists now a state of being in which the will of God is perfectly done, in which absolute harmony and unity with the Divine nature prevails. The second is, that on the earth also, and in the same perfect degree, God's name shall be hallowed, his kingdom shall come, his will shall be done; for we cannot suppose that we have been taught to utter an idle petition, but rather one that must surely be fulfilled.

From the great height of this comprehensive petition, the prayer now descends to the lowly supplication for personal mercies. It asks for nothing beyond immediate necessary provision, and expresses a sense of the absolute dependence, which is man's real condition. "Daily bread," as employed in this prayer, is, however, an expression, the deep meaning of which it is impossible for us fully to realize. We must search for light upon it through all the teachings of the Christ. Primarily it is doubtless to be understood in a spiritual sense. It forms a part of that simple but vivid figurative language everywhere employed by the Christ, who said of himself, "I am the bread of life."

Thus spiritually regarded, this petition for "daily bread" is seen to be a repetition, in a personal sense, of the former general and comprehensive petitions. It is also a petition framed in conformity with the Divine method of gradual growth and development, which is the uniform method of the transforming work of God.

After this there follows the fearful petition with a condition. This condition was directly after explained and emphasized by the great Teacher, with the assurance that in the very nature of things it is only the forgiving soul that can receive forgiveness. Here we discover again the operation of the law of likeness. Just as the revelations of truth and beauty and love are possible only *to* truth and beauty and love, so forgiveness is possible only to forgiveness. We recognize another phase of the universal harmony that runs through the spiritual creation.

The prayer then closes with a petition, likewise repeated in substance, for the spiritual watch and care of God.

It is to be observed further respecting prayer, that in order to be effective it must be the habitual state of the mind. Precisely as in all our other forms of coöperative effort, so also here. It is the long-continued labor or application or prayer, that is demanded and rewarded. There must be in prayer the same fixed and habitual concentration of the whole being, that men who are capable of strong purpose exhibit with respect to any thing whatever about which they are in downright earnest. And, indeed, prayer calls for this concentrated and persevering earnestness in the highest possible degree; as the object that is sought is of inconceivably greater consequence than any other object can be.

This is illustrated in the prayer of Solomon for wisdom. The selection of this illustration may perhaps surprise the cursory reader of the Bible. Indeed the real character of this prayer, in this respect, is generally misapprehended. So much is this the case, that the answer to the prayer of Solomon is often cited to show the imagined special and capricious action of God, in favoring whom he chooses, without being governed by a general principle. The erroneous and superficial nature of this view will at once appear.

In considering this petition, we are struck with the fact, that when suddenly the command was addressed to Solomon, "Ask what I shall give thee," the answer of the youthful king was ready. There was no hesitation about its utterance. It was also single. He made but one request. Although not limited in any way he asked for only one thing. He asked for wisdom and knowledge "to judge this thy so great people," and he ceased.

Now when we reflect upon it, it is evident that this could not have been a desire suddenly formed, in its singleness and distinctness, and expressed on the spur of the moment. This must have been the ripened and absorbing longing, with which the whole being of Solomon was already filled, in order that it should rise thus spontaneously to his lips, and find clear and eloquent utterance, at the instant of demand.

But we are not left to conjecture on this point. In three places the prayers of David for his son are recorded to the same effect, and one of these prayers is expressed in this very same language. The history is thus brought sufficiently before us. This had been the habitual petition for Solomon of his father before him. Solomon had listened to this petition from his infancy, and had made it his own. It had become the habitual state of his mind. When the responsibility of ruling was cast upon him, this longing for knowledge and wisdom from God became in the highest degree intensified.

Then, when the instant of test came to Solomon, as it comes to all without a warning, when the work of years in the formation of character is to be shown in the act or decision of the moment, "Ask what I shall give thee," there could be no struggle, nor any hesitation, because there was no other desire *in* his heart, except the life-long one that filled his whole being.

In addition to the Lord's Prayer, much of the teachings of the Christ relate to the subject of prayer. These instructions are of the deepest significance. Our present view of them must be limited and general.

In studying the words of the Christ, we find, among their many striking features, two with which we are now especially concerned. These are, their simplicity and, on appropriate occasions, their intensity. Respecting the first of these features, it is to be observed among men, that when, as the result of deep and prolonged study, a person has become familiar with any particular subject, it is generally the case that his statements and explanations of this subject become simple and direct, and this just in the degree of his familiarity with it. In this respect there is no human teaching that can, in the most remote degree, be compared with the absolute simplicity and directness of the language, respecting the deepest truths, that was always employed by the Christ.

But the language of the Christ frequently presents a startling boldness of imagery and an intensity of expression which are entirely unique. In this respect, also, it differs from all other recorded speech. As the parables of our Lord required for their production, first, an absolute comprehension of the spiritual truths that were to be illustrated, and secondly, an intimate knowledge of the duality of the creation, by which all common and familiar things are made adapted for the illustration of these truths, so in *all* the teachings of the Christ we perceive the same absolute knowledge of truth, and of the impossibility of its being compromised by admixture with the least degree of error. This demanded for its expression the ultimate and hitherto unknown power of language, language nothing like which has ever been employed since, as indeed it never could be by a finite intelligence.

In addition to these features we have everywhere, also, the form of authoritative declaration. The Christ never reasons. He assumes the office of declaring spiritual truth. This he does in language which is plain to the most simple understanding, and which, at the same time, is found by the thoughtful student to present depths of meaning that are too profound for human plummet to sound.

All these features characterize the utterances of the Christ on the subject of prayer. The great primary object of prayer is distinguished by him with singular vividness. He commands men to ask in prayer for only one thing, as its sole appropriate object. He dwells principally upon negative instruction. Most of his teaching is directed to declaring what we are *not* to seek for in prayer. The full meaning of the language of the Christ, as this is given by different evangelists, is believed to be expressed as follows: "Have no anxiety about your daily wants." "Be not concerned about your part of the universal bounty." "Be not tossed on the billows of care." "For," he adds, "your Heavenly Father knoweth that ye have need of all these things." "Consider the lilies." "Shall he not much more clothe you?" "Behold the fowls of the air." "Ye are of more value than many sparrows." Who shall measure the meaning and the tenderness of the language of the Christ on this subject? Although its significance is only feebly apprehended, yet it reaches to the heart of the human race, and is cherished by mankind among their most precious treasures.

The fact is an impressive one, though it is one we are inclined to overlook, that this wonderful language is employed by the Christ in declaring what things we are *not* to pray for, and in the effort to make us understand why we are not to pray for them.

It is to be observed that the importance of this instruction, as to that for which we are not to ask, is emphasized by the Christ, by the repetition and fulness of illustration with which he dwells upon it. But there is one thing about which we *are* to be concerned. There is one thing which we *are* to seek, and that with all the earnestness of which we are capable. "Seek ye the Kingdom of God."

Concerning this kingdom, the Christ gave to mankind this command and promise: "Ask, and ye shall receive." This is among the simplest forms of speech, yet how much does it contain! Let us emphasize the first word, the command, *ask*. Here we have presented to us the necessity of asking, as the condition of receiving this gift. We are taught that man must coöperate, in the only possible way, in the work of securing this supreme good. A mystery is involved in this necessity that we cannot fathom. We recognize the fact, however, that obedience to this requirement in the act of prayer is in harmony with the universal law of coöperation. Here, as everywhere else, our will must harmonize with the will of God. His desire to grant must be met by a corresponding desire on our part to receive. This desire must, in this, as in all other cases, manifest itself in appropriate activity. With this voluntary coöperation on our part all the infinite yearning of the Father may not dispense. This is the uniform teaching of the Bible, which closes with the symbol of our coöperative act in drinking: "Whosoever will, let him *take* of the water of life freely." However trifling the act that is required on the part of man, that act must be voluntarily performed.

In this command, to ask for a single object, we have the final illustration that will be cited of the general fact, that the Bible is nature in language. This command, like those to which attention has already been called, is one

that exists in the nature of things. It arises out of the conditions of our existence, in the present stage of our being. As already stated, the normal relations between God and man are those of infinite care on the part of God, and infinite trust, as well as dependence, on the part of man. This care is in reality exercised, but the corresponding trust is either altogether dormant, or at the best is only feebly developed. The quickening of this trust into full activity, with the change of nature which this involves, is the only good for which we are bidden to ask. It is also not merely the chief, in the absolute sense of the word it is the *only*, human want.

These few words have been given to the command. We now pass to the promise: "Ye *shall* receive." The Christ here declares the necessary connection between asking and receiving this unspeakable gift. In this case also, the consequence that was attached by the Christ to this promise is shown by its repetition. The promise, conditional upon the petition, is presented to us six times, in six different forms of expression, growing in force to the end. Then in addition a contrast is stated between the certainty of the gifts or expressions of affection of God and of man, which is important to be dwelt upon also as proving the divinity of the speaker. David had said: "Like as a father pitieth his children, so the Lord pitieth them that fear Him." It is to be observed that human language never went further than this, and that because it could not. This expressed the uttermost limit of human experience, and therefore, also, the uttermost limit of human conception. No deeper emotion can form its image in our consciousness. But the Christ says: "If ye, then, being evil, know how to give good gifts to your children, *how much more* shall your Heavenly Father give the Holy Spirit to them that ask Him?"

How much more! No finite mind can measure the meaning of these words. It is only when we consider the faithfulness of God in nature, as shown in the unvarying uniformity of His beneficent activity, that we can form in our minds some notion of the absolute nature of the connection that is here declared by the Christ to exist between our asking and our receiving this spiritual gift. In these words of the Christ, "ask, and ye shall receive," we hear the same voice to which we listen in the physical creation, declaring His own unvarying truth in all His conduct. This supreme and inconceivable good is thus declared to be wholly dependent on our prayers, and also certain to be given in answer to them. The Bible, to which we have appealed, teaches uniformly that prayer is the mode of man's coöperation in the reception of this good.

But Christians cling to the feeling that they should pray to God for every thing. They ask if it is not their duty to do so. Ought not men, they say, to ask God for every thing for which they are dependent upon Him? This inclination, which is without doubt pretty nearly a universal one, shows three things: a want of faith in God, a feeble realization of the infinite difference between all earthly benefits and the single spiritual good, and a disposition to ignore the positive and earnest command of the Christ. Let us look at the obvious reasons for this command. There is, in the first place, unspeakable danger that the desire after inferior benefits, or to escape from inferior ills, may take in the mind the place of the desire after the infinite good and to be delivered from the immeasurable ill; that the lesser may engross our thoughts and anxiety, and hide the greater from our sight. There can be no doubt that this disastrous result is always produced in some degree, and generally in a large degree. This tendency it is,

against which these commands of the Christ were expressly directed, and which is to be overcome only by absolute obedience to them.

It is also to be observed, that there is only one thing, about which we are certain what the will and purpose of God is. That is, the re-creation of our nature, of the nature of all mankind, in His image. This is the one thing for which we can ask in the full certainty that our desire is in harmony with the Divine purpose. But here we must stop. Concerning any inferior object of desire, we cannot generally have the least idea whether its possession would promote or would hinder this supreme blessing. We cannot imagine whether our prayer for it is in harmony with, or contrary to, the beneficent purpose of God. If the individual is really seeking the kingdom of God, with the faintest appreciation of its nature, how is it possible for him to have any desire, respecting any thing else whatever, except to leave it in the hands of God. It would seem as if to the soul filled with faith every thing, joy or sorrow, prosperity or adversity, health or sickness, life or death, would be equally welcome, because equally certain to be the means that its Heavenly Father was employing to convey to it the single and priceless object of its desire.

This is the spirit that will be found breathing through the supplicatory hymns, which are in familiar use among all Christian people. It finds full and fervent expression in the verses commencing :

“ Thy will, not mine, O Lord ” ;

“ My Jesus, as thou wilt ” ;

“ When thee I seek, protecting Power ” ;

as well as in many others. One is struck with the inspired character of the language of our hymn writers in this respect.

We turn again to the words of the Christ. "Sell all that thou hast." Let nothing come between thy soul and me. With what tremendous language does he repeatedly drive this demand through and through the soul. Then comes the tenderness, and revelation of the method of divine love: "Blessed are they that mourn." Then the assurance, conditioned upon obedience to the command "Seek ye first the kingdom of God and his righteousness," that without our asking "all these things shall be added unto you."

To this agree the words of the Psalm: "Let the people praise thee, O God; let all the people praise thee. Then shall the earth yield her increase; and God, even our own God, shall bless us."

In the light of this express teaching of the Christ, we feel an emotion of awe when we turn back a thousand years, and read the answer of God to Solomon: "Because thou hast *not* asked. * * * I have given thee." Observe the language: "*Because* thou hast not asked." Solomon was animated by the single spirit of consecration to duty. He saw that he must become a means either of good or of harm to his people. The absorbing desire of his heart was that he might be kept from the latter, and be enabled to achieve the former, of these two ends. This anxiety filled his mind, so that it was not possible for him to entertain any desires of a personal nature. "And God said to Solomon: Because this was in thine heart, and thou hast not asked riches, wealth or honor, nor the life of thine enemies, neither yet hast asked long life * * * Behold, I have done according to thy words * * * And I have also given thee that which thou hast not asked."

A thousand years apart! The words of God! "Because

thou hast not asked, I have given thee." "Seek ye first the kingdom, and all these things shall be added."

It would seem that with the very beginning of faith there must come the prompting to leave *all* inferior things without anxiety to Him, whose care over every creature is infinite, and who alone can know by what means to convey to the soul that good which is the single object of its desire, both for itself and for its fellow-beings. This trust cannot hinder, but, on the contrary, it must quicken, the individual in the performance of every duty. It forms the only sure ground of fidelity. It elevates the soul above the reach of repining. It increases its capacity for happiness, as well as its ability to impart happiness to others. It gives to the spirit a serene tranquillity that enables it to exert all its powers most effectively, and so becomes in the highest degree conducive to its usefulness, in every occupation and relation of life.

We are brought to this general conclusion, that prayer is that highest form of our coöperative activity, which has for its appropriate object the exaltation of ourselves and our race to a state of holiness, an object which is inclusive of all those subordinate objects that may be conducive to this supreme result.

The spirit, however, that lives in any degree in a state of harmony with the divine nature cannot fail to desire the blessing of God upon its work, upon that which is the object of its just and honest effort, whatever the nature of that effort may be. A notable example of this is referred to in the Introduction to these papers. This desire such a spirit necessarily feels, and longs to give expression to it.

The desire itself, however, is commonly vague and indistinct, and so the expression of it is often general and indefi-

nite. This is a great pity. It would be a gain every way if in all cases a clear and distinct meaning should be attached to this petition, and if this meaning should assume definite expression. On this point, as on so many others, mechanical science affords a real help. We may here listen to its final lesson. It will be the same lesson that we heard at the beginning. In mechanics we cannot accomplish any thing unless our purposes are in harmony with the purposes of God. The object of all study and of all experiment in mechanical pursuits, is to ascertain those eternal and unchangeable purposes, in order that our own may be brought into accord with them.

Intelligent prayer for the blessing of God on our mechanical work, whether this work, as was the case with Robert Stephenson, be a bridge across an arm of the sea, to be built on a plan as yet untried, or whatever it may be, whether it involve great or small responsibility, must, it is obvious, be a prayer, first, for such insight as shall enable us to comprehend all the conditions and requirements of the problem; and then for such fidelity and watchfulness as shall ensure our compliance with these conditions and requirements in every particular, from the greatest down to the least and most insignificant. This must be the prayer. And with this prayer there must be joined, and of necessity there will be, since it is prompted by the same disposition, the earnest study of these conditions and requirements, and of the principles and laws that are involved in our work; and, united with this study, a ceaseless watchfulness, and the faithful doing of every thing that is devolved on us to be done.

The universal application of this lesson is obvious. In the verbal revelation we have imparted to us the changeless principles that are to govern our conduct in our rela-

tions to our fellow-beings and to God ; precisely as in the physical revelation those principles are made known to us that must govern our conduct with relation to the physical creation. By obedience to the former, precisely as by obedience to the latter, our conduct is brought into harmony with the conduct of God.

Intelligent prayer for the divine blessing on our conduct in every situation and station in life must, then, be a prayer, first, for a clear knowledge of the immutable laws of conduct, for that complete possession of them, or possession of ourselves by them, that shall enable us to make faithful application of them to all the conditions in which we find ourselves placed ; and then for such fidelity and watchfulness as shall ensure our observance of them in every particular, even the least. This must be the prayer. And with the prayer, just as in the former case, there must be, and there necessarily will be, joined that earnest study of those principles of conduct, which will enable us to perceive at once their application to every case as it arises ; and, united with this study, a ceaseless watchfulness, and the faithful doing of every thing that is devolved on us to be done.

THE END.

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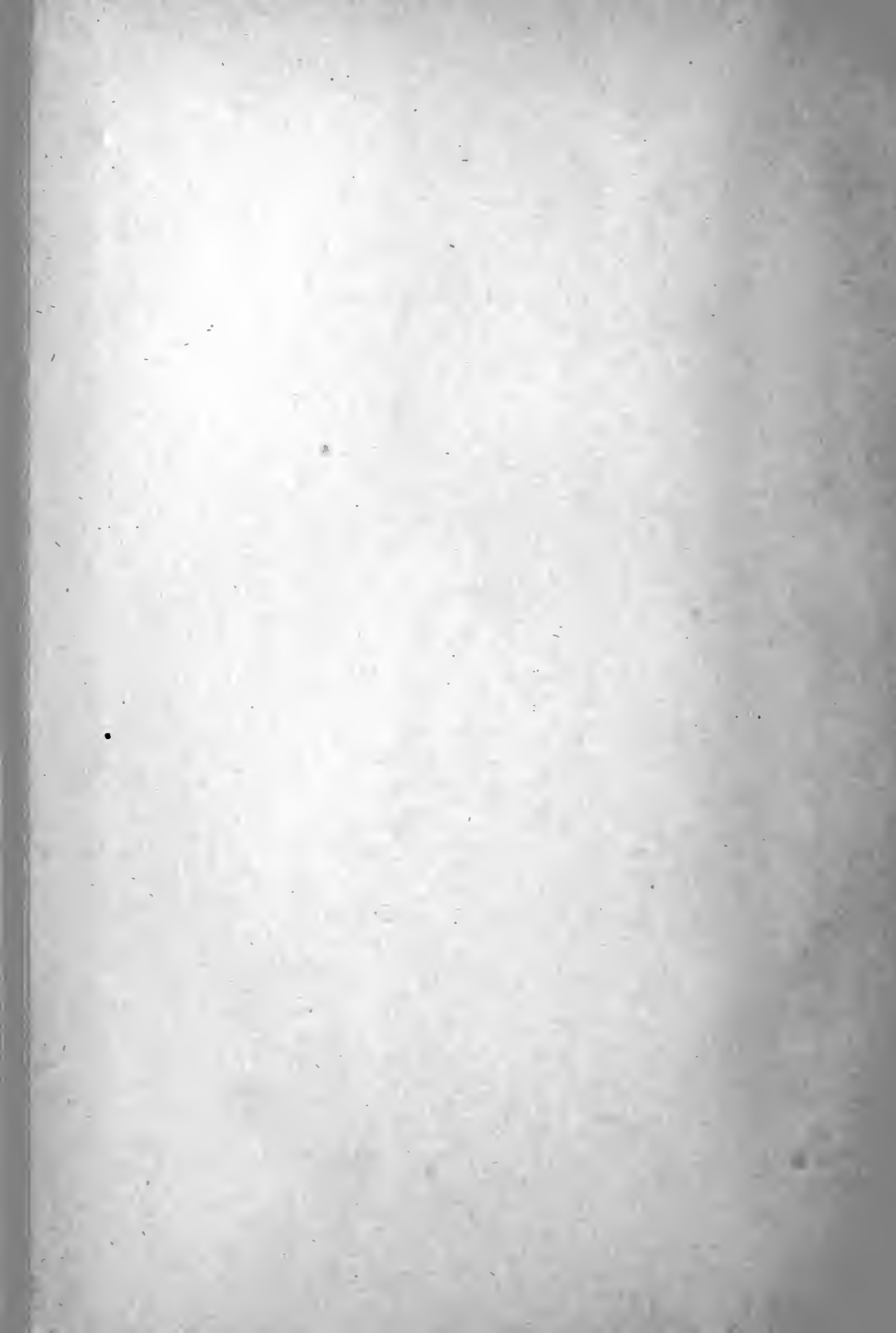
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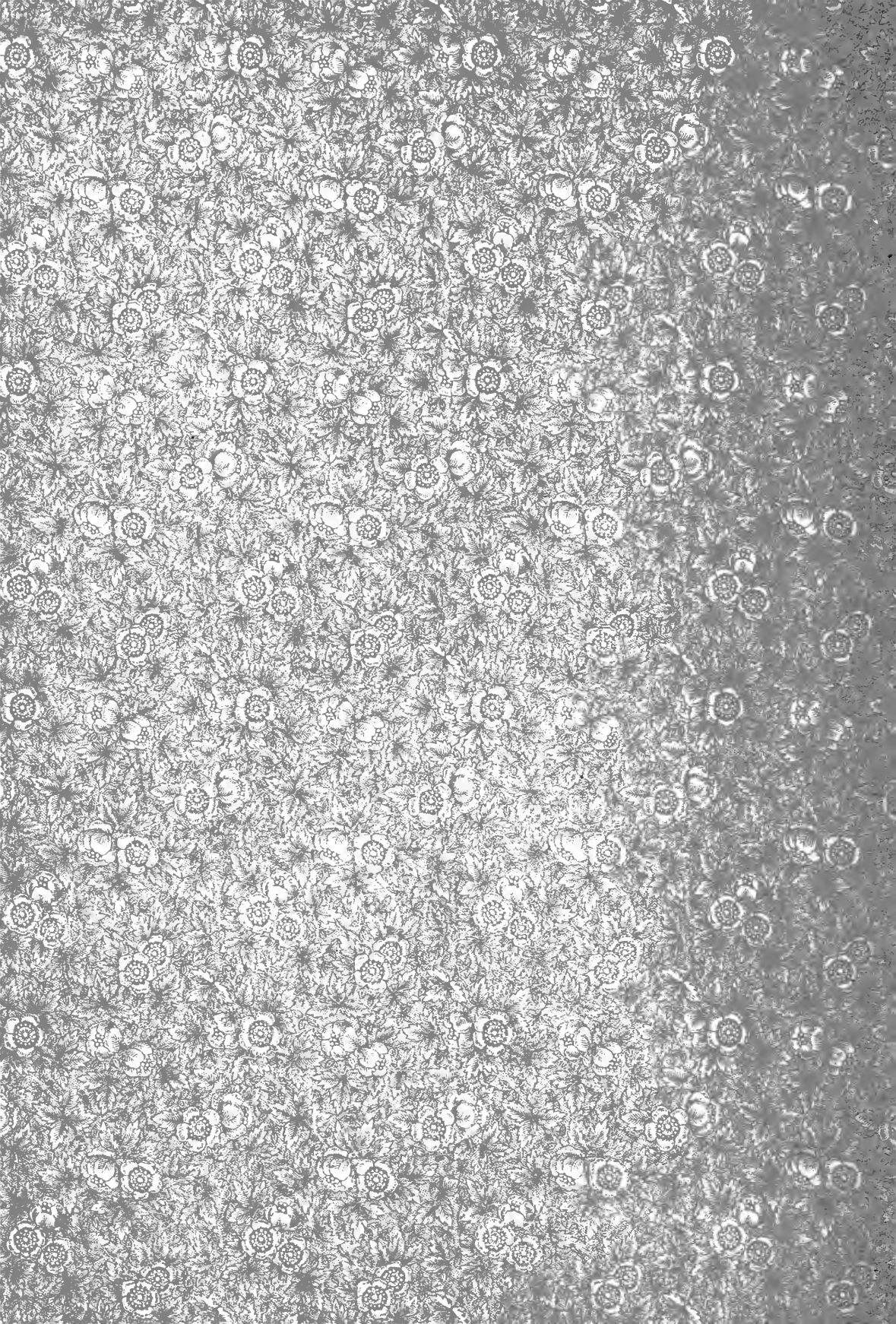
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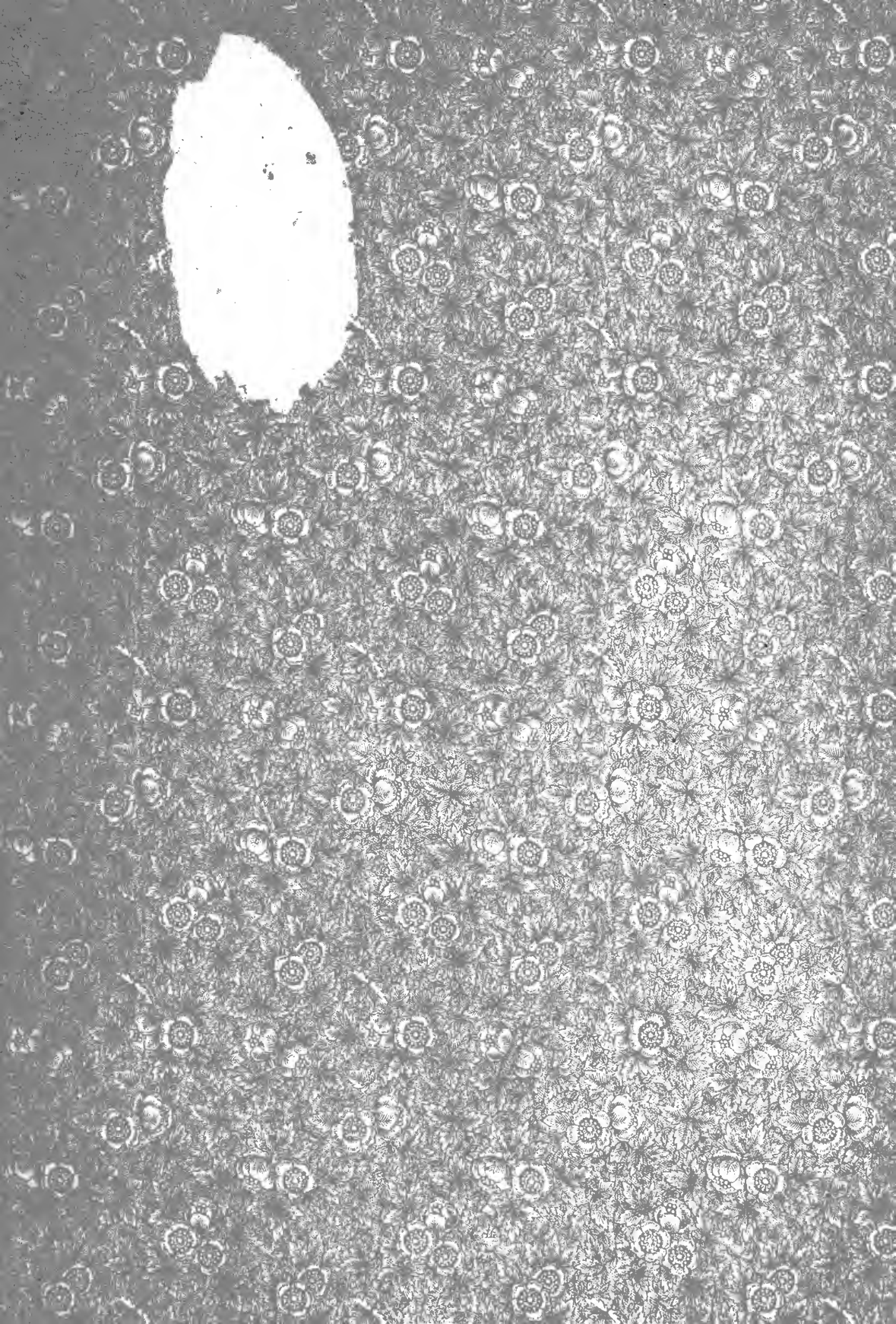
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