FUNDAMENTAL PROBLEMS

THE

METHOD OF PHILOSOPHY

AS A

SYSTEMATIC ARRANGEMENT OF KNOWLEDGE

BY PAUL CARUS

SECOND EDITION, ENLARGED AND REVISED.

No Agnosticism but Positive Science,
No Mysticism but Clear Thought,
Neither Supernaturalism nor Materialism
But a Unitary Conception of the World
No Dogma but Religion,
No Creed but Faith.

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PREFACE TO THE FIRST EDITION.

ALMOST all of the essays of this book first appeared as editorial articles in THE OPEN COURT, where they had the good fortune of being exposed to the criticism of thoughtful readers. The ideas presented could thus be tested, and the views of the author received an opportunity of being further elucidated, not in futile battles against men of straw, but in discussions with thinkers who had found difficulties in understanding the solutions proposed. here publicly acknowledge my indebtedness to the gentlemen who have favored me with criticisms.

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The author's endeavor has been to avoid originality. While working out in his mind this book on the Fundamental Problems of philosophy, he has endeavored to introduce as little as possible of his personality and his private sympathies with, or antipathies against, other solutions. The brain of the philosopher should be a mental alembic to clarify ideas, to analyze them, to extract their essence. His brain should work with the regularity of a machine. And among machines the philosophical mind must be compared to the so-called *precision machines*, the work of which is not measured by horse-power, but by minute exactitude.

The article "Form and Formal Thought" discusses a subject which is of fundamental importance. A correct conception of form and the laws of form will clear away many mysteries; it will afford a satisfactory explanation of causality and shed a new light on all the other problems of philosophy.

The view here presented, in spite of all our differences with Kant, may be considered as the natural outcome of Kant's philosophy. But it would be wrong to represent it as Kantism. It is rather the historical development of Kantism broadened by later enquiries, matured by criticisms, and adapted to the needs of our time. It is a protest against the halfness of agnosticism and a rejection of the perverted ethics of hedonism — of that view so popular now, which bases the rules of conduct upon man's desire for happiness.

The view here presented unites two qualities which may appear contradictory at first sight. It is *radical*, and at the same time *conservative*. It is radical because it fearlessly presents the issues of philosophic thought in their stern rigidity without trying to conceal the consequences to which the argument leads. The old and long cherished errors are not passed over in silence, but are confronted and critically explained. The view propounded is at the same time conservative because it preserves its historical connection with the work of our ancestors; it does not hope for a progress by a rupture with, but through a development from, the past, and does not come to destroy but to fulfill.

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The purpose of philosophy has often been misunderstood. It is not grand and beautiful air castles, not ontological systems of pure thought, not new original ideas of what the dreamland of the Absolute might be like, that is wanted in philosophy. Philosophy is not a profitless intellectual gymnastics, not a mere playing with words and subtle distinctions for the gratification of a few *beaux esprits* who delight in metal somersaults. Philosophy is the most practical and most important science, because its problems lie at the bottom of all the single sciences. It is the science of science.

Philosophy is more than that. It is the foundation of the rules of our conduct. Those conceptions of the world which have

become the popular philosophy of the age—the so-called *Zeitgeist*—will permeate the whole atmosphere of the time and will influence the actions of men for good and for evil. The fates of individuals, as well as of nations, their prosperity and their ruin, always depended, and in future times will depend, upon their fundamental conceptions of the world, in accordance with which men naturally regulate their conduct in life.

It may be objected that Religion and Ethics, not Philosophy, are the regulating factors of morality. But are not Religion and Ethics expressions of certain fundamental conceptions of the world; are they not applied philosophy? As a matter of fact history teaches that the self-same religion under the influence of different philosophies has developed into practically different systems of morality. Mohammedanism in the golden days of the Caliphate of Cordova was different from that of Bagdad, and still more from Mohammedanism as it exists to-day in Constantinople. And Christianity, the most powerful religion in the world, shows as many different phases as it has been influenced in the different ages by various philosophies.

We know of no decline of any nation on earth unless it was preceded by an intellectual and moral rottenness, which took the shape of some negative creed or skepticism, teaching the maxim that man lives for the pleasure of living, and that the purpose of our life is merely to enjoy ourselves.

The fashionable freethought of to-day is so closely connected with negativism and hedonism that most people are accustomed to identify freethought with these its excrescences. In this book, however, is proposed a philosophy of most radical freethought, that is *no* negativism, *no* agnosticism, and *no* metaphysical mysticism, but a systematic arrangement of positive facts. On the ground of positive facts, it equally opposes hedonism as well as asceticism, propounding a humanitarian ethics which, if obeyed, will keep our nation healthy and must lead us not on the easy

path of "least resistance," but on the thorny and steep road of progress onward and upward to ever higher and nobler states of existence.

Our fundamental conceptions of world and life, therefore, for practical purposes—for our individual welfare, for the destiny of our nation and for that of humanity—are of greatest importance. On the philosophy of our age depends the health of our religious, our scientific, our industrial, our mercantile, our political, and our social development.

THE AUTHOR.

AUTHOR'S NOTE TO THE SECOND EDITION.

THE alterations embodied in this second edition of *Fundamental Problems* consist mainly in the insertion of an introductory chapter, "Ontology and Positivism," and of an appendix containing the author's replies to his critics. Among them: Dr. Francis E. Abbot, Miss Mirabeau Brown, Dr. George M. Gould, Dr. Robert Lewins, Professor Ernst Mach, Dr. Edmund Montgomery, Madame Clémence Royer, Col. Paul R. Shipman and others. A few passages (on pages 66, 129, 131, 134, 185, 187) have been recast, because they did not seem to convey clearly the ideas of the author, and because they will be less liable to be misunderstood as they now read. The bulk of the book has remained unchanged.

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GEMS FROM MARCUS AURELIUS ANTONINUS

Εἴ τίς με ἐλέγξαι, καὶ παραστῆσαί μοι ὅτι οὐκ ὀρθῶς ὑπολαμβάνω ἢ πράσσω, δύναται, χαίρων μεταθήσομαι· ζητῶ γάρ τὴν ἀλήθειαν, ὑφ' ἧς οὐδεὶς πώποτε ἐβλάβη. Βλάπτεται δὲ ὁ ἐπιμένων ἐπὶ τῆς ἑαυτοῦ ἀπάτης καὶ ἀγνοίας.—VI. 21.

[If any man is able to convince me and show me that I do not think or act right, I will gladly change. For I seek the truth by which no man was ever injured. But he is injured who abides in his error and ignorance.]

Ἤτοι κόσμος διατεταγμένος, ἢ κυκεών, συμπεφορημένος μὲν ἀλλὰ κόσμος. Ἦ ἐν σοὶ μέν τις κόσμος ὑφίστασθαι δύναται, ἐν δὲ τῷ παντὶ ἀκοσμία;—IV. 27.

[Either it is a cosmos or a chaos, driven together—but still a cosmos. But can a cosmos subsist in thee and disorder in the All?]

Πάντα ἀλλήλοις ἐπιπλέκεται καὶ ἡ σύνδεσις ἱερά, καὶ σχεδόν τι οὐδὲν ἀλλότριον ἄλλο ἄλλῳ. Συγκατατέτακται γάρ, καὶ συγκοσμεῖ τὸν αὐτὸν κόσμον. Κόσμος τε γὰρ εἷς ἐξ ἁπάντων, καὶ θεὸς εἷς διὰ πάντων, καὶ οὐσία μία, καὶ νόμος εἷς, λόγος κοινὸς πάντων τῶν νοερῶν ζῴων, καὶ ἀλήθεια μία·—VII. 9.

[All things are connected with one another and the bond is holy. There is hardly anything foreign to any other thing. For things have been coördinated and they combine to form one and the same cosmos. For there is one cosmos made up of all things and one God who pervades all things and one substance, one law, one common reason in all intelligent animals and one truth.]

Ἥ τε γὰρ οὐσία οἷον ποταμὸς ἐν διηνεκεῖ ῥύσει· καὶ αἱ ἐνέργειαι ἐν συνεχέσι μεταβολαῖς, καὶ τὰ αἴτια ἐν μυρίαις τροπαῖς· καὶ σχεδὸν οὐδὲν ἑστῶς καὶ τὸ πάρεγγυς·—V. 23.

[Substance is like a river in a continual flow; the energies undergo constant changes, and causes work in infinite varieties. There is hardly anything that stands still or remains the same.]

Δίελε καὶ μέρισον τὸ ὑποκείμενον εἰς τὸ αἰτιῶδες καὶ ὑλικόν.–VII. 29.

[Separate and divide the object in the formal and the material.]

Ἐξ αἰτιώδους καὶ ὑλικοῦ συνέστηκα· οὐδέτερον δὲ τούτων εἰς τὸ μὴ ὂν φθαρήσεται· ὥσπερ οὐδὲ ἐκ τοῦ μὴ ὄντος ὑπέστη.–V. 13.

[I consist of the formal and of the material. Neither will be lost in nothing nor did either come from nothing.]

Ἔνδον βλέπε. Ἔνδον ἡ πηγὴ τοῦ ἀγαθοῦ, καὶ ἀεὶ ἀναβλύειν δυναμένη, ἐὰν ἀεὶ σκάπτῃς.–VII. 59.

[Look within! Within is the fountain of good and it will ever well up if thou wilt ever dig.]

Λῃστὴς προαιρέσεως οὐ γίνεται· τὸ τοῦ Ἐπικτήτου.–XI. 36.

[No one can rob us of our free will, says Epictetus.]

Ἕκαστον πρός τι γέγονεν· Σὺ οὖν πρὸς τί; τὸ ἥδεσθαι; ἴδε, εἰ ἀνέχεται ἡ ἔννοια.–VIII. 19.

[Everything exists for some end. For what end, then, art thou? To enjoy pleasure? See whether common sense allows this.]

Ἡδονῶν καὶ πόνων κατυπερτερεῖν ἔξεστιν.–VIII. 8.

[Thou canst master pleasure and pain.]

Οὔτε ἄρα χρήσιμον, οὔτε ἀγαθὸν ἡδονή.–VIII. 10.

[Pleasure is neither useful nor good.]

Πᾶν μοι συναρμόζει, ὃ σοὶ εὐάρμοστόν ἐστιν, ὦ κόσμε. Οὐδέν μοι πρόωρον, οὐδὲ ὄψιμον, τὸ σοὶ εὔκαιρον. Πᾶν μοι καρπός, ὃ φέρουσιν αἱ σαὶ ὧραι, ὦ φύσις· ἐκ σοῦ πάντα, ἐν σοὶ πάντα, εἰς σὲ πάντα.–IV. 23.

[Everything harmonizes with me which is harmonious to thee, O Cosmos. Nothing for me is too early nor too late which is in due time for thee. Everything is fruit to me which thy seasons bring, O Nature. From thee are all things, in thee are all things, to thee all things return.]

ONTOLOGY AND POSITIVISM.

THE basal idea of Positivism or Positive Monism is that it takes its stand on facts; and there is unquestionably no thinker of the present age, who is imbued with the scientific spirit of the time, that would offer any objection to this principle. Yet former philosophies did not take the same ground. They tried to find a footing in empty space; they attempted to explain facts by deriving them from some abstract conception that they postulated. Their favorite starting-point was the idea of abstract existence. Hence their method is called *ontology*, which may be translated as meaning "thought-structures of abstract existence." The vaguer the broader, the more general and metaphysical this abstract conception was, the deeper and profounder an ontological system appeared to be, and the more it was appreciated by the astonished public.

One of the ablest, and certainly the most famous, among ontologists was Hegel. Hegel started with the abstract idea of being or existence in general, and claimed that this concept in its emptiness was identical with non-existence. Abstract being, he said, is at the same time an absolute negation of concrete being; it is pure nothingness. These two concepts accordingly are in one respect absolutely identical, in another respect absolutely contradictory. Each one disappears immediately into its opposite. The oscil-

lation between both is the pure becoming, *das reine Werden*, which, if it be a transition from non-existence to existence, is called *Entstehen*, "growing, originating, waxing," and if it be a transition from existence to non-existence, is called *Vergehen*, "decrease, decay, waning." Having arrived, by this ingenious method of philosophical sleight of hand at the concept of Becoming, Hegel's ontology touched bottom. From the Utopia of non-existence, above the clouds, he got down to the facts of real life; and here he applies to everything the same method of a *thesis*, an *antithesis*, and the *combination* of both.

We would be obliged to go into detail if we intended to show how truly grand was the application of his method to logic, to history, to natural science, to art, to æsthetics, to religion, and to theology. Here is not the place for doing this. Yet, while objecting to the ontological method, we wish incidentally to emphasize the fact, that Hegel was one of the greatest, boldest, and most powerful thinkers of all times, whatever his mistakes may have been, and from whatsoever standpoint we choose to look upon his philosophy.

Ontology starts from abstract ideas and comes down to facts. Positivism, on the contrary, starts from facts and rises to abstract ideas. Abstract ideas, according to the positive view, are derived from and represent certain general features of facts. Ontology is bent upon explaining the existence of facts from non-existence, and ontologists therefore regard it as their duty to bridge over in their imagination the chasm between nothingness and something. Positivism does not require such mistaken procedure. It takes the facts as data and possesses in their existence the mate-

rial out of which rise the sciences and philosophy. Philosophy is no longer a pure thought-structure of abstract being, but a general survey of the sciences as a conception of the universe, based upon experience.

Ontological systems did not disappear and lose their influence over mankind suddenly, but dissolved themselves first into a state of philosophical despair. The uselessness and sterility of the ontological method were more and more recognized and found their philosophical expression in agnosticism.

Agnosticism is the most modern form of the obsolete method of ontological philosophy. The agnostic philosopher has discovered a concept that is broader and vaguer even than that of "existence in general." This concept is the Unknowable. Something that is real and at the same time absolutely unknowable is a self-contradiction. But never mind. That makes the idea the vaguer and it will thus be more easily turned to advantage. Agnostics are never afraid of arriving at self-contradictory statements, at unknowabilities, or at insolvable problems — these three terms mean the same thing—for they are just the things they believe in.*

Positivism regards the construction of philosophy upon abstract ideas as idle effort. Instead of coming

* Agnosticism blindfolds us in clear daylight. I wish every agnostic would read the following passage from our great American Logician, C. S. Peirce:

"One singular deception, which often occurs, is to mistake the sensation produced by our own unclearness of thought for a character of the object we are thinking. Instead of perceiving that the obscurity is purely subjective, we fancy that we contemplate a quality of the object which is essentially mysterious; and if our conception be afterward presented to us in a clear form we do not recognize it as the same, owing to the absence of the feeling of unintelligibility. So long as this deception lasts, it obviously puts an impassable barrier in the way of perspicuous thinking; so that it equally interests the opponents of rational thought to perpétuate it, and its adherents to guard against it."—[*The Illustrations of the Logic of Science.* (See *Popular Science Monthly*, 1877, p. 291.)]

down from an abstract conception as if it were out of a balloon to the solid ground of facts, positivism takes facts as its data. It starts from facts and arranges them properly in good order. It derives its abstract conceptions not by a theological revelation nor by intuition and metaphysical inspiration, but by the method of mental abstraction. And it discards all those abstract conceptions which have not been derived from facts. Philosophical knowledge is not at all a going beyond facts, but it is the proper and systematic arrangement of facts, so that they do not appear as incoherent single items without rhyme or reason, but as one intelligible whole in which every part appears in concord with every other.

* * *

The principle of Positivism, certainly, is very simple, but its application is by no means easy. Even the mere statement of facts requires much care and exactness, while their systematic arrangement as scientific knowledge is the privilege only of a few exceptional thinkers.

What are facts? Facts are all the events that take place; the thoughts and acts of living beings as well as the motions of not-living things, great and small; the oscillations of atoms and the movements of suns; in short all natural processes that happen. The central fact among all other facts is to every one the activity of his own consciousness. This central fact, however, must not be supposed to be either the ultimate fact or the simplest fact. To call any fact ultimate is not justifiable, because if any single fact among facts is ultimate, all facts are ultimate. Facts, if they are facts at all, are equally real; their reality cannot be regarded as of a greater or less degree. To

look upon consciousness as a simple fact would imply that it is eternal, which is contrary to our experience. Consciousness is a very complicated fact; it is the sum of many smaller facts and must be supposed to be the result of a co-operation of innumerable processes.

This, however, is stated only incidentally in opposition to certain philosophers who believe in the simplicity of consciousness and build upon this hypothesis a grand philosophical system called idealism. For our present purpose, in considering consciousness as the central fact among all other facts, it is of no consequence. It is here sufficient to state that consciousness being to every one of us the basis of our knowledge of facts, need not at all be the originator of facts; being the centre of our intellectual world, it need not at all be an indivisible unit or a mathematical point. Facts are stated as facts when they are represented in consciousness, and the means by which facts are represented in consciousness are sensations. This is to say: The philosophical problem according to positivism is the arrangement of all knowledge into one harmonious system which will be a unitary conception of the world and can serve as a basis for ethics.

A unitary conception of the world implies and presupposes the idea of a continuity of nature, which, it is true, has not as yet been proved in all its details. Nevertheless, it is more than simply probable. The continuity of nature is the indispensable ideal of science; every progress of science is, rightly considered, nothing but an additional evidence of the truth that nature does not contradict herself; she is continuous and self-consistent. There are no facts, proven to be

facts, that can overthrow the ideal of a continuity of nature. Therefore, the solution of the problem to construct a unitary system of knowledge, we most emphatically declare, is not only possible, it is also necessary, it is an indispensable duty of man as a thinking being; and its realization is the very life of science. If a systematization of knowledge were impossible, science would become impossible, and philosophy would be resolved into useless vagaries.

To sum up. The philosophical problem, according to ontology, is to derive existence from non-existence. Agnosticism, finding the problem of deriving something from nothing insoluble, declares it to be an inscrutable mystery. Positivism maintains that the problem is illegitimate. Taking its stand upon facts, positivism can dispense with the *salto mortale* of ontology.

SENSATION AND MEMORY.

THE primal condition of knowledge is sensation. All knowledge has its root in sensation, and without sensation there could be no knowledge.

Sensation is a process which, under certain circumstances, takes place in living matter when influenced by its surroundings. Take for instance a moner which you may keep on a watch crystal in a drop of water. Expose the moner to light and the light will excite its activity; touch it with a pin, dipped before in acetic acid, it will flee from the offensive object. Throw something in its way on which it can feed and it will seize it. It will be affected differently by different things, but similarly under similar conditions, and will react accordingly.

Sensation is a psychical phenomenon. When a moner is affected by and responds to irritations, it behaves in such a way as to leave no doubt that there is on a small scale and in a very simple condition the selfsame power at work which we feel active in our consciousness. Like ourselves, the moner is a sentient being, a creature that is endowed with feeling. 'Psychical,' accordingly, we call all phenomena of sensation from the simplest feeling of pleasure or pain, or indifferent perceptive impressions to the most complex states of conscious thought and purposive will.

Mr. G. J. Romanes considers as the characteristic

feature of psychic acts the faculty of choice.* This may be true. In making a special selection, in giving preference to one kind of food or another, a micro-organism will best show its psychical qualities; but the essential feature of psychic life, it appears, is sensation or the property of feeling which we must suppose to accompany certain movements of a creature and which is most plainly recognized in the way a creature makes a choice. A sieve certainly discriminates also between the coarser and finer particles which are thrown on its wires, but no one will call the selection made in this way a psychical act on the part of the sieve.

Of the existence of feeling, we have the most intimate and immediate knowledge, for we ourselves are feeling. Feeling is a fact; it is the most indubitable fact of all; and all knowledge rests on it. Psychology accepts this fact as the basic datum of its investigations and must attempt to reduce all more complicated phenomena of psychic life to simple feelings.

Every single feeling appears to us most simple, but this does not exclude that, in fact, it is a very complicated phenomenon.

The question as to the origin of feeling is an unsolved problem still, and we cannot so soon hope for a satisfactory solution. This much, however, can be safely stated, that we must expect the solution of this problem from biological investigations. Feeling does not come into the protoplasma of organisms from transcendent spheres. The conditions of feeling must exist in the inorganic matter of our world, and the appearance of the phenomena of sensation, will be found

* See Alfred Binet, "The Psychic Life of Micro-Organisms," p. 109. Open Court Publishing Co., Chicago, Ill.

to depend upon a special form in which the molecules of protoplasma combine and disintegrate.

If the same irritation, in a moner, is repeated, the animalcule will show a greater ability to respond to the occasion. In other words, the moner possesses memory. A previous sensation has predisposed it to react more readily to the second and third irritation and we must ask, How is that possible?

We can observe that the irritation affecting the moner produces certain chemical changes in its substance, and also the motions of the animalcule are in the same way accompanied by such changes in the protoplasma. The process of life, even if the creature is at rest, is an unceasing activity. Oxygen is constantly being absorbed and food assimilated while the waste products are excreted in the form of carbonic acid and in other decompositions. The rebuilding of the life-substance by assimilation takes place in such a way as to preserve the old arrangement of molecules. Even on the skin of the hand a scar remains visible years after the wound is healed, because the form and arrangement once produced is preserved: it is transmitted from the old substance to the new growth of cells developing therefrom. This preservation and transmittance of form is the physiological condition of memory. If certain changes which take place in living substance are accompanied by sensation, the preservation of certain physiological forms, produced by such changes, will preserve the corresponding forms of sensation also. They are registered in the protoplasma similarly as a speech is recorded on the tin-foil of the phonograph. If the physiological forms of sentient matter are called into activity by some stimulus, it will reproduce in a weaker form the

corresponding sensation just as the phonograph will reproduce the speech.

Memory, therefore, is the psychological aspect of the preservation of physiological forms in sentient substance and is as such the conditioning factor in the development of knowledge from sensation.

The arrangement of the molecules becomes more and more adapted to the impression of their surroundings. Thus under the constant influence of special irritations, special senses are created. Given ether-waves of light and sensation, and in the long process of evolution an eye will be formed; given air-waves of sound and sensation, and in the long process of evolution an ear will be formed. Thus sensation, with the assistance of memory adapting itself to its conditions, produces the different sense-organs.

The different sense-organs possess their "specific energies," as Johannes Müller calls their inherited memory* of reacting in a special and always the same way upon irritation. Irritations of the eye produce in the optic nerve sensations of light, and irritations of the ear produce in the auditory nerve sensations of sound, even if there be neither light nor sound, but other causes, as, for instance, electric currents. The percepts of vision are felt as images which we project outside of ourselves to places where, by the experience of touch, we have become accustomed to expect their presence.

A new percept of a thing that has been perceived before, will, under ordinary conditions, be recognized as the same. The new percept producing in the sensory nerves the same form of motion as the old per-

* See OPEN COURT, Nos. 6 and 7: Ewald Hering, "Memory as a General Function of Organized Matter."

cept of the same thing, finds certain brain-structures predisposed to receive it. Being produced in structures shaped by all the former percepts, it at the same time re-awakens their memories. All living bodies have thus become store-houses of innumerable memories, which are treasured up since organized life began on earth and are transmitted and added to from generation to generation.

The percepts of our senses, being specialized acts of feeling, are the elements of our psychic life. They are the facts (or if you so please the ultimate facts) given by reality; and it is from them that we derive all the knowledge we have. From them all our abstractions grow, our concepts, our formal thought, our ideas, and even our ideals. All the higher intellectual and spiritual life of man's consciousness, the schemes of the inventor, the fancies of the poet, and the theories of the philosopher, blossom forth from, and can be reduced to, the simple data of perception.

The simple phenomenon of sensation has in the long process of evolution grown highly complex. The nerves of animals being centralized in the brain, their feelings form a multifarious unity which is called consciousness. The unity of consciousness is not (as has been supposed in former centuries) the life-principle, nor is it the soul of the animal, and still less is it a substance existing independent of the body of that creature. On the contrary it is the product of the whole organization. Consciousness is a very complex and unstable state, consisting of many half-conscious and sub-conscious feelings, which in a healthy state of mind are focused in the present object of attention.

The whole organism with its structures and forms, in so far as we consider its psychical side, is called the

soul of that organism. Soul, therefore, we define as the psychical aspect of all the organic forms of our body.

Mind is a synonym of soul. However, the word soul is used with special preference when we refer to our emotional life, while mind rather denotes the intellectual activity of the organism. When we speak of spirit, we think of soul-life without having any reference to the bodily forms in which it manifests itself. In the same way we speak of "the spirit of a book" and "the spirit of the age." If "spirit" is supposed to have an independent existence of itself, the word becomes synomynous with "ghost."

We sum up:

Memory is the preservation of psychic forms. From simple sensations it has produced sensory perceptions in well-organized sense-organs, and then from the perceptions of the sense-organs the concepts of the mind. In the further progress of evolution we reach the domain of knowledge represented in abstract ideas with all their rich and varied forms of thought, which lead man into the provinces of science, art, religion, and philosophy.

COGNITION, KNOWLEDGE, AND TRUTH.

COGNITION in its simplest form is the act of feeling a percept to be the same as another percept perceived before. Cognition thus is founded in the relations of our percepts among each other. A single impression cannot as yet constitute cognition; two or several percepts of the same kind are needed in order to feel their identity.

Cognition consists of two elements; it has a subjective and an objective phase. The objective phase is that the object now perceived is the same (or at least in some respect the same) as the object perceived before; and the subjective phase is that it is also felt to be the same. The new percept fitting itself into the form produced in the brain by the former percept, is, in the literal sense of the word, re-cognized: it is cognized again. The condition of knowledge accordingly, in its simplest form, is 'the sameness of two or more percepts.'

Cognition of the higher and more complicated kind remains at bottom the same. It is always the act of recognizing a unity or a sameness in two or several phenomena. Cognition always presupposes a certain stock of experience, and to understand a phenomenon or to explain it means to recognize its identity with other phenomena with which we are familiar. The falling of stones to the ground is a familiar occurrence with

us, and to show in how far the motion of the moon about the earth is the same kind of motion as that of the falling stone, only under other conditions, is an explanation of this phenomenon.

Knowledge is the formulated stock of experiences in which we have discovered common features, so that their identity even under different conditions has been and will always again be recognized.

Knowledge in animals is simple in comparison with knowledge in man. Animals easily recognize concrete things and persons, but they are not able to sum up their knowledge in abstract formulas; they cannot name things, they cannot speak, they cannot think in abstract ideas. Man's knowledge rises into the realm of abstract thought where he creates a new world of spiritual existence.

The data of the natural sciences are always certain phenomena of which we are aware by sensation. We classify these phenomena so as to embrace them by the same law in innumerable and, in many respects, apparently different processes. Take, for instance, the tiny luminous specks in the nocturnal sky which we as well as many animals perceive by our visual organs. To the animal the stars are meaningless,* to the savage they are mysterious beings of an undiscoverable origin; but the astronomer by the aid of computing, and measuring, and calculating, with the additional help of telescopes, arranges in his mind the phenomena of the starry heaven in such a way as to make of his luminous sensations a well-ordered whole, standing in unison with all the other facts of our experience.

* Incidentally may be mentioned, that to the higher animals natural phenomena gain in impressiveness. The monkeys of the Sunda Isles, we are informed, gather shortly before sunrise in the highest tree-tops and salute the first rays of the rising sun with clamorous shouts.

Abstract ideas, generalizations, and conceptions of natural laws are the most important factors of human existence proper. By the help of abstract thought only has man become man. By the help of abstract thought only can he realize that he is a part of the whole of All-existence: he becomes religious. By the help of abstract thought he can regulate his actions according to maxims of universal applicability, so that he remains in harmony with the cosmical order of the Universe—with God: he becomes a moral being. By the help of abstract thought he can formulate his experiences in the rigid forms of arithmetical, geometrical, mechanical, or logical expressions, so that he comprehends the immanent necessity of the order of nature: he becomes scientific. When he finds that his abstract conceptions, his ideas, are realized in certain regular or characteristic instances, he acquires artistic taste; and when he begins to express his ideas in a visible or audible form, in colors, in sounds, or in words so that his creations represent single instances, incarnations as it were, of his ideas, he becomes an artist,—a painter, a musician, or a poet. If man succeeds in unifying all his knowledge on a scientific basis, so that it is systematized as a unitary conception of world and life and the aim of life, he becomes a philosopher. Thus abstract thought is the basis of all higher, intellectual, human, and humane aspirations. It raises man high above all the rest of animal creation and makes him their master. It is the cornerstone of humanity and produces Religion, Ethics, Science, Art, and Philosophy.

Abstract thoughts do not on the one hand represent absolute existences, nor on the other are they mere air castles; they are built upon the solid ground of

reality. The facts of nature are specie and our abstract thoughts are bills which serve to economize the process of an exchange of thought. We must know the exact value in specie of every bill which is in our possession. And if the values of our abstract ideas are not ultimately founded upon the reality of positive facts, they are like bills or drafts for the payment of which there is no money in the bank.

Reality is often identified with material existence, as if matter were an exhaustive term for all that is real. Matter is an abstract; matter of itself, absolute matter, does not exist. Matter cannot even be conceived as real unless it is possessed with some kind of force (or motion, or energy); forceless matter is a non-entity. Further, every single particle of matter must appear in some special form. Formless matter is a non-entity also. Matter, force, and form are abstracts only, which we have made for our own convenience of comprehending the phenomena of the world. Reality itself is one undivided and indivisible whole. The most important abstraction among the three (matter, force, and form), we do not hesitate to say is, neither matter nor force, but form.

Matter is a general conception abstracted from things material; it indicates their property of possessing mass and volume, but excludes all special or individual features of material bodies. At the same time, accordingly, it is an extremely poor and empty concept. Generalizations naturally are the more void, the higher they are. The same may be said of motion as well as of force. Motion means change of place; force signifies that which is productive of a change of place. In order to know matter, we must become familiar with all kinds of matter, and in order to know the forces of

nature we must study the natural phenomena, *viz.*, the actual motions that are taking place.

The concept 'form' is not so barren as the generalizations 'matter' and 'force.' We cannot create new matter, neither can we create new force or motion, but we can create new forms. We can in our mind construct new combinations; and if they have been correctly arranged in our thoughts, they will (when an attempt at their execution is made) be seen to be realizable. The laws of form laid down in the formal sciences (in mathematics, arithmetic, pure logic, etc.), can be ascertained by self-observation. While we create new forms in our mind we evolve the more complex combinations from the simple ones and can thus comprehend them. We can, by methodical generalization, as well as consistent application of generalizations to different cases, exhaust the possibility of instances and thus formulate universal rules.

Form constitutes the order of the world, its cognizability and intelligibility. It imparts to the universe the spirituality of its existence. Form and the changeability of form make evolution possible. The evolution of forms brings sense and meaning into the forces of nature; it affords a direction to their movements and determines the progressive character of all growth. Form, a special kind of form, constitutes mind and human intelligence, and the establishment of the sciences of formal thought is the basis of exact philosophy. Form gives purpose to life and the problem of ethics finds in it its solution.

We now ask that often repeated question of Pilate, "What is truth?" Tradition says that Pilate was a skeptic; like the agnostic of modern days, he did not consider it worth his while to wait for a reply. And

the gospel informs us that Jesus did not deign to answer him.

There have been complaints that we never can know 'absolute truth'; and indeed 'absolute truth' is unknowable because such a thing as 'absolute truth' does not exist. Cognition is a relation, and truth, if it has any meaning at all, means true cognition. Therefore the very essence of truth is a relation; and this relation is neither mysterious, nor inscrutable, nor unknowable, nor a profound secret; it can be ascertained perfectly well.

A conception, or a cognizance, or a formula of a number of experiences, or an abstract idea is true if it is in unison with all facts of reality; it is not true if in any way it conflicts with or is contradicted by facts of reality. The facts of reality remain the ultimate data of all our knowledge; truth is the unison of our conception of single facts with the whole system of all facts, and science as well as philosophy is our aspiration to realize the unity of nature

THE FOUNDATION OF MONISM.

THE very nature of cognition, we have learned, is unification, and through cognition our percepts, our concrete concepts, and our abstract ideas arrange themselves into a unitary system of knowledge. We cannot help searching for a unitary conception of the different phenomena, and our mind will never be at ease unless we at least feel convinced that we have found it. The disposition of our mind must thus naturally lead us to a monistic philosophy which attempts to understand all the single phenomena of the universe, as well as the whole of reality, by one universal law or from one all-embracing principle.

The constitution of the human mind, in this way, predisposes man for monism. The want of a unification of knowledge is the *subjective* condition out of which monism originates, but in itself it would have no value if it were not justified by experience. We can construct a monism a priori by pure reason, but must ratify it a posteriori through scientific investigation. The *objective* condition of monism is founded in the character of our actual experiences. All the natural phenomena which ever came within the grasp of human apprehension, were such as conformed directly or at least showed a possibility (if they were but better known) of conforming, by and by, to a unitary law. The regularity of the course of nature, and the rigidity of natural laws indicating their irrefragable

universality, are the objective arguments in favor of the oneness of the All, as assumed by monism. The more science has progressed, the more has this truth of the oneness of nature been corroborated, and we cannot doubt but that it will be more and more confirmed. It is a κτῆμα ἐς ἀεί—an intellectual possession of humanity that has come to stay for good.

It will easily be understood that the oneness of nature (the regularity which pervades the universe and which can be formulated in natural laws—*die Gesetzmässigkeit der Natur*), must be considered as the ground of, or ultimate *raison d'être* for, the principle of oneness which is found in our mind. Our cognition, with the help of sensation, only mirrors in our consciousness the phenomena of nature in their regularity; so that knowledge in its entirety must become a systematic representation of the world in our brain.

Knowledge is not a useless efflorescence of the mind, as has been supposed by some one-sided idealists; nor does it exist for its own sake simply; it serves the very practical purpose of orientation in this world. So far as our knowledge reaches, thus far do we intellectually own nature, and can hope to rule its course in the interest of humanity by accommodating ourselves and natural events to nature's unalterable laws.

The unitary conception of the world has become a postulate of science. Indeed the single sciences, each one in its province, have always worked out and endeavored to verify the principles of monism. Every fact which seems to contradict the principle of unity must be, and indeed it is, considered as a problem until it conforms to it. As soon as it is found to be in unison with all the other facts the problem is solved.

Monism, being equivalent to consistency, is that

view to realize which almost every philosopher aspires. Dualists, from principle, are inconsistent thinkers; yet even they attempt to construct at least a sham unity of their systems. Thus, supernaturalists look upon matter as a product of mind and materialists, vice versa, upon mind as a product of matter. The latter believe that life was created by dead matter, and the former that an extramundane God, the principle of life, created matter. They cannot help striving after a monistic view of the world; for the unification of all knowledge is the inherent principle of cognition.

Dualism appears to be a state of transition. It emerges from the more chaotic state of many single unifications of knowledge, that were systematized under two opposite and apparently contradictory principles. Plutarch says in his book, *De Iside et Osiride*, chap. 45:

"The world is neither thrown about by wild chance without intelligence, reason, and guidance, nor is it dominated and directed by one rational being with a rudder or with gentle and easy reins as it were; but on the contrary, there are in it several different things, and those made up of bad as well as good; or rather (to speak more plainly) Nature produces nothing here but what is mixed and tempered. There is not, as it were, one store-keeper, who out of two different casks dispenses to us human affairs adulterated and mixed together,* as a landlord doth his liquors; but by reason of two contrary origins and opposite powers—whereof the one leads to the right hand and in a direct line, and the other turns to the contrary hand and goes athwart—both human life is mixed, and the world (if not all, yet that part which is about the earth and below the moon) is become very unequal and various, and liable to all manner of changes. For if nothing can come without

*Plutarch alludes to Homer, who feigns Jupiter to have in his house two differing jars, the one filled with good things, and the other with bad. See Il. XXIV. 527.

a cause, and if a good thing cannot afford a cause of evil, Nature then must certainly have a peculiar source and origin of evil as well as of good."

Good and evil, light and darkness, heat and cold, appear, at first sight only, as contradictory principles. As soon as we grow more familiar with the facts which we comprehend by these names, and when we attempt to reduce them to exact expressions by measuring their degrees, we perceive that, in reality, they are one and the same principle which can be viewed from opposite standpoints. After the invention of the thermometer the dualism of heat and cold was abolished forever, and a monistic view is firmly established on the basis of exact data, expressed in figures. Every dualism is, upon principle, an inconsistency of thought; but it will peacefully die away as soon as the illogical character of its inconsistency is discovered.

Monism is different from the other philosophical views in so far as it is not so much a finished system, but a plan for a system. It admits of constant realization and further perfection, in all the many branches of knowledge. The plan, however, can be sketched in outline and we need not fear of its being overthrown by unexpected discoveries. Other systems, as a rule, set out with objective principles to which their upholders try to adjust the facts of reality. Some hypothesis is formed and facts are interpreted by this hypothesis. Monism, however, is a subjective principle, a rule informing us how to unify knowledge out of our experiences, a plan how to proceed in building our conception of world and life from facts. We need fear no collision between our pet theories and facts, for it is a matter of principle that we have to take our stand on facts. Monism in this sense, *i. e.*, the formal

principle of unity, is the only true philosophy, and we can repeat of monism the same words that Kant said of his Criticism: "The danger is not that of being refuted but merely that of being misunderstood."

FORM AND FORMAL THOUGHT.

I.

KANT'S CRITIQUE OF PURE REASON.

In the introduction to his "Critique of Pure Reason," Immanuel Kant proposes the question: How are synthetical judgments *a priori* possible? On the solution of this problem the whole structure of his philosophy rests, which he characterizes as *Transcendental Idealism.*

'A priori' means 'beforehand,' and its opposite 'a posteriori' means 'afterwards.' To know something a priori means to know something before any experience thereof has been had. When we know that the specific gravity of ebony is greater than that of water, we can declare a priori, that ebony will not float, but sink to the bottom (the physical law being also considered known). We can even know it *before* the experiment is made. The experiment will afterwards, *i. e.* a posteriori, verify our knowledge.

This is the general meaning of the terms 'a priori' and 'a posteriori.' But Kant uses the words in a more limited sense.

In Kant's language the term 'experience' is employed to signify sense-perception. It is not exactly limited to that meaning throughout, but certainly it is always used in opposition to non-sensory or

mere formal knowledge. That which produces experience, and which as a reality outside of us and independent of our sensation corresponds to sensory impressions, Kant calls 'matter.' Therefore, we have knowledge of the existence of matter and its different properties 'a posteriori,' or from experience, *i. e.* from sense-perception only.

There is another kind of knowledge, however, which is not sense-knowledge, but formal knowledge. Formal knowledge can be gained by abstraction. The form of things, such as globes, cubes, statues, and other bodies, can be abstracted from their material reality. We can, for instance, think away all things in the world. (We abstract from their material existence.) What is left is 'empty space'; and this conception of pure space is the postulate of a science that is called mathematics. We can abstract, also, from all processes which take place in the world; what is left is the idea of duration only; it is 'empty time,' in which these processes might have taken place. The conception of time, pure and simple, can be conceived as a progress through empty units without reference to real phenomena. Such empty units are called numbers, and by adding one unit to another, we start a process that is known as counting. Counting is the basis of arithmetic. If, again, we abstract from the substance of our thoughts, the mere forms of thought remain, which, treated as a science, are called formal logic.

It must be remarked in passing that Kant calls space and time 'pure perceptions' (*reine Anschauungen*), while the categories are treated as 'pure conceptions' (*reine Verstandesbegriffe*). This distinction is justifiable for certain purposes, and should not be slurred over by commentators of Kant's philosophy.

However, our present purpose is not to explain or popularize the Critique of Pure Reason, but to use its more prominent ideas for propounding our own views which grew out of a study of Kant's Transcendentalism. We may add that every perception, as soon as it is named and clearly defined, becomes a conception. Space can be the basis of mathematics, and time of arithmetic only when both have grown to be clear conceptions.

Formal knowledge is called by Kant a priori, because, if any truth of these formal sciences is established, it will be known to be true for all possible cases of experience, even before the experiments have been made. The rules of mathematics, of arithmetic, and logic, possess rigid necessity and absolute universality. They are the condition of all scientific investigation; for rigidity and universality (*Nothwendigkeit und Allgemeinheit*) in experimental sciences can be realized only through the assistance of the formal sciences. Astronomy and chemistry, for instance, have become sciences only by the application of mathematics and arithmetic; and where can any kind of science be found that could dispense with logic?

A priori, as used in the limited sense by Kant, is purely formal knowledge, while a posteriori is identical with experience. Marks of a priori truths are, according to Kant, absolute rigidity and universality (*Nothwendigkeit und Allgemeinheit*).

Kant has been represented as a philosopher who teaches by his doctrine of the a priori, that man has innate ideas ready in his consciousness. Pure reason, he was supposed to believe, wells up in us as some mysterious power coming from trandescendent and most probably supernatural regions. This is absolutely

unfounded, as can be learned from the very first sentence in the introduction to his "Critique of Pure Reason":

"*That all our knowledge begins with experience there can be no doubt.* For how is it possible that the faculty of cognition should be awakened into exercise otherwise than by means of objects which affect our senses, and partly of themselves produce representations, partly rouse our powers of understanding into activity, to compare, to connect, or to separate these, and so to convert the raw material of our sensory impressions into a knowledge of objects, which is called experience? * *In respect of time, therefore, no knowledge of ours is antecedent to experience, but begins with it.*"

In order to show that formal knowledge must be distinguished from sensory experience, Kant continues:

"But, though all our knowledge begins with experience, it by no means follows, that all arises out of experience.† For, on the contrary, it is quite possible that our empirical knowledge is a compound of that which we receive through impressions, and that which the faculty of cognition supplies from itself (sensory impressions giving merely the occasion), an addition which we cannot distinguish from the original element given by sense, till long practice has made us attentive to, and skillful in, separating it. It is, therefore, a question which requires close investigation, and is not to be answered at first sight—whether there exists a knowledge altogether independent of experience, and even of all sensory impressions? Knowledge of this kind is called a priori, in contradistinction to empirical knowledge, which has its sources a posteriori, that is, in experience."

Formal knowledge is independent of sensory experience in so far as we purposely exclude all sensory experience. But, after all, inasmuch as sensory experience is the beginning of all knowledge, a posteriori as well as a priori, to that extent formal

* The word 'experience' is here used in the popular acceptation, being taken as the result of sensory impressions fashioned by pure thought.

† Here the word is used in the limited sense, as sensory experience.

knowledge is dependent upon sensory experience (as Kant emphatically declares). Experience is antecedent in time, and from it alone formal knowledge can originate, which—not until a certain height of mental development has been reached — will be separated from the raw material of sensory impressions.

Kant, using the word experience in the limited sense of sensory experience, declares that investigation must go beyond experience in order to find the laws of formal knowledge, or pure thought. He, therefore, called all formal knowledge transcendental, and speaks of transcendental logic, transcendental dialectic, transcendental mathematics, and transcendental arithmetic.

Transcendental is by no means transcendent. Transcendent means unknowable, or what transcends knowledge; transcendental, according to Kant, means what transcends experience. It is not unknowable, but, on the contrary, the basis of all knowledge, and the transcendental sciences treat such subjects as demand (if treated with accuracy) axiomatic certainty. The mysterious has no place in the realms of the transcendental.

The question 'How are synthetical judgments a priori possible?' is to the same purpose as another question of Kant's, propounded in his Prolegomena, § 36, where he asks: "How is nature possible?" When Kant speaks of nature, he refers to our conception of reality, in so far as it is, or can become, the object of science representing the cosmical order of nature. We do not now intend to enter into the details of the problem, as to how far we agree with the sage of Königsberg, and how far we do not agree. But it seems necessary to point out the importance of the

problem, on the solution of which the possibility of scientific knowledge depends.

The faculty of thinking *in abstracto* is called reason; and reason (which on earth man alone possesses by virtue of language) can become the basis of science, if by a critical method fallacies and vagaries of reason are prevented. Kant says in the introduction to his "Critique of Pure Reason:"

> "The critique of reason leads at last, naturally and neces-
> "sarily, to science; and, on the other hand, the dogmatical use of
> "reason without criticism leads to groundless assertions, against
> "which others equally specious can always be set, thus euding un-
> "avoidably in skepticism."

The whole book is devoted to this critique. It shows that pure reason (formal thought) is limited to formal truths only and cannot contain revelations as to the substantial (the sensory or material) contents of our conceptions. This should have been self-evident; but as a matter of fact, philosophers before and even after Kant have most confidently asserted much about God and the world, the human soul, innate ideas, and other things, while their whole reasoning rested upon unwarranted a priori arguments. Such philosophers Kant calls dogmatical. Wolf (1679–1754), who had most methodically systematized the metaphysical doctrines of his time, is the most representative dogmatic philosopher.

If we compare our cognition to building material, Kant said, our transcendental knowledge has been employed by dogmatical philosophers for erecting a lofty dome that should reach to Heaven. For this purpose the "Critique of Pure Reason" has found the materials insufficient. Nevertheless, our transcendental cognition is most valuable; certainly it is unfit for the

airy castles of supernatural systems; but if employed for its proper purpose, Kant continues, "it very well suffices for a mansion here on earth spacious enough for all our purposes and high enough to enable us to survey the level plain of experience."

Formal cognitions, or conceptions a priori, are of themselves "empty;" and sensory impressions of themselves are "blind." If we had only unconnected sensory impressions, we would be worse off than the lowest animalcula or even plants, and the materials of our experience received through our sensory organs would be of no avail. Our formal cognitions furnish the mortar, as it were, of a synthetic method which will enable us to arrange sensory impressions in comprehensively arranged systems. Formal cognition and sensory experience, therefore, are the warp and woof of scientific knowledge. The warp as well as the woof, each by itself, consists of single threads, but in their combination they will furnish a well-woven fabric.

If a philosopher limits his method to sensory experience alone, he will never attain scientific certainty; he can never make definite and positive statements, but will only propose *opinions* which may be overturned on the slightest occasion. Such a one-sided empirical, or naturalistic, philosopher would be guilty of the opposite error of the dogmatist, and while the dogmatist ultimately must arrive at futile assertions, the empiricist's mere opinions must lead directly to skepticism. As the representative philosopher of skepticism, Kant mentions David Hume. David Hume does not recognize the difference between formal knowledge and sensory experience. To him, therefore, all knowledge consists of single, unconnected threads of knowledge.

On the last two pages of Kant's "Critique of Pure Reason," we read the following passages:

"We may divide the methods at present employed in the field "of enquiry into the naturalistic and the scientistic."

'Naturalistic' here means what is commonly called "common sense philosophy," which, repudiating all speculation, does not feel the need of a critical method. Kant continues:

"The naturalist of pure reason lays it down as his principle, "that common reason, without the aid of science—which he calls "sound reason, or common sense—can give a more satisfactory "answer to the most important questions of metaphysics than spec- "ulation is able to do. He must maintain, therefore, that we can "determine the content and circumference of the moon more "certainly by the naked eye than by the aid of mathematical rea- "soning. But this system is mere misology [contempt of rational "thought] reduced to principles; and, what is the most absurd "thing in this doctrine, the neglect of all scientific means is paraded "as a peculiar method of extending our cognition. As regards "those who are naturalists because they know no better, they are "certainly not to be blamed. They follow common sense, with- "out parading their ignorance as a method which is to teach us the "wonderful secret, how we are to find the truth which lies at the "bottom of the well of Democritus."

'Scientistic' denotes here the method of one-sided scientists. The original German text reads *scientifisch*, which has been coined by Kant in opposition to *wissenshaftslich*, *i. e.* scientific in its usual sense. This scientistic, or one-sided scientific, method lacks critique; it does not distinguish between formal and sensory (between a priori and a posteriori), and must either undervalue the importance of formal cognition, by not properly employing it as a synthetic principle, or overvalue the importance of formal cognition by attributing to it the power of a supernatural revelation. Kant continues, and concludes his "Critique of Pure Reason" as follows:

"As regards those who wish to pursue a scientistic method, they "have now the choice of following either the dogmatical or the 'skeptical, while they are bound never to desert the systematic "mode of procedure. When I mention, in relation to the former, "the celebrated Wolf, and as regards the latter, David Hume, I "may leave, in accordance with my present intention, all others "unnamed.

"The critical path alone is still open. If my reader has "been kind and patient enough to accompany me on this hith- "erto untraveled route, he can now judge whether, if he and oth- "ers will contribute their exertions towards making this narrow "foot-path a high-road of thought, that, which many centuries "have failed to accomplish, may not be executed before the close "of the present—namely, to bring Reason to perfect contentment "in regard to that which has always, but without permanent re- "sults, occupied her powers and engaged her ardent desire for "knowledge."

II.

THE ORIGIN OF THE 'A PRIORI.'

KANT answers the question 'How are synthetic judgments a priori possible?' by showing that such synthetic judgments undoubtedly exist.

A synthetic judgment is different from an analytic judgment. An analytic judgment merely analyses knowledge and contains nothing but an explanation or elucidation of what, in an involved form, we have known before, but a synthetic judgment really amplifies our knowledge; it adds to the stock of our knowledge something new, which we have not known before. In proving that the exterior angle of a triangle is equal to the sum of the two opposite interior angles of the same, we amplify our knowledge of the triangle by mere ratiocination, a priori.' Kant uses even a simpler instance. The judgment $7 + 5 = 12$ is not analytic

but synthetic. The concept twelve is neither contained in seven nor in five, but is something entirely new.

Kant leaves the subject here and is satisfied with the fact *that* synthetic judgments a priori are possible. He might have ventured a step further by proposing another question: 'What is the origin of the a priori?' Only by answering this question could he have shown, *how* synthetic judgments a priori are possible. This he did not do, and the omission has produced great confusion among German, French, and English thinkers.

The word 'a priori' is undoubtedly an old-fashioned and awkward expression, which has not yet lost the savor of 'innate ideas.' It was readily accepted in England by philosophers of a theological bias who were little aware of the dangerous properties concealed in this Kantian idea. It sounds so scholarly Latin, almost ecclesiastical; for it is an expression handed down from mediæval times. But when they drew this clumsy wooden horse within the walls of their dogmatic stronghold, they unwittingly admitted an army of bellicose warriors—Kant's critical thoughts—who are sure to conquer and destroy the citadel of dualistic orthodoxy.

"The old fashioned a priori in science, in morals, and religion," a reviewer in *Science** somewhere remarks "used to be represented as an arrogant and intolerant thing, mysterious in its manner of speech, violent and dogmatic in the defense of its own claims. The English Empiricists used to hate this aristocratic a priori and they shrewdly suspected it to be a humbug. What they gave us in its place, however, was a

*Science. Vol. V, p. 202.

vague and unphilosophic doctrine of science that you could only seem to understand so long as you did not examine into its meaning." J. S. Mill's philosophy moved in a circle. "He had founded all inductive interpretation of nature on the causal principle and the causal principle again on an inductive interpretation of nature."

Kant, as we have stated, calls the a priori truths 'formal knowledge,' and this indicates that the general postulates of the transcendental sciences, the axiomatic conceptions from which they start, are abstracted from reality by thinking away, as it were, their material existence, which is represented in our sensory impressions. Kant suggests this conception of the a priori, but he nowhere pronounces it. On the contrary, he makes statements which may be taken to exclude this interpretation of his conception.

According to our view, form is a property of reality as well as of our cognition. Formless matter does not exist. Form and matter, as they exist in reality, are inseparable. What is called formless matter is either uniform or lacking that kind of form which, in our opinion or according to our wishes, it should have. Knowledge also in its primitive shape, when it is, so to say, natural and crude, is an intimate combination of sense-perceptions and formal cognition. The sense-perceptions are the real substance of knowledge, while formal cognition is the principle which arranges and systematizes sense-experience.

As soon as a living being develops the ability to think *in abstracto*, a state which is attained by means of language, he can think of different qualities independent of things. He can think of whiteness, of greatness, of smallness, of courage, and of cowardice. And

soon after that, he will be also able to think one, two, three, four, five units *in abstracto* without the assistance of his fingers; he will count. Counting is a most important step in the development of humanity, for it is the first purely formal thought. It abstracts from the objects counted and refers exclusively to the unit numbers which then may be employed for any kind of things.

Physiologically considered the growth of abstract and formal ideas must have developed in the following way:

Irritations in the amœba can only produce vague feelings. Light and darkness, heat and cold, moisture and aridity, abundance and scarcity of food, exercise a certain influence upon the animalcule; they act upon it in a certain way and produce more or less favorable or unfavorable effects in the living substance which may ultimately result in reactions of some kind. In higher animals irritations are reacted upon differently in different organs. Sensitiveness has been differentiated, and a ray of light is perceived on the nerves of the skin as warmth and in those of the eye as light.

The same process of differentiation and specialization takes place in the brain. If a horse is seen, its image appears on the retina of the eye, whence the irritation is transmitted through the optic nerve to the interior parts of the brain. There it is perceived as a horse. According to Hering* and other physiologists, there is no doubt but that every new perception of a horse is registered on the same spot in the brain as previously. Every single brain-cell has a memory of its own, which makes it more fit to be irritated by

* See Ewald Hering; Memory as a General Function of Organized Matter THE OPEN COURT, p. 143.

that perception to which it has adapted itself. Thus, the conception of a horse is the sum total of all percepts of a horse. It is, as Mr. Hegeler * most appropriately expresses it, like a composite photograph. The common features of a certain group of same things are preserved, while the individual traits become blurred and are lost sight of.

Thus the many varying images of the eye, and all sensory impressions, as well as motory exertions, are registered somewhere in the brain, each kind in its place. The special memory of the different fibres and cells naturally arranges all percepts and concepts in a proper order. Moreover, a repeated simultaneousness of different sensations which are produced by same causes in different sense-organs, produces associations between certain percepts. We think of the rose and at the same time of its smell and its color. We see a bird and think of his song, and the dog who sees the whip feels at once in his recollection the pain caused by its lash.

Horses have been perceived which are different in size, and color, and temper, etc. These differences are occasionally of importance. A horse may attract attention because it is as white as snow. The horse is perceived and also its whiteness. Thus a new concept is created, the concept of a quality which does

* Mr. E. C. Hegeler, in his essay, "The Soul," (see THE OPEN COURT, p. 393) says:

"If an abstraction is made, many things having something in common are put together, and what they have in common is specified in words. It is then forgotten that what they do not have in common disappears in the generalization. The same takes place in Galton's composite photographs of the members of a family. Only that remains of the several faces what they have in common. This implies that the composite photograph is entirely contained in each of the single photographs of each member, each is the complete composite with additions. So in reality the composite photograph is an abstraction—a part—of each of the single photographs."

not correspond to, but has been abstracted from, concrete objects. White roses, white snow, white stones (as lime or chalk), and white horses have been perceived, and the percept of 'whiteness' is produced, to which again a special province of the brain must be ascribed, which of course must be connected by nerve fibres with all white things, more so with things that are always white than with those that appear so only occasionally. The psychical connection of such concepts is called association.

Suppose we are in a library where the books are well arranged by a number of librarians who have different but each one his own special interests. Many books are being constantly delivered. There are books about horses, and dogs, and flowers, and stones, etc., etc. Every librarian takes the books of that subject with whose study he is specially engaged and places it in his alcove. The library would be in the best order, and yet so long as the different alcoves were not named, most of its treasures would be inaccessible for many most important purposes. Such is the arrangement in animal brains. A dog knows what a cat is. Every new perception of a cat awakens in his mind with more or less vividness all the many previous percepts of a cat with their different associations, mostly memories of pursuit, perhaps also of resistance and combat. But all these memories are single percepts. They have not yet coalesced into a unitary and clear conception of catdom. If the sum total of the cat-percepts in his memory is to be called a conception, it is certainly a very imperfect kind of conception. A conception becomes distinct only by being named. This is the truth which has been so splendidly elucidated by our best philological authori-

ties, namely, that thought (the abstract thought of reasonable beings) is only possible by the help of language. Man thinks because he speaks. The name of a thing is, as it were, a string tied around all the many percepts of that thing, thus comprehending them all in one concept. Concept is derived from *con* and *capio* and means, according to its etymology, a taking or grasping together, a gathering into and holding in one.

The act of naming is therefore an enormous economy in mental activity; it is the mechanical means by which abstract ideas or generalizations are formed; and the faculty of thinking *in abstracto* is called reason. Reason, therefore, in its elementary origin, is abstracting and combining. Abstracting is a kind of separation. We separate the quality of white from white objects and combine all the different white-sensations into one concept by the name of 'whiteness.' *Both* processes, that of separation and of combination, are essential features of reason; but they are *the* essential features, and all functions of reason can be reduced to these two processes.*

Our brain is like a workshop in full and unceasing activity. In its operation, we must distinguish three things:

*F. Max Müller defines Reason as "addition and subtraction." We have repeatedly given our full assent to the great philologist's views with the remark, that we should substitute for "addition and subtraction" the terms used above, *i. e.*, "combination and separation." The terms "addition and subtraction" are confined to arithmetic; and to our mind they are different from "combination and separation" in so far as "subtraction" is used of units that are taken away from other equal units, while "separation" takes a part from something that appeared as a unit (an integral whole) before the separation. Similarly an addition sums up units of the same kind (or at least those which for the purpose of addition are considered as being of the same kind) into a larger number, while a combination unites parts into one consolidated whole. We believe that there is no substantial difference between Prof. Max Müller's view and our own.

1. The activity which is called life; it is a special kind of energy. Its presence makes itself felt as motion, which is a change of place and could be, if all details were known, mechanically expressed.

2. The material of which the whole workshop of the brain consists, and which is used to keep it in working order; viz., the matter which is constantly combining and decomposing in the protoplasm of the brain-substance.

3. The form in which life operates in the nervous substance. Every brain-cell has a special form, the groups of cells are arranged in special forms and the whole system of the different cerebral organs is built up in a special form.

We distinguish these three things, but in reality they are inseparably united. If our percepts and concepts are to be physically considered, they should not be represented as the activity only of the brain, nor as brain-substance, nor as their mere form. They are activity, and matter, and form united; being a special form of the activity in brain-substance. It goes without saying that the form of a special energy depends upon the form of that substance in which the process takes place. The form of a motion and the form of the substance in which the motion takes place, are not only interdependent, they are identical.

A certain percept, being a special form of motion in living brain substance, leaves in those cells in which it takes place, such vestiges as to produce a disposition adapted not only to receive the same or similar percepts, but even to reproduce that percept spontaneously, if the cells, nourished by the blood-circulation, are stimulated into activity through some inner process by association. This disposition (called by He-

ring *Stimmung*, which is produced by the special memory of organized matter), becomes stronger by repetition and thus imparts more and more stability to that special form.

Physiologically considered, percepts and concepts are very complicated structures which in their associations may resemble a kind of three-dimensional network, showing interlacings of innumerable star-shaped knots, the threads of which interradiate and combine the various sensory percepts belonging to the same idea. But for the sake of simplicity let us suppose that perceptions and conceptions grew in a brain like cells and groups of cells simply; they would naturally and mechanically arrange themselves in systematic order. One of the first steps in the evolution of living matter is that of giving stability to its outer form by enveloping itself in a membrane. Form, as we understand the term, is not only the outside shape, but also the inner disposition and arrangement of atoms. However, for the sake of simplicity again, and as a matter of crude illustration, let us for a moment use the membranes of cells as an example of their forms. The membranes of cells are also organic substance and their material particles are constantly changing. Nevertheless, they possess a relative stability which represents the shape of the cells, *i. e.*, their outer form. If we would take out of such a brain the living substance without destroying the membranes in which the cells have enveloped themselves, it would afford an aspect of divisions and subdivisions not unlike that of the departments, shelves, and pigeon holes of a library from which the books are removed, and we would have an anatomical representation of a system of formal thought.

It is understood that this explanation is a simile only to show that form grows *pari passu* with its substance, and mere form, if abstracted from its substance, is, for purposes of thought, by no means valueless; it is of greatest importance for a proper orientation among the enormous mass of sense-perceptions that crowd upon the mind.

An animal and a man may have the very same sensory impressions; their brain substance consists of the same combinations of nervous matter; sensations (the basis of all mental activity) are produced by the same kind of organs and in the same way. Yet there is a difference of form between the animal and the human brain in so far as the many different impressions of same percepts have not yet attained in the animal brain that stability and unity which they possess in the human brain. In the human brain the subdivisions are more marked, the furrows are deeper as well as more numerous; and from recent investigations we know that every class of same perceptions has acquired an additional and closely associated brain structure which embodies its name.* The whole group of certain percepts together with their name represents what in logical and psychological language is called a concept.

Let us now suppose that the chief librarian of the library of our brains for the sake of arranging a catalogue takes an inventory of all the books arranged in the different alcoves. He would find the same principle of arrangement applied everywhere. The differ-

* Compare the map and explanations of the human brain in *Der Mensch*, by Dr. Johannes Ranke, Vol. I, p. 530 et seq. The chapter, "*Lokalisation in der Grauen Grosshirnrinde*," explains Broca's, Hitzig's, and Fritsch's investigations. It takes into consideration the arguments proposed by adversaries of the localization theory (Goltz, etc.), and adopts Exner's view which, it appears, reconciles seemingly irreconcilable principles.

ent alcoves would have separate departments and these again would be found to possess subdivisions. This kind of arrangement, which, as we stated above, grew naturally, became first apparent when the process of naming took place. Many different names were conceived in our consciousness to be special kinds of one general kind so that they together formed one system of ideas. Logicians call it *genera* and *species*.

The librarian (we now suppose) arranges an office (perhaps for the purpose of reference) in which a general plan of the whole library can be found. This reference room contains no books. The visitor finds there no substantial information; the information to be gained there is purely formal and serves the purpose to find one's way easier in the many different departments of the alcoves. This reference room in our brain is called logical ability, or mathematical reasoning, or calculation, and we need not say that its establishment marks another important step in the development of reason; it is formal thought. It is the beginning of scientific thought by the help of which we gain information about the methodical arrangement of our conceptions. Logic does not create order and system in our brain, but it makes us conscious of the order that naturally grew in our mind.

The difference between the library and our mind is, that in a library the shelves have been put up before the books were stored, but in our brains the different notions form (or rather grow) their own categories. The notions of our minds are like living books that build their own shelves and pigeon-holes, similar to the way in which cellulizing protoplasm covers itself spontaneously with a membrane. If we abstract from the protoplasm, which constitutes the

contents of cells, we retain the empty membranes, and if we abstract from the sensory material of percepts and concepts, we retain their mere forms, which, reduced to rule, are called formal thought, *i. e.*, arithmetic, mathematics, mechanics, and logic.

Knowledge of objects has been gained by sensory impressions, but knowledge of logic can be acquired only by a process of self-observation. It is a kind of internal experience which is quite different from that of external experience; the latter takes place by, and can never dispense with, the instrumentality of the senses. If the rules of pure logic are to be established, we must carefully exclude from this process of inner self-contemplation the interference of the senses, for it is only the form of things, and thoughts, and motions, with which in purely formal thought we are concerned. The importance of these forms becomes at once apparent if we bear in mind that as they are in one case they must be in all others also. The rules by which we generalize our knowledge of formal conditions (of mathematics, arithmetic, logic and mechanics) possess universality and necessity.

The process of scientific enquiry will be seen to be everywhere the same. Science classifies sensory experience according to the categories of formal thought. In so far as we succeed in reducing the data of a certain subject to mechanical, mathematical, arithmetical, or logical principles, we solve its problems and recognize why the different phenomena which are subject to our special enquiry *must* be such as they are. Science traces necessity everywhere; and science can do so only by the help of the formal truths, which, holding good for all imaginable cases, show single instances under the aspect of universal and irrefragable rules.

III.

THE ORDER OF NATURE.

FORMAL thought represents the mere laws of thought in their abstractness, and has been acquired by abstraction. The mere forms of thought exhibit a wonderful regularity which excites our admiration all the more from the great advantages man derives from it. This regularity of formal thought, which is expressed in all logical laws, arithmetical calculations, and in all mathematical conceptions, has naturally grown in our mind as the psychical expression of a physical regularity in the arrangement of the various brain-structures and their combinations.

The arrangement of brain-structures in certain regular forms has been effected in accordance with the same laws that govern the development of forms generally. Therefore, the problem "why man happens to be a logical and reasonable being," turns out to be the same as that "why are the cells in plants arranged in a certain order?" and as that "why do crystals possess a certain regularity?" The problem common in these three questions is: "Why is the world a cosmos (an orderly arranged whole) and not a chaos?" It is the same problem that Kant proposed when he asked: "How is Nature possible at all?"

The problem has been solved differently by different philosophers, and there is no mark that better characterizes a philosophy than the answer it proposes as an explanation of the order of the world. Supernaturalism says: The order of the world is due to a special ukase of a Creator. Materialism, on the

other hand, declares that order is the product of chance. Both views have much more in common than appears at first sight. Materialism and supernaturalism are antagonistic and their explanations are irreconcilable. Nevertheless, both start from the same supposition which, from the monistic standpoint, appears to be erroneous: both are dualistic in so far as they consider the world as one thing, and order as another. Order, they declare, has been imposed upon the world either by a transcendent legislator or by a blind chance. Supernaturalism teaches that in the beginning there was *tohuvabhohu*, 'the earth was without form and void,' and materialism similarly begins the history of the world with chaos.

Theological dogmatists anthropomorphize God to such an extent that they compare him to a watchmaker, and the world to a watch. The order of the world, they imagine, has been fashioned to his designs. It is not in itself necessary, but posited by his will. It is necessary only in so far as his intention makes it so. On the other hand, materialistic thinkers similarly explain the order of the world, if not as the result of a wilful act, yet as the fortuitous outcome of blind chance. One of them expresses his opinion as follows: "The first elements, after testing every kind of position and production possible by their mutual unions, at length settled in the form and way they now present."

In opposition to both views, the monistic conception considers the world as a cosmos, *i. e.* an orderly arranged whole. Monism says: "The world and the phenomena of the world are orderly arranged, according to mechanical laws."

Consider how many billions of other combinations of the atoms in an amœba are possible, or at

least thinkable! And nature should have tried all these infinite possibilities, or part of them, before creating the amœba, and then the hydra, and then the worm, and so forth! Oh no! The order of the world is no hap-hazard effect, it is no fortuitous outcome of chaos. *There is no chaos and never has been a chaos.* Even in the gaseous nebula there is order and law, and it appears as chaos only in comparison to the more evolved state of a planetary system. Thus the barbaric stage of savage life appears to us as lacking in social order; and our present state of civilization, it is to be hoped, will appear to future generations as the chaos out of which their better arranged society emerged.

Kant says on this subject: "The aforementioned expositors of the mechanical theory of cosmic genesis (Epicurus, Leucippus, and Lucretius) derived every arrangement perceptible in the cosmic system from fortuitous accident, which caused the atoms so to hit together that they made up a well-ordered whole. Epicurus, indeed, was so presumptuous, as to require the atoms to swerve from their direct motion without any cause at all, in order to be able to meet one another. Every one of these philosophers carried this nonsensical principle so far, as to ascribe the origin of all animate creatures to this same blind concurrence of atoms, and actually derived reason from what is not reason (*Vernunft* from *Unvernunft*). In my system of science, on the contrary, I discover matter joined to certain necessary laws. In its complete dissolution and dispersion I see a beautiful and orderly whole naturally arising. This does not occur through accident or at hap-hazard, but it is seen that natural properties necessarily bring it about." Kant argues that this ne-

cessary order is a proof of the existence of God. We argue from our standpoint that this order is due to the laws of form. It can be ascertained and comprehended by an application of the laws of formal thought. This order produces, on the one hand, the *intelligibility* of the world and, on the other, the *intelligence* of rational beings. In its highest stage this order appears as a moral law to which rational beings voluntarily conform so as to be in unison with the whole cosmos. This order, we maintain, is immanent in the universe and, in fact, *it is God.* Human reason mirrors this order in the sentient brain of a living being and thus the sacred legend is justified in declaring that man has been created in the image of God.

The laws of order are omnipresent and eternal. The omnipresence and eternity of these laws does not denote transcendency, or unknowability, or supernaturalness. Nothing of the kind! It simply means that as they are in one case, so are they rigidly in all others. In their most simple shape, the laws of formal thought (logical, arithmetical, mathematical, etc. rules) are recognized as self-evident and necessary, so that we attribute to them absolute certainty and universality. The more complicated processes of higher algebra, higher mathematics, or highly involved logical ratiocinations, appear less absolute to those who are not familiar with abstract reasoning, but are after all just as absolute. We are, by reason of their complexity, liable to be easily mistaken, but, errors on our part excluded, they in themselves are quite as certain and universal, rigid and necessary, as those simple rules which are generally accepted as axioms.

Kant solves the problem "How is Nature possible at all?" in the following way. The highest or most

general laws of Nature, he argues, are within us and can be stated a priori, independent of sensory experience. He thinks it is a strange and wonderful fact that our formal thought (the rules of arithmetic, mathematics, logic, etc., which are a priori) agrees so precisely with the highest (i. e., the most general) laws of nature, which can be ascertained and verified a posteriori by experience. Kant sees only two ways of solution. Either the laws of pure reason, he says, have been gathered by experience from nature, or, on the contrary, the laws of nature have been deduced from our a priori rules. The former solution is impossible, since the formal sciences are proven to have been formulated with the exclusion of all sensory experience. "Therefore," says Kant, "the second solution only remains. Reason dictates its laws to Nature"; *i. e.* our reason is so constituted that it conceives everything in the forms of space, time, and the categories of pure reason. Space, time, and the categories are a part of the thinking subject, which cannot but think in these forms, and must thus transfer them to the objects. Our surroundings affect us by what we call sensory impressions. The sensory impressions are the raw material only from which the well-ordered whole of nature, as an object of science, is created by the synthetic faculty of reason. Reason with the help of formal thought shapes this intellectual world in our minds, which is, so to say, projected outside of ourselves into our surroundings.

Kant has taken into consideration two ways only. He overlooked the third and most obvious explanation. His explanation, therefore, will be seen to be one-sided and insufficient. The third possibility is that which has been propounded in the foregoing pages.

According to our explanation, the formal (the highest or most general) laws of Nature and the formal laws of thought are identical. Their agreement is not wonderful but inevitable as both are expressions of the forms of existence in general.

Kant's explanation is *one-sided,* because if the formal laws of Nature have been dictated by the thinking subject, it does not explain why the formal thought (our knowledge, a priori) is so precisely verified by experience. If we see, as it were, the order *into* nature, how is it that this imposition upon nature is not frustrated? Nature is by no means pliant to any fictitious dictation of subjective laws a priori. It frustrates incorrect a priori reasoning; but tallies with correct and exact calculations. Therefore we conclude, that the form of nature is the same as that of our reason. The forms of thought agree with the forms of existence for the reason that the forms of thought are only a special kind of the forms of existence.

Kant's explanation is, further, *insufficient;* it does not explain how formal thought originates. And this insufficiency of Kant's explanation, we believe, has given rise to many errors. This gap in Kant's philosophy, we think, has been the place in which mystical followers of Kant have been enabled to construct their ontological or supernatural illusions. The transcendental conceptions of pure reason have been declared by them to be of transcendent* origin. The opposition of John Stuart Mill and his school to Kant's conception of the a priori arose, as Mr. Mill confesses in his autobiography, from his considering the transcendental philosophy as an imposition of this kind—an impo-

* We have repeatedly called the reader's attention to the difference Kant makes between transcendent (unknowable) and transcendental (formal).

sition by which inveterate beliefs and deep-seated prejudices could be consecrated.

According to our solution, the radical difference obtaining between formal and material (between what Kant defines as a priori and a posteriori) is not neglected; on the contrary, its fundamental importance is fully recognized and firmly established. The conception of necessity which is the basis of all science, has found its justification as attaching everywhere to form—the laws of form being everywhere the same. The order of the Universe is thus recognized as an immanent necessity. This necessity can be traced with the assistance of formal thought everywhere, as shaping or having shaped the forms of existence. The laws of form being the same everywhere, our reason can, if not properly dictate, as Kant says, yet inform us about the form of existence in the whole universe. The laws of formal thought being absolutely and universally applicable, are our guide which like the thread of Ariadne safely leads us through the labyrinth of the manifold sensory experiences. It is this method, and this is the only one, which frees philosophy of mysticism, be it the mysticism of supernaturalists or of agnostics.

IV.

THE BASIS OF THE ECONOMY OF THOUGHT.

MATHEMATICS, as still taught in our schools, is, after the example of Euclid, unfortunately constructed on axioms. The introduction of axioms still gives to mathematics an air of mysteriousness which should be absent in this most reliable and well established sci-

ence. This doctrinal method of teaching mathematics, by starting from authoritative axioms, which have to be accepted on good faith, is unphilosophical and should give place to a more rational method. It induced Schopenhauer to declare that the whole science, being based upon non-proven truths, remains non-proven. He considers mathematical certainty to be ultimately a part of intuition and thus reaches a point where mysticism can have full play.

Hermann Grassmann in his "theory of extension" (*Ausdehnungslehre*) avoids the faults of Euclid's method. Grassmann throws a new light upon Kant's idea of the a priori by formulating a science of pure mathematics. Our space has three dimensions (*Ausdehnungen*, or extensions), and plane geometry is a mathematics of two dimensions. Grassmann's idea was, to propound mathematics as it would appear if absolutely abstracted from dimensions of any number. This science of pure mathematics must be the most abstract formal thought.*

The "theory of forms in general" (*Allgemeine Formenlehre*), Grassmann says, should precede all the special branches of mathematics. By a theory of forms in general he understands "that series of truths which

*The ingenious attempts of Bolyai and the Russian geometer Lobatschewsky (discussed in C. F. Gauss's 'Briefwechsel mit Schumacher,' Vol. II. pp. 268 to 271), to erect a geometrical system which would be independent of the Euclidian axioms in regard to parallels, and Riemann's meritorious essay "On The Hypotheses Of Geometry," have called the attention of mathematicians and scientists to a remarkable problem which finds its natural and most simple solution in Grassmann's theory of pure mathematics. Hamilton's method of Quaternions is contained in it also, since Grassmann takes into account the length *and direction* of lines. For brief information on the subject see Helmholtz's lucid sketch *Ueber die Thatsachen, die der Geometrie zu Grunde liegen* (Upon the Facts that lie at the Basis of Geometry), J. B. Stallo, "The Concepts and Theories of Modern Physics," pp. 208 seqq., and 248 seqq., and compare also with Hermann Grassmann: *Ausdehnungslehre, Anhang* I. and III. pp. 273 seqq., and 277 seqq.

refers equally to all branches of mathematics and which presupposes only the general concepts of identity and difference, of combination and separation. * * Products of thought can originate in two ways, either by a simple creative act (that of positing) or by the double act of positing and combining. The product of the former kind is a constant form or magnitude in a narrower sense, that of the latter kind is a discrete form or a form of combination."

On the concepts of the identity and difference of posited acts of thought by mere combination and separation, Grassmann builds his magnificent structure of a theory of forms in general, of which arithmetic, geometry, algebra, mechanics, phoronomics, and logic appear to be applications only of special kinds. He is in need of no axioms whatever. The only postulates are such as these: Arithmetic is a system of first degree; plane geometry is a system of second degree; and space is a system of third degree. Plane geometry has two dimensions, and, therefore, if we have one point fixed, two magnitudes are required for the determination of any other point. Space has three dimensions, so that taking a fixed point three magnitudes are necessary for the determining of any other point. Colors, it appears, are another system of third degree; they can be reduced to three primary colors: red, orange, and blue. Accordingly three magnitudes are required for determining any kind of tint. A distinguished scientist has invented a method of graphic representation of colors by triangles.

We cannot have any intuitive conception of a space having four dimensions. Nevertheless, pure mathematics, being independent of dimensions, applies just as much to systems of four and more degrees as to the

actual space of three dimensions. The regularity of every system is fixed a priori by the elements posited for that system. The elements, positing themselves or being posited by us according to the rigid rule of strict consistency, will necessarily form a regular and orderly arranged system. We can therefore state with absolute precision all the formal laws by which bodies of four or five dimensions, if they existed, would be governed.*

The chief difference between the numbers of arithmetic, geometrical planes, mathematical space,

* As an example we may use the instance, that the product of two magnitudes in a system of second degree can be algebraically expressed by

$$(a + b)^2 = a^2 + 2ab + b^2,$$

in a system of third degree, by

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

in a system of fourth degree, by

$$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4.$$

Accordingly, a cube or any parallelopipedon which is the product of two magnitudes consists of eight tri-dimensional parts. This fact cannot only be proven a priori by mathematical or algebraical demonstration of purely formal thought, it can be ascertained by experience also. A cube that is cut in all its three dimensions, according to the ratio of a + b, will afford an example, and a body formed by two magnitudes (a + b) in four dimensions, if it were possible, would consist of the following 16 four-dimensional parts:

1. A regular body which in all four directions measures a ($= a^4$).

2. Another regular body which in all four directions measures b ($= b^4$).

3. Four bodies which in three dimensions measure a ($= a^3$), and in one b

4. Four bodies which in three dimensions measure b ($= b^3$), and in one a.

5) Six bodies which in two dimensions measure a ($= a^2$), and in two b ($= b^2$).

on the one hand, and Grassmann's systems of 1, 2, 3, or *n* dimensions on the other, is, that numbers, planes, and actual space are accepted as given; they are the data of arithmetic, geometry, and mathematics, while the systems constructed by Grassmann's "theory of forms in general" are conceived as products of thought. They are posited by a progress of thought and can be considered as data only if their parts, once posited, are further used as such for combinations among themselves.

It is obvious that the only condition of all kinds of such systems of formal thought is *consistency*. Truth with regard to our knowledge of reality is the agreement of our concepts with the objects represented; but truth in the domain of pure formal thought is the agreement of all posited forms of one and the same system among each other. This consistency is the basis of all law, regularity, and order; and whatever system of forms may be selected, its rules and theorems will be developed by our mind with the same wonderful harmony and precision as can be observed in mathematics, arithmetic, logic, and mechanics. Accordingly, if the world were otherwise than it is, if space had only two, or if it had four dimensions, the laws of the world would be otherwise, but none the less regular than at present—they would be strictly *gesetzmässig*, *i. e.*, conforming to, and explainable by, law.

Consistency must be considered in the empire of form as the counterpart of inertia* in the realm of matter. So long as nothing interferes to produce a change,

*Inertia in German is sometimes called *Trägheit*, sometimes *Beharrung*. *Trägheit* is the literal translation of inertia; it is a negative term which denotes the non-appearance of new energy, or motion, or activity. *Beharrung* is the better term; it affords a positive expression for "inertia," denoting the unchanged continuance of the energy in existence.

everything will remain as it is. Consistency therefore, the very root of order, from which all order of form in every possible system of forms finds its explanation, is the natural state. Consistency like the law of inertia and the law of identity explains itself. Wherever we meet with it, it need not be accounted for; an explanation becomes necessary only where consistency is lacking. From this consideration it is apparent that to whatever system the form of reality belonged, it could in no case be devoid of order. The world could not be a chaos, but of necessity must be a cosmos.

Grassmann's theory of 'forms in general' throws a new light upon Kant's doctrine of the a priori, since it exhibits a science of pure form in its most generalized abstractness. Thus the a priori has lost the last vestige of mystery and we can easily understand how the cosmical order is due to the formal laws of nature. While Kant's reasoning has been correct in the main, it is apparent that real space is not quite so purely formal as he imagined. A system of form of the third degree can be posited a priori by formal thought; but the fact that real space is such a system of the third degree can be ascertained by experience only.

We have used the word order in the sense of objective regularity which of necessity results from a consistency of form throughout one and the same system. This regularity of forms enables us to think many samenesses by one idea and thus makes an economy of thought possible, which as Ernst Mach declares is the characteristic feature of science. Ernst Mach (who I must suppose has attained to his ideas quite independently of Grassmann, although there is no doubt that both have been strongly influenced by Kant), points out, by a happy instinct as it were, the

most practical application of the theory of formal thought in general.

The regularity of form being repeated in the physiological arrangement of the nervous cells and fibres in our brain, produces in man an economy of feeling and thinking which the more it is realized and practiced, gives him the greater power over nature.

V.

CONCLUSION.

ALTHOUGH Kant's Transcendental Idealism cannot be considered as a final solution of the basic problem of philosophy, it nevertheless pursues the right method and has thus actually led us to a solution which, we hope, will in time be recognized as final. In Kant's time, it seemed as if the key to the mysteries of cosmic order should be sought for in nature's manifestations outside of the human mind. Kant, a second Copernicus, reversed the whole situation and pointed out that the key to the problem: "How is nature possible at all?" is to be found in the human mind. And yet the natural sciences, inquiring into the secrets of nature by the observation of natural phenomena, were after all not on a wrong track. Kant and the natural sciences seemed to exclude each other, but they were complementary. Schiller who in so many respects fore-felt and fore-told future events in the prophetic spirit of his poetry, said in one of his Xenions, referring to Transcendental Philosophy and Natural Science:

"Both have to travel their ways, though the one should not know of the other.
Each one must wander on straight, and in the end they will meet."

Two truths may at first appear contradictory,

though they are not. Let us not distort the one for the sake of the other, but let each be presented without regard to the other, and let every point of divergency be brought out fully. Theory and practice, formal thought and experience, the thinker and observer, will at last agree better if they boldly take the consequences of their views and combat those of the other. About the relation of transcendental philosophy to natural science in his time, Schiller said:

> "Enmity be between both, your alliance would not be in time yet.
> Though you may separate now, Truth will be found by your search."

There has been enmity enough between philosophy and natural science. Philosophers looked with scorn upon the specialists who confined their labors to narrow circles, and scientists, confident of their positive results, smiled about the phantastic dreams of theoretic speculations. However, in the progress of time, philosophers learned to prize the valuable researches of natural science, and the scientists felt the necessity of a philosophical basis for their investigations and methods of investigation. At present the want of a close contact between philosophy and the sciences is a fact that is freely acknowledged by both, philosophers and scientists.

In Kant's and in Schiller's time an alliance between philosophy and natural science would have been premature. How many futile attempts have been made in the mean time! Fichte, Schelling, Hegel, and Schopenhauer in Germany, the two Mills and Herbert Spencer in England, Auguste Comte in France, have appeared with their systems, partly opposing, partly repeating Kantian ideas in other and original ways of presentation, partly combating his very method, partly popularizing, and at the same time opposing his views.

But none of them (not even Comte*) succeeded in creating a well-established positivism that could dispense with the mystical element altogether, whether it appear as the Transcendent, the Unknowable, or the Supernatural.

We have attempted in these essays on "Form and Formal Thought" to lay the cornerstone of such positivism, which, it is to be hoped, will prove to be the only true Monism, *i. e.*, a philosophy free from contradictions and in accordance with reality, thus offering a basis for a unitary and harmonious conception of the world.

* See foot-note on page 67.

THE OLD AND THE NEW MATHEMATICS.*

In mathematics, just as in all sciences and in religion, we have an orthodoxy sanctioned by the authority of many centuries. This orthodoxy represents a conception of things, which in the past, to some extent, has proved sufficient for our needs. It is presented in the most direct, and for its purpose therefore in the best method — namely in the shape of dogmatism. Thus matters are, we are told, and it suffices to know that they are so.

The representatives of orthodoxy are opposed by a class of heretics, who claim that humanity would have progressed more rapidly but for the impediments of dogmatism. The ideas of dogmatism, they say, are fundamentally erroneous, and must be overturned. Room must be made for doubt. Humanity, up to the date of the appearance of heretical views, it is held, has been erring under the dominance of orthodoxy, and we must commence to live the life of mankind over again.

These heretics, tearing down and criticizing the old dogmatism, are by no means useless, or nefarious, or dangerous men, although they are very often looked upon as acting the *rôle* of Mephistopheles and although, as a rule, they exhaust their power in mere negations without being able to build anew. Voltaire said: "If God did not exist, we should invent him." Sim-

* Written in answer to a criticism of Dr. Edward Brooks, of Philadelphia.

ilarly we can say: "If the devil did not exist, we should invent him." "The spirits who deny" play a very important part in the household of nature.

> " Man's aspiration flagging seeks too soon the level,
> Unqualified repose he learns to crave ;
> Whence, willingly, the comrade him I gave
> Who works, excites, and must create as Devil."

The negative criticism of heresy leads the orthodox conception to a higher plane of development, not by tearing down, but by forcing us to remould it, to eliminate its errors, and thus to unify its tenets with the other facts of reality. If we really had to commence to live the life of humanity over again, we would again have to start with the old or a similar dogmatism, until we were sufficiently matured to enlarge our views to a broader conception, in which our former orthodoxy is not so much destroyed as outgrown.

Dr. Brooks represents the orthodox standpoint of mathematics. He dogmatically believes in the finality of mathematical axioms; he says: "To know how we know the axioms to be true would be equivalent to proving them to be true." But he does not believe that we can know this *how*. "There is no 'how,' he says. * * We just know that they are true and that is the end of it. * * To prove a truth is to establish it by some other truth; but there are no truths back of or before these axiomatic truths which authenticate them. They are absolutely first truths, underived and self-existent, and as such are cognized by the mind."

This standpoint of orthodox dogmatism in mathematics may be called the intuitive method. In opposition to it John Stuart Mill proposes his heterodox views, which are best characterized as the empiricist method. Mr. Mill says in his System of Logic (2, V. Sec. 1):

"The points, lines, circles, and squares which any one has in his mind, are (I apprehend) simple copies of the points, lines, circles, and squares which he has known in his experience. The idea of a point I apprehend to be simply our idea of the *minimum visibile*, the smallest portion of surface which we can see. A line as defined by geometers is wholly inconceivable."

If Mr. Mill's empiricism were correct, mathematics would be an experimental science, like chemistry and the other natural sciences. There would be no difference between formal sciences and experimental sciences, and such things as necessity or necessary truths would be illusions. Mr. Mill accepts this consequence and tries to eliminate "necessity." He says:

"This character of necessity, ascribed to the truths of mathematics, and (with some reservations to be hereafter made) the peculiar certainty, attributed to them, is an illusion. * * *

"When, therefore, it is affirmed that the conlusions of geometry are necessary truths, the necessity consists, in reality, only in this, that they correctly follow from the suppositions from which they are deduced. Those suppositions are so far from being necessary that they are not even true; they purposely depart, more or less widely, from the truth. The only sense in which necessity can be ascribed to the conclusions of any scientific investigation, is that of legitimately following from some assumption, which, by the conditions of the inquiry, is not to be questioned."

According to Mr. Mill, our mathematical conceptions "are not even true; they purposely depart, more or less widely, from the truth." They certainly would depart from the truth if mathematics were an experimental science, if mathematical lines were images of material lines, perhaps of lead-pencil lines, if the mathematical point were truly a *minimum visibile*, etc. Mathematical concepts depart from the real diagrams which we draw for the purpose of assisting our mathematical imagination, but they do not, therefore, depart from the truth.

If Mr. Mill's theory were correct, if mathematics were not a creation of pure formal thought, invented for properly comprehending the laws of pure form, if it were based upon the inaccurate, unreal, and, therefore, untrue images of material points, lines, circles, planes, etc., we would have to remodel the whole science of mathematics so as to make our conceptions of points and lines and planes "true." But an experimental mathematics of that kind, it need not be said, would lose all its value, its certainty, and its exactness. Indeed, as a system of purely formal laws, it would be "untrue"; for it would conflict with the principle of mathematical conceptions that limits the field of mathematics to pure forms and excludes from it any kind of material existence.

The basis of mathematics is pure formal thought. The pure form of a thing is the spacial relation of its parts among themselves. The pure form of a leaden ball is its globular shape. Mathematics, accordingly, deals with the laws of spacial relations purely, without taking into consideration anything else. All other qualities, especially those relating to matter and force, are rigidly excluded.

Dr. Brooks says: "Some things not only exist but their existence is a necessity. They exist independently of all conditions and are subject to no contingencies." Among these things, time, and space, and axiomatic truths are classed. The paper, he says, "has length, breadth, and thickness; length, breadth, and thickness are possible only in space, therefore space also exists."

Certainly space exists, but it does not exist of itself. It has no absolute existence. It exists as a property of reality, and our conception of space has been

abstracted from reality. 'Length, breadth, and thickness,' we propose to say, '*are* space.' If we say with Dr. Brooks, they "are possible only in space," the dualistic error is near at hand, that space is not a mere abstract idea representing the quality of extension abstracted from extended things, but that it is something existing of itself; something which is the condition of extension, which makes it possible that things can have length, breadth, and thickness.

Space being an abstract and not a thing of itself has been supposed by some philosophers to be a non-entity. Descartes says,* that if that which is in a hollow vessel were taken out of it without anything to fill its place, the sides of the vessel, having nothing between them would be in contact. This is erroneous. Space is not a non-entity, but a real property of things. The spacial relation between two sides of a hollow vessel remains the same whether there is or is not any matter between them. If we could succeed in annihilating the whole world, all spacial relation would be destroyed with it. But let there be one atom only, or one given point, where in our imagination we may place ourselves, and we will therewith establish a possibility of motion in all directions, and the possibility of constructing in our imagination other points in different distances or relations: we would have space—not a part of space, but space entire. Space being the possibility of motion, is determined by measurable relations, in which existences or possible existences or points can be arranged. A part of space, alone and absolute, can neither be created nor can it be annihilated; for space being of itself a mere possibility of relations, is always entire. Thus the min-

* Princip. Phil. II. 18.

utest part of a parabola contains the law of the whole parabolic curve into infinity, and so with the slightest part of space the whole of space is determined.

The old orthodox view of mathematics takes its stand on axioms (such as "a straight line is the shortest distance between two points"), which are accepted as self-evident truths. Among the simplest mathematical theorems is one stating that "the corresponding angles of parallels cut by a straight line are equal." Since an exact proof of this theorem was impossible, it has found a place among the axioms, and is in our textbooks usually treated as such.

Some mathematicians, however, did not rest satisfied with this solution and attempted to develop geometrical conditions in which the theorem of corresponding angles should not be accepted as an axiom. They succeeded in establishing a new kind of geometry different from Euclid's. The sum of the angles in a triangle according to Euclid is exactly 180°. In the new geometry it is less than 180°. Further investigations showed that there was still another possibility of geometrical conditions which would make the sum of the angles in a triangle more than 180°.*

The new geometry has been called that of curved space, because its figures could be represented in lines possessing a constant curvature.† Two kinds of curvature could be distinguished, the positive and the negative; and the Euclidian theorems now appeared as special instances of this geometry. They

* Further details in a popular form will be found in *Helmholtz*, "On the Origin and Significance of Geometrical Axioms," and in *Dr. Victor Schlegel*, "Ueber den sogenannten vier-dimensionalen Raum."

† The shortest distance between two points is called in the new geometry "straightest line" to distinguish it from the "straight line" of Euclidian space. Professor Lindemann of Königsberg, one of the best living authorities on the subject, calls my attention to an error made in the first edition of this book, viz:, that "two straightest lines in curved space, if sufficiently prolonged, can inclose a space." The same error appears also in Prof. Helmholtz's otherwise excellent essay, and has even slipped into some mathematical works.

can be considered as constructed in a plane the curvature of which is zero.

We learn from the attempts made in this direction that the mathematical axioms are by no means "absolutely first truths, underived and self-evident." They depend upon the special condition that the space curvature is zero, which (however justified for practical purposes) has been tacitly assumed.

* * *

We can generalize the concept space and consider the line as a space of one dimension, the plane as a space of two dimensions, and actual space as a space of three dimensions. It is impossible to form any intuitive conception of a space of four and, still less, of more than four dimensions. Nevertheless, we can abstract from dimensions altogether and conceive of such absolute space as 'Form, pure and simple.' In doing so we can lay down the laws which are equally valid for all kinds of spaces, whether of three, or four, or n dimensions. Algebra, indeed, is an abstraction of that kind, and algebraic laws are equally valid whether their symbols indicate lines, or planes, or solid bodies, or other things, as for instance logical concepts.

The ultimate step which can be taken in this direction is that of establishing a "theory of pure forms," as has been done by Grassmann. Grassmann recognizes no axioms whatever. He builds his "system of pure forms in general" and finds that Euclid's geometry, as well as the actual space of three dimensions, are special cases only of innumerable other possibilities, the laws of which are all contained in his "theory of forms in general." What Euclid called axioms are a few characteristic features which can be derived from the supposition that plane geometry is a system

of second degree. Far from being first, or absolute, or independent truths, the axioms depend upon this supposition, and are applicable only for cases where it is avowedly accepted or at least tacitly assumed.

Grassmann no longer stands alone in the position he has taken; he has found followers who more and more realize that he has been the pathfinder of a new and fertile field of mathematical investigation.The ultimate basis of mathematics is no longer the intuition of space but the conception of "abstract form in general." The apriority of the mathematical laws of actual space has to be limited to the extent that we can know by experience only that actual space has three dimensions, and we have learned to consider the world-space as one actual instance among many theoretical possibilities: it is a formal system of third degree.

Actual space, abstracted from reality, is a quality of real things representing their relations, the relations of their parts, and the possible directions of their motion. But actual space, as we can ascertain by experience, is at the same time a system of third degree. As a system of third degree, it is a creation of our mind, it is purely formal thought, to which all the rigidity and universality of formal laws is attached. The sentence "space is a system of third degree," is as little tautological, or begging the question, as that the earth is a spheroid; and it is at the same time just as much a matter of experience. The laws of a system of third degree apply to actual space with the same necessity as the principles of mathematical geography apply to the earth.

* * *

Dr. Brooks says: "Some truths are not only true,

but they are necessarily true," and "the mind has the power of knowing that they are necessarily true."

That gunpowder explodes is true; but it is not necessarily true. In damp weather it may not explode; the explosion depends upon certain conditions. But if all the conditions upon which, according to our experience, the result is contingent are fulfilled, we assume that it will explode. It ought to and very likely it will; but must it necessarily explode? Certainly not! There may be one condition which in all former cases was always fulfilled without our knowing it. If this one condition were absent in an eventual experiment the usual result would *not* take place. The results of experimental sciences are never necessary in this rigid sense. Rigid necessity does not depend upon conditions; it is intrinsic and we must be able to verify it as a necessity; we must know why or how it is a necessity, not by intuition, but by proof.

All formal truths are rigid necessities. Propositions, as for instance $2 \times 2 = 4$, and $(a + b)^2 = a^2 + 2ab + b^2$, possess intrinsical truth; for they do not depend upon external conditions, and hold good everywhere and for all possible cases.

For the sake of distinction, the truths of purely formal thought are called *correct*, and the truths of a well-ascertained experience *real*. Correct, accordingly, signifies that which is true in a mere formal sense, and real (in this limited sense) signifies that which has a material existence. Mr. Mill, therefore, in the above quoted passage, should have said that the mathematical suppositions are not realities (*viz.*, realities in the limited sense). They are not material existences. But that is no reason for declaring that they depart from the truth. If they are but correct, they are true;

they are true so far as their form is concerned. By correctness we cannot gain substantial knowledge of things, but the correctness of our formal thought alone can afford that necessity, by means of which any kind of truth is established. Without the assistance of arithmetic, mathematics, mechanics, and logic, scientific knowledge cannot be obtained.

The assumption of Dr. Brooks that there are necessary truths, of which the mind has the power of knowing by intuition that they are necessarily true, would lead us back to the conception of "innate ideas." If we are not bound to explain why or how certain ideas are true, there is no means of discriminating between inveterate or inherited errors, and genuine truths.

The existence of the material universe is by no means necessary; nor is it necessary that actual space has three dimensions. We can imagine that we did not exist and that the whole world did not exist; we can imagine that a world existed, the space of which would possess two dimensions. But we cannot think it possible that $2 \times 2 = 5$; and we can positively understand why the laws of form in general must hold good under all conditions and in all possible worlds. If they were never realized in actual existences, they would nevertheless remain what they are—correct.

* * *

In the province of mathematics we move in an atmosphere of abstract thought. The simplest mathematical conceptions are by no means so absolutely simple as they appear; they are simple only in comparison with other mathematical ideas, definitions of, and theorems about, complex figures. A bright little boy of six years may have very clear conceptions as to dogs, horses, and even engines or other concrete

things, but there is little probability of his understanding the meaning of a mathematical point. That simple idea is too complex for his immature comprehension.

Dr. Brooks says:

"A derivation of one truth from one or more other truths is called reasoning. * * * All reasoning can be traced back to truths which cannot be derived from other truths, and hence are not the result of reasoning."

According to our view the basic conceptions of mathematics and the axioms so-called, *are* the result of reasoning. They are not first truths from which we start quite from the beginning; they are not self-evident in the sense that there are no truths back of or before them; but we acquire them after a long exercise in mental work only. They are based upon a well-directed and disciplined discrimination. This discrimination between form and matter, simple though it appears to us now, is most subtle, and its importance is invaluable. It enables us to construct systems of, and to evolve the laws pertaining to, formal thought. This discrimination between form und matter is, therefore, the commencement of a higher development; it makes scientific thought possible.

The correctness of formal knowledge was formerly based on axioms which had to be taken on faith. But as long as the certainty of axioms is based upon intuition, mathematics (and all other formal sciences) must appear to hover in the air and have no connection with the solid facts of reality. Mathematicians, it is true, rarely were inclined to foster mystic views (Cabalistic and Neoplatonic mathematicians are exceptions), and Dr. Brooks also repudiates any kind of mysticism. Nevertheless as long as a science is ultimately based on intuition, there is room for any

degree of mysticism. Grassmann's broader conception of mathematics has made all mysticism impossible. He has taught us to dive down to the bottom of the problems, where we can understand the origin and whole growth of mathematics and where they are seen to be in connection with the other facts of reality.

* * *

For our present purpose we are satisfied with having pointed out the connection which obtains between mathematics and the other facts of reality; but we may add for those interested in the philosophy of mathematics, that from Grassmann's standpoint the connection, also, that exists between the different mathematical theorems and solutions is more readily understood. Hamilton's quaternions and the significance of imaginary quantities have been anticipated by Grassmann and appear in their connection with his system in a new light. Grassmann's method allows a survey of the whole field and thus gives to the student that easy freedom which a traveler feels who constantly keeps in sight the point towards which he is journeying, as well as the road on which he approaches it.

Grassmann says*:

"Since both mathematics and philosophy are sciences in the strictest sense of the term, the methods employed in each must accordingly have something in common, which gives them their peculiar scientific character. Now, we give a scientfic character to a method of treatment when the student, on the one hand, is of necessity led by it to the recognition of every single truth, and on the other hand is placed in a position wherefrom he is enabled, at every point in the development, to survey the course of further progress.

*Grassmann, "Die lineale Ausdehnungslehre, ein neuer Zweig der Mathematik," Introduction, page xxxi.

"The indispensableness of the first requirement, *viz.*, *scientific rigidity*, every one will admit. As to the second, the same remains a point that is not as yet sufficiently recognized by the majority of mathematicians. Demonstrations are frequently met with, where, unless the theorems were stated above them, one could never originally know what they were going to lead to; here, after one has followed every step, blindly and at haphazard, and ere one is aware of it, he at last suddenly arrives at the truth to be proven. A demonstration of this sort, perhaps, leaves nothing more to be desired in point of rigidity. But scientific it certainly is not. The second requisite is lacking — namely, *the power of survey*. A person, therefore, that goes through such a demonstration, does not attain to an untrammelled cognizance of the truth, but he remains—unless he afterwards, himself, acquires that survey—in entire dependence upon the particular method by which the truth was reached. And this feeling of constraint which is at any rate present during the act of reception, is very oppressive for him who is wont to think independently and unimpededly and who is accustomed to make his own by active self-effort all that he receives. If, however, at every point in the development, the student is put in a position to see at what he is aiming, he remains master of his material, he is no longer bound to the particular form of presentation, and his assimilation of what he attains becomes actual reproduction."

Metaphysics: The Use and Meaning of the Word.

KANT calls every transcendental (or a priori) judgment 'metaphysical,' and the science of pure (or a priori) conceptions 'metaphysics.' Metaphysical notions, accordingly, are such as are true even if not confirmed by practical experiment, such as can not be refuted by experience. They are rigidly necessary and universal. Kant might have called metaphysics the mathematical or formal aspect of things.

The metaphysics of natural sciences is what Kant calls "pure natural science" (*Reine Naturwissenschaft*), and the law of Causation is one of the most important truths of pure natural science.

The doctrine of the 'Conservation of Matter and Energy,' although it has been discovered with the assistance of experience, can be proved in its full scope by pure reason alone. 'And therefore it would be, according to Kant's terminology, a metaphysical cognition.

Other philosophers have used the word metaphysics in a different sense. Perhaps misguided by a wrong etymology or at any rate under the influence of the literal meaning of the word, they attached to the term the idea of a science that investigates into that which lies behind nature. This unknown something was considered as the source and origin of natural phenomena. Schopenhauer says:

"By metaphysics I understand every pretended cognition which goes beyond experience and therefore beyond nature or the given appearance of things in order to give information about that upon which nature somehow is dependent, popularly expressed

what is behind nature and makes nature possible." (Translated from "*Welt als Wille und Vorstellung*," Vol. II., 2d ed. p. 180.)

The term metaphysics has become popular in the sense conceived by Schopenhauer. No wonder that Comte, from the standpoint of positive philosophy, denounced metaphysics as radically erroneous. Before he was acquainted with Kant's works, he considered him as the representative metaphysical philosopher. Later on when he had read one of Kant's writings, he acknowledged in a letter to a friend,* that at every point Kant showed the spirit of positivism. A republication of the letter is found in the preface to Max Müller's translation of Kant's "Critique of Pure Reason."

The name metaphysics is due to a misunderstanding. Aristotle teaches that natural science (φυσικὴ φιλοσοφία) must be treated according to ceartain principles (ἀρχαί);

* 'J'ai lu et relu avec un plaisir infini le petit traité de Kant (*Ideen zu einer allgemeinen Geschichte in weltbürgerlicher Absicht, 1784*); il est prodigieux pour l'époque, et même, si je l'avais connu six ou sept ans plus tôt, il m'aurait épargné de la peine. Je suis charmé que vous l'ayez traduit, il peut très-efficacement contribuer a préparer les esprits à la philosophie positive. La conception générale ou moins la méthode y est encore métaphysique, mais les détails montrent à chaque instant l'esprit positif. J'avais toujours regardé Kant non-seulement comme une très-forte tête, mais comme le métaphysicien le plus rapproché de la philosophie positive.... Pour mois je me trouve jusqu'à present, après cette lecture, d'autre valeur, que celle d'avoir systématisé et arrêté la conception ebauché par Kant à mon insu, ce que je dois surtout à l'éducation scientifique; et même le pas le plus positif et le plus distinct que j'ai fait après lui, me semble seulement d'avoir découvert la loi du passage des idées humaines par les trois états théologique, metaphysique, et scientifique, loi qui me semble être la base du travail dont Kant a conseillé l'exécution. Je rends grâce aujourd'hui à mon défaut d'érudition; car si mon travail, tel qu'il est maintenant, avait été précédé chez moi par l'étude du traité de Kant, il aurait à mes propres yeux beaucoup perdu de sa valeur. Auguste Comte par E. Littré. Paris, 1864, p. 154. Lettre de Comte à M. d'Eichthal, 10 Déc. 1824.'

We must add, that to our conception Comte was more metaphysical even than Kant, for he still believed in the Unknowability of what he called "first and final causes," and considered only "the middle between them" accessible to cognition. His conception of positivism was to limit science to the positively knowable; but he did not succeed in entirely freeing his philosophy from mysticism—which after all is the primary object of all philosophy.

therefore it is no independent science. He calls the science of these principles the first, and natural science the second philosophy* (*πρώτη καὶ δευτέρα φιλοσοφία*). The first science, the philosophy of principles, is treated in a book which in the collection of Aristotelean works had been placed immediately after the books on physics, and some ingenious commentator or copyist, unable to find a proper title, inscribed the essays on the first science *τὰ μετὰ τὰ φυσικά* (sc. *βίβλια*) "The books after the physical ones." From the words *μετά* (after, behind), and *φυσικά* (physical) the term metaphysics has been coined, which gave rise to so many errors and seemed so appropriate and expressive to dualistic philosophers.†

Metaphysics, as employed by Kant, is the most important and most valuable study we have. It is the theoretical basis for all scientific knowledge. Metaphysics, as a science that should give us information about the origin of existence at large, is generally called ontology, or the science of absolute being. Metaphysics, in the sense of ontology, has become, since Kant, untenable ground; and, therefore, Kant has been commended for having given the *coup de grace* to metaphysics.

Goethe and Schiller did not misconstrue the tendency of Kant's criticism, when they declared in one of their Xenions:

> "Since Metaphysics of late without heirs to its fathers is gathered,
> Here at the auctioneer's are 'things of themselves' to be sold."

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* *εἰ μὲν οὖν μή ἐστί τις ἑτέρα οὐσία παρὰ τὰς φύσει συνεστηκυίας, ἡ φυσικὴ ἂν εἴη πρώτη ἐπιστήμη· εἰ δ'ἔστι τις οὐσία ἀκίνητος, αὕτη προτέρα καὶ φιλοσοφία πρώτη.*—Arist. Metaph. v. 1.

† Titulum vulgatum *τὰ μετὰ τὰ φυσικά* non ab ipso esse Aristotele his libris inscriptum, adeo est verisimile ut pro certo haberi possit. *Bonitz*, ad Arist. Metaph., p. 3.

Metaphysics, in the sense of first principles, would be a clarification of our most general ideas, which, like logical theorems, are most obvious truths. Schiller occasionally jests about the subject, saying in one place:

"Metaphysicians know, I'm told,
That what is hot cannot be cold;
Light is not dark, they'd bet,
And dry things are not wet."

The more a statement is generalized, the less positive knowledge will it contain. The most general laws, which imply absolute universality, are merely formal and do not contain any positive knowledge, however important they may be for the purpose of orientation, so as to enable us to locate and map out our different cognitions according to a systematic method; and those philosophers who assume an air of profound wisdom when speaking about metaphysics are satirized by Schiller in the following lines:

"How deep the world beneath me lies;
My craft the loftiest of all
Lifts me so high, so near the skies
I scarce discern the people crawl."

Thus shouts Tom Roofer from his spire,
Thus in his study speaks with weight
Metaphysicus, the learned sire,
That little man, so high, so great.

That spire, my friend, proud and profound.
Of what is 't built; and on what ground?
How came you up? What more is 't worth,
Than to look down upon the earth?

Mephistopheles, in Goethe's Faust, treats the subject in a well-known passage with great sarcasm. He satirizes those metaphysicians who are pleased to veil their language in mystical and contradictory expressions, which either contain trite truisms in the shape of philosophical conundrums, or must be classed with hallucinations and other pathological phenomena of a diseased brain. Mephistopheles says:

"The next most important thing to mention,
Metaphysics will claim your attention!
There see that you can clearly explain
What fits not into the human brain:
For that which will not go into the head,
A pompous word will stand you in stead."
—Translated by *Brooks.*

Metaphysics, in the sense conceived by Schopenhauer, and combated by Comte, is the last remnant of theological supernaturalism. It is dualism, pure and complete, without religious mythology. The mythological entities have been volatilized in the crucible of philosophy to vague shadows of a transcendent or metaphysical something. This something is supposed to be "the thing of itself," the ultimate x in all philosophical problems, and the unknowable, eternal reality behind the knowable transient phenomena. Metaphysicism of this kind has been and will more and more be superseded by Positivism.

THE PROBLEM OF CAUSALITY.

CAUSALITY, the law of causation, is the basis of all our experience, and a clear conception of causality is indispensable to correct observation as well as to sound reasoning. In spite of this, the problem of causality has been unbecomingly neglected; the vagueness of terms, the lack of lucidity, and the innumerable errors springing from such uncertainty are astounding. Expressions such as 'first cause,' 'ultimate cause,' 'final cause,' 'remoter cause,' 'general cause,' 'universal cause,' '*causa sui*' are in vogue among thinkers of no inconsiderable repute. In elucidating the problem, we shall first propose a few examples, then our definitions, then some explanations, and finally discuss the erroneous conceptions of causality.

EXAMPLES.

I. A sculptor is modeling in clay; after much pressing, trimming, and finishing, a figure is shaped. The form of the statue is the effect of his work. [Production of a new form of matter.]

II. A key on the piano is touched, the hammer strikes the chords, and a sound is produced. The sound is called the effect. [Production of a new form of energy.]

III. A chemist brings hydrogen and oxygen together. An explosion takes place and water is produced. The

water is called a product of the combination, and the form in which hydrogen and oxygen are combined in water is the effect, of which the combination (the act of combining) is the cause. [Creation of a new form of matter, being another substance and exhibiting new properties.]

IV. The trigger of a loaded gun, pointed toward a deer, is pulled. The deer is hit and dies. The pull on the trigger is the cause, and the death of the animal is the effect. [Destruction of form.]

V. During a rainless season water is poured every evening on an almost withered plant. The plant commences to thrive, it grows and sprouts, and after a while it brings forth blossoms. The plant's blossoming is the effect of its repeated irrigation. [An example from the vegetable kingdom.]

VI. A mother loving her child more than her life, observes that a lion of a menagerie is at large in the market-place. All people flee. Her baby is left behind by its nurse and the lion approaches the infant. The mother rushes out of the house and rescues her child in the face of the lion. [An example taken from human life; the story is an historical fact, known under the title of "The Mother of Florence." The cause, in this case, is the motive of the mother; the effect is the rescue of the child. The motive is mostly a very complicated state of mind, which in the present instance can be summarily characterized as a mother's desire to save her child.]

EFFECT.

The effect has not existed before. It has been produced by its causes. What then is the effect?

Matter cannot be created, and energy cannot be

created; the effect, therefore, can only be a *new form* of matter and energy:

I. The clay of the sculptor existed before the statue; the form of the statue alone is new.

II. A sound is a special vibration of air. The air (in instance No. II) is not created nor is the motion of the air created out of nothing. The vibration of the sound is nothing but transmitted energy coming from the muscular action of the finger that struck the key. The effect, accordingly, is a special form of energy agitating the air.

III. The material elements of the water (H_2O) existed before their combination. The water, in so far as its material particles are concerned, has not been produced. The effect of a chemical combination of H_2O can be called water in so far only as water signifies the *form* into which the elements have combined. In common language we make no distinction between water as matter and as a combination of the two elements.

IV. The death of an animal caused by violence or by natural sickness is destruction of form. True, it is a destruction of life, but life is not a material object, not a thing of substance; life in the narrower sense (the individual life of a deer) is the spontaneous activity of a certain body; it is a form of nerve-energy. Life in the broadest sense of the word, meaning force, or spontaneity, or self-motion, with which all matter is endowed, can not be destroyed. It is indestructible, as we know from the law of conservation of energy. But life in the narrower sense is a certain combination of energy in the special form of an animal body. Death is the destruction of this form; while propagation, being growth and trans-

mittance of form, is a continuance of the paternal form of life in offspring.

V. The blossom of a plant is not the effect of its irrigation. The matter of the blossom, the elementary particles of which the blossom consists, have existed before as water, air, and parts of the soil. And the vegetative energy stored in its cells has also existed in the shape of sunbeams or otherwise. The effect produced is this special form, in which by assimilation and transformation the organs of the plant have combined energy and matter as a blossom.

Definition. Accordingly effect is a new state of things: a new arrangement; a new form produced through some alteration of circumstances.

CAUSE.

The previous state of things, which existed before any effect was produced, cannot have been at rest. If it had been at rest, no effect would have been possible. The previous state of things must have been in motion. Without motion no causation. Motion is an alteration of place. When properly combined, the atoms of oxygen and hydrogen will shape themselves into new configurations. The cause is a motion; it is their properly meeting each other. The atoms being of a certain size and shape, and having special powers of attraction, so that they fit to one another, appear in the new form of water.

A chemist who makes the experiment has, as a matter of course, to observe all the conditions under which the process takes places.

A gardener who waters a plant must at the same time take care that the plant receives sufficient sunlight, that it stands in good soil, and is protected from

injurious insects. These facts taken altogether, are called the circumstances. Circumstances in so far as they are indispensable to the realization of an effect, are called conditions

Definition. Cause (being the factor that produces the effect or the new state of things) is a motion. It is an alteration in a certain state of things whereby a further alteration, a re-arrangement or a new combination, becomes necessary.

EXPLANATIONS.

1. *Causes and Conditions.* It is obvious that if in a certain state of affairs the effect is produced by several, perhaps simultaneous, movements, we may arbitrarily call one of them the cause and the other ones its conditions, or we may call all of them together the causes. So for instance, the sunbeams (not as things, but as a motion, as ether-vibrations) may be called the cause of blossoming just as well as the watering; or we may designate both as the common causes.

2. Cause and effect are two states, the one following the other: The causal state disappears by creating the state of the effect; or in other words, the cause, vanishing as such, reappears in the effect. The same matter, the same energy are exhibited in a new form or a new combination.

3. The scholastic maxim, *cessante causa cessat effectus*, is accordingly wrong. The cause is always passed, if the effect is produced.

4. Causes and effects form an infinite chain of alterations; every cause is the effect of another cause; and every effect can become the cause of another effect. If a key on the piano is touched, a lever is set in motion which raises a hammer; the hammer strikes

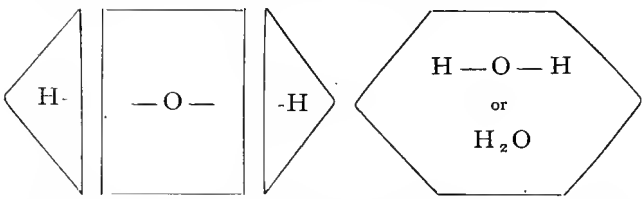
against the chords and sinks back; the chords vibrate according to their length and induce in the air corresponding undulations. The air-waves meet a human ear and transmit their rhythmic motions to the tympanum, thence the disturbance passes through many stations in the aural apparatus and reaches the auditory nerve where it is perceived as sound. In this and in all other chains of causes and effects, any of the succeeding stages may be called the effect of its antecedents and the cause of its consequents.

Accordingly the signification of cause and effect is to a great extent arbitrary and depends much upon the proper tact of the observer. He should select as cause and effect two states which somehow correspond to one another in importance for a special purpose. How far the intermediate links can be neglected, depends upon circumstances.

5. Our example No. III (the generation of water) is often used as an instance to prove the transcendence (or unknowability) of the law of causation. However, there is no room for mysticism if we take into consideration that the product is a new molecular form of its constituent elements. By molecular form of water, we understand the combination of H_2 with O in that special form in which it appears as water.

Suppose we have a rectangle of 5 x 3, and two equilateral triangles, the bases of which are 5 and the sides 3. Combine the two bases of the triangles with the longer sides of the rectangle and we will have a hexagon all whose sides are 3. The rectangle, as such, has disappeared, and the triangles, as such, have disappeared also. A new form is created, a hexagon, which has lost the properties of its component figures and possesses properties that were not exhibited in

the same. The longer sides of 5 which existed in the triangles as well as in the rectangle are as such altogether lost in the hexagon. The hexagon is equilateral and has six obtuse angles, while the triangles have two acute, the rectangle four right angles, and neither the triangles nor the rectangle are equilateral.



Some imagine that the properties of a combination must have before existed in a latent form; but in our geometrical instance this is evidently impossible. The hexagon is an entirely new form, which has neither existed in the one nor the other of its components. If such is the case in this extremely simple instance, how much the more is it true of the highly complicated combinations and changes of form in reality, which by the smallness of atoms are not directly observable, and can often only be guessed or traced with greatest difficulty!

It is a fact which is overlooked by great thinkers that by combination or change of form things can be created which never existed before in that form, and the qualities of which can neither as latent nor as apparent properties be traced in their constituents.

6. Materialism overlooks the importance of form. While justly opposing the wrong conception of any immaterial existence, materialism goes too far when it considers matter as the only aspect of phenomena, thus making it the sole principle of explanation. Mr.

Spencer tries to reduce everything to matter and motion, and Professor Louis Büchner similarly proposes his philosophy of *Kraft und Stoff*. In this way they fail to see that evolution, progress, the occurrences of inorganic nature as well as the highest aspirations of man, can only be explained from the fact that new combinations or new forms are actually new creations.

It is undeniable that immaterial realities can not exist. The thing exists by its being material; and its reality is manifested by its being a combination of energies; it is a *Kräfte-Complex*. But the thing exists *as such*, because it has a certain form. Destroy the form and the thing as such ceases to exist and changes into something else.

Diamond, graphite, pure coal, and soot, so far as their material constituents are concerned, are the same; all being carbon. And yet they are radically different things, with different properties. Diamond is as white and clear as water and as translucent as air. It is the hardest substance known in nature. Coal, graphite, and soot are of the deepest black, and are soft enough to leave dark, lead-colored traces on paper. Diamond is rare and valuable, while the other formations of carbon abound in nature. The difference of these simple substances is exclusively one of form.

Combinations of the same chemical composition, with different properties, are called isomeric. For instance, the formula $C_2 H_4 O_2$ represents acetic acid as well as methyl ether of formic acid, the former being an acid the latter a neutral substance. The boiling point of acetic acid is almost 90° higher than that of the methyl ether of formic acid, and with same substances the one forms other combinations than the

other. Grape sugar, being $C_6 H_{12} O_6$, consists of the same elements in the same proportion also. Quite different from the other two substances, it is sweet, crystalline, capable of fermenting, and neutral to litmus paper. It is neither an acid, a base, nor a salt.

Graphic formulas * have been invented in order to give a visible expression to such differences.

Consequently a thing, a body, a substance, is not only the sum total of its material elements, it is *the form* of its material elements. Materialism is right in so far only as it maintains that things exist at all because they are material; but it must be remembered that they exist *as such* because they have a certain form. Form, so to say, is the soul of things.

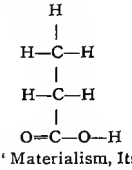
The same is true of man. Man is not only an aggregate of matter and energy; he is an aggregate of matter and energy *in a special form.* And it is the form which makes him a man. Prof. Büchner says: †

"The greatest of all poets who has ever lived and whose masterpieces are immortal, because he stood upon this ground of truth and reality, *Shakespeare*, was already a Materialist in his innermost convictions, and with his prophetic eye pursued the

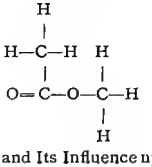
* The elements differ in atom-fixing power. An atom of hydrogen, being able to attach to one atom of any other substance, is called a monad, which is expressed by H'; an atom of oxygen is a dyad, O''; nitrogen a triad, N'''; carbon a tetrad, C'''' or $C^{iv.}$ The graphic formula for water is: H—O—H.

Propionic acid, Methyl acetate, and Ethyl formate (all three being $C_3 H_6 O_2$) are, as their names suggest, entirely different substances. They have been expressed by graphic formulas in the following way.

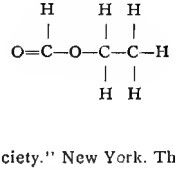
PROPIONIC ACID.



METHYL ACETATE.



ETHYL FORMATE.



† "Materialism, Its History and Its Influence upon Society." New York. The Truth Seeker Co.

eternal wanderings of matter as the last and primitive cause of everything that exists, through the same pathways, upon which modern science has traced it with mathematical certainty, when he says (Hamlet, v. 1):

> 'Imperious Cæsar, dead and turned to clay,
> Might stop a hole to keep the wind away;
> Oh! that the earth that kept the world in awe,
> Should patch a wall to expel the winter's flaw!' "

In the bible God says to man: "Dust thou art and unto dust shalt thou return." So, God must have been "already a materialist in his innermost convictions." But this biblical utterance is only one side of the truth, it is the one-sided truth propounded by materialism. The other side of the truth is, that man as such is form; and form is changeable; it can be evolved, and this evolution of form is the purpose of our life, the ideal of our aspirations and the basis of ethics.*

WRONG CONCEPTIONS OF CAUSALITY.

1. Cause is an alteration in a state of things and effect is a new arrangement of things. But cause and effect are never objects or things. A thing by its motion or a person by his labor may produce an effect; but the thing itself or the person is never a cause, nor is the thing produced an effect. A sculptor may carve a statue; the sculptor is not the cause, and the statue as a thing is not the effect. The sculptor's labor is the cause; and the effect is the special *form* of the wood, clay, stone, or bronze, *i. e.*, the statue without reference to its material.

2. God has been called 'first cause.' First causes are of mere relative existence. A first cause is the starting-point in a series of some longer chain of causes and effects. The first cause in our second example is the touching of the key; all the effects of this cause are

later causes in the series. According to the nebular hypothesis of Kant the first cause in the formation of our planetary system must have been an unequal distribution of matter. This state of things happened many billions of years ago, and has passed away, as any cause must disappear when its effect has resulted.

'Ultimate cause' is a synonym of 'first cause.' The first term becomes the ultimate one if we count backwards. The expression 'ultimate cause' is even more unfortunate than first cause.

3. Hume speaks of 'general causes,' meaning thereby natural laws. The Germans distinguish between *Grund* and *Ursache*. *Ursache* is what we have defined as cause; *Grund* is the law by which we explain *why* the cause acts. *Grund* is the *raison d'être*, the reason, the principle, the law according to which things change or move, and according to which men act. For instance, gravitation is not the cause that a stone falls to the ground. The cause may be that my fingers let it go. Gravitation is the *raison d'être* of a stone's fall in this particular instance as well as in any other case. A cause is a single event, a single fact, a certain motion or alteration. The *raison d'être* of gravitation, however, is a general law and a principle of explanation.

Those who call God the first cause really mean to call God the ultimate ground of the world; they intend to represent him as the most comprehensive principle of existence; as the ultimate generalization of all laws.

4. The scholastic dictum, *cessante causa cessat effectus*, which is quoted above as wrong, refers to this *raison*

*Compare Mr. E. C. Hegeler's essay, "The Basis of Ethics," in No. 1 of the OPEN COURT, and the editor's pamphlet, "Monism and Meliorism," V., §5-9.

d'être. It should read, *cessante ratione cessat causatio*, *i. e.*, if the ground or reason, the rationale, ceases to be valid, the cause cannot take effect. For instance, love of freedom was the *raison d'être* of Greek industry, progress, and civilization. As long as this love of freedom prevailed, Greece was free, prosperous, advancing, and civilized. As soon as this love of freedom yielded to indifference, avarice, and other vices, Greece began to decline. It was a ground but not a cause — it was a continuous principle which manifested itself in many single cases. So the law of gravitation is no cause, but a law recognized in many instances and regulating the causation of gravitating objects.

5. The *causa sui* of Spinoza is one of the worst self-contradictions in existence, designating "a cause which is the cause of itself." Spinoza apparently means *ratio sui*, a reason or principle which explains itself; a ground which has its ground in itself, meaning a self-evident truth that for verification does not depend upon some other evidence. Spinoza confounds this *ratio sui* with the idea of an absolute existence; *i. e.*, an existence which contains in itself the ground or *raison d' être* of its existence. On this logical error rests the whole structure of his grand and noble philosophy.

6. 'Final cause' is a most unfortunate expression for purpose. The schoolmen distinguished 'effective causes' and 'final causes.' It is obvious that all causes are effective. If a certain cause is the will of a man, the idea which guides him is an indispensable condition. This idea is the end to be attained. If such causes are to be called 'final causes,' we must bear in mind that these 'final causes' are just as much effective

causes as any others. There is no essential difference. Both result into their effects with the same necessity.

Final cause being an inappropriate synonym of purpose, has only sense when it is used in reference to a will. We cannot speak of the final cause of cereals as being serviceable food for man. There is no final cause in nature outside of the province of volition.

7. *Causality immanent. The world no chaos, but a cosmos.* Those who use the word 'final cause' in a more general sense, imagine that a divine providence has arranged the order of things according to some plan or design. They consider the universe by itself as chaotic, and believe that God imposed law and order upon it from the outside.

Materialism, denying altogether the existence of final causes and design in nature, falls into the same error as its enemy, dualistic superstition. Materialism also considers the universe as originally chaotic, and explains the order of the world as the fortuitous outcome of haphazard, which if once happily arranged has necessarily more stability and more chance to continue so than other, chaotic formations. This view disagrees with facts. The relatively chaotic combinations of lower natural manifestations are more stable than the higher evolved forms of life, the highest forms being least stable.

Monism teaches that the order of the universe is not transcendent; it is not imposed upon nature from the outside; the order of the world in its mechanical regularity is immanent. The world is no chaos, it is a cosmos, and if God is to be called the order of the universe, monism teaches that God is immanent; God and the universe are one.

MATTER, MOTION, AND FORM.

In all causative processes we must distinguish three things, Matter, Motion, and Form; and indeed the comprehension of a phenomenon is not complete until we know in what *form matter moves*.

Matter, motion, and form are three abstractions. None of them exists of itself, and no natural phenomenon can be without any one of these three things. The form of existence is called space, and experience teaches us that it is tri-dimensional. All the single forms of reality which are found to exist bodily, therefore, depend upon the laws of a formal system of third degree. A knowledge of these formal laws was for this reason, in ancient Greece, considered as the basis of science and received the name which it still bears, "Mathematics" (from μανθάνειν, to learn, μάθημα, knowledge, μαθηματικός, pertaining to knowledge).

Matter is that which affects our senses. It manifests its existence by certain motions and by filling space. Apart from space and without the capacity of motion matter cannot even be conceived. The most general term by which matter is characterized is mass. Mass denotes the quantity of matter merely, without considering its weight or volume, which vary according to circumstances.

Motion is change of place. But no real motion is possible unless some material particle is moving. Every

motion is an alteration of the disposition of matter: it is an alteration of form. Space being the form of reality, all motions depend upon mathematics or laws of space. The science of motion, based on mathematics, is called mechanics.

Motion can be stored up as it were. A pressure with an equal counter-pressure, a stress, is in a state of rest and yet this state of rest contains the possibility of motion, if through some disturbance, acting as a cause, a part of the whole force of these two pressures is set free. Force and energy are concepts which have been framed to account for the innumerable forms of motion and to explain how one form of motion originates, while another disappears. Under certain circumstances apparent rest seems to produce motion; but in reality potential energy is set free; stress or stored up motion is transformed into actual motion.

Monistic tendencies in the domain of philosophy can with a certain consistency result in three different views. One considers Matter as the universal principle from which all phenomena must be explained; the other selects Motion, and the third Form for the same purpose. The first has been called Materialism, the second may fitly be named Dynamism, or Kineticism, and the third appears as Spiritualism or Idealism. All three views lose sight of the fact that matter, motion, and form are mere abstractions and that none of them exists or can exist of itself; they are only three aspects of reality. Reality, being one indivisible whole, possesses properties for which matter, motion, and form are general terms.

Dynamism, in its purest form, has never become prominent. Materialism generally appears combined with Dynamism. Mr. Spencer attempts to explain

everything by Matter and Motion, and Professor Büchner similarly reduces all to Matter and Force. Idealists, on the other hand, look upon form as the matrix of all existence. Plato attributes to pure form a higher kind of reality than exists in the province of material bodies. To him the ideas or pure forms of things are eternal, while their material realizations possess a transient sham-existence. They are mere appearances of phenomenal, not of real, being.

Plato's doctrine of idealism appears to be loftier than the materialistic conceptions of the world, because an appreciation of form is the basis for comprehending those phases of the world which must be prized most highly. The cosmic order of the world must be understood through the laws of form. Mind is a special form of life. Volition and human action are special forms of motion, and so are all manifestations of the life of organisms. The rules of the beautiful in the empire of art, the maxims of goodness in ethics, the laws of truth in science, find their ultimate foundation in form; and what are ideals if not higher forms to be realized? Form is, as it were, the spirituality of the world and a neglect of the importance of form deprives man of all that makes life worth living.

The tendency of our age is materialistic, and materialism has established a most important truth by insisting upon the fact that there is no reality but in material existence. But matter, although a most essential feature of reality, is not the whole of it. Man's personality is not his material being; he is not the sum total of the atoms of which he consists. Man's personality, his mind, his intelligence, his character, is the special form in which the atoms have taken shape Break this form and his personality is destroyed. Pre-

serve this form, or build it again, and his personality is preserved.

Form admits of change. It can degenerate and it can even be destroyed, but it can be improved also. Form and the changeability of form, are the conditions of evolution. It is the possibility of a constant progress resulting therefrom, which gives to life its ethical value.

UNKNOWABILITY AND CAUSATION.*

MR. SALTER says: "The law of causation is perfectly intelligible * * * it is the cause that may be transcendent or unknowable."

In no one of our examples can the causes be transcendent or unknowable. Every cause is a motion or change of place, and although there are many phenomena so complicated that we have not as yet been able to discover their causes, we may be quite sure that the causes exist and that they are motions of some kind, ascertainable and measurable.

The cause, being a motion, is, as a rule, not very difficult to discover. The difficulty commences when we begin to search for reasons. In order to discover the cause of a phenomenon we have to observe the progress of motion, first the touch of the key on the piano, then the rising of the hammer, the vibration of the chord, the vibration of the air, then of the tympanum, then the irritation of the auditory nerve, and the perception of sound. In order to know a cause we must either directly or indirectly experience it. A cause is a fact, an event, an occurrence, that must be stated. Our reason, which is the faculty of comprehending, is called into action when we ask for an explanation of the fact. This explanation is something quite different from the cause of a phenomenon, for it is not a motion, not a single event, not a separate oc-

* In reply to a criticism of Mr. W. M. Salter.

currence but a general law or an abstract rule, a formula that comprehends all possible instances of the same kind.

In former ages skepticism was more powerful and indeed more justifiable than it is to-day. The relativity of knowledge seemed to take all vigor out of science. The human race was recognized to be limited to this earth; how could a man dare to hope ever to know of what the sun and the stars consist! The impossibility of any knowledge of that kind appeared obvious. Man's eye is so constructed that the impressions of light require a certain time and intensity; how can he ever expect to have information about the path of the lightning-flash or about stars whose light is not intense enough to impress the retina? The impossibility of any conception of that kind seemed plainly demonstrable. Man's ear can perceive sounds of certain pitch only; if they are too high or too low they will pass by unnoticed. These imperfections necessarily seemed to preclude man from any knowledge that lay without the range of his sensory organs, which are the basis of all his cognition. And yet, a few simple inventions have admitted us to all these seemingly inaccessible laboratories of nature. It is the very relativity of our knowledge, so often impugned, that allows an indirect, yet most reliable, apprehension, where a direct observation is impossible.

Causes are facts of nature; and although it requires much ingenuity and critical discrimination, it is nevertheless comparatively an easy task to trace them in natural phenomena. Our senses may prove dull in many subtle cases, but instruments for our assistance have been and will be invented. There is nothing to be comprehended in facts, they have simply to be

stated. But the statement of the causes in a phenomenon is the raw material only with which science works. The causes of a phenomenon being known, we search for its reason. The reason why the chord produces a certain sound must be sought in the peculiar qualities of the chord and its surrounding air; perhaps also, in the manner in which the chord is struck by the hammer. The chord possesses elasticity and has a certain tension. Strings not possessing these qualities will produce other or perhaps no sounds whatever. If certain qualities are proven to be the conditions of the effectiveness of the cause, we can easily formulate this experience into an abstract law which will serve as an explanation for all instances of the same kind.

The word cause is frequently used to designate what we have defined as reason or *raison d'être*, although both ideas are two essentially different things. And the license of language which has sanctioned this confusion, produces many most perplexing problems. Now, considering that causes are comparatively easy to ascertain, while most reasons, even of the simplest phenomena, can be found only with great difficulty, it seems probable that Mr. Salter means "reason" not "cause," when he says: "It is the cause that may be transcendent." The reasons of innumerable phenomena of nature are still unknown and are supposed to be unknowable by minds of mystic disposition. But their being unknown by no means justifies us in considering them as unknowable. The successful solution of so many perplexing problems should encourage our scientists to devote their efforts to those problems which now appear hopeless to us.

* * *

BUT the problem whether there is anything unknowable in causation lies deeper still. When dualistic philosophers so confidently speak of the Unknowability of a First Cause, they undoubtedly mean the ultimate *raison d'être* of phenomena, which would be the most general and therefore universal law, under which all the other less general laws had to be classified, and from which they will find their explanation.

If a group of phenomena is classified and formulated into a law, this law represents the reason why these phenomena occur. But with this the task of science is not yet exhausted. For our law representing the reason why, demands in its turn an explanation also, and we ask again what is the reason of this law? When we succeed in finding a reason for this law, it will be seen to be a more general law which shows that the first formulated and less general law is only a special and perhaps at the same time a complicated instance of other, simpler phenomena, with which we are more familiar.

Let us take, for example, a phenomenon referred to by Prof. Mach, in his essay, "Transformation and Adaptation in Scientific Thought."* "Smoke rises into the air." * * * We formulate a law that "heavy bodies tend downwards and light ones upwards. It soon turned out, however, that even smoke had weight, —and that it was forced upwards only because of the downward tendency of the air, as wood is forced to the surface of water because the water exerts the greater downward pressure." Thus many cases and formulas of quite different phenomena, which at first sight seemed to be irreconcilable, are comprehended under

* Published in THE OPEN COURT, Nos. 46 and 48.

one more general law. Science went further still. Newton discovered that the fall of a stone toward the center of the earth, and the circuit of the moon around the earth could be classified as two instances of one and the same law, which has been called by one word —*gravitation*. Gravitation has so far solved very intricate problems. It has solved them, because we can think of many phenomena together as being produced by one and the same quality of matter. To use Professor Kirchhoff's words, we are thereby enabled to "describe certain phenomena of motion in the most simple and comprehensive way;" and, as Professor Mach would express it, we thus "economize our thought."

Gravitation, which is not yet explained, can just as little be considered the *omega* of our knowledge in physics, as the idea of affinity is the *ultimatum* of chemistry. Gravitation demands its explanation also; and some scientists have ventured on the hypothesis that both affinity and gravitation are explainable from attraction. Gravitation would be, so to say, the mechanical attraction between two masses, while affinity should be called molecular attraction. Even if this is true, we are still very far from seeing the *how* and *why* of this hypothesis, so as to propose it as a consistent and obvious theory.*

The further modern science progresses, the more is the conception of monism realized, which teaches the unity of truths. All the different truths appear as so many applications of one and the same law. Now, suppose that we were in possession of all truths; the whole universe would be mirrored in our mind, methodically arranged. All the formulas and laws of the different sciences would be recognized to constitute

one great system, and one law would be seen to pervade the whole. This supreme law, being the most general, would represent the ultimate *raison d'être* of all the other laws, and it could not, in its turn, be reduced to a still more general law. Accordingly, the modern agnostic says, it is unknowable and it must be transcendent.

Agnosticism is the latest revival of skepticism. The old skepticism declared that we could know nothing: all knowledge is mere opinion, objective truth does not exist. Agnosticism marks a progress in so far as it limits transcendency to the "First Cause"; or, as we would express it, to the ultimate *raison d'être* of the world. There would be no objection to the agnostic idea, if the ultimate *raison d'être* were declared to be the limit of knowledge, the point where our investigation would naturally come to a halt. But then we must know, that the whole of reality, with all its inexhaustible wealth of problems, lies within the bounds of knowability, while beyond that limit is empty nothingness.

Mr. Spencer says:

"For, if the successively deeper interpretations of nature which constitute advancing knowledge are merely successive inclusions of special truths still more general, it obviously follows that the most general truth not admittimg of inclusion in any other, does not admit of interpretation. Manifestly, as the most general cognition at which we arrive cannot be reduced to a more general one, it cannot be understood. Of necessity, therefore, explanation must eventually bring us down to the inexplicable. The deepest truth which we can get at must be unaccountable. Comprehension must become something other than comprehension before the ultimate fact can be comprehended."

Comprehension, it seems, has from the beginning been to Mr. Spencer something different than it is to

us. How can it, all of a sudden, change into its contrary? Comprehension is the act of comprehending, or comprising; it is the act of grasping in our mind several things at once, being derived from *com-prehendere*, to grasp together. To understand means the same. *Under*, in the Anglo-Saxon verb *understandan*, has its primary sense of "among, between," as has the German *unter* and the Latin *inter*. *Understandan* means to stand under or in the midst of things, so as to see all their different aspects at once. The Latin *intelligo*, (inter-lego) rests on the same figure of comparison. But the concept and the word 'transcendency' (unknowability) convey the idea that the solution of all problems should ultimately be sought outside of the world, behind or beyond the realm of nature, in another realm which is inaccessible, so that cognition would be obliged to transgress (to transcend) the sphere of knowability in order to get possession of it.

The ultimate *raison d'être*, far from being transcendent, would denote the most immanent quality of things. It would be the most obvious and most simple truth of which all other cases would be more complicated instances, for it would be used to account for all. Certainly, it could not be deduced from a more general statement, and in so far it would be "unaccountable" and "inexplicable." But at the same time there is no doubt that we would need no explanation, and in so far as this could be proven, it would on the other hand be "accountable" and "explicable."

It is a great error to imagine that if we knew this most general law we would be in possession of the key to all the problems of the world. We must not forget that the more a statement is generalized, the emptier the circle of its contents will be of positive in-

formation. To know why and how all other instances are special applications of the most general law would be necessary also for their comprehension. Generalization is only one half, discrimination is the other half of comprehension.

Dualistic philosophers have supposed natural phenomena to be mere shadows of the realities behind phenomena.* They looked upon phenomena as visible effects of invisible causes. Cognition, they thought, penetrates through phenomena in order to get a glimpse of the real things. The discovery of natural laws seemed to afford such knowledge of what was considered the real and invisible causes. They appeared as eternal entities behind a transient sham-existence. Taking this view of nature, we shall inevitably come down to mysticism. From this standpoint the truism of the relativity of knowledge would be tantamount to a confession that real knowledge is impossible.

Monism rejects this dualism. The monistic view is positive, and positivism accepts natural phenomena as facts. There is no difference between primary, remoter, and ultimate facts. There is but one kind of facts: such as are real. Real facts, natural phenomena, are at the same time primary and ultimate facts. Knowledge of facts means that they are, as it were, mirrored in our minds. To know a thing means that its image exists in our brain as a feeling nerve-structure, which occasionally can become conscious. Comprehension does not go, and cannot go, beyond facts; but is simply a matter of systematic arrangement. A consideration of this kind, it must have been, that induced Professor Kirchhoff to omit the word "causes"

* Plato's simile of the Shadows in the Cavern (Rep. VII) will here be remembered.

in his definition of mechanics. His work, published in 1875, commences with these words:

"Mechanics is the science of motion. Its object we define to be this: To describe with exhaustive thoroughness and the greatest attainable simplicity the motions that are taking place in nature."

In his inaugural address upon entering the Rectorate at Heidelberg, in 1865, Prof. Kirchhoff had spoken of "the causes that condition motion." The omission of the word cause, therefore, marks a progress from metaphysicism (or, at least, the possibility of metaphysicism) to positivism. All our knowledge is a description of facts, and all our comprehension is economy of thought, through greater simplicity combined with exhaustiveness.

The law of causation applies to all natural phenomena, but not to nature as a whole; it accounts for the single things as such; *i. e.*, it explains why they appear in these special forms. But the law of causation does not apply to existence *in abstracto*. Abstract existence can have no cause; abstract existence is simply the statement of the self-evident fact that existence exists.

If there is anything transcendent, it is these facts themselves in their stubborn reality. All their relations are knowable, all their qualities can be explained, and their forms accounted for; but their abstract existence, why they are at all, why anything and the whole world exists, remains, and will remain, what it always has been—a fact. If this absoluteness of facts is to be called transcendency, we must confess that transcendency and immanence are two aspects of one and the same thing, for there is nothing so immanent in the world as its reality or the fact of its existence.

CAUSES AND NATURAL LAWS.*

MR. SALTER while trying to fit our formula of causation to all possible cases, presents an instance which appears perplexing. "When a stone goes up," he says, "the motion of an arm is a sufficient† cause; but how when the stone comes down? * * * It looks as if there were change without an antecedent motion. The only antecedent motion was that of the rising stone,—and this has exhausted itself."

The problem presented by Mr. Salter must be explained from the Conservation of Energy. The expression that a certain motion exhausts itself is ambiguous and will naturally lead to misconceptions. No motion exhausts itself. It disappears in one special form only to reappear in another form. There are two kinds of energy, potential and kinetic. Kinetic energy (work being performed) is energy of motion, visible or invisible (molecular) motion, heat, electricity, or magnetism. Potential energy is force acting in things at rest —energy of position. A stone of a certain mass lying on the ground, performs no work, but in its weight it represents a certain amount of potential energy. Another stone of the same mass that lies thirty feet above the ground on the roof of a house, repre-

* In reply to a criticism of Mr. W. M. Salter.

† The expression "*sufficient* cause" has been purposely avoided in our discussion on causality. Every cause is a sufficient cause. The mere idea of insufficient causes is productive of confusion. However, reasons may be more or less sufficient.

sents the same amount of potential energy plus the potential energy equivalent to the kinetic energy expended in lifting that stone thirty feet. If this stone is dropped from the roof its additional sum of potential energy is changed during the fall into kinetic energy. When the stone arrives on the ground it has lost the kinetic energy of its fall, and by this loss is created an exact equivalent of heat which, if employed to raise the stone, could lift it again thirty feet above the ground.

When a stone is thrown into the air, we transmit to it kinetic energy. When a stone arrives at the highest point of its rise, it may be considered as possessing in addition to its weight such potential energy as is equivalent to the kinetic energy which we have transmitted to it by the throw. If the stone is not somehow retained in the air, it will at once change this potential energy again into kinetic energy; it will fall down.

Conservation of energy means that the sum total of all kinetic and potential energy remains the same in the whole universe. Kinetic energy may be created from and may disappear into potential energy. There is no creation in the old sense nor any annihilation, but only change from one form of energy to another.

In the case presented by Mr. Salter, the cause of stone's rising to a certain height is the act of throwing; and again, the stone's rising is the cause of its arrival at a certain height. Its arrival there is the cause of its falling down. When arrested on the ground, the stone's downfall is the cause which produces heat. The heat is given off to the surrounding soil and atmosphere where the further effects become imperceptible to us; still, they do not cease to exist.

From the beginning of the throw to its subsequent descent the stone never ceases to be in motion, although the velocity of its ascent is constantly decreasing and when it becomes zero, the direction of its motion upwards is changed into a downward direction.

The whole phenomenon is a combination of two forces acting upon the stone: *first*, that of the throw, which is caused by the effort of my hand; and *second*, that of gravity, which is the downward pull towards the earth. (The downward pull is not *caused* by gravity; it *is* gravity. Gravity is a quality that always exists, being in and with things. Therefore we say, "it *is* the downward pull.")

Gravity is continually acting upon the stone; but, inducing in the stone a less momentum at the start than the momentum imparted by the throw, the stone rises. The momentum produced by the force of gravity in the direction of the earth is continually and rapidly increasing and will soon be greater than the momentum produced in the upward direction by the throw, which remains constant. When the stone reaches the highest point of its rise, the momentum induced by gravity has become equal to the momentum imparted by the throw; the stone *seems* to rest for an imperceptible moment before falling; but it is just as much in constant motion as if it were thrown in a curve; *there is no new cause interfering, nor is any new force called into activity.*

Causation is the progress of motion. The progress of motion takes place under certain circumstances (which are to be called conditions, if they are indispensable). The circumstances in this case are the mass of the stone, its distance from the centre of the earth, the mass of the whole earth, the acceleration

due to gravity, the resistance of the air, etc. An inquiry into these things and their qualities would afford us the *reason* of the stone's fall; and these reasons, of course, are not motions; they are formulated as natural laws. The circumstances, being certain qualities, are in this case, as in most others, productive of additional motion; potential energy after a change of position is changed into kinetic energy. But without a preceding change of place this would be impossible; there must be a motion (a change of place) of some kind, to *cause* a change.

An avalanche would lie for all eternity on the Alpine ridge if it were not started by some motion. But under certain conditions the flapping wing of a bird might suffice to hurl the whole mass down, thus creating kinetic energy of an enormous amount through an almost imperceptible cause. No phenomenon in nature is without a cause; the cause is always a change of place, a motion of some kind; but the explanation why potential energy is changed into kinetic energy, or why the stone is attracted towards the earth is not the cause but the *raison d'être*, the reason, of a stone's fall. Explanations of the effectiveness of causes under certain conditions are formulated by our scientists into what they call natural laws. Natural laws are abstract conceptions of a certain class of phenomena; they are thoughts which enable us to comprehend all causes of the same kind. Accordingly, gravitation is a law, but not a cause.

Some critical mind may object: "This abstract idea of gravitation which has been formulated by Newton, represents a natural law. Abstract ideas are not real entities, but natural laws are by no means non-

entities but realities which exist independent of our thought."

My answer is: gravitation like all abstract ideas certainly is a non-entity, but in so far only as it does not exist of itself. It is real in so far as it represents a quality which has been abstracted from real things. Abstract gravity as a thing in and of itself is a non-entity; but things exist that possess weight and their quality of possessing weight is called gravity. This quality is real; it exists in certain things independent of our conception.

Qualities are always present in things; they are co-existent with them and in them. Reasons, *raisons d'être*, or grounds, which from the qualities of things account for their actions or motions under certain circumstances are of a general nature; they apply to all cases of the same kind and serve to explain the effectiveness of causes. However, causes are always tran-transient phenomena in single and individual cases.

IS NATURE ALIVE?*

MR. SALTER asks: "Is Monism to conduct us back to Mythology? * * * If *causa sui* is a self-contradictory conception what can be said of 'self-motion' or 'spontaneity.' * * * Can a body move itself? If so what becomes of the definition of cause as motion? If so, there can be change or movement without any antecedent motion."

I.

THE UNIVERSALITY OF LIFE.

MONISM, it is hoped, will not lead us back to Mythology, but will free us from its trammels by explaining it. Mythology, like other errors, and beliefs in ghosts and supernatural entities, leads a hard life because there is some truth in it. The Indian looks upon nature as alive; the things that he sees and hears about him, the rustling leaves of the trees, the babbling brook, the passing cloud, and the silently towering rock, all are supposed to possess life like himself. Is he not a part of nature and should not the rest of nature be similar to him? What is the origin of life if nature is dead?

Science, no doubt, has put an end to anthropomorphic conceptions. We no longer think that thunder is the work of a thunderer, and that the wind is a restless spirit-hunter who chases the clouds. But the

* In reply to a criticism of Mr. W. M. Salter.

connection between man and nature has by no means been severed. It has rather become more intimate than it ever was conceived to be by our ancestors. The evolution theory has proved the kinship between man and animals, and later researches concerning the origin of life arrive at the result that life has no origin: it must be eternal. The barrier between living organisms and inorganic nature is broken down, and life is recognized as a fundamental property of matter.

The theory of the immanence of life in nature, as we may call it, is the result of purely empirical investigations. *Omne vivum ex ovo* was the essence of the biological investigations of the seventeenth century. But since the microscope has introduced us into the mysteries of protoplasm, our modern biologists have corrected the sentence into: *No living substance but from living substance.* There is no life but from life The hypothesis of *generatio æquivoca*, of a spontaneous generation of life, of heterogenesis, and of a vivification of so-called dead matter, as it had been supposed to take place in putrid substances, are now counted among the many superstitions of science which are done with forever.

Our view of life itself has been changed at the same time. Life had been considered as a substance. What life-substance and mind-substance might be like, were even not long ago objects of serious discussions. Even so modern a thinker as Mr. Spencer discusses the subject and arrives at the conclusion, so characteristic of his agnosticism, that it is a problem too profound for solution.*

The view of life as a substance yielded to the

* Mr. Spencer sums up his opinion in these words; "In brief, a thing cannot at the same instant be both subject and object of thought; and yet the substance of the mind must be this before it can be known."

belief in a life-principle (a kind of life energy), a view which is generally called vitalism. Vitalism, however, had also to be abandoned, and the life of organisms is now recognized as a phenomenon of nature which depends on the presence of neither a special life-substance nor a life-principle. The phenomenon of organized life appears, as all other phenomena, if its conditions are present; it disappears, if its conditions are absent, and so far as science now goes, life has never been discovered but as a continuation of, or a development from, prior life.

The new view of the immanence of life in nature makes it necessary to distinguish between life in a broader, and life in a narrower sense. Life in a narrower sense appears in the two organic kingdoms as vegetable life and animal life. The lowest kind of organized life exhibits irritability, or sensitiveness to irritations, growth, *i. e.*, alimentation and the assimilation of food, and propagation, which is a special kind of growth. In the animal kingdom, sensitiveness develops sensation and consciousness. Life in the narrower sense, or organized life, in all its wonderful forms, has been developed by imperceptible degrees from life in the broader sense. Life in the broader and broadest sense will be found to be more and more uniform. The highest branches of organized life, however, admit of an almost infinite variety of form.

From the standpoint of a unitary conception of the universe, there is no doubt that the forms of organized life which exist now on our planet, originated from the forms of inorganic life. There was a state of the earth when animal and plant life was impossible. The problem how organized life originated is not yet solved,

but there is no reason to consider the problem beyond the reach of science.

The characteristic feature of life in general is self-motion or spontaneity. The spontaneous action of a man originates in his mind and represents his will. Spontaneity or self-motion, however, being the most general feature of life, will be found not only in the organized forms, but also in that kind of life which we call life in a broader sense.

By self-motion, or spontaneity, we do *not* mean a motion to which there is no prior motion and which thus originates out of itself without a cause, or without another motion. Self-motion is used in contradistinction to a movement by push. Suppose, for instance, that the sun in its progress happens to cross the path of a comet, and, being the greater mass, attracts the lonely wanderer. If the attraction of the comet is due to the nature of the comet and of the sun, it is self-motion or spontaneous motion; but if both bodies are inert (inactive), it may be due merely to the push of ether. In either case, whether the motion is spontaneous, *i. e.*, due to an intrinsic quality, or whether it is transmitted by a pressure from without, it could never originate without a cause. A motion of some kind, a change of position, must have happened. This change of position, in this instance the progress of the sun, is according to our conception the cause of the comet's self-motion.

Spontaneity is a quality inherent in all matter and if spontaneously moving bodies have to be called alive we must acknowledge that nature throughout is alive. In this sense Heraclitus said, *πάντα πλήρη θεῶν*.*

*Literally: "All things are full of Gods" and the saying has always been taken in the sense that all things are *beseelt*, 'en-soul-d'; all things are alive.

The world-substance is not acted upon by pressure, but it acts spontaneously and of itself. Our scientists have attempted in vain to explain the origin of life from dead matter. The truth is that life in a broader sense, *i. e.*, the self-motion of matter, never originated. Life is as eternal as the world, and to search for a beginning of life is as wrong as to search for the origin of matter.

We must well distinguish this kind of life in a broader sense (which is an inherent quality of matter) from the vegetable and animal life of organisms. The former is elementary and eternal; the latter is complex and unstable, because produced by a combination of the former. The life of elementary atoms must be considered as uniform and most simple, that of organisms as manifold and highly complicated.

The word life, however, as commonly understood, is applied to organized life only. Organized life of plants and animals must be recognized as a special form of the universal life, *viz.*, of life in a broader sense. In addition to spontaneity organized life must possess special features which should find their explanation from their special forms. But if there is an essential difference between both it is certainly not that of spontaneity, or self-motion*; the essential difference is, the absence of organic growth and psychic life in the one, and its presence in the other.†

* Spontaneity is generally pointed out as the essential and characteristic feature of psychic life in treatises on Free Will, where, as a rule, we meet with the vague expression that man is a "first cause." Those who employ this phrase mean, I suppose, that certain qualities of a man are the ground or *raison d'être* why to certain motives he responds, according to his character, with certain actions, so that all his actions must find their ultimate explanation (their ultimate *raison d'être*) in his character. This is true but the same holds good of all matter. The quality of being an acid is the ground why a certain substance combines with a base.

† Prof. Bunge, of Basel, and with him Alfred Binet, of Paris, call these

II.

CAN THE WORLD BE MECHANICALLY EXPLAINED?

If causation is a law of motion every phenomenon of nature must have a mechanical aspect, and its process can in so far be reduced to mechanical laws. This being agreed upon, the question arises: "Can the world as a whole, and the life of the world, the actual existence of motion in the universe, be mechanically explained?"

Mechanics is the science of motion. Every motion can be expressed in terms of time and distance, *i. e.*, every motion is determined by its direction and velocity. Accordingly it can be computed with the assistance of mathematical and especially arithmetical rules. There is no motion, neither that of live organisms nor that of dead machines, which does not comply with mechanics: self-motion, as well as the transmitted motion of merely mechanical movements, is determined by the laws of mechanics. But this truism is not identical with an explanation of life from mechanical laws. Mechanics is not the *scientia ultima*, the ultimate *raison d'être* of natural phenomena. A mechanical explanation of the world would be possible, if the world consisted of purely mechanical phenomena. But purely mechanical phenomena do not even exist. Mechanical laws like pure mathematics have been abstracted from reality, ultimately resting upon the discrimination between form and matter, and represent one aspect only of real processes, *viz.*, the forms of motion. Purely mechanical

special features of organized life "vitalism." This usage of the word is fully justified if it is well distinguished from the old vitalism.

processes exist as little as mathematical points and lines.

The question so often proposed whether the existence of the world can be mechanically explained is therefore not justified. The question itself is wrong. A mechanical explanation is possible for every motion, for every single process that takes place. In all natural phenomena the transference of motion can be traced, the change from one form of motion into another can be shown. But a mechanical explanation is not applicable to solve the problem of the existence of motion. Existence, the existence of the world and the existence of motion, the sum total of the energy in the system of the universe, is a generalized statement of the fact of reality,—and the attempt to explain this fact mechanically as if existence at large were one special form or a single phenomenon, is based on a misconception. Science explains the different forms of existence, how one arises from the other, but not existence itself. Thus, also, mechanics explains the different forms of motion, how by transference one kind of motion originates from another kind; but motion itself can not be explained by mechanics.

Mr. Salter asks: "How can a body move itself?" The fact is, the body moves, whether it be some organized substance or an inorganic lump of matter; and our problem is: Does the body move because it possesses a certain quality which is intrinsic in the body, or does it move because it is pushed by a pressure from without? The problem is by no means definitely solved, so as to be verifiable by experiment; but there is no reason why in time it should not be solvable.

The most consistent solution from the standpoint

of materialism is perhaps the proposition of Le Sage and Mann.* Le Sage and Mann attempt to explain the chemical and physical motions of the atoms by the pressure of an all surrounding ether.

The ether-hypothesis of Le Sage is based on the consideration that matter is dead and the world a lifeless mechanism which must be set in motion by a pressure from the outside. It was invented in order to account for motion in inanimate masses. Le Sage thought to get rid of the idea of self-motion and of an animated universe. He attempted to explain the Universe mechanically and did not see that a mechanical explanation was impossible.

Our chief objection to Le Sage's mechanical explanation of life by a *vis a tergo* is, that it leaves the problem for the solution of which it was invented, untouched. If all the atoms of our body acted only because they are set in motion from the outside by the pressure of ether, feeling as well as consciousness would remain unexplained. In that case the ether would possess spontaneity, and not the atoms. If it were so, the ether around us and within us might feel and become conscious, but not the atoms that build up our body, and the problem of the origin of psychical life would be obscurer than ever. The origin of life would not be explained. On the contrary, by the assumption of dead and inert matter, life would become an impossibility.

Our opinion is, that the atoms possess spontaneity or the property of self-motion, which is akin to what in the higher forms of natural phenomena in the organic kingdom is called life. Self-motion is, therefore,

* In his pamphlet, *Der Atomaufbau in den chemischen Verbindungen.* Berlin: 1884. Heinicke.

life in a broader sense, and the phenomena which are exhibited in protoplasm must ultimately find their explanation from the form of protoplasm as a special and complicated instance of the simpler self-motions of inorganic substances.

The indisputable truth, that the universe with its life and motion cannot be mechanically explained, has induced some philosophers to speak of "hypermechanical" processes in nature as if motions existed that could not be computed by mechanics. The word "hypermechanical" conveys the idea that it has to do with mechanics of a higher degree, where the usual laws of motion are annihilated and some incomprehensible mysticism takes their place to account for certain peculiar phenomena of motion.

* * *

THE problem under discussion will find further elucidation by a comparison of mechanics with other formal sciences—especially logic. Logic is also an abstract science. It treats of formal thought abstractly. Thought has to comply, and does comply, with the laws of logic. Of course thought does not always comply with the rules of logic; it drops often into illogical fallacies. But that is no exception to the rule that logic expresses the laws of formal thought abstractly; for every error in real thought, every wrong conception in our mind, even every material disorder in our brains, will lead to wrong conclusions which appear to sound thinkers as illogical. This exception is no other than that of a machine which is out of order so that its mechanical result, in full accordance with the laws of mechanics, is not what it ought to be.

Great philosophers have tried to understand the

universe logically. They were confident of constructing a universe out of pure thought and deducing existence (or being) from reason. This kind of philosophy, obviously erroneous and yet so natural in its time, is called ontology (from ὤν, οὖσα, ὄν, ὄντος, being), because real being or reality was derived from abstract being. The most famous, and perhaps most consistent and grandest, system of ontology is that of Hegel, who belongs to the generation following the era of Kant. Yet so little was Kant understood at the time, that Hegel grew prominent and more renowned than Kant ever had been during his life. But the spirit of Kantian criticism grew also; it grew like an oak, slowly but strongly, and one sentence in his "Critique of Pure Reason" so shook the system of Hegelian ontology that it tumbled together like a house of cards. This sentence of Kant's declares that "all knowledge *a priori* is empty and cannot give information about things."

Knowledge *a priori* Kant calls in other places 'formal' or 'transcendental' knowledge, and 'transcendental' in Kant's terminology does not denote anything transcendent or mysterious. Transcendental logic, or pure logic, treats of the form of thought only, and abstracts form from the contents of thought altogether. Therefore, pure reason, useful as it is for its purpose if employed for criticism and as a regulator of correct thinking, is useless for the purpose of ontology.

In opposition to the futile method of the ontologist, those thinkers that instinctively felt that logic could not answer the ultimate question about the existence of the world—such men as understood the depth of the problem, yet were unable to solve it—denounced reason as altogether insufficient and even erroneous.

They spoke of a superior and divine reason in opposition to our weak human reason; as if reasons of different kind could exist.

The idea of 'hyper-mechanical motions' is shaped after the pattern of such 'supernatural reason,' which is conceived to stand in opposition to human reason. Hyper-mechanical is just as self-contradictory as hyper-logical, hyper-arithmetical, or hyper-mathematical, and all attempts to construe Rieman's ingenious idea of a curved space into a hyper-mathematical space-conception are vagaries.

If we meet with processes of motion which are so complicated that we cannot with our present knowledge discover in them the general law of motion, we need not despair of explaining them, by and by, from mechanical principles; even if they seem to contradict our basic concepts of mechanics, we must at last be able to find out that they are fundamentally the same phenomena and subject to the same laws.

Suppose that a man unfamiliar with the spirit of mathematics chanced to become acquainted with logarithms. Would he not be inclined to say that the rules of logarithms flatly contradict those of common arithmetic? Addition and substraction in the one system are represented by multiplication and division in the other; and again multiplication and division in the one represent raising the powers and extracting roots in the other. Logarithms will appear to him a kind of hyper-mathematics in which the theorems of common mathematics no longer hold good but are annihilated and substituted by other laws. Being in possession of the clew to the origin of logarithms from numbers, we know that this view is not justifiable. Logarithms are only one special and complex form of

arithmetic in which the common laws and basic concepts of arithmetic are not annihilated but modified and specialized.

The unitary conception of the world keeps equally aloof from ontology, which is an overvaluation of reason, and from mysticism, which is an undervaluation of reason.

Comprehension has always to deal with forms. Exclude from a conception form or the formal aspect of things, and you exclude comprehensibility itself.

The order and form of the universe can be comprehended and investigated; but the universe, in its existence as a living whole, is not a special form of existence. There is, accordingly, nothing to be comprehended in existence in general. It is a matter of experience simply, to be stated as a fact.

By the form, for instance, of planets, we understand their shape as glóbes (or rather as spheroids); by the form of their motions we understand their paths, which are conic sections. We cannot comprehend why planets materially exist, and why force exists inseparably connected with matter. The material existence of planets, that their mass endowed with motion exists at all, is a fact; but their existence as planets, why they exist as spheroids, and why they travel in paths of conic sections can very well be comprehended.

Intelligibility involves regularity of form, or order. Chaos is unintelligible, but order can be comprehended. The form of the universe being regulated by the laws of form is the condition of its cosmical order and of its intelligibility.

If the existence of matter and force in general cannot be mechanically explained, because this problem is not included in the province of mechanics, we

are sure that every motion, every change of form can, at least theoretically, be explained from mechanics, the science of motion.

Mechanical laws explain mechanical phenomena, and mechanics is applicable to processes of motion only. Since existence at large, the existence of the world, is not a mechanical phenomenon, the question whether it can be mechanically explained, is not admissible.

111.

THE ELEMENTS EXPLAINABLE BY FORM.

THE materialistic, kinetic, and atomic conceptions of the world, as a rule, look upon matter as dead, and under the influence of this view the force of gravity has received the name of inertia. But matter is not dead or inert; its most generic quality is that of spontaneous motion and all the specific qualities of matter will eventually find their explanations from their special forms.

We may fairly suppose that matter in its most elementary shape is homogeneous. The world-substance, very probably, is continuous, and may in its very simplest form be identical with what our physicists call ether. The tenuity of ether is such that we cannot with our most delicate instruments verify its presence, and can only infer its existence from such physical phenomena as light and electricity. Whether it consists of discrete units we do not know; it is possible that it does. But if it indeed consists of minute units, single and uniform (I should call them with Leibnitz *monads*), it is certain that the world-sub-

stance possesses at the same time a continuity which places *all* these monads in relation to each other.

By continuity of the world-substance we mean that quality which binds all the ultimate units together so that the innumerable monads are not single independent individuals, but integral parts of the whole world—parts which by their positions mutually influence one another according to laws which can be ascertained and mathematically accounted for.

Two or more ether-monads combine into what is known as atoms, two or several atoms into molecules. The ether-monads are uniform, the atoms of the same combination of monads are uniform, and also the molecules of the same combination of atoms are uniform.

The combination of ether-monads into elementary atoms, I take to be comparable to the process of crystallization of minerals. Certain it is that it must take place according to mathematical laws. The atom must have a regular, perhaps a crystal-like shape; it must form a geometrical figure consisting of two or more monads.

This explanation of the problem seems to me the only possible solution which agrees with Mendeljeff's law of the periodicity of atomic weights. If the atoms possessed an individuality of their own, ultimately due to material qualities, if their properties were not due to their form but to their substance, it would be very strange if not miraculous that one atom of oxygen is so exactly like unto every other atom of oxygen. What can be the cause of this, so far as we can judge, absoute identity of all atoms of the same element? Can it really be an ultimate and substantial quality which inheres in it from all eternity? If it were, we should be disposed to believe *a priori* (if we did not know anything to the contrary) that no two atoms would be

exactly like each other, and that innumerable elements would be found in nature. Facts disprove this.

The absolute identity of two atoms of the same element can be reasonably explained only if we consider their identity as a sameness of *form*. Let us suppose that several (perhaps two) uniform monads of the homogeneous ether, by a certain pressure, at a certain degree of heat, and under other certain conditions yet unknown, crystallize, as it were, into a certain geometrical figure which chemists now call an atom of Hydrogen. Under other conditions thirty-two monads ($2 \times 16 = 32$) will combine into another geometrical figure, which would be an atom of Oxygen. The substance in the two monads of the Hydrogen atom and the thirty-two monads of the Oxygen atom is supposed to be the same ether; but the combinations are different. If we knew what the geometrical shapes of the atoms were, we would be able to state why in the one case two and in the other thirty-two monads are required to make up one atom.

If a difference of the various elements is a difference of form only, we can account for their uniformity in all regions of the universe as easily as we account for the spheroidal shapes of the heavenly bodies and for their paths in conic sections. Moreover, if such is the case, we understand why the number of the elements is so limited, and why the atomic weights of the elements are so regular and invariable. Perhaps if we had a sufficiently powerful lense we could arithmetically compute and geometrically demonstrate why the atomic weight of sodium, for example, is exactly 23, why at the same time an element of one or a few unit-weights more or less cannot exist, and why the periodicity of the atomic weights cannot be otherwise.

Perhaps such a *demonstratio ad oculos* of the fundamental chemical law would be as simple as to show that the tetrahedron has four, the octahedron eight, the tetrahexahedron twenty-four equal faces of equilateral triangles, that the cube's faces are squares and those of the dodecahedron, pentagons. We, then, should see why the atomic weights of the elements form progressive series, as 7.02, 23, 39.14, 63, 85.2; why the elements can be classified in families as it were, and why in the same family atoms of intermediate weights are as impossible as, *e. g.*, a heptahedron with congruent faces is a geometrical impossibility.*

While the combinations of the monads into atoms are limited to the comparatively small number of about seventy elements, it is natural that the possibilities of molecular combinations increase immeasurably; and the possible combinations of molecules into specific substances must be infinite.

IV.

MACHINES AND ORGANISMS.

WHILE we are compelled to recognize in the atomic combinations of molecules the features of living spontaneous action, we would not consider a conglomeration or a chemical mixture, as an interaction of live relations. A piece of marl, or sandstone, or granite, is an unorganized *mixtum compositum* of parts that possess a mere fortuitous coherence without a living interaction among themselves. A piece of stone as such is not a living thing. It is a dead aggregate, whatever life its parts may possess.

* For further explanation of the Periodic Law compare *Wurz*, "The Atomic Theory," Eng. Transl., pp. 158, 159, 163 and 170; and *Dr. Lothar Meyer, Die Modernen Theorien der Chemie*, pp. 139–141.

Similarly a machine, although its parts are systematized for a special purpose, cannot be said to be alive. It does not possess the life of an organism. Its particles, the wood and the iron, will, under certain conditions, exhibit the same self-motion of which all matter is possessed. The molecules of wood, for instance, will embrace the oxygen of a flame as fervidly as a lover rushes into the arms of his mistress. But the machine as a whole does not possess the life of an organism. Its motion is no spontaneity of an organic interaction of its parts, but a mere transference of movement by push and pressure. Living bodies have been compared to machines because the motions of life-structures take place according to the same mechanical laws as the motions of machines. And, indeed, living bodies are mechanisms just as much as machines. But there is a difference. The difference is that they are living machines. In a machine the motion is transmitted by expansive pressure from the fire-place and boiler to other parts of the machine. In an organism the smallest particle has a fire-place and boiler of its own from which it derives motor power. Its parts possess a spontaneous and mutual interaction, producing a systematic communication among them, which grows out of their own intrinsic qualities into a natural unity; whereas the unity of a machine is that of an artificial composition.

V.

ORGANIZED AND PSYCHICAL LIFE.

It is contended that while the problem of the Descent of Man may have been solved, the problem of Life remains unsolved, because the origin of protoplasm is not yet demonstrated.

This is true; but it must be remarked that the problem to be solved is rather the "origin of the form of protoplasm" than the "origin of life." The spontaneity of living substance is found in the kingdom of inorganic nature also. A base and an acid rush toward each other and combine in the form of a salt. As soon as we know what the molecular forms of bases and acids are like, we can hope to be able to comprehend why they combine into substances of a new form, which have the properties of salts. If the science of molecular chemistry (which does not yet exist) should succeed in a discovery of this kind, the problem of the formation of salt crystals would be solved and the affinity of bases and acids would have found its explanation. But the problem why the atoms of a certain shape fit to atoms of another shape, is different from the other problem: Why do the atoms rush towards each other at all?

Although the origin of organized life has not yet been sufficiently explained, the characteristic feature of organized life is to some extent determined. In the vegetative kingdom it has been called constructive metabolism in so far as plants through the process of osmose convert the relatively simple compounds of inorganic substances into protoplasm, in the complex

structure of which energy is stored. The characteristic feature of animal life is not only the procreation of protoplasma freighted with energy, but chiefly the expenditure of this energy. The process of life in the cells of animal organisms therefore exhibits two essential phases—the one is constructive of energy (anabolism), the other by a process of decomposition sets energy free (katabolism) and is thus productive of the special features of animal life, particularly heat, free motion, and sensation.

Animal life is a continuous process, a constant building up and breaking down. "There are two series of events, two staircases, as it were, of chemical transformation,—one an ascending staircase of synthetic, anabolic processes through which the pabulum, consisting of several substances, some of them already complex and unstable, is built up into the still more complex and still more unstable protoplasm; the other a descending staircase, consisting of a series of katabolic processes giving rise to substances of decreasing complexity and increasing stability."*

The origin of psychic life has always been the greatest stumbling-block to scientists and philosophers. It appeared so totally different from other natural phenomena that it was considered as something that must have been introduced from other, unknown and more spiritual, spheres. The existence of psychic life is indeed the corner-stone of dualism. Dualism will prevail so long as feeling, sensation, and consciousness are considered as something foreign to our world—something that has not grown from, and does not stand in connection with, the elements of reality. But if we

* Encyclopædia Britannica, vol. xix, p. 19, Physiology, where Prof. E. Hering's theory is explained.

bear in mind that physical and chemical processes can not be explained as inert movements produced through some machine-like, mechanical transference by pressure or outward push upon dead particles of matter—if physical and chemical processes are recognized (as they actually are) to be live spontaneous self-motions—we can see no theoretical difficulty (however great the practical difficulties may be) to the assumption that biological processes originate from the same elements and are a special and more complex form merely of natural phenomena in general.

When we observe some very simple process in nature, e. g. the fall of a stone, we represent it as a motion and must assume it to be a self-motion. We formulate the operation of the stone's fall into a law, describing its mode of action as it holds good in all cases of the same kind. But the motion observable and representable in our mind is not all that takes place. There must be some additional feature which in a further development will appear as man's consciousness.*

The question arises, If the life of organisms is a special form of life in a broader sense, why did our scientists fail to produce organisms artificially, or at least the organized life of protoplasm?

The answer is obvious if we bear in mind that all organized life is the result of memory. Our most powerful microscopes, even if they were a thousand times improved, would be still insufficient to discover even the grossest vestiges that constitute, in protoplasm, the physiological aspect of memory. To read a sonata from the tinfoil of a phonograph must be easy in comparison with a discovery of the traces of memory

* The problem of the procreation of psychic life is discussed in the first two chapters of my "Soul of Man." See also page 185 of this book.

produced in organized substance. And if our scientists were able to produce living substance in which at least the process of metabolism took place and which preserved the traces of memory, the discovery would be grand, but we should be in possession of the mere potentiality of organized life. In order to produce an organism as low in the scale of life as a moner, we should have to expose it to all the irritations and experiences through which the moner has naturally passed; and we are not sure as to how many thousand years are required for this process, and whether, if it were artificially abbreviated, the same result could be attained.

All organized life and especially all psychical life has evolved through form combinations from the general life of the universe. The development from the most primitive life of self-moving matter, which obtained in the igneous state of our planet, to the expression of intellectual human activity, forms one great and uninterrupted continuity. The ground and basis of this continuity is the conscious and still more so the unconscious memory of organized matter in all its many differentiated forms. Science has solved many problems of psychology, physiology, and biology, but the solutions have always been such as account for certain forms of life. The evolution-theory, so far as it goes, explains how the human form and other animal forms have developed from the simplest forms of protoplasm. Every living particle of man's body is protoplasm of a certain form; and science, when showing how the human form must have developed, has solved the problem of the Descent of Man.

It is a very strange fact that protoplasm, being a very complex compound, exhibits in its first stage a

singular sameness wherever it is found. This indicates that here also the solution of the problem must be looked for in the structure (*i. e.* the form) of protoplasm. The shaping of forms follows mathematical modes; and unalterable regularity is always dependent upon the laws of form. And the development of feeling from the not-feeling elements of feeling with which all natural processes are alive, can depend only upon the action of special form-combinations. Functions of a certain kind are accompanied with psychical phenomena.

CONCLUSION.

THE existence of life being a fact, and all supernatural or dualistic theories being inadmissible, we see no simpler solution of the problem than that of considering life in its broadest sense as an immanent property of matter. As such, it remains what it ever has been—a fact ascertainable by experience. All explanations of the higher life of plants and animals will have to be confined to demonstrating how the higher forms of life originate from uniform life by showing the continuity of all life and the development from its simplest forms of spontaneous motion to its highest form, which in the human will, rises to heroic heights.

Monism, by accepting the idea that nature is alive, does not return to the old mythological standpoint. The characteristic feature of mythology is the fact that things are considered as animated *like ourselves*. The savage has sufficient power of generalization, as Mr. Spencer would express it, to see the similarity between ourselves and things. But he lacks the power of discrimination, which is indispensable to scientific investigation. He cannot appreciate the difference be-

tween the babbling brook and a prattling girl: in the murmur of the water he hears the voice of a nymph. Monism, by explaining the truth that lies at the bottom of mythology, will afford the only means of liberating our minds from its errors; for mythological errors, it is true, are lurking everywhere in our conceptions and in our words. It would be impossible to clear language of mythological comparisons and similes without sweeping it entirely out of existence. If we tried to use language that is free from mythology, we would be obliged to invent a new Volapük—a language that has no historical development, that is not infected with the errors of the past, yet will be understood nowhere.

Is it necessary to create such a language, a philosophical Volapük? Probably not. It is sufficient to show the traces of mythology and to explain their origin. We still speak of sunrise and yet we know it is the earth by its rotation that causes the appearance of the sun on special parts of its surface. We know it, and every child now knows it, without taking offense at the inadequacy of the expression.

We make bold to say that there is no word in any language which is not from some point of view an inadequate, or a mythological, or a dualistic expression. If we employ the term life in its broadest sense as spontaneity or self-motion, we are conscious of using a mythological expression. The same is true of such words as affinity in Chemistry, attraction and repulsion in Physics, of the sexes in Botany and of innumerable other cases.

Anthropomorphism is not only allowable and justifiable, it is even indispensable to a proper comprehension of phenomena external to us. Man is a part of nature and man's whole existence must be under-

stood as a special form and combination of certain natural phenomena. A direct knowledge of nature is given to us in our consciousness only; and this consciousness must be used in order to interpret the other phenomena of nature. Accordingly, the natural development of human comprehension will lead us through anthropomorphism, of which science will free us step by step, from which, however, we never shall nor can be severed entirely; for there is a truth in anthropomorphism which is fully explained by the doctrine of monism that Nature is one great and living whole of which man is a part—such a part as contains in its form the quintessence of nature's life.

Psychical phenomena, such as take place in our consciousness, so far as we are now familiar with them, must be limited to organized life. But since the atoms, in spontaneous self-motion, exercise the faculty of choice, it seems that a time will come, although it is not near at hand, when we shall find ourselves obliged to use the term 'psychical' in a broader sense and speak of a psychology of atoms and molecules.

CAUSE, REASON, AND END.

EVERY phenomenon has a cause (*αἰτία*), which is a motion that starts the whole process; every phenomenon takes place according to a certain law (*νόμος*), which explains its *raison d'être*, the reason why the process takes place. Every phenomenon takes a certain course, and its motion results in a new state of things. This result is called the aim or end (*τέλος*) of the phenomenon. If the motion is a conscious will, the aim or end pursued is called the purpose. Accordingly there are three aspects under which phenomena may be considered; the inquiry into their causes is the *ætiological*, into their laws the *nomological*, into their ends the *teleological* method. None of them is sufficient by itself; thorough investigations have to employ all three.

Teleology is a most fruitful method. Observing the direction whither an arrow flies, we are helped to determine the direction whence it came. Teleology, however, must not be identified (as it mostly is) with the idea that the aims or ends of physical processes have been determined beforehand by an omniscient demiurge.

The teleological method, in so far as it is employed for teaching the ought of aspirations to rational beings, is called *ethological* (from *ἔθος* character, morality). As such it investigates the course of phenomena and the state of things to which they lead; and in order to produce higher forms of life and further the progress of humanity it lays down certain rules or maxims which appear to us as religious commandments or ethical norms.

THE IDEA OF ABSOLUTE EXISTENCE.

I.

THE VEIL OF MAYA.

THE Hindoo Sages compared the world, as it appears to our senses, to a veil—the veil of Maya—which lies upon our eyes and thus shrouds the true aspect of things. And the same view, with comparatively slight modifications, is repeated in the philosophy of Plato. In a poetical passage in the "Republic," the Grecian philosopher compares human knowledge to the condition of men who sit in a cavern facing the wall opposite the entrance; being bound to the spot since birth by chains about their feet and neck. They cannot look around, they cannot see the persons and things passing by behind them, but they see their shadows on the wall opposite and imagine that these appearances are the real things.

The view that natural processes are not actual realities, but mere shadows of invisible existences behind them, has been revived often since, and must be considered even to-day as the philosophy of our time; and only gradually a new conception of the world is rising that looks upon natural processes, the phenomena so-called, as the positive facts of knowledge. The expression 'phenomenon' means 'appearance;' the word has been introduced and is now generally

employed as a synonym of 'natural process' because the Hindoo conception of the sham-existence of reality was, some time ago, all but universal.

Immanuel Kant, in his Critique of Pure Reason, often speaks of "the thing of itself," and he says that we cannot have any positive knowledge of it. This was very discouraging, but it afforded those who paraded a Faust-like thirst for knowledge yet did not have the strength to devote a life of patient labor to earnest thought and research, an easy means of satisfying their yearning. Our knowledge is but relative, they said to themselves, and it is impossible to conceive the Absolute; the Absolute is the Unconditioned, and to our limited cognition it must be unknowable. If we could comprehend it, we would be omniscient like God, but as matters are, we are limited to the phenomenal world and must confess with Faust:

> "That which one does not know, one needs to use;
> And what one knows, one uses never."

If the absolute is incomprehensible, all our knowledge is vain, and worst of all, we can never hope to know anything about God and about our soul. Is not our soul our absolute self, the thing of itself which manifests itself in our existence? And is not God, the absolute of the universe, manifested in all the innumerable phenomena of nature? God and soul viewed from this standpoint, are unknowabilities.

Kant goes beyond this standpoint. The concepts 'Soul' and 'God,' as absolute existences or things of themselves, are paralogisms of pure reason. We have arrived at these ideas by a fallacy. We experience in our consciousness a consecutive series of sensations or thoughts, but from this fact we cannot infer the existence of a 'consciousness without its contents' as a thing

of itself. The world is an orderly arranged whole, but from this fact we cannot infer that a transcendent God is the author of this order. Kant adds in his Critique of Practical Reason, that although the ideas of God and soul are paralogisms, we should regulate our lives as if they existed; we should act as if we had a soul and as if a God existed—a just judge to reward the good and punish the evil.

These ideas of Kant have become popular and the unknowability of the thing of itself contributed greatly to the growth of agnostic thought in England.

II.

AGNOSTICISM AND PHENOMENALISM.

THE name 'agnostic' was invented by Professor Huxley for the avowed purpose of appeasing obtrusive persons, who bored him with questions as to his belief or disbelief in the existence of God, and the immortality of the soul. Prof. Huxley states the facts as follows:

"Some twenty years ago, or thereabouts,* I invented the word 'Agnostic' to denote people who, like myself, confess themselves to be hopelessly ignorant concerning a variety of matters, about which metaphysicians and theologians, both orthodox and heterodox, dogmatize with the utmost confidence; and it has been a source of some amusement to me to watch the gradual acceptance of the term and its correlate, Agnosticism. * * * Thus it will be seen that I have a sort of patent right in 'Agnostic.' It is my trade-mark and I am entitled to say that I can state authentically what was originally meant by Agnosticism. Agnosticism is the essence of science, whether ancient or modern. It simply means that a man shall not say he knows or believes that which he has

* These lines were written by Prof. Huxley in 1884.

no scientific grounds for professing to know or believe. * * * I have no doubt that scientific criticism will prove destructive to the forms of supernaturalism which enter into the constitution of existing religions. On trial of any so-called miracle, the verdict of science is 'not proven.' But Agnosticism will not forget that existence, motion, and law-abiding operation in nature are more stupendous miracles than any recounted by the mythologies and that there may be things, not only in the heavens and earth, but beyond the intelligible universe, which 'are not dreamt of in our philosophy.' The theological 'gnosis' would have us believe that the world is a conjurer's house; the anti-theological 'gnosis' talks as if it were a 'dirt-pie' made by two blind children, Law and Force. Agnosticism simply says that *we know nothing of what may be beyond phenomena.*"*

In another passage the great English biologist states his views concerning the immortality of the soul:

"If anybody says that consciousness cannot exist except in relation of cause and effect with certain organic molecules I must ask how he knows that; and, if he says it can, I must put the same question. And I am afraid that, like jesting Pilate, I shall not think it worth while (having but little time before me) to wait for an answer." †

If, with the Hindoo, we regard natural phenomena as a veil, we may compare the scientist to a man who dares to lift that veil, and reveals to us part of the hidden truth. But even so, many Agnostics say, our knowledge must remain incomplete. While we inquire into the manifestations of forces, while we observe how they operate, we shall never be able to know what Matter is and what Force is. Their relations in the phenomenal world may be knowable, but their absolute existence is unknowable.

In answer to this view we must state that there is no absolute force, no force of itself. The so-called 'phenomena' of forces are the realities, and the differ-

* The *italics* are ours.

† Prof. Huxley in the *Fortnightly Review*, Dec. 1886.

ent forces, such as heat, electricity, etc., are abstract conceptions in which we embrace all the natural processes of one kind. Not 'force' and 'matter' are things to be comprehended; they in their turn have been invented to comprehend phenomena. They do not go beyond phenomena but simply classify and arrange them, in order to comprehend them all together, if possible, in one unitary and consistent system.

Prof. Huxley, while confessing himself to be an Idealist, in an address on Descartes's 'Discourse,' introduces at the same time the mysticism which naturally follows from the principle of Agnosticism that "we know nothing of what may be beyond phenomena." Prof. Huxley says:

"If I say that *impenetrability* is a property of matter, all that I can really mean is that the consciousness I call *extension* and the consciousness I call *resistance*, constantly accompany one another. Why and how they are thus related is a mystery; and if I say that thought is a property of matter, all that I can mean is that, actually or possibly, the consciousness of extension and that of resistance accompany all other sorts of consciousness. But as in the former case, why they are thus associated, is *an insoluble mystery*."*

The concepts 'Impenetrability,' 'Extension,' and 'Resistance,' as they appear in our consciousness, are abstracts which denote certain qualities to be met with in our experience. If the spheres of two abstracts cover, either entirely or in part, the same ground, then as a matter of course the two ideas will always (either entirely or in part) appear to be associated. We form the abstract idea of matter by noting the qualities of all the different kinds of matter, dropping their individual features and retaining those only which they possess in common. Two qualities of matter (the two features which all matters have in common) are generalized

* *Italics* are ours.

under the names of mass and volume. Mass and volume, both being abstracts of the same object, *viz.*, of matter, it is but natural that they will always be associated, the one with the other. According to Prof. Huxley's method we should say: Why the consciousness I call 'mass' and the consciousness I call 'volume' constantly accompany one another is an insoluble mystery.

If we take the agnostic standpoint, the whole world becomes enigmatic and even such a fact as that the consciousness we call 'liquid' constantly accompanies the consciousness we call 'fluid' would appear as a profound mystery.

Professor Bain shows in his "Practical Essays," p. 56, that the word 'mysterious' has sense only if used in opposition to what is plain and intelligible :

"When we are told * * * that *everything is mysterious;* that the simplest phenomenon in nature—the fall of a stone, the swing of a pendulum, the continuance of a ball shot in the air—are wonderful, marvelous, miraculous, our understanding is confounded; there being then nothing plain at all, there is nothing mysterious. * * * If all phenomena are mysterious, nothing is mysterious; if we are to stand aghast in amazement because three times four is twelve, what phenomenon can we take as the type of the plain and the intelligible?"

Prof. Huxley in answer to two onslaughts on his position (one by Dr. Wace from the standpoint of orthodox theology, the other by Mr. Harrison, the defender of the Comtean Positive Philosophy), most ably and, indeed, successfully defends his agnosticism.* It is almost superfluous to state that we concur

* *Nineteenth Century* February, 1889. Prof. Huxley informs us in this article that Sir William Hamilton's essay "On the Philosophy of the Unconditioned" which he read when a boy had stamped upon his mind the strong conviction that the limitation of our faculties in a great number of cases renders real answers to certain questions not merely actually impossible but theoretically inconceivable.

with him wherever he objects to the antiquated belief of demonology. When he characterizes agnosticism as the principle 'Try all things and hold fast by that which is good' and when he identifies it with "the axiom that every man should be able to give a reason for the faith that is in him," we heartily and fully agree with his agnosticism; our objection holds *only* in so far as Professor Huxley says "that we know nothing of what may be beyond phenomena."

III.

GŒTHE'S MONISM.

AGNOSTICISM, in so far as it declares that we know nothing of what lies beyond phenomena, divides the world into two parts: One of them consists of knowable phenomena, and the other is the realm of the absolute, of the unknowable. The former are things as they appear, and the latter, things of themselves. The phenomenal is merely the outside appearance of some mysterious inside kernel. The famous naturalist Haller expressed this opinion in the following lines:

> "Nature's 'within' from mortal mind
> Must ever lie concealed.
> Thrice blessed e'en he to whom she has
> Her outer shell revealed."

Goethe who could not be reconciled to this view which splits nature in twain and places us outside of nature as if we were locked out from her secrets forever, replied to Haller's verses with the following poem:

'Nature's 'within' from mortal mind"
Philistine, sayest thou,
"Must ever lie concealed?"
To me, my friend, and to my kind
Repeat this not. We trow
Where'er we are that we
Within must always be.

"Thrice blessed e'en he to whom she has
Her outer shell revealed?"
This saying sixty years I heard
Repeated o'er and o'er,
And in my soul I cursed the word,
Yet secretly I swore.
Some thousand thousand times or more
Unto myself I witness bore:
"Gladly gives Nature all her store,
She knows not kernel, knows not shell,
For she is all in one.
But thou,
Examine thou thine own self well
Whether thou art kernel or art shell."

IV.

PHENOMENA AND NOUMENA.

KANT'S philosophy and especially his doctrine of the unknowability of 'things of themselves' have given, it is true, a great ascendency to agnosticism and at the same time to the mysticism of antiquated orthodoxy. Nevertheless the spirit of Kantian thought is far from both, and it leads neither to the one nor to the other of these deadly antagonists, but to a unitary conception of the world on the ground of positive facts—a conception which may be called Positivism,* or Monism.

*The introduction of the word "Positivism" into philosophy is the merit of M. Auguste Comte. Although we cannot accept M. Comte's conception of Positivism, we gratefully adopt the name, which, as a synonym of Monism, is a strong and expressive term.

Kant's philosophy, we must bear in mind, is not a system but a method. He tried to avoid the faults of Wolf's Dogmatism on the one side, and of Hume's Skepticism on the other. Thus, he proposed what he called Criticism. He did not offer a plain and outspoken solution of the problems, but he did the work to enable others to solve them: he formulated the problems.

Kant discusses (in Chap. III of the Transcendental Doctrine of the Faculty of Judgment) the "discrimination of all objects as phenomena and noumena." Phenomena are the natural processes which affect our senses (*Sinneswesen*). They are the data of our experience and provide the building materials out of which we create our conceptions of things. Noumena, in contradistinction to phenomena, are pure ideas (*Verstandeswesen*). Kant used the word "noumenon" in its original sense. It is the present passive participle of *νοεῖν* 'to think' and means 'something thought' or 'a creation of our mind.'

The word noumenon is not only wrongly used by many philosophers of to-day, but our dictionaries also present a wrong definition. Webster says:

"*Nou'-me-non* [Gr. *νούμενον*, the thing perceived, p. pr. pass. of *νοεῖν*, to perceive, *νοῦς*, the mind,] (*Metaph.*) The of itself unknown and unknowable rational object, or *thing in itself*, which is distinguished from the *phenomenon* in which it occurs to apprehension, and by which it is interpreted and understood:—so used in the philosophy of Kant and his followers."

"*νούμενον*," here, is a misprint for *νοούμενον*. Accordingly the pronunciation *no-oo'-menon* is preferable to Webster's pronunciation *noo'-me-non*. The latter is commonly used, but the former is the only correct pronunciation.

Webster's translation of the original Greek word as "the thing perceived" is wrong. The noumenon is the thing *thought*, while the phenomenon must be called the thing *perceived*. The Greek verb νοεῖν does not mean "to perceive," as Webster states, but to think.

Such concepts as God, World, and Soul are pure ideas according to Kant, therefore he calls them noumena. Things of themselves (whether they exist or not) are not objects of sensation, they are creations of our mind; therefore they are noumena. Accordingly, not the noumenon is a thing in itself, as Webster states, but just the opposite is true: The thing of itself is a noumenon. In other words, Kant does not say: Pure ideas (such as God and Soul) are things of themselves; but on the contrary he says: All things of themselves, the concepts God and Soul included, are pure ideas; they are not objects of sense perception.*

Concerning noumena or pure thoughts Kant emphatically declares that they have no significance unless they have reference to the phenomenal, *i. e.*, to the real sensations of our experience.

Kant says: †

"Everything which the understanding draws from itself, without borrowing from experience, it nevertheless possesses only for the behoof and use of experience. * * *

"That the understanding, therefore, cannot make of its *a priori* principles, or even of its conceptions, other than an empirical use, is a proposition which leads to the most important results.

"A transcendental use is made of a conception in a fundamental

*We discuss Webster's mistake thus fully because the errors that are perpetuated in dictionaries are highly misleading and injurious. One wrong idea of fundamental importance imbibed in younger years produces a great confusion, of which weaker minds will never perhaps be able to free themselves.

†Translation by Meiklejohn.—"Intuition" is the German "*Anschauung*." It might have been more appropriately translated by "perception."

proposition or principle, when it is referred to things *in general* and considered as things *in themselves;* an empirical use, when it is referred merely to *phenomena*, that is, to objects of a possible *experience*. That the latter use of a conception is the only admissible one, is evident from the reasons following.

"For every conception are requisite, firstly, the logical form of a conception (of thought) in general; and, secondly, the possibility of presenting to this an object to which it may apply. Failing this latter, it has no sense, and is utterly void of content, although it may contain the logical function for constructing a conception from certain data

"Now an object cannot be given to a conception otherwise than by intuition, and, even if a pure intuition antecedent to the object is *a priori* possible, this pure intuition can itself obtain objective validity only from empirical intuition, of which it is itself but a form. All conceptions, therefore, and with them all principles, however high the degree of their *a priori* possibility, relate to empirical intuitions, that is to data towards a possible experience. Without this they possess no objective validity, but are a mere play of imagination or of understanding with images or notions. * * *

"The conceptions of mathematics would have no significance, if we were not always able to exhibit their significance in and by means of phenomena (empirical objects). * * *

"The pure categories are of no use at all, when separated from sensibility."

In the second edition of his Critique of Pure Reason, Kant has inserted a few paragraphs, in which he discusses "the causes why we (not yet satisfied with the substratum of sensation) have added the noumena to the phenomena." "We have learned," he says, "that sensation does not perceive things of themselves, but as they appear to us in accordance with our subjective condition." Now, as they cannot be appearances of themselves, we suppose that something must correspond to it, something which is independent of sensation.

Kant distinguishes two kinds of noumena. Noumena, in the positive sense, he defines to be those that

are supposed to have originated in a non-sensuous intuition, and declares that they are inadmissible:

"We in this case assume a peculiar mode of intuition, an intellectual intuition, to wit, which does not, however, belong to us, of the very possibility of which we have no notion."

Noumena, in the negative sense, Kant calls things in so far as we abstract from sensation altogether; they are pure ideas, merely formal thought. They are not only admissible but for certain purposes necessary.

"A noumenon considered as merely problematical, is not only admissible but even indispensable. * * * It is a negative extension of reason. * * * We limit sensation by giving to things of themselves (in so far as they are not considered as phenomena) the name of noumena."

"The division of objects into phenomena and noumena, and of the world into a *mundus sensibilis* and *intelligibilis* is therefore quite inadmissible in a positive sense (although conceptions do certainly admit of such a division); for the latter class of noumena have no determinate object corresponding to them, and cannot therefore possess objective validity.

* * * "After all, the possibility of such noumena is quite incomprehensible, and beyond the sphere of phenomena all is for us a mere void. * * * What, therefore, we call noumenon, must be understood by us as such in a *negative* sense."

Thus the question whether our reason, in addition to its admitted empirical use, can be employed in a transcendental way to noumena as objects, is answered by Kant in the negative.

The root of false noumenalism, it seems to us, must be sought in language. It is a misconception of the nature of words which leads us to think that things are absolute existences, being independent of, and distinct from their qualities. If we keep a clear conception, however, of the way words have arisen, and of the purpose they serve, we shall not fall into this

dualism that believes in an absolutely unknowable world supposed to be hid behind the knowable world of sense-phenomena.

Words are, so to speak, bundles of percepts. If we pull single percepts out, the bundle is still a bundle; but if we take away all, there is no bundle left, there is nothing remaining that made the bundle a bundle; we have left only an empty nothing. If we take away from a thing all the properties that we are accustomed to comprehend by a word, there is left the meaningless word, a mere sound, the bare string with which the bundle was tied together.

The world is not in a rigid unchangeable state, but in a continuous flux. Yet knowledge becomes possible only when we fix certain percepts and give them relative stability. The faculty of fixing and retaining percepts, namely memory, is therefore the ladder that leads us upwards to a higher spiritual existence; it affords the mechanical means of gaining a firm foothold in the course of eternal changes.

It is as if we sat in an express train and were looking at the landscape flitting by us. The picture, taken as a whole, swims indistinctly before our eyes. If we wish to get a clear idea of the situation, we must allow the eye to rest on some one object, neglecting the others. This we do, in viewing nature, by the concept, *i. e.*, by the word. Words are the instruments by which we fix, in symbols of sound, certain classes of events, perceptions, or experiences; giving them a relative stability despite the universal change of things. In this rests the importance of words, for it is only in this way that we can at all separate a group of occurrences from the course of nature, in order to scrutinize them closely, and to understand them. We must always

bear the fact in mind that the element of stability that seems to be present in many words, is a fiction designed to serve a definite purpose. Absolute rest does not exist. Things are in a constant flux, and if we give our words and concepts a relative fixity, we must nevertheless not seek in them eternal existences, or absolute entities, as did Plato, in his 'Ideas.'

V.

THE ONENESS OF THE PHENOMENAL AND THE NOUMENAL.

WHAT we call things, what we call our personality, our Self, our Ego, are merely abstract concepts that we have formed for the purpose of distinguishing them from other things. Words serve the practical purpose of orientation among the innumerable phenomena of nature. Absolutely considered, and independent of their properties, things neither exist, nor do we ourselves. Properties are parts of a thing, abstracted from it in thought. Some, and in fact very many, of these properties are only separable in thought, and not in reality, from things; while the totality of all properties constitutes the thing entire. Most of the words, by which we designate things, are furthermore shifting concepts. We retain the same word, even when parts or properties of a thing, it may be, have fallen away or when new ones are added. The rose-bush in the garden continues the same rose-bush, even after we have engrafted another species into its stem; it has merely lost certain properties and acquired new ones. A hat without a band and trimming is still a hat, and an old hat with a new band and new trimming con-

tinues to be the same hat to us. Only when the change made is very great do we cease to designate the object by the old name.

We ourselves remain ourselves, although continually changing, in body as well as in mind. Of our world of ideas, various parts fade away, or are wholly forgotten, while with new experiences new thoughts continually grow from the old ones.

In order completely to understand a thing, we must know it in its relation to other things. The character of a table is constituted not only by its shape, but also by its purpose to serve people as a table. Without this purpose, properly considered, a table would *not* be a table. A stone, for instance, that has been accidentally shaped into the form of a table by the grinding action of a glacier, is no table. The surroundings in which a table serves the purpose of a table, thus belong to the table as a property which we cannot separate from it. We must learn to understand everything, therefore, not as the expression of something having a separate, absolute existence, that lies concealed behind its realities, but as a part of the All.

Our bodies, of themselves, and apart from all else, would not be able to exist. Without the pressure of the atmosphere, we would burst asunder, while the air surrounding us belongs most intimately to our lungs. A recent scientist has called the kitchen an extension of our chewing and digesting apparatuses. And correctly. But also the fields upon which grow the corn that miller and baker convert into bread for us, belong to our Selves. In reality, the whole world is a part of our being, and the manifestation of our existence is conditioned wholly by the relations in which we stand to the outer world.

This holds good not only of our physical, but still more so of our spiritual existence. Our soul is made up of perceptions and ideas. The objects of our perceptions and our thoughts acquire thereby a relation to our Self; they become parts of the Self, which in the event of a change also transform the corresponding parts of the Self.

The closer the connection is in which a thing stands to us, the more it appears as a part of our being. The skilled violin-player feels his violin, as though it were a part of his body. He controls it, indeed, as an acrobat does his limbs. A benumbed limb which no longer pains, on the contrary, appears as a foreign body that does not belong to us. The captain of a company conducts his troops, as an engineer controls his engine. The engine becomes a part of the engine-driver, the company a part of the captain, and the audience a part of the speaker. Everything it is true, rests upon reciprocity. The speaker in his turn is a part of the audience. Language is the bond of union; in language speaker and audience are one. The speaker must speak the language of his audience, and the audience must understand the language that he speaks. So the engineer is part of the locomotive and he must be familiar with it; in other words, a picture of the locomotive must exist as a living nerve-structure in his brain.

Although we are, in fact, distinct individuals, distinguished from each other by an "I" or a "you," by a "he" or a "she"; yet when closely scrutinized, the "you" of our friends and enemies is a part our own Self. In every way the "I," "you," "he," "she," and "we" are parts of a great whole; and human society with its social and political institutions, with its

ethical ideas and ideals, is only possible because these "you's" are but little distinct from the "I's." That our life and property in general is safe, that we buy and sell, marry and are given in marriage, that the laws are observed, and that in ordinary circumstances we hold intercourse with one another mutually trusting in our honest intentions; that, too, we struggle and compete with one another and try our best to maintain our places in the universal aspiration onward:—all this is only possible because we are parts of the same humanity and the children of the same epoch, possessing the same ideas of right and wrong, and bearing within ourselves in a certain sense the same souls.

Could some evil spirit, over night, change our souls into those of savages and cannibals, or even into those of the robber-knights of the middle ages, all our sacred laws, all our constables, all the police power of the State would be of no avail: we would inevitably sink back to the state of civilization in which those people existed. But could a God ennoble our souls, so that the sense of right and reason became still more purified in every heart, then better things would result spontaneously and much misery and error would vanish from the earth.

VI.

GOD AS THE MORAL LAW.

And the God that can accomplish that, lives indeed —not beyond the clouds, but here on earth, in the heart of every man and woman. An absolute God exists as little as an absolute soul or an absolute thing. We no longer believe in ghosts, and an abso-

lute God, just as an absolute soul is not distinguishable at all from a ghost.

By God we understand the order of the world, that makes harmony, evolution, aspiration, and morality possible. This God is no transcendental thing, existing of itself, enthroned above the clouds; he is immanent, and lives in the hearts of men as their good-will, their honor, their conscience, their ideal, or however else we may please to distinguish it.

The belief in a transcendental God, from lack of clearer ideas, long served our forefathers to symbolize this immanent God. Therefore we will not vilify the old views; they after all contain a great truth. We shall treat them with reverence, notwithstanding we reject them. To us the idea of a God, absolutely existing, has become a superstition; but all the more have we thus come to know the meaning of the God we have abstracted from the reality of the world and from the life of our heart. In this sense, the Faust of Goethe speaks:

> "The God that in my breast is owned
> Can deeply stir the inward sources,
> The God above my powers enthroned
> He cannot change external forces."

The idea of a transmundane God, a God of itself, would be an attempt to create 'a noumenon in the positive sense,' (as Kant calls it) which is inadmissible. There is no reality corresponding to it. However, the idea of a God as the possible presence of a moral law in the world to which we have to conform, is a conception of pure thought which involves no self-contradiction. It would be (to use Kant's expression again) 'a noumenon in the negative sense,' the use of which is admissible and even indispensable for arriving at general conceptions. The idea of God in this

sense, it will be found, has some realities corresponding to it, just as much as the quality of heaviness or weight corresponds to our conception of gravity. The God outside of the world is an anthropomorphism, and is as such a remnant of former ages. Monism leads us to the purer and loftier idea of an immanent God.

Goethe says:

> "What were a God who from the outside stirred
> So that the world around his finger whirred?
> He from within the Universe must move,
> Nature in Him and Him in nature prove.
> Thus all that in him lives and moves and is
> Will ne'er his power and his spirit miss."

Agnosticism believes that the substance of these spirits, things absolute, as well as their existence, is an inscrutable mystery of which we can know nothing. Monism goes a step beyond this. According to Monism, the division of the world into knowable things, as appearing in their operations, and into absolutely unknowable things held to exist behind or in phenomena, is an untenable and self-contradictory dualism. Monism rejects altogether the ghost-illusion of existence absolute, and constantly keeps in mind that every thing is a part only of the All, and that every natural process is only an aspect of the entire indivisible existence of the universe. We, too, are a part of the eternal All in which we live, move, and have our being.

THE STRONGHOLD OF MYSTICISM.

1.

THE UNKNOWABLE.

THE most modern specter that haunts the realms of philosophy goes under the name of the Unknowable. Ghosts and goblins are done away with by science, but, in spite of that, superstition returns and assumes a vaguer and more indistinct form in the idea of an indefinite and undefinable something which is supposed to be an inscrutable mystery. Some people fear it as a hidden power, some reverence it as the embodiment of perfection, some love it as a fit object of their unaccountable longings, and almost all who in their fantastical visions imagine to conceive it, bow down and worship it. It is the Baal of modern philosophy, and even the iconoclasts of the nineteenth century have not freed themselves from this fetish. While denouncing supernaturalism in the religious creeds of to-day, they preach the supernaturalism of a mystic Unknowable that lies beyond human experience, and do not seem to be aware of their inconsistency.

The Unknowable is like the fog which the Anglo-Saxon saga relates was rising in the shape of the giant Grendel from the fens and marshes in Jutland, and "*h*aunted the *h*alls of men." It is an intangible monster that hides the real aspect of things from the hu-

man eye and spreads an unwholesome mysticism about all our conceptions.

The world, however, does not consist of things recognizable, and of fog around or within them. Natural phenomena do not emanate from transcendent sources. Nature is one throughout, and natural phenomena are linked together by causation. Causality, the law of causation, is not a capricious ukase of an autocratic demiurge, who, like a human monarch, rules the world according to the maxim, *car tel est notre bon plaisir*. Causation is no mysterious process; its law is demonstrable and explainable. In accordance with the conservation of matter and energy, causality signifies the identity of matter and energy in a change of form. Fundamentally, causality rests on the same evidence as the logical rule of indentity, and is in its most general aspect as simple as the arithmetical formula "once one is one."

The idea of the Unknowable has its root in the relativity of knowledge. We know things only by the way they affect us. Subjective sensations are the elements of all objective knowledge. Knowledge being itself a relation, the agnostic should but try to state in clear terms what he conceives 'absolute knowledge' to be, and his unattainable ideal of 'absolute knowledge' will explode in the attempt.

Every manifestation of nature that affects us either directly or indirectly can thus afford us material for our sensation. Inasmuch as all existence must manifest its existence somehow (if it did not, it could not be said to exist), we maintain that all existence can at least indirectly be or become an object of cognition.

The existence of a thing implies the manifestation of its existence. It exists only in so far as it manifests

itself, and every manifestation, producing somehow an effect either directly on ourselves or indirectly on other things can be (directly or indirectly) observed, described, inquired into, and comprehended. Absolute existence which is not manifested in some way means non-existence, it is a *contradictio in adjecto* and a chimerical impossibility. Hegel says: "Existence and non-existence are identical." This is true if Hegel refers to an absolute existence, or an existence in and of itself.

The unknown is by no means unknowable, for our ignorance of some subject does not justify the dogmatic assertion, that it can not be known at all. There are many problems which have not yet been investigated, and there are innumerable things we do not yet know of, but there are no phenomena in the world which *per se* are unintelligible. The vastness and grandeur of the world are so great that the province of science is unlimited, and after each discovery new problems will constantly present themselves to keep the inquiring scientists busy. The new problems will be born from the very explanations of the old problems, and they will open new vistas of research of which we never before dreamed of; but wherever our inquiring mind may venture, we shall find that, throughout, nature is intelligible.

Nature is not mysterious; if it appears to us mysterious, it is a proof of our ignorance and of our misconception of nature. The mystery lies in the subject not in the object; and we should always endeavor to formulate it in an intelligent question. A thoughtful mind is not overawed by things which he does not understand, but he treats them as problems and tries to solve them.

Nature, it is true, is wonderful; but what is most wonderful is that the most intricate and complicated phenomena of Nature are marvelously simple in their ultimate and elementary conditions.

II.

THE FASHIONABLE MYSTICISM OF TO-DAY

THERE are many philosophers—or so-called philosophers—whose avowed object it is to introduce us into the mysteries of the absolute. A philosophy that as a matter of principle takes its stand on the data of positive science aims at nothing of the kind; it sees the main object of philosophy in clearing away the fogs of mysticism, and from this standpoint we attempt to present definite solutions of the fundamental problems in clear and popular language.

While pressing this anti-mystical tendency the author of these essays feels in duty bound to express his esteem for the mysticism of the fourteenth century as represented in Master Eckhart of Augsburg, and Johannes Tauler of Strassburg. The historian recognizes in this powerful and enthusiastic movement the preparation and beginning of the Reformation. But it was more than that; it was a religious movement which dimly foreshadowed the future Religion of Monism, *i. e.*, a faith by which the individual would find salvation and comfort in his oneness with the All. The idea of resigning all egotism and becoming God-like by oneness with the All, was drawn from the living well of man's religious sentiment, and it was justified by the New Testament. This idea was the quintessence of Eckhart's and Tauler's doctrines, which in those

days could be grasped and presented, could rise in the Church with the Pope's approval, and become popular with the masses, only in the garb of mysticism.

The mysticism of Eckhart and Tauler (if we exclude the narrowness of certain views that belonged to their time rather than to their ideal) is very different from the fashionable mysticism of to-day. The secret which they were revealing, like the moral instructions of Christ, had an ethical importance; it appeared as a mystery only to the worldling whose spiritual eye is closed. But it was no absolute mystery; it was a clear and plain truth to the knowing. Like the moral maxims of primitive Christianity, it could and it should become a truism universally acknowledged and accepted. Christ said: "What I tell you in darkness that speak ye in the light; and what ye hear in the ear, that preach ye upon the housetops."

The fashionable mysticism of the day is a lack of intellectual grasp and laziness of thought. The old mysticism arose from a fulness of the heart; a moral truth was recognized which seemed to conflict with wisdom and perhaps conflicted indeed with worldly prudence. The mystic of to-day takes the unsolved problem as inscrutable and thus by limiting his mind easily settles his doubts; the religious mystics found in the abyss of man's bosom the self-same power at work that bears and sustains the whole universe; the *ego* was recognized as a transient phenomenon of the everlasting All, and if man desires to live, he must (to use Tauler's expression) surrender his *ego* and become God (*entwerden um Gott zu werden*). They were mystics because they preached the paradox to gain all things through self-denial, and to become All by doffing that which seemed to be our individual self, and to live

by abandoning the passions that grow from the properly egotistic existence.

Let us not worship the unknown, but let us declare war against it; let us conquer it. If there is any maxim in science and philosophy that can be justified, it is this: there is nothing unknowable; no problem is *per se* insolvable. A philosopher whose philosophy ends in something unknowable may be compared to a man working out a computation which does not come out right.

A problem that is not solvable but insearchable, is no problem, but unmitigated nonsense. If it has sense, it must be solvable, although with our current knowledge and with insufficient methods of investigation *we* at present may not be able to solve it. It is, then, unsolved, but not insolvable.

* * *

THE irrational in mathematics might be paraded as an analogy to Mr. Spencer's idea of the Unknowable. But the irrational is a very inappropriate expression for a process that on the contrary is purely and exclusively rational but imaginary. To extract the root of -1 ($\sqrt{-1}$) cannot be realized and the irrational would properly be called the unrealizable.

The infinite is another conception that being misunderstood by unmathematical minds serves as a basis of mysticism.

III.

THE INFINITE A MATHEMATICAL TERM.

IN the realm of mysteries the infinite is monarch. Even those who have freed themselves from the belief

in 'things of themselves,' in transcendent forces, and absolute entities, are, as a rule, faithful worshipers at the shrine of the mystery of mysteries. Here they think the limit of human reason is reached, here we have to bow in silent adoration.

The Infinite, however, and its correlative, the Eternal, are as little mysterious as any other of our abstract ideas. There is no reason for spelling it with a capital I, or for making it an object of religious sentiment. If we do not understand the origin, purpose, and meaning of these conceptions, we had better go to work and study them. Man is given dominion over the whole creation and not the least part of the creation is the intellectual world of man's own ideas. However, in order to have dominion over it, man must by worthy of it. He must conquer it.

The infinite is a symbol for a mathematical process. When I count I may count up to a hundred or two hundred, to a thousand or to a million, or to whatever number I please. If I do not stop for other reasons, I may count on without stopping—in a word, into infinity.

Infinitude is never an accomplished process. Take for instance an infinite decimal, say a recurring decimal. It is a decimal fraction which we think of without a limit. Thus $\frac{1}{3} = 0.3333\ldots$. The dots indicate that the process of placing threes in the decimal fraction can be carried on *ad infinitum*. The more threes are put there, the nearer will the decimal be equal to $\frac{1}{3}$. It will never be absolutely equal and we may stop short as soon as the error resulting from it becomes immaterial.

We can produce an infinitude wherever we can apply such an infinite process. If we soar into the

heavens and let our thoughts wander into cosmic space, we may proceed from star to star in the milky way and beyond we may perhaps reach other milky ways. If we still proceed we may wander in empty space for ever and ever. If these wanderings were possible we need as little stop as in counting.

A drop of mercury can just as well be used as an instance of infinitude as the universe. It can be divided into two halves, and each half is again divisible. It is divisible *ad infinitum* because the division is a process which may be carried on as long as one pleases. The infinitely small is no more a thing in itself than the infinitely great, and there is no more mystery in the one than in the other.

IV.

IS THE INFINITE MYSTERIOUS.

MR. L. T. IVES presents to the elimination of the mysterious in our conception of infinitude the following objection :*

"When the word infinity is used, a something is expressed that cannot be made or reached by addition. In this respect it is certainly unlike anything with which we have had experience. The immense distances dealt with in astronomy, are, by simply enlarging our unit of measurement, as readily disposed of as measuring thirty-six inches of ribbon, and by a similar process. But when we come to something which no enlargement of our unit will affect, something to which the diameter of our sidereal system would be as a unit of measurement no better than the diameter of a sand grain, then surely we have reached a something not a symbol of anything save itself, and about which it cannot truly be said, 'there is no mystery.'

*THE OPEN COURT, p. 872

"Does not infinite space present this problem? You say, 'beyond nature is empty non-existence.' This empty non-existence is infinite room for existence, infinite space—space without limit. We say 'without limit' because we cannot conceive it as having limit. The space we know here is not empty, so, judging from experience, there is reason to believe infinite space not empty—and the problem that presents itself to our thought is infinite fullness rather than infinite emptiness. But in either case the infinite element remains the same."

The fundamental error in this statement is that infinity is from the beginning supposed to be *something*. People hearing infinitude spoken of in solemn terms suppose that the process is realized in nature somewhere; when asked to conceive the infinite they are overawed by the thought that they are themselves unable to accomplish the task. They believe that the infinite is a real entity, and in the vain attempt to grasp it despair at last of ever reaching the end of the infinite.

* * *

BUT is not the space of the world truly an infinitude that is realized in actual existence?

The method of solving the problem has been indicated by no less a man than the great sage of Königsberg, by Immanuel Kant. Before entering into a discussion of the infinitude of Space and the eternity of Time, we must have a clear conception as to the nature of Space and Time. We do not agree with Kant, but we adopt his method and attempt to solve the problem in the way it is presented in the Critique of Pure Reason.

V.

SPACE AND TIME.

In his Critique of Pure Reason (Part I, Section I), Kant proposes the question: "What then are time and space? Are they real existences?" And he answers in the negative. He says:

"If we ascribe objective reality to these forms of representation, it becomes impossible to avoid changing every thing into mere appearance. For if we regard space and time as properties, which must be found in objects as things in themselves, as *sine quibus non* of the possibility of their existence, and reflect on the absurdities in which we then find ourselves involved, inasmuch as we are compelled to admit the existence of two infinite things, which are nevertheless not substances, nor any thing really inhering in substances, nay, to admit that they are the necessary conditions of the existence of all things, and moreover, that they must continue to exist, although all existing things were annihilated,—we cannot blame the good Berkeley for degrading bodies to mere illusory appearances. Nay, even our own existence, which would in this case depend upon the self-existent reality of such a mere nonentity as time, would necessarily be changed with it into mere appearance—an absurdity which no one has as yet been guilty of."

Space and time, Kant declares, are nothing else than forms, the one of our external the other of our internal sense. They are not real, they are ideal.

We agree with Kant that space and time are ideal, not real in so far as they are no things, no objects, but abstract conceptions. Space of itself apart from extended, extending or moving things, and time of itself apart from changes do as little exist as matter of itself or force of itself. Space does not extend, but things extend and move; and their extension *is* space. Time does not change but things are changing; their change,

or rather the measure of their change, *is* time. Without extended things no space, and without motion or change no time. We disagree from Kant in so far as he says that space and time are the forms *of the thinking subject only*. He denies that they are properties inhering in the objects, because, he maintains, they cannot have been abstracted from reality. If they were abstracted from reality, he argues, mathematics would be an experimental, yet no transcendental, *i. e.* formal, science, and we could never attribute to mathematics absolute validity (rigid necessity and universality). Kant explains his position as follows:

"Those who maintain the absolute reality of time and space, whether as essentially subsisting, or only inhering, as modifications, in things, must find themselves at utter variance with the principles of experience itself. For, if they decide for the first view, and make space and time into substances, this being the side taken by mathematical natural philosophers, they must admit two self-subsisting nonentities, infinite and eternal, which exist (yet without there being any thing real) for the purpose of containing in themselves every thing that is real.

"If they adopt the second view of inherence, which is preferred by some metaphysical natural philosophers, and regard space and time as relations (contiguity in space or succession in time), abstracted from experience, though represented confusedly in this state of separation, they find themselves in that case necessitated to deny the validity of mathematical doctrines *a priori* in reference to real things (for example, in space),—at all events their apodeictic certainty. For such certainty cannot be found in an *a posteriori* proposition; and the conceptions *a priori* of space and time are, according to this opinion, mere creations of the imagination, having their source really in experience."

From this standpoint Kant concludes:

"I maintain that the properties of space and time, in conformity to which I set both, as the condition of their existence, abide in my mode of intuition, and not in the objects in themselves."

Taking this position that space and time are forms of our cognition merely, not of things, Kant accepts the inevitable consequence that

"The question, 'What are objects considered as things in themselves?,' remains unanswerable even after the most thorough examination of the phenomenal world."

If Kant were right in his solution of the problem, the question "How does the constitution of thinking subjects universally, (so far as we can judge), happen to have such forms of space and time as they are," would be unanswerable. Could we not, or at least some of us—of living beings—just as well have a constitution of four-dimensional space? And if so, how would in that case our conception of four dimensional space tally with actual space?

If space inhered, as Kant maintains, in the thinking subject *only*, special relations and laws would appear different to four-dimensional beings. Kepler's third law for instance, that "the squares of the times of revolution of the planets are always proportional to the cubes of their mean distances from the sun," would to them most probably appear as "the cubes of their times of revolution being proportional to their mean distances taken to the fourth power." To us a right-angled solid that measures two inches in each of its dimensions, (*viz.*, a cube) contains eight cubic inches. A four-dimensional being would be sure that a right-angled solid that measures in all its dimensions two inches must necessarily contain sixteen four-dimensional inches. Anybody who denies that such radical changes would take place in the objects of the phenomenal world, must inevitably admit that tridimensionality is not merely our "mode of intuition," but an inherent quality of matter.

If the form of matter is tridimensional it is natural that beings whose bodies are built up of tridimensional matter will be able to ascertain the tridimensionality of their world by experiments of mere inner experience. Taking up space themselves, they can by mere reflexion determine how many dimensions actually exist. Kant does not distinguish such internal experimenting from reasoning a priori. Reasoning a priori should be strictly limited to pure formal thought, while experiments are and remain a matter of experience whether they are executed on phenomena of the outer world or whether the subject experiments on or within his own body, which after all, like the rest of things, is an object in the phenomenal world.

If Kant had investigated the problem of the a priori (of formal thought), he would have found that the forms of our cognition naturally grow with experience, and that we acquire them indeed by abstraction. Consequently, absolute apriority which Kant attributes to space can not be granted it. Our mathematical laws possess absolute rigidity and universality for tridimensional space and as a system of third degree they are a priori, *i. e.*, pure formal thought, but the fact that space is tridimentional is exclusively a matter of experience.

How much of experience enters into our conception of space can be seen from the following logical syllogism :

PREMISSA MAJOR :

The formal laws of a system of third degree apply to any system of third degree with rigidity and universality,

as we know a priori (*i. e.*, from pure reason, or formal thought, from inner reflection upon the laws of pure form).

PREMISSA MINOR:

Actual space being tridimensional is a system of third degree,

as we know by experience and can prove by experiment.

ERGO:

The formal laws of third degree apply to space with rigidity and universality.

* * *

KANT, in his argument, identifies 'ideal' and 'subjective.' The conception of space being an abstract idea and its being to some extent formal thought, does by no means compel us to deny that actual space is a real (although by no means a material) property in objects.

Kant says:

"The proposition, "All objects are beside each other in space," is valid only under the limitation that these things are taken as objects of *our sensuous intuition.* But if I join the condition to the conception, and say, 'all things, as external *phenomena*, are beside each other in space,' then the rule is valid universally, and without any limitation.

"Our expositions, consequently, teach the *reality* (*i. e.* the objective validity) of space in regard of all phenomena which can be presented to us externally as objects, and at the same time also the *ideality* of space in regard to objects when they are considered by means of reason as things in themselves, that is, without reference to the constitution of our sensibility. We maintain, therefore, the *empirical ideality* of space in regard to all possible external experience although we must admit its *transcendental ideality*, in other words, that it is nothing, so soon as we withdraw the condition

upon which the possibility of all experience depends, and look upon space as something that belongs to things in themselves."

Whether space and time apply to "things in themselves" must be considered from the standpoint of monism as an idle question, since "things in themselves" do not exist.

In contradistinction to Kant's view we maintain: The nature of our cognition is such that space can not but appear tridimensional to us. Our existence is tridimensional, and for that very reason our cognition is tridimensional also. Our existence, however, is a part of the whole of reality and our life is a phenomenon among many other innumerable processes of nature. Consequently we look upon the forms of our existence as upon a specimen, so to speak, of the forms of existence in general.

It does not lie within the scope of our problem to enter into the details of the growth of space-conception. There is but one way for a living being to acquire the idea of space, and that is by motion—not only through the observation of moving bodies, but also and chiefly through self-motion. If we were immovably fixed to one spot, we would have no conception of space or at least a very dim one. Only while moving ourselves, can we measure distances, and by measuring we form our ideas about space. If this is true, and I think it can be proved experimentally, the definition of space as "the possibility of motion in all directions" will be justified. That the different senses having a different kind of motion, will have different measures for space is obvious. The most primitive method of the different senses in judging of distances is the remembrance of the effort necessary to pass through it from one end to the other. Errors are cor-

rected by a comparison among the results of the different senses and may be altogether avoided by the application of a standard measure in which all distances can be expressed.

VI.

INFINITUDE AND ETERNITY.

THE problem of Infinitude and Eternity depends upon a correct view of space and time. "Space in and of itself—apart from reality—does not exist, save in our imagination. Space is abstracted from reality. We abstract extension, *i. e.*, the relational, and omit all material. Hegel defines space as *Das Neben-einander der Dinge* (The beside-another of things). But space is more than actual relation and extension, it is also the possibility of new relation and further extension. Accordingly we prefer to call it the possible direction of motion. If space is any possible direction of a point* or a particle of matter, there can be no doubt as to the infinitude of space ; for the possibility of motion is infinite in every direction. This fact is thus self-evident from the definition of space.

If we think of space as a real entity, it is the greatest mystery—a mystery which, we must confess, can never be solved. If we recognize that space is a symbol for a possibility, *i. e.*, for an unlimited process, everything is clear, and there is just as little mystery in the infinitude of space as in the infinitude of a recurring decimal like 0.333. . . . .

The only correct usage of the word 'infinite' is that

*A posited point is no real existence, but it presupposes a positing being, which in order to exist must be a material reality.

of the mathematical term. As a poetic license, however, we use it also in the sense of 'immeasurable.' We speak of the infinite ocean and the infinite depth of the sea, although both are very definite and even not immeasurable. So also the "infinite" world, the universe, is a definite reality. Certainly it is in its totality immeasurable; but we recognize that its energy as well as its matter can neither increase nor decrease, a fact which is now indorsed by science and generally styled the law of conservation of matter and energy.

As of space, the same thing holds good of time. Time is also an abstract; absolute time does not exist. Schopenhauer is right in saying that neither past nor future exist; the only real time is the present and it *is* always.

Time is a generalization or abstract of existence in regard to its continuance or possible change, but without reference to anything else, be it matter or form. Hegel calls it *Das Nach-ein-ander der Dinge* (the after-another of things). This can lead to a misconception if by "things" in their totality we mean the world. The material things in their totality *are* always; they exist not one after another, but are simultaneous and thus matter remains in all changes permanent. To express it in two words: *Reality is*, which *is* includes that it has existed and that it is going to exist. Hegel's definition, however, is correct in so far as things are considered as changeable forms. It is motion which changes things either in their mutual relation, or their forms. Time, accordingly, can only be measured by motion; and, indeed, time is the 'measure of motion' and nothing more.*

* Aristotle uses an unfortunate expression when defining time as the number of motion ὁ χρόνος ἀριθμός ἐστι κινήσεως.

If time is conceived as an objectively existing entity, we will soon find out that it is inconceivable and full of self-contradiction. It would be the realization of an unlimited process, the actualization of an impossibility, and the bold establishment of a palpable self-contradiction. Kant justly maintains that objective time (just as much as objective space) is an absurdity.

Past and Future are still more complicated abstracts than the present. When conceiving them as objective existences, we are driven to statements which are inconceivable and impossible. They are without limit. Infinitude in time is called eternity. Eternity, conceived as a real thing, is a self-contradiction.

The decimal 0.333 . . . is not a finished magnitude; it is a process to approximate ⅓, but it is never equal to ⅓. If we should demand that an infinite decimal like 0.3333 . . . . be complete, and equal to ⅓, we would be made to understand that this demand is absurd and its realization impossible. We cannot finish it and cannot even conceive of an infinite decimal as being finished. But we use where it is wanted the cipher 0.333 . . . for indicating or symbolizing it. The words 'Past' and 'Future' are in no less a degree symbols of a process that does not admit of a full realization.

The eternity of the Past is an unlimited retrogressive motion. It attempts to comprehend in one conception all the changes which we can imagine to have anteceded the state of reality as it is now. The eternity of the future is the infinite and indefinite possibility of the changes to come after the present state of things. And thus both are fundamentally an eternity of the present time, which means that time must be conceived as limitless. Reality existed always and will

exist always, and the possibility of change cannot be exhausted—at least we can imagine it to be inexhaustible, or if exhaustible we can imagine that certain long series of changes can periodically be repeated over and over again.

Time is an abstract from Reality. Reality by all its changes remains. Past, Present, and Future are abstracts of the states of Reality, with respect to whether they are, or have been, or are going to be.

This form of expression 'are, have been, or are going to be,' is most correct for our present purpose, as it defines both past as well as future in the present tenses 'they *have*' and 'they *are* going to be.' The present only is real; both past as well as future must thus be conceived as special aspects of the present.

Space and time, infinitude and eternity, are no mysteries unless we make them such by wrongly attributing to them a 'thingish' or objective reality which they do not possess.

The nations of old worshiped Space and Time, Infinitude and Eternity, and we now smile at their errors and call them pagans. It is a paganism superior to fetishism, as its idol is woven out of the most delicate woof which can be obtained, *viz.*: the ideas of the thinker. But there is no essential difference between this higher kind of paganism and fetishism; it is a difference of degree.

Kronos and his colleagues belong to the past, but the worship of eternity and infinitude still obtains with our present generation, and will continue to be an object of idolatry until we understand that infinitude and eternity are creations of our own minds.

AGNOSTICISM AND POSITIVISM

THE positive philosophy of Auguste Comte has been most severely attacked in England by those who should have hailed the French thinker as their best ally and co-worker, by Mr. J. S. Mill, Mr. Herbert Spencer and Professor Huxley. And yet all three are inspired, like Mr. Comte, with an arduous and holy zeal to free the human mind from traditional dogmatism; all three have devoted their lives to establish a new philosophy of radical free thought. But what is stranger still, all three, especially Mr. Spencer and Prof. Huxley, are entangled in the very same error as their great French predecessor. They all together believe in the unknowability of absolute existence, of the unconditioned, of that which lies beyond phenomena, and thus failed in their aspirations to present a philosophy of positive science. They did not succeed in liberating us from mysticism. They all are Agnostics.

M. Comte observes* that there are three phases of intellectual evolution, for the individual as well as for the mass: the *Theological* (or *Supernatural*), the *Metaphysical* and the *Positive*.

In the theological phase the mind explains phenomena in a mythological way as the productions of supernatural agents. In the metaphysical phase the

* Compare "Comte's Philosophy of the Sciences," by G. H. Lewes, pp. 10, 11, and 18.

supernatural agents are set aside for abstract forces and entities. In the positive phase the mind, convinced of the futility of all enquiry into causes and essences, restricts itself to the observation and classification of phenomena, and to the discovery of the invariable relations of succession and similitude which things bear to each other: in a word, to the discovery of the laws of phenomena. "The metaphysician," M. Comte says, "believes he can penetrate into the causes and essences of the phenomena around him, while the positivist recognizes his incompetency and limits his efforts to the ascertainment of the laws which regulate the succession of these phenomena."

Between the second and third phase, according to M. Comte's definition, there is no other essential difference than the "conviction of the futility of all enquiry into causes and essences." And this conviction is the main doctrine of agnosticism. M. Comte accordingly was truly an agnostic before Prof. Huxley invented the term, and before Mr. Spencer wrote his First Principles. All the difference between M. Comte on the one hand and agnostic thinkers on the other are of secondary importance. They are like sectarian divergencies among denominations of the same creed.

We consider as M. August Comte's greatest merit —aside from his ardent enthusiasm for truth in philosophic enquiry, and for reform in our state of society—the invention of the term "positive" which is a very expressive word. But we do not understand by "positive," as does M. Comte, any limitation of the human mind. We understand by "positive" the monistic view of a unitary conception of the world.

Positivism, as we should express ourselves, recognizes that the so-called phenomena are positive facts,

that there are neither causes nor essences behind them, that Absolute Existence or the Unconditioned, or the Metaphisical (or by whatever name the Unknowable may be called) are chimerical nonentities, self-contradictory conceptions, and impossibilities.

By experience only man becomes familiar with the facts of existence. The facts of existence are no phenomenal sham; they are real, and knowledge means the systematical arrangement of experiences.

M. Comte erroneously considered Kant as the representative metaphysical philosopher. In truth it was Kant who struck the first vigorous blow at the errors of ontology and the belief in absolute existence, while M. Comte was still as deep entangled in metaphysicism as are his English rivals and opponents, the partisans of agnosticism.

We are little helped if we are told that we can never know anything about the causes and essences of things and that the Unconditioned is an inaccessible province which we should not attempt to enter. This view which is so excellently and adequately called agnosticism, appears from our conception of positivism, as a transition from the metaphysical to a truly positive phase. It is the last remnant of dualism. In the philosophical conception of agnosticism, the metaphysical essences have faded into vague unknowabilities and will disappear entirely as soon as the idea of absolute existence is recognized as untenable ground—as soon as philosophy is conceived as a unitary conception of the facts of reality.

IDEALISM AND REALISM.

THE old opposition between Idealism and Realism has, from the standpoint of monism, become immaterial. Both are right in their way, and, in so far as they are severally insufficient, both are wrong.

Idealism starts from thought and sensation, from the subjective aspect of phenomena, and in its most consistent form, as spiritualism, denies the existence of matter. Realism starts from real existence, from the objective aspect of phenomena, and in its most consistent form, as materialism, denies the existence of spirit.

Now, as a matter of fact, neither spirit nor matter exist of themselves: they are abstracts. Realism is right in so far as the facts of reality cannot be considered as sham. Idealism, on the other hand, is also right, in as far as the building-stones of all knowledge are our sensations; they are the facts of reality. However, the processes that within our body produce the subjective feeling of sensations, can not be considered as essentially different from the phenomena of the outer world; since science, the classified system of observations, shows that the former not only are most intimately interwoven with and conditioned by the latter, but that they must have grown from them in the process of natural evolution.

Idealism pretends that sensations are radically different from the phenomena perceived. The sensation of light is different from ether-waves, the sensation of sound different from the vibrations of the air. In his excellent essay, "Sensation and the Outer World," M. Alfred Binet says:

"Suppose that, my eyes being closed, I lay my hand upon my table, and that I feel a pin rolling about beneath my finger; I experience a sensation of a tactile kind, which excites in me a series of inferences, conscious, sub-conscious, and unconscious, and the whole occurrence is comprised in the following judgment: I touch a pin. In this way, through external perception, we possess knowledge of objects by the sensations they produce in us. * * *

"That which has produced our sensation of a pin, is not *directly* the pin; it is the nervous modification which that object has produced, in acting upon our sense of touch; our sensation follows this nervous modification. * * *

"Nothing resembles less the external object than the excitation it propagates in our nervous substance. What resemblance is there, for example, between the head of a pin that lies beneath my finger, and the physico-chemical phenomenon that passes through the sensitive fibers of my hand and that reaches my brain through the spinal marrow, where it gives rise to the conscious perception of a pin. Plainly, here are phenomena entirely dissimilar. It follows, therefore, that if there is a fact, at the present day, firmly established, it is that the sensations we experience upon contact with external objects are in no particular the copy of those objects. There is nothing outside of my eye that is like color or light, nothing outside of my organ of hearing that is like noise or sound, nothing outside of my sense of touch that is like hardness or softness or resistance, nothing outside of my sense of smell that is like a perfume, nothing apart from my sense of taste that is like a flavor." * * *

Sensation and the phenomena of the outer world are different. Sensations are not the real copies or images proper of things. The nervous system is not actually a mirror to reflect phenomena just as they

are. Yet we may justly compare it to a mirror. For, after all, certain features of the phenomena are preserved. They are consequently not so entirely different as is maintained. A certain form of a phenomenon corresponds to a certain form of sensation. The phenomena being different among themselves produce sensations that in their turn also are different among themselves. And the difference suffices to distinguish them.

The electric current in the wire of a telephone is entirely different from the air-waves of sound. Nevertheless the form of air-waves produced by spoken words can be translated, as it were, into the electric current and from the electric current back again into air-waves. Both can adapt themselves to the same form and thus become messengers of information. Must we declare that all communication through the telephone is impossible because electricity and sound-waves, wire and air, are entirely different?

It is true that the pin on the table does not resemble the physico-chemical phenomenon that takes place in our nerves. But it is true nevertheless that this physico-chemical phenomenon of our sensation together with the memories of other sensations, especially those of touch and sight, produces in our mind the conception of a pin. In spite of all difference between the outer world and sensation, the pin as we conceive it to be, is the net result of such sensations. This is possible as in the example of the telephone by a transference of motion from one medium to another through the *preservation of form.* The same is true of the whole world. Our conception of the world, in order to be true, must ultimately be based on the facts of sensation—not on the subjective aspect of sensation only, but also and especially on its objective

aspect as motions of a special form. In this way only can we acquire a conception of the objects, as they must be supposed to be independent of the subject.

The difference between the phenomena of the outer world and sensations, appears more striking than it really is, because, in order to understand a process fully, we must reduce it to some form which can be expressed in mathematical symbols or figures. Formal thought is always the basis of a scientific comprehension, and in order to comprehend a phenomenon, so as to measure and calculate it, we must in many cases translate it, as it were, into the language of that sense which is the organ of measurement and calculation. Therefore audible sound-phenomena are represented as visible air-waves. Hence the growing importance of the sense of sight.

Cognition never alters the data of sensory experience, although the invention of instruments may enlarge its reach. The Copernican system differs from the naïve view, that the earth is a flat disk, not because it denies or contradicts the facts of sensation, but because it arranges them more systematically with the assistance of mathematics (*i. e.* the method of formal thought).

It is a misconception of knowledge to demand that it should be something different than a methodical arrangement of facts. Our cognition, although it may translate one sensation into another, never indeed goes, nor need it go, beyond sensation.

* * *

But if cognition is merely the arrangement of the data of sense-perception, if the thinking subject cannot go beyond his sensations, are we not indeed limited

to the subjective aspect of phenomena and does not their objective aspect remain to us a book with seven seals?

This objection is made, indeed and that too, by most subtle thinkers; it is based upon a deep insight into the nature of cognition; but it is nevertheless erroneous, because it overlooks one most important point. The subjective aspect of sensation which we call feeling, and the objective aspect of sensation which is a physiological phenomenon, and as such a process of motion, are actually one and the same thing. They are two aspects only of one and the same indivisible fact.

Professor Bunge, of Basel, says in his pamphlet "Vitalism and Mechanism" :*

"True, the eye is a physical apparatus, an optical mechanism, a camera obscura. The image on the retina is produced at the back of the eye, in conformity with the same immutable laws of refraction that regulate the production of an image on the photographer's plate. But—surely that is no psychical phenomenon. The eye plays purely a passive part in that operation. The retinal image, moreover, may be produced in an eye that has been removed from its socket—in a dead eye.

"The *evolution* of the eye—that is a psychical phenomenon! How has this complicated optical apparatus been formed? Why do the cells of the tissues so unite with one another as to produce this wonderful structure? That is the great problem, to the solution of which the first step has not as yet been taken. Undoubtedly, the *succesion* in which the evolutionary processes have taken place, admit of observation and description; but of the *reasons* we know absolutely nothing. * * *

"All processes in our organisms, I maintain, that admit of mechanical explanation, are just as little psychical phenomena as the movements of the leaves and the branches on a tree, shaken by the blasts of a storm. * * *

"In *activity* lies hidden the mystery of life. The notion of

* Leipsic. F. C. W. Vogel.

activity, however, has not been derived from sensory perception, but from *self-observation*—from the observation of the will, as it strikes our consciousness, as it is revealed to the *inward* sense. And when this self-same thing meets the outward senses, we do not again recognize it. We see perfectly well what it does and what is done to it—mechanical processes. But the pith of the matter we cannot get at." * * *

Professor Bunge contradicts himself when stating that we know absolutely nothing of the reasons. He says in another passage of the same pamphlet:

"Our cognition must proceed from the known of our inner world to the unknown of the outer world."

We can indeed get at the pith of the matter. The solution of the problem as to the "activity" of life is contained in another sentence of Professor Bunge that follows in the very same paragraph. He says:

"If this self-same thing meets the outward senses, we do not again recognize it."

That mysterious activity in the outer world, that kernel within, which is supposed to be unknowable, is the self-same thing that we ourselves are.

And Schopenhauer, the admirer of Hindoo philosophy, is correct in so far as he says that we can indeed look behind the veil of Maya, not in natural phenomena, but in ourselves. The phenomenon of our existence, he says, is our body in all its knowable relations and manifestations, the kernel is that something which Schopenhauer calls 'Will.'

However, this something (the Will of Schopenhauer) can be analyzed, and is found to be of a very complicated nature which grows in a process of evolution from the simplest conditions to more and more complicated combinations. While analyzing it, we experience that the kernel supposed to be behind its

phenomenal manifestation is inseparably connected with it—yea, it is identical with it.

Now, in analyzing the phenomena of nature we apprehend them as manifestations, the motions of which can be mechanically traced. If their motions are not actually explained, they are at least explainable. The residuum which is left is the spontaneity that pervades all processes of nature. Nature is not passive, it is no dead machine acted upon from the outside by push. Its manifestations must be considered as active processes of self-motion.

This conception of nature is corroborated by the fact that the psychical and physiological life of organisms must have developed from non-organized substances. The phenomena of non-organized nature, accordingly must contain the conditions and possibilities of all higher organized life.

Thus the objective aspect of sensation, which is a phenomenon of motion, is, at least in theory, mechanically explainable. Not so the subjective aspect of sensation, which we designate as feeling that accompanies the process. Feeling (in so far as we understand by the word the psychical phenomenon only, and not its physiological basis) being no motion, it would be absurd to look for a mechanical explanation of feeling in this sense.

The motion of every muscle and nerve is determined so that it might be expressed in definite figures, but the subjective aspect, alone and by itself, to the exclusion of its objective manifestations, cannot be expressed in mathematical terms. In order to know what this "activity," the spontaneity of willing and perceiving, is, we must experience it ourselves.

We can measure the intensity and duration of feel-

ing in its objective aspect as a motion, but its subjective aspect can only be felt. The mental feeling is, so to say, the inseparable 'within' of the physiological phenomenon, which corresponds to the emotion. The note *C major* can be mathematically explained as a special form of motion in our auditory nerve; but the living feeling that apprehends it as a sound, can not; it is nevertheless a fact of experience; and there is no other possibility than to consider them both as one: —as two aspects of one reality.

* * *

In the old quarrels of the schools, idealism in its extreme form had one great advantage over materialism. It took its stand on the given facts of sensation. Thus it could not be refuted on its own grounds. Baron Holbach says:

"What shall we say of Berkley who endeavors to prove that everything in the world is a chimerical illusion and that the universe exists only in ourselves and in our imagination. He makes the existence of all things doubtful by means of *sophisms which are unanswerable* to those who accept the spirituality of the soul."

In a similar way Lord Byron acknowledged the validity of Berkley's arguments. He said:*

"When Bishop Berkeley said 'there was no matter,'
And proved it—'twas no matter what he said.
They say his system 'tis in vain to hatter,
Too subtle for the airiest human head,
And yet who can believe it? I would shatter
Gladly all matters down to stone and lead.
Or adamant, to find the world a spirit,
And wear my head, denying that I wear it.

"What a sublime discovery 'twas to make the
Universe universal egotism!
That all's ideal—all ourselves; I'll stake the
World (be it what you will) that *that's* no schism."

*Don Juan XI. 1, 2.

Idealism, while it cannot be beaten on its own ground, is nevertheless unable to account for the facts of reality. It cannot be refuted, yet it explains nothing. Materialism on the other hand is weakest at home. As a philosophy it is poor, but as a theory for practical explanations it is strong.

Materialism has been very successful when applied to natural phenomena, even to the explanation of psychological or other problems. But it could not be defended if attacked in its own province. Matter itself remained unexplained and, as a matter of consequence, materialists dropped into mysticism, declaring that matter itself was the ultimate mystery unsolved and unsolvable.

The weak point of materialism is that it identifies matter and reality. It starts with the assumption that all phenomena must be explained from the mechanical motion of inert matter. Man is a mere machine, an aggregate of molecules, the movements of which are produced through a *vis a tergo*, by push. Since, in the natural sciences, mechanical explanations prove of great value, Professor A. Lange proposed in his "History of Materialism" that science should continue to work out the solutions of problems as if materialism were correct, but at the same time we should know that from a critical and philosophical standpoint it is untenable ground.

The reason of this strange opposition between Idealism (or rather Spiritualism) and Materialism must be sought for in the consistency of one-sidedness which is found in both views. Neither spiritualism, *i. e.* idealism in its most advanced shape, nor materialism (the exaggeration of realism) can properly combine the parts of subjective and objective existence. Both

views are deficient in their explanation of the elementary data of psychical life. Spirit is declared to be a mere function of matter by materialists, and matter is declared to be a mere illusion of spirit, by idealists.

The unitary conception of the world alone can bridge over the chasm between the subjective and the objective. The motions of the world cannot be explained as mere changes of place, produced by push only. Wherever we look into nature's laboratories, we are confronted with self-motion. There are of course some motions which are produced merely by push: We call them "purely mechanical." But these purely mechanical motions presuppose spontaneous motions as their causes. Nature must be alive in the sense that it is a self-moving mechanism, carrying a rich stock of energy. The construction of a *perpetuum mobile* is an impossibility because we cannot separate one part of the world from the rest. But the world as a whole is a *perpetuum mobile*. The work done in one part is transmitted to another part; yet it is not lost, so far as the whole world is concerned. The sum total of all energy remains constant in the universe.

Nature is alive also in another sense. It contains in its elements the germs of feeling; or, as Clifford expresses it, the world consists of "mind stuff"—not of actual mind, but of a stuff that can become, and under certain conditions does become mind.

To regard the fall of a stone as only a very simple instance of essentially the same process that takes place when a man does an act, i. e. performs a motion accompanied with consciousness, appears at first sight strange or even absurd. But we cannot escape the assumption that it is the same. We are obliged to adopt this monistic conception of things by inexor-

able logical arguments; and we are supported in it by the observation of natural processes.

Human action develops by degrees out of other natural processes, and we have sufficient evidence to believe that humanity with its civilization, science, art, and all its ideals is but a differentiation of natural forces that has come to pass upon the cooled off surface of the earth under the influence of solar heat. Man is transformed solar heat. All the forces animating the planetary system are differentiations from the heat of which our solar system was possessed when in a nebular state. We ask further, What is the heat of which nebular masses are possessed? It is the motion of celestial bodies, of comets, or of so called world-dust, changed by collision into molecular motion.

Gravity attracts mass to mass. The more gravity there is, the more mass we have. It is but an artificial explanation of gravity, to suppose that it is something outside of and independent of mass. The simplest conception is to consider attraction as an intrinsic property of mass. In other words, gravity is mass itself; and the most elementary motions are not so-called purely mechanical, caused by push, by a *vis a tergo*, they are spontaneous, they are a *vis viva* or self-motion. They are mechanical, however, in the sense that they conform strictly to the laws of mechanics.

When we declare that nature is alive, we mean more still than that the world is a self moving mechanism. There is some additional element in the processes of nature, which in its full development appears as feeling and reaches its highest stage known to us in the consciousness of man. And this additional element is the properly psychical feature of life. The fall of a stone we do not believe to be accompanied

with actual feeling, but we cannot help assuming that it is animated by or accompanied with a potentiality of feeling, containing in an elementary form the germs from which actual feeling and consciousness can be transformed, similarly as its motion may reappear in the cerebral activity and muscular exertions of man.

Idealism confines its world to the phenomena of feeling; materialism cannot explain their origin. Monism sees in actual feeling a process that, like other natural processes, takes place under certain conditions and disappears if these conditions disappear or are counteracted.

Our feelings are only part of our existence. They are the subjective part of it. The other objective part is our activity, presenting itself as motions. And again our conscious feelings are only part of our subjective existence. They are as it were the surface only, where many things appear that have their origin in the unknown depths. Many results come to light, of processes that never enter into the range of man's individual consciousness.

Man's consciousness is like a light that illumines the world of his existence, but does not create it. Our body, not otherwise than a plant, grows and forms itself without the interference of consciousness. So our social institutions grow, so our religions, and philosophies, and ideals develop independently of purposive interference and often contrary to directions consciously imparted.

Let us use the light of our consciousness as best we can. It serves the purpose of orientation. In the dark we can only grope, but where a light is lit we can survey our paths and need not go astray.

HEDONISM AND ASCETICISM.

A SYSTEMATIC conception of the universe is the theoretical, and ethics the practical aspect of philosophy. It is obvious that both are closely associated; the one is the basis of the other, and we cannot properly judge of the problems of the latter unless we have grasped the main truths of the former.

By "morals" we understand the proper conduct of life, and by "ethics" the science of morals. Now, it is true that a man can instinctively lead a moral life without having any knowledge of the theoretical basis and the practical application of ethics. Morals are, as a rule, very stable, and a moral man who in later years happens to believe in a wrong system of ethics is not liable to change much of his good habits of life. It is also true that a man who has inborn, perhaps hereditarily ingrained, immoral tendencies will by theoretical instruction in ethics most likely not be greatly improved. Nevertheless, as a rule, philosophy and ethics go together, and a wrong philosophy will produce a wrong ethics, and a wrong ethics will, if not in the present, certainly in the next generation, corrupt the morals also.

The details of a philosophy, or a religion (which latter, after all, is but a popular philosophy, a philosophy of the heart) may be, and, indeed, are, quite indifferent as to the ethical inferences that can be drawn from it. But the main truths are not. The main truths of a re-

ligion or philosophy lend the color to the ethics that grows therefrom. And we find in the history of philosophy that materialism, with a great regularity, produces hedonism or utilitarianism; for it places the ultimate object of life in material existence and its well being, *viz.* in happiness. Spiritualism, on the other hand, as a rule, leads to asceticism; it renounces the pleasures of the world, for it seeks the object of life in the deliverance of the soul from the fetters of the body. Monism rejects both views; it finds the purpose of existence in the constant aspiration of realizing a higher and better, a nobler, and more beautiful state of existence. Life is a boon so far only as it offers an occasion to improve that which lies in our power to change—the forms of things and the modes of life. It is not pleasure or happiness that gives value to our days, but the work done for the progress of our race. Moses expresses this truth most powerfully in a passage of his grand psalm, which we quote according to the forcible translation of Luther: "Man's life will last three score years and ten, or, at the best, four score; but if it was precious, it was of labor and sorrow."

Mere happiness will leave the heart empty, and the aspiration for happiness will make of man a shallow trifler. Asceticism, on the other hand, will prove destructive and suicidal. But if we consider the punctual performance of our daily duty, every one in his province, as the object of our lives, which must be done to enhance our ideals and help mankind (be it ever so little) to progress, we shall find occasion to unite the truths hidden in both,—the materialistic and spiritualistic ethics. We shall find sufficient occasion to practice abstinence, to exercise self-control, and to set aside the fleeting pleasures of the moment. At

the same time, while the pleasure-seeker will be wrecked in his vain endeavors, we shall experience that a noble satisfaction, which is the highest kind of happiness imaginable, follows those who are least concerned about enjoyment, and steadily attend to their duty.

CAUSATION AND FREE WILL.

Two views have ever stood opposed to each other in the realm of religious and philosophical questions: the one claiming absolute determinism in the province of causation as a matter of course for all phenomena of nature and life, human actions not excluded; the other maintaining that whatever be the claim of determinism in the province of physical science, man's actions are *not* determined, for man is endowed with free will. The former opinion is generally considered as the scientific, the latter as the moral or religious view.

It is apparent that the very existence of morals and religion depends upon man's having a free will, and at the same time that determinism full and unrestricted, without any exceptions, is the condition of all science. The conciliation of both views is indeed the fundamental problem of all ethics. The idea of a free will in contradiction to the necessity of natural law is the last and perhaps the strongest redoubt of dualism. Two well-established truths here face one another, and appear irreconcilable,—for the *ought* in our breasts, our moral consciousness, we gladly confess, is an undeniable fact. And this *ought*, or, as the great sage of Königsberg calls it, "the categoric imperative" in us, postulates that man is a moral being, and that he has a free will. This free will, men of a dualistic bias think, is irreconcilable with the idea of the unison of all truths, which is the basic doctrine of monism.

Dualism (*i. e.*, spiritual dualism) which takes the view that two worlds exist independent of each other, —the spiritual world and the material world,—does not object to determinism in the material world, but it vigorously asserts that free will obtains in the spiritual world.

Materialism, in opposition to spiritual dualism, claims that freedom of will is a sham, that man has no free will, because his actions are determined throughout by law.

If spiritual dualism is right, scientific truth has very little value; for science exists only in so far as natural phenomena are, by strictest necessity, determined with regularity, and do not happen according to hazard or chance. If materialism is right in saying that man's freedom of will is a self-delusion, it would be ridiculous to speak of morals, and ethics (the science of morals) would be a self-contradiction.

Prof. James, of Harvard University,* accepts the dualistic view as best adapted to a moral teacher. He says: "We postulate indeterminism in the interests of the reality of our moral life, just as we postulate determinism in the interests of that of our scientific life."

Monism accepts determinism wholly and fully. But from the same standpoint of monism, free will must also be accepted as the basis of moral life. We deny that the issue is determinism *or* free will. In opposition to spiritual and material dualisms, we propound determinism *and* free will. We maintain that moral truth and scientific truth, that religion and science, regularity according to law and free will, are not irreconcilable contradictions. They are oppositions complementary to and explanatory of each other. If one is con-

* In a letter to THE OPEN COURT, published in No. 33, page 889.

ceived without taking the other into consideration, our view will be one-sided and insufficient. Both together form the monistic view, in which science and religion find their reconciliation.

Religious teachers usually adhere to the dogma of free will, while the philosophers of "matter and motion" do not accept this doctrine, but proclaim it to be in contradiction to the unyielding law of causality. The religious teachers know, that if there were no freedom of will, ethics would not exist; for it is freedom that implies responsibility for one's actions. On the other hand, Materialism as a rule annihilates ethics at its root and establishes in its stead such rules of conduct as will ensure the greatest amount of happiness.

Now, according to the law of causality, the actions of man result through the same necessity as any event or phenomenon. It is a strange confusion to make of necessity and freedom a contradictory opposition, so that either would exclude the other. If a man can do as he pleases, we call him free; but if he is prohibited from following motives which stir him, if by some *restraint* or *compulsion* he is limited, he is not free. But every man, whether under certain conditions he be free or restrained, under exactly these and no other circumstances must will, of necessity, just as he does will, and not otherwise. As to this there is no doubt, if causality is truly the universal law of the world.

The actions of free will are just as much regulated by law as any other natural phenomena. The moral *ought* certainly involves a *can*. Two men under the very same conditions *can* act differently; but a man of a certain character and under certain conditions, if he is free, will necessarily act in accordance with his character and not otherwise.

Those who maintain that free will and determinism are irreconcilable contradictions start from the apparently slight but important error that *compulsion* and *necessity* are identical. They think that what happens from necessity proceeds from compulsion somehow. They overlook the fact that there is a necessity imposed from without as well as a necessity operating from within: the former acts by compulsion, from outward mechanical pressure as it were; while the latter works spontaneously, though necessarily, in accordance with the character of the man, constituting his free will. For instance, a man delivers to a highwayman his valuables because he is compelled to do so by threats or even blows; he suffers violence; his action is not free. But if a man, seeing one of his wretched fellow-beings suffering from hunger and cold through extreme poverty, and overpowered by compassion gives away all he has about him, this man does not act under compulsion. He acts from free will, but being such as he is, he so acts of necessity, in accordance with his character.

Where compulsion exists, free will is annihilated; but necessity need not be compulsion. Whoever is unable to make this distinction between compulsion and necessity, will never get a clear insight into the theory of free will. Necessity is the inevitable sequence by which a certain result follows according to a certain law. It is the internal harmony and logical order of the world. Compulsion, however, is an external restraint, and a foreign pressure exercised to check and hinder by violence. Give the magnet freedom on a pivot, and it will, of necessity, turn toward the north, according to the qualities or properties of magnetism. But if you direct it by a pressure of

the finger to some other point, you will exercise some compulsion, which does not allow it to show its real nature and quality. Were the magnet endowed with sentiment and gifted with the power of speech, it would say in the first case: "I am free, and of my free will I point toward the north." In the second case, however, it would feel that it was acted upon and forced into some other direction against its nature, and would declare its freedom to be curtailed.

It is the same with man; and the moral worth of a man depends entirely upon what motives direct his will. An ethical estimate of moral actions is not possible, except under the condition that they are the expression and realization of free will. Freedom is the *sine qua non* of morality and moral responsibility. But the best action would amount to nothing if it were a mere chance result which, like a throw at dice, might have occured otherwise. And if the free actions of man were not regulated by law, if free will meant that a man of certain character under certain conditions could act otherwise than he does, if free will were identical with chance, if, in a word, free will were indeterminism, this kind of free will would not only destroy science but morals and ethics also. The whole value of any moral deed rests on the fact that the man *could not*, under the conditions, act otherwise than thus, that it was an act of *free will*, and, at the same time, of inevitable *necessity*.

The interests of "moral life" and of "scientific life" thus appear from the standpoint of monism as two aspects of one truth, in which both find their explanation. The dualistic solution of the problem will prove destructive of both views; for dualistic science and dualistic ethics must in mutual annihilation play the parts

of the famous Kilkenny cats. Monism teaches that the moral view and the scientific view are two different aspects, although their object may be one and the same thing. A psychologist, a physician, or a lawyer may view the actions of a man from a scientific standpoint; and a clergyman, a preacher of morals, or a historian, or a biographer, or the critic of an author, may contemplate the very same actions from a moral standpoint. Should we then, in the former case, take to determinism, and in the latter to indeterminism,—or shall we, by excluding human actions from the province of determinism, entirely annihilate ethics as a science?

Indeterminism is unthinkable in science as well as in morals; it would make every action a morally indifferent and scientifically indeterminable phenomenon.

Free will and determinism do not exclude each other. Free will is the postulate of morals, determinism is the postulate of science. The actions of a free will are not irregular or without law; they are rigidly determined by the character of the man that acts.

FORMAL THOUGHT AND ETHICS

THE most remarkable treatise on ethics as a science is Immanuel Kant's "Foundation of the Metaphysics of Morality." (*Grundlegung zur Metaphysik der Sitten.*) He attempts in this little book to show that the rules of moral conduct can be based on an unalterable principle, which by rational beings can and must be recognized as being of universal application. Kant says:

"As pure mathematics is distinguished from applied mathematics and pure logic from applied logic, so may the pure philosophy (the metaphysics) of ethics be distinguished from the applied philosophy of ethics, that is, as applied to human nature. By this distinction of terms it at once appears that ethical principles are not based upon the peculiarities of human nature, but that they must be existent by themselves a priori,—whence, for human nature, as well as for any rational nature, practical rules can be derived."

We prefer to call Kant's Metaphysics of Morality* "Formal Ethics." Formal ethics is as truly the basis of applied ethics as for instance geometry is the basis of geodesy. Formal ethics is a science as demonstrable and plain as logic or arithmetic, and like the other formal sciences will find its verification and application in experience.

* We here briefly review Kant's ethics in so far only as we agree, and abstain from a discussion in so far as we do not agree. Some of Kant's ideas, and more so his terminology admit of criticism. For instance, his conception of freedom is vague, and his discrimination between man as *homo noumenon* or a moral being, and man as *homo phænomenon* or a physical being, can not be conceded in the sense he puts it.

Kant says:

"Will is conceived as a power of determining itself to action in accordance with the conception of certain laws. And such a power can only be met with in rational beings. Now it is the end that serves the will as the objective ground of its self-determination, and *this end, if fixed by reason alone*, must hold equally good for all rational creatures. * * *

"To know what I have to do in order that my volition be good, requires on my part no far-reaching sagacity. Unexperienced in respect of the course of nature, unable to be prepared for all the occurrences transpiring therein, I simply ask myself: Canst thou will, that the maxim of thy conduct may become a universal law? Where it can not become a universal law, there the maxim of thy conduct is reprehensible, and that, too, not by reason of any disadvantage consequent thereupon to thee or even others, but because it is not fit to enter as a principle into a possible enactment of universal laws."

Kant formulates his maxim in the following way:

"Act so as if the maxim of thy conduct by thy volition were to become a natural law."

If a maxim of conduct is fit to enter as a principle into a possible enactment of universal laws, it will be found in harmony with cosmical laws; if not, it must come in conflict with the order of things in the universe. It then cannot stand, and will, if persistently adhered to, lead (perhaps slowly but inevitably) to a certain ruin.

A will that as a matter of principle determines itself to be guided by reason alone, and thus to remain in unison with the order of the universe, Kant calls a *good will.* The command prescribed by pure reason is the "*categoric imperative.*" He calls it "categoric" because its behests admit of no exception, and are to be applied with rigid universality. Since there is only one kind of reason, there is only one measure or standard of morality, which must be the same for

all rational beings. A "*person*," according to Kant, is an individual who can be held responsible for his acts. A person can by the power of his reason regulate his action according to principles, and the subject-matter to which in special cases the categoric imperative obliges or binds us, is called "*duty*."

The enormous practical importance of formal thought appears here in its full significance. All formal truths are necessary truths; they possess universality, and therefore they can be employed as norms. In other words, they are ethological; they can be used as rules and constitute a categorical *ought*. Ethics is, as it were, the logic of man's conduct, and vice versa; logic may be considered as the ethics of thinking. Geometry is the ethics of measuring and arithmetic the ethics of calculation. Without formal thought and without the rigidity of the laws of formal thought, we could have no constitutive norms whatever, no basis for scientific investigation, no guidance for invention, and no foundation of ethics.

* * *

Before Kant arrived at his ethics, he had tried to explain morality from man's desire for happiness.* But he abandoned this idea entirely; and certainly, morals can not be identified with our desire for happiness, although it is true that immorality always causes much misfortune, and will, as a rule, lead to unhappiness. In fact, morals are preached in order to counteract the dangers of our desire for happiness. The high-road of virtue does not appear at all pleasurable, nor does it promise ever to become so, while the by-paths of vice are extremely pleasant to look upon, and many

* *Werke* viii, p. 676, and iii, p. 392.

of them will continue to be so for a long time, perhaps even to the end; and the end may be a sudden and painless death.

Happiness is like a shadow; if pursued it will flee from us; but if a man does not trouble himself about it, and strictly attends to his duties, pleasures of the best and noblest kind will crop out everywhere in his path. If he does not anxiously pursue it, happiness will follow him.

Happiness in itself, the quickened pulse of joy, the gladness of heart, and the laughter of our lips is a shallow and empty thing; it has no value, and the man who attended to his duty for the mere pleasure of having the consciousness that he has done his duty, would find his reward poor. He must attend to his duty for the sake of his duty, and he will realize that it is not happiness itself that blesses us, but the object which causes our happiness; it is not the joyous thrill as such, but the ideas, the hopes, the aspirations that joyfully thrill through the fibres of our mental existence. Accordingly, we should not so much care for happiness and for a great amount of happiness, but that our desire for happiness be satisfied with, and respond to, such motives only as possess moral value —such as are in harmony with the universal order of things.

* * *

Although we accept Kant's formal ethics as the basis of morality, thus attributing the highest authority in matters of conduct to reason, we do not in the least undervalue the importance of experience as a source of information concerning our moral aspirations. And although we maintain that, as there is but one reason, so there is but one standard of morality, we do not

deny that there are many different stages and innumerable aberrations in the moral development of mankind. The abstract conception of a good will is always one and the same, being the unison of will with reason, but the conception of that which is to be looked upon as good, must necessarily vary not only with the kind and amount of reason we possess, but also with the changeable demands of the circumstances in which we live. Different conditions require different duties; and to different duties different moral ideals correspond.

Usually we are inclined to judge the actions of men of past times from the standpoint of the moral ideals of to-day. But that is entirely wrong, and many apparently barbarous deeds are justifiable—even right, with regard to the circumstances and requirements of their era. If some hero of olden times had acted according to the higher and better ideal of these latter days, it would have been considered (and sometimes perhaps justly so) as weakness on his part. For though the ethical tendency is the same throughout, yet the evolution of ethical ideals shows different stages.

* * *

The innate qualities and talents with which nature endows certain individuals, and which therefore are justly called gifts, according to the theory of evolution, are faculties inherited from ancestors. The labor of former generations is not lost; its fruit has been preserved and handed down to the generation now living.

This fact has a profound ethical import!

There is nothing without work in this world. That easy and apparently effortless production which we admire in genius, is possible only through the inherited abilities acquired by the labor of ancestors.

The single individual, therefore, ought to be conscious of being the product of the labor of ages. And what he does, be it evil or good, will live after him in so far as his individuality impresses itself and influences his contemporaries. In consideration of this fact, man will think with reverence of the past, with regard for the future, and with earnestness of the present.

* * *

The categorical imperative of Kant appears as a norm or a regulative law which is of universal validity just as much as the norms of arithmetic or logic. All the rules of formal sciences have a normative, *i. e.*, a regulative value.

If they are rigidly applied, they will in all cases be found to be correct and to lead us to true results. The categoric imperative, however, (not unlike the norms of the other formal sciences,) is more than a mere regulative law; it is a natural law which rules the development of the world and is the cause of all progress in the history of evolution. We can verify its presence through an impartial observation of facts by experience.

Human society could not even exist, nor could it ever have risen into existence, if the moral 'ought' did not constantly prompt the majority of human minds to obey the behests of the categoric imperative. No society is possible unless it is founded upon the basis of morality.

Morality, although in a broader sense of the word, extends far beyond the province of rational beings. It does not only regulate the relations among them, it also creates the conditions from which they originate.

Cells possess all properties of organized beings:

alimentation, growth, and propagation. A mother-cell, having reproduced itself by repeated divisions, is still connected with its filial cells. All cells in their union are more fit to encounter the struggle for existence. Henceforth the work to be done for their preservation is divided and dispensed in such a way that some cells perform one, other cells an other function for the unity thus created. It is division of work, according to a general plan; and that is what constitutes an organism.

The single organ or limb of a body does no longer exist for itself but serves the idea of a larger unity of which it feels itself to be a part. The purpose, aim, and end of its existence is forthwith not in itself but in something higher than itself. This principle pervades all organized nature. Organisms cannot exist but under this condition. The relations of the different organs of an organism among themselves demand special kinds of work to be done, which, if the organs were conscious, we would not hesitate to call their duties. The organs of an organism, if in a state of health, obey this principle, and this principle is essentially a moral principle.

The same principle which produced organisms and animals, guides them in their further development; and only so far as any creature is animated by this ethical guidance, is it able to develop into some higher being. The moral principle is the star of Bethlehem that guides the foremost men of all human races to the cradle where a new truth and new duties are born and where the germs of new ideas are thriving.

The human body and the organism of society both rest on the same principle. The first higher unity is the family; families grow into tribes, and tribes form

nations. The love of parents has broadened into patriotism, and no doubt the next higher ideal will be that of humanity.

The next higher stage to which natural development ever tends is its ideal, and there will be no rest in the minds of the single individuals until this ideal is realized. After that, new ideals arise and lead us onward on the interminable, infinite path of progress, not as Darwin says, merely driven by the famous law of the struggle for life, but prompted by the strife for the ideal.

The ethical principle is no mere constitutional law, proposed by a legislature as fitted to serve the majority. It is, as we have learned, a natural law pervading the universe ; and a scientist must be blind to facts if he does not discover it. Even in the inorganic world, I venture to say, this law prevails, though in a broader sense. Gravitation out of a whirlpool of gaseous materials forms well-arranged solar systems. It is the law of order and unity which dispenses to different bodies the different parts to be performed. The law of gravity, as formulated in mathematical terms by Newton, is the ethical rule of primordial matter ; and if the single atoms of a nebula which are still rushing in different directions, could tell us their ideal, it would be that of a harmoniously regulated solar system. The chaos will clear, according to simple mechanical rules ; the ideal will be realized, and the general turmoil will give way to order.

* * *

This world is not a world of happiness, but of ethical aspiration. The essence of all existence is evolution or a constant realization of new ideals. True, it

is the struggle for life; but if you look at it more closely, is it really life that the progressive part of humanity is striving for? No, they sacrifice even their lives for some higher purpose, for their ideal. If we look upon the martyrs of progress, it would indeed be a strange contradiction to say that people are consciously sacrificing and losing their lives in a struggle for life.

The ideal is erroneously supposed to be an imaginary nonenity; or the illusion of an enthusiastic—perhaps even a morbid brain. An ideal, however, is a part of our soul, and it is such as prompts us to action, and can regulate all our conduct in life. The power and importance of ideals is greatly increased because it can easily be imparted to others in a few words. A martyr may die, but his heroism can at the same time be impressed on the minds of his very hangmen, so that the best part of his soul is implanted into their souls, and triumphs through the sacrifice of his life.

Ideals are the most intense realities imaginable. Physically considered, they are certain organized structures in a living brain. The mechanical work done by the combustion of the oxygen in a few drops of blood is extremely small, and how great, incalculably great, is the result obtained! Here is the *δός μοι ποῦ στῶ καὶ κινήσω τὴν γῆν** of which Archimedes spoke. The thinking of an ideal may not cost more expenditure of energy than 0.001 foot-pound, and yet it may revolutionize the world.

The ideal is no mere fiction, it is a power of reality, pervading the universe as a law of nature; and

* Translated: Give me a place to stand on and I will move the world.

with regard to humanity it points out to man the path of progress. Progress, if it is guided by the ideal, will produce new and better eras for humankind. And if a moral tendency were not the fundamental law of nature, there could not be any advancement, development, or evolution.

THE ONENESS OF MAN AND NATURE.*

ACCORDING to Monism man is a part of Nature, a part of the one great All, and the ethical import of Monism is based on the recognition of this idea of oneness. The barrier which in the opinion of dualistic systems existed between the ego and the rest of the world is broken down. The individual belongs to the whole as an integral part of it. The more fully, the more correctly and truly the cosmos† of the Universe is mirrored in a consciousness, the closer will be the union of the ego with the All, and the more moral the individual must become. The better a man understands the true connection of his soul with the souls of his fellow-beings, and the better he comprehends his right relation to the great whole of all-existence, the more will he conform to what he calls the laws of sociology and the moral rules of conduct. And the more he conforms to these conditions, the fitter he will be to survive in the struggle for existence.

This is, in outline, the ethical aspect of Monism, and this is the character of evolution also. The ethics of Monism can fitly be named Evolutionism, for evolution is possible only because the laws of the world in which we live, are a moral power. The Cosmos itself, the order of the world, is the foundation of morality. Properly speaking, we cannot say that the Cosmos, or the All, or God, is moral. This is an

* Written in answer to an essay of Mr. Moncure D. Conway.

† *Cosmos* literally translated means *order*.

anthropomorphic expression, which, in poetic speech, may be allowable, but is not correct. The truth is individuals are moral in so far as they conform with the Cosmos, in so far as they become one with the All and conform to its order, or humanly speaking, as they obey the laws of the whole.

Mr. Conway says:

"Where is any moral law found in nature except in man? Except in man, and in so much of the world as man has partly humanized, nature seems predatory, and cruelly impartial between good and evil, brier and the fruit—if not, indeed, favorable to the brier. May it not be more truly said that there is a moral law in man to which nature must conform in order to live well and be blessed?"

From the monistic standpoint man is the highest product of the All. Man is the blossom on the tree of nature, and humanity is its fruit. Man is grander and nobler than the rest of nature, as the blossom is a higher stage of evolution than the leaf. But a flower and a leaf, though they may be contrasted as the higher and lower stages of one and the same plant, cannot be considered as two essentially different beings. Thus human civilization, and the vegetable and animal kingdoms, can be viewed under the aspect of opposites, but not as contradictories. Both are products of the same tree, both are natural, and we shall find that in human society the same fundamental laws are at work as in the other natural kingdoms. Man by his higher qualifications conforms more quickly and readily to these laws. There is more truth in his conception of the universe than in the imperfect percepts of animal brains. Therefore he is more powerful, therefore he is more moral, and therefore fitter to survive in the struggle for existence.

These facts cannot be denied when we observe how man takes possession of the earth and how brutes and wild beasts are extirpated; how also among men the savage races die out, while the civilized nations conquer the world. And yet it is an every day's experience that the morally bad triumph over the good, and that the honest are worsted by the wicked. The possibility of falling into error is greater than that of hitting the truth: accordingly while one truth is born, hundreds of errors have occasion to arise. Errors multiply quicker than truth and the briers seem more fertile than the useful fruit-trees.

The truth of this is obvious, although the potency of wickedness seems to contradict flatly the former statement that morality makes man fitter to survive. Similarly, the fertility of error seems irreconcilable with the fact that truth is stronger than error and must survive in a world where the fittest will finally conquer. And if we experience, ourselves, the power of iniquity, if we personally suffer from the advantages which the wicked gain by their very unscrupulousness, we are but too much inclined to lose all confidence in the moral order of the world.

There have been and still are times of trial and tribulation in the development of entire nations as well as of single individuals, when it takes all our strength not to lose faith in ethics and in the worth of ethics. Even Christ cried out, in the agony of death, his *Eli, Eli, lama sabachthani.* "My God, my God, why hast thou forsaken me?" All the sages of humanity agree that it takes a strong character and the moral power of purpose, faithfully to endure in temptation and constantly to trust in truth and righteousness. There is sufficient cause for a lack of faith, and enough

occasion for following the path of vice and wrong-doing. Almost all aberrations from truth and justice appear pleasant and full of promise at the start, and the warnings of parents and teachers are easily forgotten. Nevertheless these aberrations lead to inevitable ruin, and although the righteous path may be thorny now and then, perhaps too often for our taste, we should nevertheless, difficult though it may be, never lose faith in the final triumph of truth and justice.

The spirited shepherd boy who became king of Judea sings in one of the psalms:

The wicked in his pride doth prosecute the poor.

His mouth is full of cursing and deceit and fraud; under his tongue is mischief and vanity.

He sitteth in the lurking places of the villages: in the secret doth he murder the innocent: his eyes are privily set against the poor.

He lieth in wait secretly as a lion in his den: he lieth in wait to catch the poor: he doth catch the poor, when he draweth him into his net.

He croucheth, and humbleth himself, that the poor may fall by his strong ones.

He hath said in his heart, God hath forgotten: he hideth his face; he will never see it.

And in another song the royal Hebrew poet gives an answer to his anxious doubts as to the apparent lack of justice in the order of the world. He says:

Fret not thyself because of evildoers, neither be thou envious against the workers of iniquity.

For they will soon be cut down like the grass, and wither as the green herb.

Cease from anger, and forsake wrath; fret not thyself in any wise to do evil.

For yet a little while, and the wicked shall not be: yea, thou shalt diligently consider his place, and it shall not be.

But the meek shall inherit the earth; and shall delight themselves in the abundance of peace.

The wicked plotteth against the just and gnasheth upon him with his teeth.

The wicked have drawn out the sword, and have bent their bow, to cast down the poor and needy, and to slay such as be of upright conversation.

Their sword shall enter into their own heart, and their bows shall be broken,

A little that a righteous man hath is better than the riches of many wicked.

The wicked borroweth, and payeth not again: but the righteous showeth mercy, and giveth.

I have seen the wicked in great power, and spreading himself like a green bay tree.

Yet he passed away, and, lo, he was not: yea, I sought him but he could not be found.

I have been young, and now am old; yet have I not seen the righteous forsaken, nor his seed begging bread.

Depart from evil, and do good; and dwell for evermore.

The righteous shall inherit the land, and dwell therein for ever.

David finds comfort in observing the eventual fate of the prosperous evil-doer,—for "a little while" and "he passed away and, lo, he was not."

The triumph of truth and virtue, however, is not such as to make their devotees wander through the pleasant vales of perpetual happiness. Just the contrary; the path of virtue and truth is often not easy to find and difficult to walk upon. "Strait is the gate and narrow is the way which leadeth unto life and few there be that find it." Similarly the Greek poet says:

Τῆς δ'ἀρετῆς ἱδρῶτα θεοὶ προπάροιθεν ἔθηκαν
Ἀθάνατοι· μακρὸς δὲ καὶ ὄρθιος οἶμος ἐπ' αὐτήν.

[Toil before Virtue is placed by judicious decrees of Immortals. Steep is the path to her heights and rugged the road to the summit.]

The evil consequences of error, folly, and crime, it is true, often come so slowly that it appears as if the

sinner would escape punishment. They come late, yet they are sure to come, as a Greek sage has said:

ὀψὲ θεῶν ἀλέουσι μύλοι, ἀλέουσι δὲ λεπτά.*

"Though the mills of God grind slowly,
Yet they grind exceeding small;
Though with patience he stands waiting,
With exactness grinds he all."†

The simple narrative of the crucifixion of Christ has impressed humanity so deeply because of the moral lesson is conveys. The most touching and sympathetic features of the holy legend must be found in the suffering which the God in man has to undergo. The divinity of man is a source of intense pain and tribulation. Our very ideals lead us into trouble and temptation and even into the darkness of death. And yet we should not despair; we should preserve our faith in truth and righteousness. It is this lesson which made of the tragedy of Golgotha, a gospel and glad tidings to the struggling and despairing human race.

It is true, that with the new revelation of Christianity *per crucem ad lucem*, which showed that the path of righteousness leads through suffering, and that only a crown of thorns can become a crown of glory—errors arose which retarded or seemed to retard the general progress of truth. The same had happened to Buddhism. Its true ethical idea was soon overgrown and smothered by errors. Buddha himself, and in a similar manner Christ himself, opposed the dualistic and pessimistic conceptions of their forerunners,

* Sextus Empiricus.

† The English version by Longfellow is a translation of Friedrich von Logau's epigram:

Gottes Mühlen mahlen langsam,
Mahlen aber trefflich klein;
Ob aus Langmuth er sich säumet,
Bringt mit Schärf' er Alles ein.

the one of the Sankya philosophy, the other of the Essenes. Both for a time observed the prescripts of the sects from which they arose. Then both opposed the Asceticism practiced by their predecessors without falling into the error of hedonism. Both rejected fasting as injurious to body and soul, both left the abodes in deserts and abandoned monkish habits. They lived as men among men, they sat down at table and ate and drank with the sinners. The disciples of St. John therefore began to grow doubtful as to the divine mission of Jesus. They sent word to him and asked: "Art thou he that should come or do we look for another."

Christ, as well as Buddha, represents a reaction against pessimism. It was the start of a new faith, a new hope, a new religion, a religion that should bear the features of meliorism. These melioristic features in Christian ethics, which beam forth in Faith and Hope and Charity, have been the strength of Christianity and did most for its propagation. It is the Christian faith that conquered the world, not the pessimistic and world-despising despair of its dualism.

The tares grow with the wheat, and errors freely sprout where a new truth is conceived. Errors multiply and increase more luxuriantly than truth does. And yet it is only for a while; they will pass away and truth will stand forth victorious.

It was again the Christian faith, the melioristic feature of Christianity, that proved a regenerative power in the time of the Reformation and led humanity one step nearer to a monistic, a unitary, and a harmonious conception of the All. It is faith in ethics and confidence in our ideals that, by an abandonment of creed, will lead humanity to the purer heights

of a nobler conception of life and a more elevated existence on earth.

The ethical aspect of Monism has been brought to light more strongly by the recent investigations of experimental psychology, which have been instituted in France by M. Th. Ribot and other investigators. The modern psychology of M. Ribot agrees well with the monistic view that has been propounded by German scientists. The dualistic conception, that there is at the bottom of the soul such a thing as an ego, has been proved to be wrong. The ego, or the state of consciousness, is not an entity which produces our mental life; on the contrary, it is the result of the innumerable and complicated nerve-organisms in our body. The thoughts we think are the elements of which our mental life consists. Our mind is *de facto* a republic of ideas, of which now the one and now the other is called into activity. The unity of mental activity is no proof of Descartes's view that the soul is a simple being; for the unity of the mind is now considered as resulting from a rich and complicated system.

The ego of our consciousness is concentrated and centralized, according to M. Ribot, in a similar way as our sight is focused in the lenses of our eyes. Prof. Mach compares the personality of an individual to an indifferent symbolical thread on which are strung the valuable pearls of our real existence.* These pearls are the ideas which that entered into our brains. The ideas that live in us are our true Self. These ideas we have received from others and we communicate to others. These ideas, in so far as they are ideals, warm

*Prof. Ernst Mach, "Transformation and Adaptation in Scientific Thought." THE OPEN COURT, Nos. 46 and 48.

our hearts and keep aglow our enthusiasm so as to make life worth living; for life is only worth living if we aspire towards something that is greater and nobler than our limited ego. These ideas in so far as they are the essence of what we call humanity, make of every single man a representative of mankind.

Thus the barrier between the ego and the great whole of the All is broken. Prof. Mach* says: "Humanity in its entirety is like a polyp-plant. The material and organic bonds of individual union have, indeed, been severed; they would only have impeded freedom of movement and evolution. But the ultimate aim, the psychical connection of the whole, has been attained in a much higher degree through the more luxuriant development which has thus been made possible."

The individual man is ethical by his Oneness with humanity, and humanity is ethical by its Oneness with Nature. If humanity would cut itself loose from Nature in which its origin lies and which affords the condition of its existence, it would die away and wither like a tree that is severed from its root. Humanity as a whole, as well as the single man, can live and grow, advance and prosper, only by remaining one with the All, by being moral; *i. e.*, by observing and conforming to the cosmical order of Nature.

ETHICS AND NATURAL SCIENCE.

THE beginning of ethics is *thought*. The animal who cannot think or reason cannot be called an ethical being. When man begins to think, he commences to understand his relations to others and thus learns his duties. He formulates his duties in general principles and regulates his actions according to maxims of universal application. In this way only can he place himself and his life in harmony with the order of All-existence.

When we reflect a moment upon what we owe our ancestors, we shall soon find that we owe them all we have and even more: we owe them all we *are*. What are we but the accumulated activity of all our ancestors from the very beginnings of life, the moner and the moner's struggles for existence included? Our nineteenth century civilization is not a revolution which has introduced any new idea that inverts or destroys the thoughts, ideas, or aspirations of former centuries. The most advanced view, however different from the old views, is a further evolution of the past.

The recognition of this truth is the essence of historical research, and those who are most advanced in the culture of true progress, who acknowledge the principle of scientific investigation in ethics and religion, those who are decided to modernize their mor-

als and adapt themselves to the spirit of the dawning future, should be the first to understand this truth. Yet many radical thinkers overlook it. Through their opposition to the errors of the past they become blind to its merits. Only by understanding the connection of the present with the past will they be able to do justice to the cause which they defend, for they can gain justice for themselves only by doing justice to others, and the just claims of the present can only be established by showing that they are the logical outcome of the past.

Ethics is not, as some modern philosophers try to make us believe, an arithmetical example by which to calculate how we can purchase, at least sacrifice, the greatest amount of happiness. This barter morality of hedonism is a pseudo-ethics which indeed would make true ethics impossible.

The pseudo-ethics of hedonism starts from the wrong idea that man lives solely for being or becoming happy. If this were true, the great pessimist Schopenhauer would be right in saying that life is a failure and that existence is not desirable because a life without trouble and pain, a victory without battle, a conquest without wounds and anxiety, are impossible. Ethics is so much at variance with man's craving for happiness that if man lived merely to be happy there would be no ethics whatever. Ethics indeed is taught to counteract the dangerous, although perhaps inborn and natural, craving for happiness.

The beginning of ethics is to reflect upon ourselves, our surroundings, and our actions. Before we act we must stop to think. The brute animal follows his impulses; so does the savage. The thoughtful man takes into consideration all possible results of his

action; and however dimly at first, he soon learns that his person is intimately connected with his surroundings, with his fellow-beings, and with nature.

Even a savage knows that he is no absolute entity, no unit by himself. His very existence is the product of his parents, and his life is sustained through certain natural conditions by a constant struggle in which he is aided or hindered by his fellow-men. His relation to his fellow-men, and his dependence upon nature which yields to him substance that maintains his life, teaches man that he has some duties to perform, which if neglected will prove disastrous to himself and his fellow-beings. The *relations* in which man stands to others imply *duties;* and the man who attends to these duties is moral.

When man earnestly attends to what he recognizes as his duties, he will progress and in consequence thereof his comfort and prosperity will increase. His pleasures will be more refined; his happiness, his enjoyments, and recreations will be better and nobler.

The increase, or rather refinement of happiness, however, cannot be considered as the ultimate aim of ethics, for pain and affliction increase at the same rate, because man's irritability, his susceptibility to pain, grows with the growth of his intellectuality.

The pain of a more civilized man will be more intense than that of a savage, and it is an undeniable fact that people of a lower degree of culture are as a rule merrier than the more educated classes. There is sufficient occasion in this country to observe the glad and hearty happiness of the negro, who is so easily satisfied. In comparison with the African the more cultured American of European ancestry must appear morose.

If all the advancement of our civilization had no other object than to produce a greater amount of happiness, the anthropoids would have better remained in their forests and have lived upon the tropical trees, subsisting on their fruit. They would thereby have better attained this end. Therefore we maintain that the elevation of all human emotions, whether they are painful or happy, the elevation of man's whole existence, of his actions and aspirations, is the constant aim of ethics.

* * *

THE hostility which prevails between scientists on the one side and moral teachers on the other is produced through a misunderstanding. The moral teacher, and especially the clergyman, is afraid lest science undermine the principles of ethics. The doctrine of the survival of the fittest appears to contradict the principle of morality. And the scientist in his turn does not find the moral law as it is commonly preached in the pulpit, justified in nature.

Professor Huxley says:

"From the point of view of the moralist the animal world is on about the same level as a gladiator's show. The creatures are fairly well treated, and set to fight—whereby the strongest, the swiftest, and the cunningest live to fight another day. * * *

"In the cycle of phenomena presented by the life of man, no more moral end is discernible than in that presented by the lives of the wolf and of the deer. * * *

'As among these, so among primitive men, the weakest and stupidest went to the wall, while the toughest and shrewdest, those who were best fitted to cope with their circumstances, but not the best in any other sense, survived. * * *

Professor Huxley undervalues the use of morality in the struggle for existence. Man survived not because of his toughness, or his shrewdness, but because

of his moral qualities. The antediluvial fox was perhaps shrewder, and the lion or bear tougher, than the prehistoric savage or man-ape; but they were lacking in the moral faculties which bind single individuals together with the ties of love, of family, and of friendship. Moral feelings, or rather the capacity and conditions of the growth of moral feelings, the tendency to reveal moral qualities, made the primitive man sociable. A social animal develops more morality than solitary beings, and the shrewdness of a social being becomes intelligence

Intelligence is more powerful as a weapon in the struggle for existence than shrewdness, because it does not lack in morality; it is more in unison with the cosmic order. Human speech is the product of intelligence and not of shrewdness. Man was able to develop speech only because he was moral enough to be social, and this morality elevated man above the rest of the animal world. Among savage tribes the most intelligent and *not* the shrewdest survived.

It is an undeniable fact that in any given district the tribes who were lacking in morality, even when the very shrewdest and toughest, had to go to the wall, while in the end the more moral remained victorious.

It is a wrong historical view to imagine that the Romans conquered the world because they were shrewder, stronger, and more ferocious than their neighbors. They conquered the world because they possessed in addition to strength a rare moral quality —the quality of justice. With regard to their exercise of justice, indeed, they were by no means perfect; but they were more advanced, more moral, and better in this respect than any other nation of their time, cul-

tured Greece not excepted. Yet even the strength of the Romans was not the physical force of a ferocious bull; it was the moral strength of courage.

It will thus be seen that morality affords the power to survive, and if the primitive savage was not moral in the present acceptation of the word, he was in his time relatively the most moral being on earth, and this gave him more strength than toughness or shrewdness could ever afford.

Prof. Huxley declares in other passages of the same essay:

"The history of civilization—that is, of society—on the other hand, is the record of the attempts which the human race has made to escape from this position. * * *

"But the effort of ethical man to work toward a moral end by no means abolished, perhaps has hardly modified, the deep-seated impulses which impel the natural man to follow his non-moral course." * * *

Professor Huxley adds with special reference to the civilization of the English nation of to-day:

"We not only are, but, under penalty of starvation, we are bound to be, a nation of shopkeepers. But other uations also lie under the same necessity of keeping shop, and some of them deal in the same goods as ourselves. Our customers naturally seek to get the most and the best in exchange for their produce. If our goods are inferior to those of our competitors, there is no ground compatible with the sanity of the buyers, which can be alleged, why they should not prefer the latter. And, if that result should ever take place on a large and general scale, five or six millions of us would soon have nothing to eat. We know what the cotton famine was; and we can therefore form some notion of what a dearth of customers would be.

"Judged by an ethical standard, nothing can be less satisfactory than the position in which we find ourselves. In a real, though incomplete, degree we have attained the condition of peace which is the main object of social organization (and it may, for argument's sake, be assumed that we desire nothing but that which

is in itself innocent and praiseworthy—namely, the enjoyment of the fruits of honest industry). And lo! in spite of ourselves, we are in reality engaged in an internecine struggle for existence with our presumably no less peaceful and well-meaning neighbors. We seek peace and we do not ensue it. The moral nature in us asks for no more than is compatible with the general good; the non-moral nature proclaims and acts upon that fine old Scottish family motto, 'Thou shalt starve ere I want.' Let us be under no illusion, then."

If the unitary conception of the world is true, that all existence is but one great continuous whole; that all difference is but variety in unity; that one truth is in harmony with all other truths as every part of existence is related to the whole existence of the One and All:—if this is true, how can there be a difference between the moralist's and the naturalist's views? Should we not declare *a priori* that there can be no contradictory truths? Either the naturalist or the moralist, perhaps both, are wrong.

With all due respect to the facts presented by Professor Huxley, we must object to the conclusion at which he arrives. Professor Huxley's view of morals is based on the error that the wolf is immoral while the sheep is moral. The strong one is supposed to be an evil-doer, simply on account of his strength, while the weak one is supposed to be *good* simply on account of his weakness. Not the hero is glorified that "fights the good fight of faith," but the martyr that allows himself to be slaughtered without resistance.

This ethics has long been fostered by Christian moralists, because unfortunately Christ was compared to a lamb that is sacrificed, and because, in one of his allegories, Christ compares the good to sheep whom he will place at the right hand. The allegory is misinterpreted. It is not the weakness, not the inactivity,

but the purity of the sheep that is approved by Christ. How much is blamed, in another parable, the inactive and cowardly servant who buried the talent that was entrusted to him!

This ovine morality has detracted much of the pith and strength from Christian ethics. It has made it tame and weak and even despicable. Morality is not as many lamb-souled moralists pretend, the negative quality of suffering; morality according to modern ethics is the positive virtue of energetic activity. Ours is, as the scientist correctly states, a struggle for existence; and those who consider it meritorious to succumb to injustice and violence justly go to the wall. Their enemies, unjust though they may be, are comparatively more moral, for they are their superiors in the virtue of courage which gives them strength and power.

Prof. Huxley describes how the moralist, in the effort to restore harmony, tries to account for the iniquities in this world. He says:

"From the theological side, we are told that this is a state of probation, and that the seeming injustices and immoralities of Nature will be compensated by and by. But how this compensation is to be effected, in the case of the great majority of sentient things, is not clear. I apprehend that no one is seriously prepared to maintain that the ghosts of all the myriads of generations of herbivorous animals which lived during the millions of years of the earth's duration before the appearance of man, and which have all that time been tormented and devoured by carnivores, are to be compensated by a perennial existence in clover; while the ghosts of carnivores are to go to some kennel where there is neither a pan of water nor a bone with any meat on it." * * *

This would indeed be a consistent consequence of a soft-brained and weak-hearted system of ethics, which praises the innocence and meritoriousness of

mere suffering, and depicts as the ideal of morality a millennium of eternal peace, where the struggle for existence is unknown, where no labor or painstaking is necessary and all time is spent in the glorification of an all-wise Creator.

Such a state of absolute perfection is impossible and we must smile at the ingenuousness of those philosophers who pretend to teach modern ethics and still adhere to the old millennium idea of a life of perfect adaptation where universal happiness will prevail.

The error in this Utopian idea is easily seen if we understand that the struggle for existence is inherent in nature. The struggle for existence is not only not in contradiction to ethics, it is on the contrary its most important factor, which must be taken into consideration and *is* taken into consideratien by the monistic view of ethics. The old ethical view demands that man shall not resist evil; that he shall leave off fighting and humbly allow himself to be trodden under foot. But the ethics of monism does not make man unfit for life, it renders him fitter in the struggle for existence. It teaches that so long as we are in harmony with the One and All of nature, so long as we remain in accord with natural laws, we shall be best able to resist evil. And this we can only do by constantly exercising our faculties and strengthening brawn and brain for the continued struggle,—which will cause us, it is true, much trouble and uneasiness, but at the same time will raise us to a higher level; it educates us and enhances the work of our existence.

The moral law is a natural law, it may be contrasted to, but does not stand in contradiction with, the other natural laws of a lower order. The deeper we investigate the more we shall be convinced that

benefits acquired by injustice will prove to be injurious in the end: very often they are even the beginning of ruin. Truth and justice are the most powerful weapons in the struggle for existence. Truth and justice will always conquer in the end. It often takes more time than the life of a single individual to see the triumph of truth; but we can be sure, even if the defenders of truth and justice die, if they succumb to their immoral enemies, that truth and justice will survive.

It is the belief in truth and justice which lies at the bottom of the old religious and ethical views. This belief was a faith, but took the shape of a creed. The moral quality of a religious virtue soon ossified as a system of dogmas. It was mixed with superstitious notions, with anthropomorphic ideas, and with unwarranted phantastical expectations of a compensation in a supernatural Utopia. It grew powerful because, after all, it was more in harmony with truth than the views of those who saw only the surface of natural facts and could detect no order and no moral law in nature. But it became intolerable through the errors taught and the wrongs committed.

If, now, new ideas triumphantly break their way, let us remember that the new ethics and the religion of the future do not come 'to destroy, but to fulfil.' The present is the product of the past and the future will be the product of the present. A Latin proverb says, *Sic nos non nobis!* It is we who stand here as the representatives of humanity, but it is not for ourselves, nor for the gratification of personal vanity. It is we of the nineteenth century, but not by the wisdom of the nineteenth century, which would not exceed the wisdom of former ages if it were not benefited by their

experience. Nor do we work and struggle to benefit ourselves. As our ancestors worked and struggled for us, so we have to struggle and fight for future generations.

Sic vos non vobis! Bear in mind it is you who work for the advancement and elevation of the human mind. But it is not you or you alone that you aspire for; it is humanity which is represented in you.

All life on earth forms one great, unbroken chain, one continuous whole, the unity and law of which we comprise in the formula of evolution. Let us regard ourselves as the representatives of this great whole, let us faithfully act according to this view and we need not trouble for the rest. Our actions will be moral and we shall at the same time be allied to those powers of nature which grant the strength of survival and represent advancement, progress, and the elevation of humanity. This ethics is in harmony, not at variance with natural science, and this is not the destruction but the fulfilment of the old religious faiths and their ethical aspirations.

CHRIST AND HIS ETHICS.

CHRIST and Christianity are radically different; and if the Christ of the Gospel were to come unto his own, his own would receive him not.

Christ was the Copernicus of Ethics. Naturally man believes that his ego is the centre around which the world revolves. The heathen hope by prayer and offerings or abject worship to gain the favor of God, as if they could deflect the sun and the stars from their paths in order to gratify their wishes. Christ revised the apparent order of things and taught that the ego was not the centre of existence; we cannot make God conform to us, but we ourselves must conform to God. He forbade therefore "the vain repetitions as the heathen do," and ordained a prayer the tenor of which is characterized in the sentence '*Thy* will be done.'

Our relation to the sun and centre of our moral life, Christ conceived under the allegory of a child to a father. Him we should imitate, and as he acts, so we should act. "Be ye therefore perfect even as your father which is in heaven is perfect."

Christ did not teach (as did at his time the Essenes and afterwards anchorites and ascetic monks) the annihilation of the ego, but he did teach resignation of all egotistic pretensions. He demanded unreserved surrender of self not for death but for life, not to destroy the souls of men into everlasting perdition but

to preserve them, to comfort and heal them, to save them.

The question of worship, whether God is to be adored in the Jewish or Samaritan fashion, had become immaterial to him. God, he said, is spirit,* and those who worship him should worship him in spirit and in truth. The worship in spirit and in truth is no self-humiliating cult of adoration. Christ recognizes as his disciples not those who say, 'Yes, Lord,' but only those who do the will of his father in heaven.

It seems to be the fate of great men that their followers dwarf their ideas in proportion to the homage paid to their persons. It is certainly easier to worship Christ than to obey his commands. It is, however, our duty not to obey blindly, but to prove everything, to discard erroneous notions, and to hold fast to that which is good.

This Copernican transfer of the centre of our actions from the ego to the moral law, it seems, was the basis of Christ's doctrines. In the strength of this legitimate demand we must find the key to the success of Christianity, and we trust that it will be seen to be its surviving truth.

*The original text reads "God is spirit," πνεῦμα ὁ θεός, not as our translators have it, "God is *a* spirit." The introduction of the article "a" perverts the whole passage and changes a most radical conception of God into a spiritualistic view, making God a ghost.

NO CREED BUT FAITH.

By creed we understand a summary of the articles of religious belief, and by faith a trustful confidence in something or some one that we are convinced is good and true. Creed is dogmatic; faith is moral. The creeds of the world are contained in the many Credos in the doctrines of the different religions; faith is enshrined in human hearts. Creeds are dead letters; faith is the quickening spirit.

The religious problem of to-day will find its simple solution in the sentence: No creed, but faith. Let us have faith in the moral order of the world, the faith of a grain of mustard seed, and without swerving live and grow accordingly. Let us have faith in our ideals of Truth and Beauty and Goodness. If we have no faith, how can our ideals be realized? How can the tree grow if the seed be dead?

Faith in Hebrew is *amunah*, which means firmness. No credulity is wanted, but steadiness of character. Faith in Greek is πίστις, which is etymologically the same word as the Latin *fides* and the English *faith*. The verb πιστεύειν does not signify to believe, but to trust. So long and in so far as Christianity was a living faith, it was truly human and progressive. But as soon as priestcraft prevailed and identified creed with faith, the religious spirit lost its life; it became a reactionary power, for it was fossilized into the letter that killeth; and instead of faith credulity was enthroned as the

basic virtue of a religious life. Not truth ascertainable and verifiable by scientific investigation was accepted as the basis of religion, but certain unverified and even absurd doctrines, which were established as self-evident axioms. Science was pooh-poohed like Cinderella as worldly and ungodly, whereas by rights it should hold the torch to faith lest it walk in the path of superstition or other errors.

Three days after the crusaders had taken Antioch (June 3, 1098), Kerbogha, the Emir of Mosul, arrived with an army which was in almost every respect, and especially in numbers, superior to the Christians. He invested the city and cut off all supplies. Famine and sickness caused great havoc, and many goodly knights, among them even prominent leaders, such as Count Stephen of Blois, deserted in great despair. The whole army seemed to be doomed to die by the sword of the Moslem or to be starved. In this plight Peter Bartholomew, a Provencal of low birth, came to Count Raymond and declared that St. Andrew had shown him the holy lance that had pierced the side of Christ, and that it lay buried in St. Peter's Church of Antioch. The search began at once; twelve men dug a whole day, and in the evening a lance was really found not far from the altar. The lance being found, the crusaders began to have confidence again. Under the command of the circumspect and brave Boemund, they went out to do battle. Although worn out by fatigue and famine, they were confident that the holy lance would lead them to victory, and full of enthusiasm they beat the Emir so that his great army was soon scattered to the winds.

The story of the holy lance, it was soon discovered by the more sober Normans, was an imposture, but

among the sanguine-minded Provencals the belief in it had worked wonders of prowess and made the apparently impossible an actual fact.

There may be a living faith concealed in a foolish superstition. It is not the error, not the superstition that works wonders, but the faith that lives in it. No victory, no virtue, no strength, without at least a grain of faith, be it ever so much mixed with false notions. False notions are a disastrous ingredient in faith, and unless in time discarded, they will and must lead into danger. For weak souls, an alloy of truth and error may serve as a substitute for pure truth; but it is truth alone that can make us strong and free.

Creed rarely can stand criticism, but faith can not only endure and survive criticism, it should even invite it. Criticism may destroy all creeds, but it will never destroy faith, and if it could, it would take out of life that which alone gives value to it. It would take away our ideals, our hopes, our aspirations, and the purpose of life. Life would be empty and meaningless.

Christ said:

"Verily I say unto you: If you have faith as a grain of mustard seed, you shall say unto this mountain, Remove hence to yonder place and it shall remove; and nothing shall be impossible unto you."

The instance of the crusaders' victory over Ker bogha is an example of how powerful faith can be, even though closely interwoven with superstition. It was not the superstition, however, that gave strength to the crusaders, but the moral faculty of confidence closely connected in this case with superstition. Great minds can exercise the same self-control and perform the same deeds, even greater deeds, without the

assistance of superstition. It can be said of weak minds only, that superstition serves as a support to faith. It is true, that if well directed, it can give to a child the self-confident strength of a man. But woe unto us if we mistake superstition as genuine faith.

Our faith must not be blind, but rational; it must be based on exact knowledge, and it is our duty to purify it by critique and to harmonize it with science.

The reconciliation of moral ideals to knowledge, of religious faith to science is not of to-day nor of yesterday. Ever since humanity has aspired to progress and to increase in wisdom as well as in power, there has been a constant readjustment of the relation of these two factors. The prophet Hosea says:

"Hear the word of the Lord, ye children of Israel: * * * My people are destroyed for lack of knowledge. Because thou hast rejected knowledge, I will also reject thee."

It is lack of knowledge, or as we would now say, of science, that threatens to be destructive. If our clergy do not cease to preach creed, if they oppose science because it is in conflict with their creed, they will no longer remain priests of the Almighty, *i. e.*, of the moral power that leads humanity onward on the path of progress. They will deteriorate into a caste of time-servers and hypocrites, for they are lacking in the faith of the grain of mustard seed, which is the power of growth and progress.

Superstitions have under exceptional conditions, in the days of man's childhood, served as substitutes for faith; but we should learn that they are not the living faith itself nor do they add to the strength of faith. They rather detract from its vigor, its purity, and its nobility. Superstitions and the lack of knowledge will ultimately lead to perdition. On the other hand we

should learn that our faith, our confidence in the truth of moral ideals, is by no means subverted if the superstitions incidentally connected therewith are recognized as illusions. Science of late has done away with many errors which had grown dear to us, but it has not and never will do away with our ideals of Truth, Beauty, and Goodness. It has rather taught us the laws according to which they can more and more be realized. Ideals evolve and change and, upon the whole, they progress and are improved.

If the grain rots in the earth we no longer fear that it is lost. We now know that the transformation is no sign of decay but of growth and as the husks of our superstitious notions are breaking, a new faith bursts forth which will be wider and broader, purer and greater than all the old creeds with their narrow sectarian convictions. Dogmas will be forgotten, but Religion will remain. All the creeds will die away, but Faith will live forever.

THE IMPORTANCE OF ART.

MANY scientists and, to a great extent, business people also look upon art and poetry with a certain contempt. There are philosophers even who have no room for art in their systems or consider it as useless play—as a sport which properly should not exist, as it does not serve any real purpose.

This view of the subject is entirely erroneous and does not agree with the facts of real life. Art, and especially poetry, serve a real and good purpose in life, and are, almost as much as religious impulses, exceedingly strong. Religious sentiment induces men to sacrifice their lives for an idea, and poetical enthusiasm, in extraordinary cases, lacks very little of attaining a similar power.

Religion and patriotism have no better ally than poetry. When the Spartans waged a luckless war with the Messenians, they sent to the oracle at Delphi and requested help from their patron God, the God of light and of poetry. Apollo sent from Athens, as the legend goes, a lame school-master. But this man of seemingly little promise proved a great power,—for he was poet.

The famous verses of Tyrtæus, fragments of which are still preserved, became the leading motto of all the patriotic battle hymns in later ages, which inspired thousands and hundreds of thousands of warriors to sacrifice their lives for their country. To a great

extent the sacrifices must be accounted for by a love of home and freedom. But these sentiments, no doubt, were often kindled by the glowing flame of poetry.

The influence of poetry in almost all domains of human life cannot be doubted. It is the very soul of our emotional aspirations in love, in patriotism, in religion. Poetry possesses a power directive of human passions, which may and often does lead to the elevation of human souls. Poetry is the natural vehicle for ideals. An ideal is a conception or idea of such a state of things as does not yet exist, but the realization of which is fostered in our aspiration. Poetry contains in the crystalized shape of verse certain ideas which appeal to our hearts and stir our emotions as well as our sympathies.

The harmony which obtains in versified speech makes it more impressive, so as to enter more easily into and to remain better fixed in our brains. In this way certain ideas, poetically formed and conveyed, may attain such a wonderful power as to make people stake their lives for their realization, and accordingly it is not strange that poetry was credited with potentialities and qualities that are superhuman.

Poetry in a certain sense is indeed superhuman, although it is not supernatural. The ideas often take hold of the poet, they arise in him and he seems aware of the fact that it is not he who governs them, but that they govern him.

Poetry is a formative power by which the views of whole nations are built up. 'Homer and Hesiod,' as an old verse declares, 'have given Greece her gods.' They shaped the Greek myths and ideals and exercised a decisive influence upon the literature, religion, ethics, and politics of their nation. Goethe's and Schiller's

poetry told more powerfully on the formation of modern German thought than the works of all scientists and philosophers. Kant's influence on the masses is greatly due to Schiller, who confessed himself a disciple of the great thinker of Königsberg and allowed himself to be swayed by his philosophy.

If poetry is not sound, its influence is harmful. It is a fact, that after Goethe's *Werther* was published and eagerly read in Germany, suicides increased to an annual average never before reached ; and this was due to the weakening sentimentality of this one novel, which in spite of many great features is morbid to the root.

Woe to the nation whose poetry is rotten ! If poetry has grown immoral, it is the worst symptom of as peedy decay.

Germany's literature was full of promise in a time when her political prospects were extremely poor and almost hopeless. But those who saw more than the outside of things predicted her future glory. The German oak was stripped of its leaves, but the sap was sound and thriving.

There are wonderful prophesies in the German folk-lore legends, of the renewal of the German Empire and the resurrection of Frederic Barbarossa. There are prophetic poems by Rückert, Geibel, and others, which have been fulfilled beyond expectation almost literally. There is a passage in Heine's works, published in the *Salon*, originally written in French and for the French, in which the German poet tells his friends in France what the German nation will be like, if she should again be provoked to fight for her homes, her liberty, and her ideals. If she is roused, Heine said, her energy

and warlike spirit will swoop down upon her enemy like a thunderstorm.

The poet is prophetic, not only because the finer nerves of his mind are quicker to understand the signs of his time, but also because his poetry is going to tell on the development of the nation. It is a strange fact, that Schiller's dramas severally forboded the events of his time. He wrote the *Räuber*, characterizing the rebellious spirit of an entire overthrow of society, and the French Revolution ensued. Then he wrote *Fiesco*, which depicted the powerful mind of a princely usurper his daring boldness and final failure, and a figure like Napoleon appeared in Europe. After *Fiesco*, he wrote *Wilhelm Tell*, the drama of national fraternity and liberty, and the *Jungfrau von Orleans*, in which he praises the marvelous delivery of a nation from a foreign yoke. Also these dramas prophetically proclaimed the suppression and the rising of the German nation, her wars in 1813–1815 and even the foundation of the Empire in 1870.

Such verses as:

Seid einig, einig, einig!

and:

So lasst uns sein Ein einig Volk von Brüdern
In keiner Noth uns trennen und Gefahr.
(Let us unite like brothers, as one nation
That undivided stands in time of danger.)

exercised on incalculable influence on the German mind, which as long as this influence lasts will keep her strong and healthy and which is of greater import than her bayonets and guns.

Washington Irving has somewhere said, that it is easier to fight many battles than produce one national poem. And certainly the procreation of a healthy national literature, impregnated with great

ideals and a moral spirit, is the most essential *desideratum* for the future welfare, growth, and progress of our nation. America is famous for her wealth and the American often boasts of it. Wealth is a good thing in good hands but it is a dangerous and doubtful boon in the hands of indeliberate persons, it is certain ruin and poison in the hands of libertines and slaves of passion. More important than wealth is the store of ideas, especially those ideas which are ideals, those which serve to lead us onward on the path of progress.

TRAGEDY AND THE PROBLEM OF EVIL.

ART is no mere trifling and playing, attractive and charming though its works may be. Its object is grand and serious, and its aim is not inferior to that of science.

Art and science both reveal the secrets of nature, but they adopt different methods. While science inquires into the various provinces of nature under the guidance of induction and deduction, art, intuitively grasping the idea of the whole and representing nature in single examples, gives a clew to the enigma of the world.

Every object of art is a microcosm—a little world in itself, which means, it forms an orderly arranged unity. Unity is the first and principal rule of art, which by all variety should never be neglected in any artistic production. The rule of unity teaches us that there is law and order in the microcosm of an artistic representation and at the same time suggests that the same order can be found in the macrocosm. In the creations of his imagination the artist explains the problem of the world. In his works every part must be understood through the whole, and the whole is revealed in its parts. Thus in the world and in life every single thing or being, its form, its aspect, its purport, must be interpreted as a part of the whole or as one

phase in the development of All-existence. With this in mind, the Romans called a poet *vates*, seer or prophet. The poet is a priest of humanity. And, truly, of every real artist and poet one must aver, as Goethe makes Wilhelm Meister say about Shakespeare, "It is as though he revealed all the secrets of life, and yet one cannot say that this or that passage contains the solution of the riddle.'

Poetry is generally considered as the highest art, if a gradation of the arts is admissible at all. Music and Dancing, Painting and Sculpture, with other arts, exhibit a harmonious order in the rhythm of sounds or movements and in the harmony of colors or figures; they are most powerful and effective, but they do not rise to the clear conceptions of poetry, which expresses human sentiments in words and thoughts. The drama is again considered as the highest kind of poetry and among dramas the tragedy takes precedence as the profoundest, the most dignified, and most philosophic representation of human life.

Not every tragical drama is a tragedy. German æstheticians make a distinction between a *Trauerspiel* and a *Tragödie*. The tragical drama is any representation on the stage which produces mournful and inauspicious actions, while the essential feature of a tragedy must be found in the psychical development of the acting persons. The complication of the plot brings about an entire change of situation (what Aristotle calls the περιπέτεια), leading to the catastrophe. By the crisis, however, a psychical change takes place also. The acting persons, especially the hero of the drama, take another and a higher view of life and of their ideals. While the hero suffers and even dies, his ideals grow and expand. A tragical drama

may represent the disastrous consequences of vice or folly only; a tragedy reveals the law of evolution which leads through toil and sacrifice to the victory of a lofty idea.

From the time of Aristotle the tragedy has been considered as the highest kind of art, perhaps because the tragic poet delves down to the deepest problem of human life: Why must the innocent suffer and why are the heroes of humanity martyrs of human ideals?

One of the greatest problems of æsthetics has been the question: How can we derive pleasure—and the noblest kind of pleasure, too—from observing, on the stage, representations of tragic events? We condemn cock fights and gladiator shows; but it is a noble pastime to witness the sufferings of a hero in a theatre. Is it not because the hero suffers for a cause, and the spectators learn from him how to live, to suffer and to struggle?

There is a law of life and of the evolution of life; and we cannot understand one phase of life without taking into consideration the law which pervades the whole. The three chief stages of psychical growth are designated by the three views of life: 1, *optimism;* 2, *pessimism;* and 3, *meliorism.*

The human being in his youth is optimistic; but when a man encounters worldly evils, when care preys upon him, sorrows worry him, and want and illness harass him, when the solemnity of death impresses his soul with fear of the unknown future, then a crisis arises in his psychical development: the catastrophe of pessimism destroys the optimistic delusions of early years, and it is but with heartrending struggles that man regains the lost balance of his aspi-

rations in establishing a purified, a higher view of life, which we call *meliorism*.

In the phase of *optimism*, man enjoys life and accepts it as a boon which has value in itself. We live simply for the pursuit of happiness. Optimism is the ingenious conception of the child and of childlike natures. In the phase of *pessimism*, man despairs of ever being successful in his pursuit of happiness. Man learns that if happiness is the sole purpose and aim of life, life is a failure and life is not worth living. But pessimism is not the end of all worldly wisdom. *Meliorism* is taught by the martyrs of truth who suffer at the stake and the heroes of progress who die on the field of battle; they have lived a life that was well worth living. It is not life but the contents of life, our actions done, our deeds performed, and our ideas thought, that have value. Life is valuable because it is an occasion to work and to struggle, to advance and to progress. The phase of meliorism recognizes that the purpose of life lies beyond the narrow sphere of the ego; the value of life lies in our ideals, which will live after us, which, indeed, are worth living and toiling and striving for.

The philosophers of matter and motion look upon the world as a dead machine that works even in the nerves of human beings, (to use Mr. Spencer's expression), in "the line of least resistance." Monism recognizes the living spontaneity of nature which pervades the whole universe and comes to the front in God-like beauty in the moral character of man. Life, accordingly, is not a chase for pleasure but the manifestation of an effort; and Meliorism recognizes the truth "that 'the line of progress in human affairs' is very far from being the 'line of least resistance' and

that in fact no great advance in some directions is possible among men without considerable work in lines of strong resistance."*

The highest art represents man as struggling for and aspiring to noble ideals, it exhibits the development from a naïve, childlike existence through the crucial tests of evil, error, and failure, through misery and terror of death to the conscious and manly standpoint of meliorism. Such a representation is the tragedy. It is not essential that the hero should die, but it is necessary that he should pass through a process of trial and purification. Thus the hero has become another man. In spirit he is new-born, and takes a new and deeper view of life and its import. The crisis of pessimism has matured his mind, and even should he die, his ideal lives; vanquished, his ideal is victorious!

In this manner the doctrine of meliorism sheds a new light on Tragedy and explains most clearly the complete sense of the Greek term, *katharsis*, or purification of the hero, which Aristotle teaches us to be the purpose of a tragedy. The katharsis should be infused into the souls of the audience through the medium of *pity and fear* (δι' ἐλέου και φόβου): pity for the hero and fear in the auditor for himself lest he may meet with the same fate. The audience should be led through the same ordeal of purification. Without positive suffering, but merely by witnessing the suffering of the hero, they attain a higher, a purer, and a more ideal conception of life. It is the destruction of the egotistic passions (κάθαρσις τῶν παθημάτων), and the construction of a lofty philanthropic temple of altru-

*Quoted from Prof. Cope's essay: Ethical Evolution, in No. 82 of THE OPEN COURT.

ism. The hero no longer lives for himself; he lives for his ideals. His ideals live in him and his life is subservient to his ideals. In listening to a tragedy we are overawed; our souls are full of a sentiment which is best expressed in the ecclesiastical term of *edification.*

According to Schopenhauer and his pessimistic adherents, the purpose of a tragedy is to preach pessimism; the hero has to turn his back upon life. In the school of misery he must learn to resign and deny his will. Schopenhauer, Hartmann, and Mainlaender declare that negation of will is the only aim worthy of religion and philosophy. It is this negation, they declare, that tragedy has to exhibit. But Schopenhauer did not find one instance among the ancient tragedies in which the hero really denies his will. Ajax commits suicide in order to atone for his errors, yet there is nothing of negation of will. Neither is it to be found in Œdipus. Hippolytus when dying is consoled by Artemis, who promises, after his death, to bestow upon him the highest honors in Thebes. From these instances Schopenhauer does not conclude that his theory is wrong, as probably Lessing would have done, to whom the ancients were the standard of good taste; he argues that classical tragedy is shallow and inferior to the Christian dramas, which rank higher owing to the fact of their heroes expiring with enthusiasm. Lessing in his *Dramaturgie*, mentions Christian dramas in which the heroes sometimes rush into death with the confidence of finding a higher and a happier existence in another world. We should not, however, call this a pessimistic negation of life. They love life, but they prefer eternity. It is the aspiration toward some higher,

loftier state of existence which allures them to their fate.

Among our standard works of pessimistic art there is not any pessimistic tragedy, except the operas of Wagner, and particularly *Die Götterdämmerung*, in which Wodan terminates the existence of the world, and, tired of life, commits suicide. Wagner, strongly biased by Schopenhauer's philosophy, intentionally created his works in a pessimistic spirit; he is an exception. Dramas by other poets are free from pessimism, as, for instance, *Faust*, *Egmont*, *Marie Stuart*, *Romeo and Juliet;* the minds of the chief characters exalted by their sufferings even to death, are elevated to a higher range. They do not attain a negation of will or annihilation of the ideal to which they aspire. Just the contrary. While Romeo and Juliet die, their love lives and restores peace between the hostile houses of their parents. In a word, our standard tragedies are melioristic and not pessimistic; for, otherwise, in their development, we should miss the solace which alone is able to afford us consolation for the misfortunes of our heroes.

The auditors profit by the experience of the hero. They grow spiritually, intellectually and morally, while he grows through his struggles. While he gains in breadth of mental grasp and in intensity of feeling, the spectators also gain. The purification of our souls, the intellectual and moral gain, in a word, the growth of our minds, is what exerts a beneficial influence and constitutes the pleasure of listening to a tragedy; for all growth is a pleasure: it is the only solid pleasure in life.

Schiller finds "*the cause of the pleasures we derive from tragic objects*" in "our admiration of moral pro-

priety, which is never more vividly recognized than it is when found in conflict with personal interest and still keeps the upper hand." Schiller says: "We here (in some tragedy) see the triumph of the moral law. It is such a sublime experience that we might even hail the calamity which elicits it;" and, further on, "How noble to violate natural interests and prudence in order to be in harmony with the higher moral law. If, then, the sacrifice of life be the way to do this, life must go." Schiller's explanation is profound and grand, but it does not exhaust the subject. The tragedy is more than a conflict between moral propriety and prudence. Such a conflict might happen in a tragedy, but need not happen. The tragedy is rather the solution of the problem of evil. The questions, What do we live for? What do we struggle and suffer for? are answered in a tragedy. We do not live for the pursuit of our happiness only, but for the struggle after, and the realization of, our ideals.

Thus the law of life and evolution is disclosed. In growing we must ultimately encounter the catastrophe and endure the hour of trial. It cannot be evaded by any one who is arriving at maturity. Our mental development starts from optimism, and, passing through the inevitable crisis of pessimism, it reaches the manliness of meliorism, which extends our life beyond the narrow limits of our Ego.

The problem as to what is the purpose of our existence is solved as soon as we recognize that man is one with humanity and that the evolution of the whole universe is at work in his aspirations. The barrier between the Ego and the All is broken and man's truest self is found in his ideals. We can find no satisfaction in the attainment of our personal well-being merely.

We must live and struggle and strive onward, not because we chose to do it, but because Nature thus works out her plans in our souls. We must, because evolution is a cosmical law. We are a part of the All, a part in which the All works and shapes its ends. The All works in us as it works everywhere. Man is the highest stage of evolution on earth, and he therefore is the most representative part of the All we know of. Man is the first born son of Nature, and humanity with its holiest ideals is on earth the grandest, the most perfect, and most beautiful revelation of the All.

Man's life is a constant struggle for progress, a strife for the ideal and an advance to loftier heights on the infinite path of great possibilities. This idea is the keynote which vibrates through the highest works of art and which thrills through the universe as the law of cosmical evolution.

CLASSICAL AND ROMANTIC ART.

In art and poetry we meet with different conceptions similar to those in religion and philosophy, although they appear under other names. There are factions and partisans also in the domain of artistic taste, and the most prominent oppositions are the classical and romantic schools. These Whigs and Tories of poetry fight with no less zeal than political parties. The contrast is obvious and striking and you can hear classical and romantic art spoken of everywhere. In music and in painting, in sculpture and in architecture the same opposition is noticeable.

What the terms classical and romantic mean, has been interpreted very differently and often correctly, but its relation to philosophy has never been sufficiently explained. Classical, it is commonly said, is that conception of art which takes the Greek of old as a standard, but the romantic does not acknowledge either their superiority or their taste. Classical authors acknowledge *rule* in the domain of art, romantic authors from a matter of principle banish rules and judge products of art from the *effect* produced. Classical authors on the contrary have often shown a certain contempt for effect and think it below their dignity to stoop to popular taste for the sake of effect. Romanticism had always a hankering after that kind of poetry which is to be met with so frequently in the Romance nations

that are prominently good Roman Catholics. Accordingly some literary writers of protestant Germany identified both, declaring that Romanticism is a return or at least the desire of returning to Catholicism. And it is true that many Authors of the Romantic School in Germany turned Roman Catholics. Nevertheless Romanticism has only a kinship to Roman Catholicism, but should not be identified with it. This may be proved by the fact that Victor Hugo the head of the Romantic School in France was bitterly opposed to the Roman Church.

Among classic schools we must carefully distinguish between pseudo-classic and real classic authors. The Greeks must be recognized as that nation who naturally produced the classic taste for poetry as well as art in general. Corneille, Racine, and Voltaire under the reign of Louis XIV and Louis XV of France were the first who attempted to establish classical taste in modern poetry. But they must be designated as pseudo-classic; they were imitators of the Greek taste as it had been codified by Aristotle. They did not understand the principle of classic art; they applied Aristotle's rules, but failed to recognize the spirit of Greek poetry.

True classic poetry was produced in Germany when Klopstock began what Goethe, Schiller, and Lessing carried into effect with the grandest perfection ever realized in modern literature. Beethoven's appearance at about the same time was no incidental coincidence among these German aspirers. The classic spirit of Greek antiquity was revived and resuscitated. Theirs was no slavish imitation of the Greeks; they like the Greeks and like Shakespeare, whom they recognized as the model and standard of dramatic poetry

just as much as Sophocles, imitated nature. But they did not imitate nature in the sense of M. *Emile Zola* and the modern naturalists of France according to whom the dirt of nature is privileged with special attention. Their imitation is an imitation of nature as a whole, as one great entirety, as a Cosmos, which in its laws is one and the same throughout. Their poetry is permeated by the same unity and unison which penetrates the universe. Thus they represent in art the ethical law of justice which rules impartially, meting out to men the fates they shaped for themselves. And in the highest form of poetry in the tragedy, this justice bestows victory upon the idea which is represented in its hero. The hero dies, he sacrifices his life for what is greater than himself, for his ideal. He is conquered, the individual man with his faults and imperfections perishes, but his ideal is triumphant.

The classical principles are those of monism, while romantic art is dualistic. Classic art bears the features of serene and majestic truth, of simplicity, of reality; it is lucid and intelligible. Romantic art is artificial, complex, unreal, and fictitious; it is obscure, hazy, and mystic. Classic art has a high purpose, its aim is holy to the artist, his art is a religion to him. Romantic art attempts to fly from this world into a beyond, it is a play of fiction, a dream. Either the artist considers art as a sport, a fictitious, unreal fancy, or if he is serious, he usually is a fanatic and his poetry is not so much a religion as a superstition.

Romantic poets and artists have biased our popular views to such an extent that they succeeded to implant in the popular meaning of the word "art and poetry" the idea of romanticism, that of fictitiousness.

It is for this reason that art and poetry are characterized as a 'useless and superfluous exercise of human faculties' (as Spencer says), and that it is to be compared to sport and its value measured according to its complexity. Art and poetry are so far from being superfluous and useless that they are the most important treasures of the human race, for they contain the intellectual, the spiritual, and emotional wealth of human ideas, not of single thinkers but of whole nations, in a popular and harmonizing form so that they can easily be communicated even to the larger, broader, and less educated masses.

Goethe, Schiller, and Lessing did much to enhance and advance the idea of monism. Their poetry was the bud from which the monistic philosophy was the full grown fruit.

Classicism and Romanticism are not confined to Art. Religion also is either classical or romantic; it is either based upon clear and definite principles or upon a hazy mysticism. If Religion is not in agreement with science, it is founded upon the brittle basis of superstition. If it is in contradiction with a unitary conception of the universe, it will develop the world-despising dualism whose ideal is the oppression of nature and of all that is natural in us.

Monism in the province of philosophy means perspicuous simplicity. It is the systematic and clear conception of an intelligible reality. In opposition to the diverse dualistic conceptions of the universe in their romantic, phantastic, supernatural, or mystic garbs, monism is the classical philosophy.

RETROSPECT.

THE fundamental problems of Philosophy can be classified under two headings:

1. What is the origin, the foundation, and the law or method of our cognition ; and,

2. What is its purpose? What is its use and application?

The former question is theoretical, the latter practical. The former demands as an answer a conception of world and life, a theoretical philosophy, *i. e.*, a view of the universe ; the latter a system of ethics, a practical or moral philosophy, *i. e.*, a principle according to which the maxims of man's conduct can be regulated.

Our solution propounded to the former problem, is summarily named *Monism*; that to the latter, *Meliorism*. Monism and Meliorism belong to each other, the one is not complete without the other. The former is the indispensable condition of the latter. The latter is the inevitable consequence of the former.

A conception of the world and a norm of ethics will tend to find expression, not only in our thoughts as a system of philosophy, but also in our acts as morals, and even in our imagination as creations of art. Religious creeds are, to a great extent, poetical productions of the mind, expressive of some conception of the world and its corresponding norm of ethics symbolically represented as myths, holy legends, dogmas, or ceremonies.

One-sided unifications of knowledge, such as appear in materialistic as well as in spiritualistic monism (views, which in distinction from monism proper are better called henism*) will naturally lead to Optimism.

Dualism, which makes of the duality of matter and mind, of body and soul, of God and World, a matter principle, will most clearly show the dissonance of its view in its ethics. Dualistic ethics are invariably to be classed as Pessimism.

The ethical problem finds a sound satisfactory solution in Monism only, and monistic ethics are best characterized by the term Meliorism.

* Derived from "εἷς, *μία ἕν one.*"

DEFINITIONS AND EXPLANATIONS.

THE DATA of experience are perceptions.

REALITY is the sum total of all facts that are, or can become, objects of experience.

The relativity among the objects of experience we call form.

The relativity among perceptions we call formal thought.

The laws of form and of formal thought are ultimately based on the self-evident principle of *consistency*, which is the same as the logical rule of identity, $A=A$.

The order that prevails among the facts of reality is due to the laws of form.

Upon the order of the world depends its cognizability.

Methodical or systematic arrangement of experience (order among the data of experience) is possible only through the laws of formal thought.

COGNITION is the systematizing of experience.

Cognition being the systematizing of experience ultimately leads to a unitary conception of all the data of experience; it leads to Monism.

TRUTH is the conformity of cognition to reality.

[Truth being a relation between subject and object appears to be relative in its nature. Absolute truth is a self-contradiction; it would imply cognition without a cognizing subject.

At the same time it is obvious that absolute existence (in fact everything absolute) is impossible. Reality is properly called *Wirklichkeit* in German, derived from *wirken*, to take effect. Reality is not immovable and unchangeable absoluteness, but the effectiveness of things in their relations. Reality therefore implies not only existence, but the manifestation of existence also. Existence and its manifestation are not two different things; both are one.

The idea of something absolutely Unknowable is therefore also untenable; it would imply the existence of an object whose existence is not manifested *i. e.*, existence without reality; *Sein ohne Wirklichkeit*—which is a contradiction, an impossibility.]

SCIENCE is the search for truth.

The method of science is the economy of thought. (*Mach.*)

Economy of thought is possible through application of the laws of form to thought.

KNOWLEDGE is the possession of certain truths.

[Knowledge is, so to say, the present stock or capital with which Science works. Science cannot exist without knowledge. The object of Science is not only to increase and enlarge knowledge but also to purify the present stock of knowledge from vagueness, errors, and misconceptions.

The purpose of knowledge is that of increasing our power over nature.]

PHILOSOPHY is a conception of the world as a system of all knowledge and of all further increase of knowledge.

[The purpose and application of philosophy is the regulation of our conduct. Different philosophies produce different systems of morality and the latter will always show the soundness or the defects of the former.]

IDEALISM is that conception of the world which takes the thinking subject as its starting point

[According to Plato the forms of things only possess reality.

Idealism, in its most advanced position, denies the existence of anything beyond subjective thought. This exaggerated Idealism is called Spiritualism.]

SPIRITUALISM explains the world solely from spirit, (*i. e.*, the substance of which the thoughts and feelings of the subject are supposed to consist) and assumes that matter does not exist. Matter is an illusion in the mind of the subject.

[Spiritualism is to be carefully distinguished from Spiritism, the latter being the belief in spirits.]

REALISM is that conception of the world which takes the object as its starting point.

MATERIALISM, or the one-sided exaggeration of the principle of Realism, explains the world solely from matter (*i. e.*, the substance of which the object is supposed to consist). Spirit is merely a function of matter.

SKEPTICISM (as taught by David Hume) is that view according to which man can have only uncertain opinions, but no exact knowledge.

AGNOSTICISM (according to Prof. Huxley) teaches that our cognition can not go beyond phenomena, and (according to Mr. H. Spencer) it assumes that cognition arrives ultimately at the unknowable.

MONISM is that philosophy which recognizes the oneness of all-existence.

According to Monism:

Idealism is right in so far as it recognizes the perceptions of the subject to be the data of experience.

Realism is right in so far as it recognizes the reality of the objects of experience.

Skepticism is justified to propose doubt as a necessary stage in the evolution of thought in order to free us from the vain assertions of dogmatism and to lead us to a critically established and irrefutable philosophy.

At the same time:

Idealism (or rather Spiritualism) is wrong in so far as it limits itself and does not go beyond the sphere of subjective perception, attempting to explain the world from spirit and the subjective element alone.

Realism (or rather Materialism) is wrong in so far as it limits itself to the material element of the object and attempts to explain the world from matter alone.

Skepticism (or rather Agnosticism, the dogmatized skepticism) is unjustifiable in so far as there are no correctly formulated problems that are not solvable.

[Science guarded by criticism can establish positive knowledge. The phenomena of nature are the facts of Reality, there is no unconditioned, no absolute existence behind them, and the idea of anything unknowable is inadmissible.]

RELIGION is man's aspiration to be in harmony with the All; it is *das Allgefühl im Einzelnen* (the All-Feeling in the Individual.)

MORALS are man's conduct in so far as it is in unison with the All.

[The basis of morality is religion. A moral educator or preacher may justly be asked, "On what authority dost thou justify thy precepts?" And he will tell us that his authority is not personal; he speaks in the name of universal order. Accordingly his authority is that of religion. If it were not so, all his good precepts would have no foundation; they would hover in the air like beautiful dreams that have no reality.]

ETHICS is the Science of Morals; it teaches man why he must, and how he can, regulate his conduct so as to be in unison with the All.

[Religion (man's aspiration to be in unison with the All) has naturally produced many superstitious notions in the world, of its origin, and of its purpose. Similarly, science (man's search for truth) has produced many errors or false notions of reality. But all the superstitions of religion do not prove that religion as such is an illusion, and all the errors of science are no evidence that science as such is a sham.

It is obvious that religion and science, as here defined, are not contradictory to, but complementary of, each other. If religion and science do not agree, it is a certain sign that our conception of either the one or the other is wrong. The history of the human mind has been one of constant conflict and reconciliation between religion and science. Their relation has repeatedly been disturbed and re-adjusted.

The unitary conception of the world affords the only basis for the union of Religion and Science, and opens a new vista of progress for both.]

OPTIMISM takes for granted that the world and the conditions of life are good, or at least the best possible. Man lives in order to be or become happy. Happiness is the aim and end of humanity.

PESSIMISM holds that the world is bad, and that man is to be redeemed or ransomed from the evil of existence. Meditative intuition and suffering are the way of salvation. Non-existence is the ideal of pessimism.

MELIORISM stands on the doctrine of monism, that man is a part of All-existence. As a part of the whole, he has to conform to

the cosmical laws of the whole. Obedience to these laws leads to a constant progress, developing ever higher forms of existence.

[The term Meliorism has been falsely used in the sense that humanity, though at present not in a state of happiness, will nevertheless reach by and by an existence in which miseries will be impossible. That, however, is a kind of Optimism. For in spite of all amelioration, happiness will remain about the same. Happiness is relative, and Schopenhauer justly likens it to a fraction, the denominator of which represents our desires and the numerator their gratifications. Every progress allows a simultaneous increase of both.

The source of error, common to both optimism as well as pessimism, is the supposition that happiness is the sole purpose of life. Pessimism is a progress in comparison to optimism; it recognizes that if the transient happiness of a life were its only end, life would not be worth its own troubles.

Meliorism reconciles the one-sided truths of optimism and pessimism. Meliorism recognizes with optimism the value of life, but not because life has an intrinsic value or because happiness is its purpose and is attainable, but because life affords an occasion of working out the possibilities of higher forms, and of realizing the better, purer, and nobler potentialities of existence. The value of life is to be measured by the efforts made in obedience to the cosmical laws.]

Optimistic morality is essentially an ennobled and elevated egotism.

Pessimistic morality, being destructive of egotism, leads to a negation of world and life. Its chief merit is that it favors the rise of altruism.

Melioristic morality considers the individual as a representative of All-existence, and thus gives a purpose to the life, to the work, and the aspirations of the individual beyond the sphere of its transient selfhood.

APPENDIX.

IN REPLY TO CRITICISMS OF "FUNDAMENTAL PROBLEMS."

AGNOSTICISM AND MONISM.

In a review of "Fundamental Problems," published in *Watts's Literary Guide*, Miss Mirabeau Brown, while upon the most important points in general agreement with the author, takes issue in favor of agnosticism. She says:

"The situation we think may be summed up thus: While some minds, after contemplating the Universe, will satisfy themselves with the thought that all things *are one* (Monism), there are other minds which prefer to believe that all things *are from one source*, that source being unknowable (Agnosticism)."

Miss Brown in this passage furnishes a most concise statement as to the nature of and main difference between Agnosticism and Monism. Monism says: "All things are one." Agnosticism says: "All are from one source."

Some agnostics deny that Agnosticism is dualism, metaphysicism, or mysticism. Whoever accepts Miss Brown's definition must agree to its being:

1. *Dualistic*—the knowable world being the one form of existence, and its unknowable source the other;

2. *Metaphysical*—the world consisting of the phenomenal world which is nature in all its cognizable realities, and of a metaphysical entity behind nature.

3. *Mystical*—the transcendent source of nature being unknowable. Things cognizable and the source of things are supposed to be so heterogeneous, so radically different, that between them there is a great gulf fixed, so that they who would pass from hence to the unknowable source of things cannot. Neither can the source of things pass to us if it would come from thence in any shape of a

revelation. Thus the source of all things necessarily transcends all comprehension.

In like manner an esteemed contributor expresses himself in a private letter, from which I quote:

"The words: 'All cosmic being always working behind two "'veils that none may draw—the veil that shadows all beginning "'and the veil that shadows the secret of the end'—refer to the "emergence of life out of the All and its return, we know not "when—but both mysteries surely."

This is agnosticism no less than that of the unknowable source. Agnosticism says: "All things come out of the All and will return to the All." Monism says: "All things in their totality are the All."

* * *

Suppose the agnostic view were correct. Would we not be obliged to accept the idea of a creation? This world of things must have once, in the beginning of time, emanated from the source of all things; and most likely will return to it. However, this conception stands in contradiction to the law of the conservation of energy and matter. According to this law, matter and energy are eternal. Neither matter nor energy can be either created or destroyed—although their forms may change.

So long as the law of the conservation of energy and matter remains unrefuted, the monistic conception of the world will stand unshaken. The indestructibility of energy and matter, and their eternity are irreconcilable with the idea of a source from which they are supposed to come.

It may be conceded by some agnostics that "the source" lies within, not without; but being within, behind a veil, as it were, it is unknowable; matter and energy, they say, are the source from which, as their manifestations, natural phenomena emanate; while the manifestations are knowable, the source (matter and energy) is unknowable.

This cuts nature in twain. But, in fact, there is no line of division between the two halves: Natural phenomena are forms of real matter and of actual energy, they are no mere appearances, no mere emanations from energy and matter! Things (ourselves not excluded) *are* certain forms of matter and energy. The source of these things are other things; which means that the present forms have evolved from other forms by a transformation of their

shape, according to certain laws. But reality itself, the world, the All, the totality of matter and energy, has no source. It is eternal.

The idea of an extramundane source would imply an extra-natural origin of nature—and this view, after all, is not greatly different from supernaturalism. It is the essence of dualism extracted from a volatilized supernaturalism, which by and by must give way to a positive conception of nature.

Necessarily any act of creation must remain a mystery. Like can come from like only. It is not understandable how the phenomenal can emanate from the noumenal, the physical from the metaphysical, or the natural from the supernatural. And yet the orthodox explanation, that the world came into existence through a divine *fiat*, is, in spite of its *naiveté*, simple and intelligible in comparison with the agnostic idea of an "unknowable source." To me it seems preferable to Agnosticism. And according to the principle of Agnosticism, the old view is after all quite possible.

* * *

By the bye, the Mosaic account in Genesis does not speak of a creation out of nothing, as do our orthodox theologians nowadays. The Hebrew word *barah* signifies "to make, to shape, to form." Moses says: "In the beginning God shaped the heavens and the earth." There is not a word about matter or energy having emanated from him as their source. There are Rabbis who look upon God as the principle of order that shapes all the world. And there are also Christian theologians who discard the idea of a creation out of nothing and look upon God as the Eternal power in which we live and move and have our being. Similarly Monism considers God as the All in All. We call the All God in so far as the omnipotent power of All-existence is a well-arranged Cosmos, the laws of which are immutable, and of which the more we know the more wonderful they appear in their beauty and harmony. We do not call the All God in order to bow down into the dust and to adore it. We regard adoration as a pagan custom which, it is a pity, survived in Christianity. The idea of God always had, and still retains, a moral significance. Therefore it is right to name the All in its cosmic order "God," in so far as we find in it the basis of the moral order of society. It is the grand authority upon which the ethical law rests, the authority which enforces it, for it is visiting the iniquity of the fathers upon the children unto the third and unto the fourth generation and showing mercy upon thousands of them that keep the commandments.

As a rule, we can, in this physical world of ours, know the source by the water that it pours forth. Why can not the Agnostic know what the source is like, from which all things are? Should they not rather, from their own standpoint, say, that things are a revelation of that source? Suppose we knew all things in their totality, should we not know all about their source? So the old religions teach that we know God (the source) by his works, and I see no flaw in this logic. (Only let the believers in the old religions beware that they do not take the formulas of their sectarian creeds, or writings in which they are embodied, as the word of God.) We certainly should know all about the Universe, the All, the Cosmos, if we knew all the so-called manifestations of nature—all natural phenomena in their totality, as well as in their minutest details!

Such an exhaustive knowledge being practically impossible, we can know nature only in parts. Even though we may know much, the region of the unknown remains immeasurably large; and as nature is constantly changing, evolving, and re-evolving, not even a God could exhaust the wealth of her rich possibilities. Therefore it is true, as the Apostle says, that now we "know in part." And further, since relativity is the character of knowledge, even an exhaustive knowledge depends upon the cognizing subject. Therefore it is true, also, "when that which is perfect is come," as Paul continues, "we shall know even as also we are known." If agnosticism means that the range of enquiry will always remain unlimited, and that all knowledge is relative, I also am an agnostic; but so long as it limits enquiry by the unknowable, I can not accept it.

* * *

'The All is eternal,' means it exists; uncreated and undestroyable, it has always existed and will always exist. The laws of the All which we have all reason to admire in their grandeur, are ultimately based upon form and the intrinsic regularity of form. The laws of form are no less eternal than are matter and energy and "Verily I say unto you, till heaven and earth pass, one jot or one tittle shall in no wise pass from the law!"

The laws of form and their origin have been a puzzle to all philosophers. "Ay, there's the rub!" The difficulties of Hume's problem of causation, of Kant's *apriori*, of Plato's ideas, of Mill's method of deduction, etc., etc., all arise from a one-sided view of form and the laws of form and formal thought. The author of

"Fundamental Problems" has tried, and hopes to have succeeded in formulating the problem in its simplest way. Let us recapitulate the solution thus:

If it can be proved that twice two could not always so regularly be four, unless some extramundane mathematician had imposed this as a law upon things, let us then accept theological supernaturalism. Let us then believe in a demiurge and accept the anthropomorphic conception of God.

If it can be proved that twice two need not always be four, but only happens to be four in those comparatively few cases we know of here on this little planet, let us accept the materialistic view that the world is a chaotic jungle without rhyme or reason, and that its order is at best a chance effect, a chimera of our prejudiced brain.

If it can be proved that every single case in which twice two is four must remain an unsolvable mystery and that it is beyond our ken to know why it is so, let us accept agnosticism.

The solution proposed in "Fundamental Problems" recognizes the intrinsic necessity of this as well as of all purely formal propositions. Necessity means that it is so and that we know it will be so in all other cases. Twice two will always be four, whether I try it with apples, or planets, with suns, or atoms.

The intrinsic necessity of formal laws excludes on the one hand the supposition that they have been decreed and shaped by a law-giver with intentional foresight or purpose, who might have, if it had pleased him, arranged matters differently than they are. The intrinsic necessity of formal laws excludes on the other hand that they can in any wise be considered fortuitous.

Furthermore, since cognition is only an act of systematizing and of unifying facts, with the help of the formal laws of thought, the intrinsic necessity of formal laws, implying their universality, makes all facts systematizable, *i. e.* knowable. Indeed cognition means nothing more or less than a tracing of the red thread of necessity which winds through all the changeable forms in this world of facts. Thus the intrinsic necessity of formal laws, when recognized, makes agnosticism impossible.

* * *

In this actual world of reality there is no room for any thing so chimerical as is the unknowable. Reality is identical with knowability. The German word *Wirklichkeit*, derived from *wir-*

ken, to take effect, (as has been stated on page 254), is an excellent and most expressive term. Reality, if considered as something outside of and distinct from the actual effectiveness of things in their relations, especially effectiveness upon the senses of sentient beings, is a mere abstract term. A thing that has no effect at all, —that does not *work* somehow—does not exist. (The term "*work*" is here used in the sense of the German *wirken.*) Reality or *Wirklichkeit*, therefore, implies not only existence, but the "work" or manifestation of existence also.

Schiller makes Wallenstein say:

> "*Wenn ich nicht wirke mehr, bin ich vernichtet.*"
> If I'm no longer active—I'm undone;

or literally translated:

> If I no longer work, I am annihilated.

This is literally true, if *working* means all the effects of a man's activity, the work done by every cell of his body. The work of a man is not only the effect of his life; his work *is* his life.

The table before me exercises a certain pressure; it has a certain shape, color, etc. All these qualities represent definite effects upon other things and also upon my senses. There is not a "table in itself" that produces these effects, but the totality of all these effects is the table. A transcendent existence that exists by itself without exhibiting any effects, is no existence; it is an impossibility. Existence without effects is a mere phrase without meaning, not realizable in thought. Yet existence, as soon as it exhibits any effect, can be perceived, classified with other effects, and is thus knowable.

Absolute existence, which is an impossibility, may be called unknowable; real existence is always knowable.

THE SIN AGAINST THE HOLY GHOST.

A REVIEWER of "Fundamental Problems" in the *Christian Standard*, which is an orthodox Baptist paper, quotes the motto from the title page :

> "No Agnosticism but Positive Science,
> No Mysticism but Clear Thought,
> Neither Supernaturalism nor Materialism,
> But a Unitary Conception of the World,
> No Dogma but Religion,
> No Creed but Faith,"

and calls it a "specimen tangle." My reviewer takes special offense at the idea that "God is immanent." He says : "This tangles things, but so learned a man does not mind tangles," and then adds with a good dose of irony : "He has found bottom, too, where others have been adrift."

* * *

The Reverend Gentleman, for such I take my critic to be, involuntarily calls to my mind the remembrance of a good and dear old schoolmate of mine, who, regarding mathematics as a *non plus ultra* of human vanity and a useless display of mental summersaults, ever quietly slept during the mathematical recitations of our Professor, who was no less a man than Hermann Grassmann.

Sometimes I tried to stir my friend up, when matters of importance were discussed, and once when I told him that he should pay attention at least for a quarter of an hour, he awoke to life and listened for a while to the recitation. I thought Prof. Grassmann's explanation was wonderfully lucid, but my neighbor quietly said, "What bosh ! It's a mere tangle of words," and continued his nap. I tried to convince him that Grassmann was marvelous, and clear as daylight. But in vain, and in a long discussion on the subject he got the best of me, finally convincing me that all mathematics were and would ever remain a tangle to him—a mere tangle of words.

This schoolmate of mine became a clergyman, and I am told he is a good one, whom the members of his parish like to hear preach. In the pulpit he is not at all asleep and makes the sleepers of his congregation wake up.

In later life I called on him, and on Sunday we went to church. He spoke of the Holy Ghost and the sin against the Holy Ghost, which shall not be forgiven either in this world or in the next. He made himself very clear on the subject, so that every one of his hearers felt that he was, or at least might have been, the one who had committed the sin against the Holy Ghost; at least I did. He said, among other most forcible things, we were rational beings endowed with the power of thought and of faith by the Holy Ghost. If the Holy Ghost conducts our thinking, we shall wander in the right path, but woe worth him who trusts in human reason. Reason, he said, is like the mercenary woman of Babylon,—here he quoted a well known passage from Luther—of whom the prophets speak with disgust. The Holy Ghost represents Divine Reason, but human reason is sham wisdom. Like Sheol, it is a flame that burns, but gives no light and leads astray like an *ignis fatuus*. He who follows human reason, and were it ever so neatly expressed in mathematical formulas, is the man that commits the sin against the Holy Ghost and he is on the road to perdition.

After the sermon I tried to persuade my friend that there was but one Reason. There cannot be two different reasons. And this reason is a very simple thing, and if there seem to be two different reasons, there is a very simple method of testing which is the right one. I simply try which is in accord with reality. That which agrees with reality is the only right reason. This one Reason I shall call the Divine Reason, because its laws are really divine; they are imperishable and eternal. They are plain and yet grand, obvious and yet of far-reaching importance; they are clear and demonstrable, and will be applicable to the most desperate cases. Should any one oppose them, he will in the end be the loser, for he would stubbornly knock his head against the iron facts of reality. And be his head ever so hard, facts are harder. If he should persevere in his perversity, he is the man who commits the sin against the Holy Ghost, for it is a sin that none can forgive, because he makes it a principle to oppose the Holy Ghost—the spirit of truth, of charity, and of light.

Human reason is true only in so far as it is, in man's brain,

an embodiment of the only one, the only possible Divine reason, that reason which lives as well in the correct formulas of a mathematician, as in good deeds founded upon the logic of faith—of that faith which trusts in an ever-increasing realization of truth and good will here on earth. This is the *logos* of which Philo spoke, and which, as St. John tells us, became flesh upon earth in man.

If there is any human reason in opposition to Divine reason, it is that of the Scribes and Pharisees whom he, who calls himself the son of man, reproached for keeping the key to heaven away from people. It is that sham reason of the orthodox, which pretends to be the light of the world, and yet it denounces all that is truly light, it shuns the plain, the clear, the demonstrable, and retires into the dark, the mysterious, the unintelligible.

* * *

If any one thinks that I convinced my friend, he is mistaken. He made a long and clever speech about the arrogance of philosophy, which tried to comprehend things that are in themselves incomprehensible; he made objection to the assumption of identifying the Divine and the Human. "Every monism is atheism," he said, "and God being the source of all good, atheism necessarily is the root of all evil, and if the simplest formula—for instance, $(a+b)^2$ equals $a^2 + 2\,ab + b^2$ —were in contradiction to Divine Reason, it must be abandoned, no matter whether it agrees with or dissents from reality. He who would not abandon it, is not worthy the glory of the Holy Ghost, and the superior light of a spiritual life."

When I humbly asked how I could know the difference between the two kinds of reason, he informed me that the revelation of the Divine Reason is to be found in the Bible, but observing that the Devil might quote scripture as well as a Baptist, he added that it is the Bible as interpreted by the Symbolical Books of his church. He had publicly promised on the altar of God to teach these doctrines only, *i. e.*, the doctrines of the Bible as interpreted by the Symbolic Books, and he considered any attempt of doubt in the divinity of the corner-stone of his faith as felony. He looked upon himself as a soldier who had sworn allegiance to the Lord, and it was not his matter to criticize his Liege.

I was silenced, but I could not help thinking that to bind men by such an oath of allegiance to the narrow views of a few men—to the views of the authors of the Symbolical Books—is exactly what Christ means, when he says: "They bind heavy burdens and grievous to be borne, and lay them on men's shoulders." To

keep men in such fetters, that is the sin against the Holy Ghost, because it extinguishes the divine spark of independent thought in men. It quenches the fire of faith of the living and ever-growing spirit upon the altar of truth, and replaces it by a creed embodied in the letter that killeth.

* * *

The lesson I learned from that experience was, that that which is clear to one man can after all be a tangle to another. Yet before any critic has a right to call any essay or explanation a tangle of words, he should prove that it contains self-contradictions. So long as he cannot do so, his assertion must be taken as a personal statement as to the state of his own mind, but not of the book he reviews.

I cannot conclude without thanking my critic that he continued to read the book after he had received the impression of its author, that "much learning hath made him muddled." When he had worked his way through the tangles, he declared that "the author says some capital things in a forcible and original way." He makes a few quotations, that have his full approval, *e. g.*, that Christ was the Copernicus of Ethics, p. 227.

I am sorry that the quotations are spoiled by a misprint—"age" is printed for "ego"—which makes the whole quotation unintelligible. I should not wonder at all, if the readers of the *Christian Standard* think: If this empty verbiage is declared to be good, what incomparable nonsense must be contained in other passages denounced as tangles!

THE MODESTY OF AGNOSTICISM.

IT is always easier to scold than to reason. Accordingly it is a general rule that if a reviewer cannot, or if he does not care to, answer an argument, he commences to rail at the author whom he dissects. An Agnostic reviewer in the *American Hebrew Standard* says of "Fundamental Problems": "Nowhere in this book "is the modest reserve of the true man of science visible. We "have not the truly liberal spirit of the English school of nat- "ural philosophers, the spirit of a Newton, or a Darwin, or a "Spencer, but the harsh self-assertion of the German school of "metaphysicians, of a Hegel, or an Oken, or a Hæckel."

The honor of being labeled as a metaphysician, I must decline, and if the reviewer had been considerate enough to read the article on metaphysics, p 74, he would most likely have avoided that term.

But why is "the truly liberal spirit" missing, why must "the arrogance of this author's style" be condemned? My reviewer says: "In his insistence upon the value of form, and of formal "knowledge, the author is standing upon firm ground. But when "he attempts to discredit the doctrine of 'the unknowable,' by in- "sisting upon that of 'Absolute Being,' [here we do not know "what our critic means,] he simply does not know what he is "talking about."

Is it not strange that Agnostics usually retreat into the redoubt of modesty? Modesty is made an argument of their dogma. We declare that everything that exists, must exist somehow; it must manifest its existence in some way. And this manifestation can be represented in the mind. We can become aware of it. Accordingly it is knowable. Existence, that does not manifest its existence somehow, is no existence. Absolute existence is equiv-

alent to non-existence. Real existence is real by manifesting itself. Therefore existence is always knowable.*

To know the different facts of reality, to be aware of them, and to state them is not sufficient. We must try to understand them. The comprehension of facts is their methodical arrangement. The comprehension of facts is the object of the different sciences, and their ultimate unification in one great system is the object of philosophy. We are answered: "'The Power that the "Universe manifests to us,' may be scrutable to Dr. Paul Carus, "but to all less gifted mortals it remains as it was to Moses,† as it "is to Mr. Spencer, 'inscrutable'—something that 'no man can "see and live:'"

Now I think that we see the power that the universe manifests to us daily, and yet we live. Yes, we live in it and by it. We experience it in every throb of our heart and in every vibration of our brain. If my critic believes that in my insisting upon the value of form and of formal knowledge, I am standing upon firm ground, how can he object to my abandoning the agnostic view of the unknowable? Is it not form and the irrefragable laws of form that make it possible, and more so that make it unavoidable that the world throughout is cognizable? The regularity that arises from the laws of form affords us the key to the problems of nature.

Agnosticism appears at first sight as an expression of most laudable modesty. Who can blame a man for openly acknowledging his ignorance and who can doubt his sincerity? Socrates has been much admired for his confession, 'I know that I do not know anything!' But the agnostic outdoes Socratic wisdom and forfeits all claim to modesty by declaring that no one else can know anything about the mysteries which he himself cannot explain. By changing the unknown into the unknowable, the agnostic turns modesty into arrogance.

Let me mention here that the terms liberalism and tolerance are often misunderstood or misapplied. Tolerance means the recognition of other people's right to express their opinion. It means that a man who has an opinion and expresses it, should not be put down with violence, nor should he be cried down with harsh words;

*For details the reader is referred to the work itself.

†It is an original idea to claim Moses as an Agnostic. Moses's doctrine was certainly not Agnosticism and the holy legend that he could not see God face to face admits of other interpretations.

he must not be called arrogant, because his opinion differs from ours. Tolerance demands that he should be heard, and if he be wrong, should be answered with good and sufficient reasons. "Truly liberal spirit" does not at all demand that all opinions must be considered as of equal value, nor does it oblige us to withhold our opinion in "modest reserve."

Critics can show their truly liberal spirit, by freely criticizing that which they consider as false; they can show their tolerance by explaining why they disagree with the author criticized. Our agnostic critic might have shown both by informing us what, according to his view, knowledge means. Before anybody declares that the whole world is unknowable, he should first lay down a clear definition of "knowable." Schopenhauer said that "physically everything, and metaphysically nothing is understandable." Very well! My definition of understanding is that of a physical understanding; and I count the conception of a metaphysical understanding which, from its very nature can never be understood, among the superstitions of science. We can easily dispense with such knowledge as is *per se* impossible, and with absolute or metaphysical knowledge, for what it means no one knows. If agnosticism merely meant that metaphysical knowledge is an impossibility, there would be no quarrel.

A philosophy which starts from the positive data of experience, and arranges them in the system of a monistic conception of the world, will meet with many great problems and in solving them will again and again be confronted with new problems. It will always grapple with something that is not yet known. The unknown seems to expand before us like an infinite ocean upon which the ship of knowledge advances. But the unknown constantly changes into the known. We shall find no real unknowable whereever we proceed. The idea of the unknowable is like the horizon —an optic illusion. The more we advance, the farther it recedes. The unknowable is no reality; the unknowable can nowhere prevent knowledge nor can the horizon debar a ship in her voyage, from further progress.

Insolvable problems are by no means such as are too profound for solution but such as are wrongly stated. This truth is splendidly illustrated in the following little poem* by Adeline V. Pond.

It was a small and foolish child who met the Great Wise Man,
And opening wide his Question-Bag, 'twas thus the child began:

* *Wide Awake* for April, 1889, p. 336:

"O, Great Wise Man, I've questions here that long have puzzled me,
And if you've answers that will fit, I'll buy me two or three.

"First, can I make a new pig's ear out of my old silk purse?
Is killing time like eating dates, or is it really worse?

"Next, what do little fishes do to keep their stockings dry?
And, since the water is so wet, how do they ever cry?

"Pray, what's the fish that gives us scales wherewith we weigh our words?
Could people really kill a stone, if they should use two birds?

"Then, last of all, please tell me, sir—and this is question seven—
Is't raining up or raining down, when they have rain in heaven?"

The Great Wise Man thought hard and fast: his finger-ends he bit;
He searched in vain his Answer-Book for answers that would fit.

At last he said: "I know great things; when I was very young,
In nine and ninety languages I learned to hold my tongue.

"And backwards, even when asleep, or standing on my head,
In child's Chinese and grown folks' Greek, my tables oft I said.

"The higher mathematics—they seem very low to me—
I know in Heidelberg's Great Tun how many gills might be.

"The thousand answers in my Book, will tell you things like those,
But what *you* ask I cannot tell: and so, there's no one knows."

The Great Wise Man went on his way, as great and wise men will;
I fear me much that foolish child is small and foolish still.

A witty paper contained a few weeks ago a remark to the purport, that "he who solves nature's problems is a scientist, but he "who declares them to be insolvable is a philosopher." This was said in jest, but the agnostic is in earnest, and when a man propounds another and a positive view of philosophy, declaring, not that all philosophical problems are solved, but that they are solvable, he is arraigned for arrogance.

If philosophy is to be called the conviction that the world is inscrutable, let us abandon philosophy and in its stead let us arrange the knowledge which scientific researches yield us, into a unitary harmonious conception of the universe—call it what you will!

A REVIEWER'S VIEW OF DOGMATISM.

HONESTY is a great virtue, and a reviewer who confesses that he has not studied the book he reviews and condemns, must be admired for his honesty. It is a pity that that is all that can be said in favor of a review of *Fundamental Problems* by Mr. John Owen, published in *The Academy* of London. Mr. Owen says:

"The author is kind enough to spare both reader and reviewer the task of reading the whole of his book, by presenting them with a syllabus of its conclusions. Thus he tells us: 'The philosophy which 'The Fundamental Problems' present is Monism. Monism holds that all existence is One. . . . . The author objects to Supernaturalism as well as Agnosticism. The method of his philosophy is a systematic arrangement of knowledge.' . . . . After this authoritative exposition little remains to be added. The book consists of a series of essays which appeared in a Chicago publication called *The Open Court*. . . . . The 'court' is 'open' only to one species of philosophy, and its judgments are as dictatorial and *ex cathedra* as if they emanated from an infallible Pope."

The quotation which Mr. Owen makes is not a quotation from *Fundamental Problems*, but from the publisher's slip which, as is customary in America, is sent with copies for review for the benefit of reviewers. The notes on the slip were neither made by me nor had I the opportunity of revising them for they were made during my absence. How badly I feel that I cannot even accept this little bit of praise—as to having been "kind enough"—which my critic so grudgingly gives me!

Mr. John Owen reviews *Fundamental Problems* together with Mr. S. Laing's *Problems of the Future*. He says:

"'Problems' are either questions 'set' in order to be answered, or questions which, after discussion, are declared to be, for the time being, unanswerable. In one sense they may have the signification of dogmas, in the other of open questions. Each of these meanings is represented by the works above named."

After having reviewed Mr. S. Laing's book, he turns to *Fundamental Problems* and declares:

"Here are problems which as I have hinted are in reality dogmas."

Now in my mind the whole purpose of problems is to be solved. Problems answered are "solutions" and not "dogmas." Dogmas are unfounded assertions. Does Mr. Owen wish me to waste time, paper, and print in discussing problems that for the time being are unanswerable. What is the use of writing and what is the use of reading about unanswerable problems? Every book written ought to be a contribution toward an answer of some problem, even if the result be negative, showing that a solution has not been gained by this or that method. Mr. Laing has the misfortune to be praised by Mr. Owen for his "cautious and undogmatic tone." Dogmas being "problems answered" Mr. Owen declares that Mr. Laing contributes nothing to an elucidation or solution of the problems of the future.

It is strange that those men who are dogmatic themselves are most prone to reproach others for their own fault. The elephant and the tiger once got into a dispute, and when both had exhausted their vocabularies of names, the elephant said: "You are the most thick-skinned creature I ever met with," and the tiger answered: "You are the most cruel, rapacious, and bloodthirsty beast upon earth." There is a moral in that fable for Mr. Owen.

How glad I would have been if Mr. John Owen had pointed out the fallacies of my reasoning—mainly in the chapter "Form and Formal Thought," which is the basis of the whole work. If my reasoning has a flaw in it, it must lie there, and from there it will wind, and be traceable like a red tape, through all the other chapters. The chapter "Form and Formal Thought" attempts to lead philosophy into a new phase of development, in so far as it is intended to be a conciliation between Mr. John Stuart Mill's empiricism and Kant's transcendentalism. The problem of the a priori lies at the bottom of all problems, be they philosophical, scientific, or ethical. How is it that we can know beforehand that twice two will always be four? It is this problem which Mr. Mill failed to solve. Kant solved it, or rather pointed out the method of its solution. Yet Kant's solution is so overgrown with thoughts of a later period, that the student of Kant is more mystified than benefitted by it.

Has Mr. Owen any idea of the importance that attaches to

the solution of this problem ? I doubt it very much. For if he had, he would not have disappointed me by his empty declamations.

I mind neither hostility nor animosity nor sarcasm in a critic, if he be but a real critic—a man that points out fallacies, errors, and defects. If a reviewer is a critic, he will be instructive, and I shall gladly avail myself of the opportunity to learn from him. Criticisms are intellectual food ; they make our minds grow. If criticisms show us defects, they help us in mending them, and thus we gain a broader insight into, and a more correct conception of, the truth. Every word that can teach us must be welcome, and if our friends are too kind to point out our deficiencies, we must go to our enemies. They will tell us the truth, they will not conceal those things which, as they suppose, are to be blamed.

I feel grateful to every one of my many critics. I have studied their criticisms carefully and tried to learn from them. I have been able to learn from them even though they did not convert me to their views. If there is anything to be learned from Mr. Owen, it is this : Supposing that dogmas are, as he maintains, problems answered, what can we do better than strive with might and main to become dogmatic. But let us avoid mere assertions in which Mr. Owen indulges, let our dogmas be simply statements of fact, and they will be the most useful and valuable possessions of the human mind.

ODD VIEWS OF MONISM.

AMONG the different reviews of "Fundamental Problems," I find two which really deserve no answer, first, because the reviewers have apparently not read the book, and secondly, because there is no way of coming to an understanding with men who, with a contempt for logic, speak infallible oracles from a critic's tripod. There is no court of appeal from their absolute decisions. Nor do I desire any to exist.

One of these gentlemen is an anonymous reviewer in *Science*. About "Fundamental Problems" he says:

"The author's philosophy is crude and crass materialism. Indeed, we have never seen a work in which the materialistic view was presented in so extreme a form as in this of Dr. Carus. Thus, in discussing the origin of feeling, he says, 'We must expect the solution of this problem from biological investigations.' . ."

Biology is the science of life. Feeling, being one of the most important features of life, it is almost a tautology to state that the problem of the origin of feeling must be expected from biological investigations.

Without much ado he continues: "The doctor's ethical theory is confused and inconsistent. He rejects utilitarianism and at first adopts Kant's view that the moral law is purely formal, without any reference to ends."

My critic should say: "He rejects hedonism"—the word "utilitarianism" does not occur in the whole book. It was purposely avoided, because it is not a good and expressive word, and people are liable to mistake its meaning in the one or in the other way.

Utilitarianism, it is true, is identified by Utilitarians with hedonism. It should nevertheless be carefully distinguished. The "useful" is a different idea than the "pleasurable," and by making the "useful" the principle of ethics we would produce quite different moral views than by making the "pleasurable" the principle of ethics.

Kant's ethics are called in the criticism "formal ethics without reference to ends." Kant's view would better be characterized by "the ethics of a good will, which is a will in conformity with reason without regard to personal advantages" There is a great difference between "without reference to ends" and "without reference to personal advantages."

Mr. Spencer said that Kant speaks of "a will without reference to ends," but Kant never uttered such a contradiction. The error appears to arise from bad translations, and I suspect that if my critic ever read Kant, he never took the trouble to look up the original. If he had done so, most likely he would not have characterized Kant's ethics as being without reference to ends. He will find matters fully explained in the editorials of Nos. 51 and 52 of THE OPEN COURT: "Herbert Spencer on the Ethics of Kant."

Now it is true, as my critic says, that the formal ethics of Kant are adopted in "Fundamental Problems"; but (on page 200) they are adopted as the basis only for applied ethics. Formal ethics are insufficient, if they are not applied to the facts of experience.

My critic continues: "These views are supplemented by the theory that morality consists in living for the ideal, though what the ideal is, we are nowhere informed." The definition of ideal is found on page 235: "An Ideal is a conception or idea of such a state of things, as does not yet exist, but the realization of which is fostered in our aspiration." And in other words on page 204 "The next higher stage to which natural development ever tends is its ideal."

Reviewing means first of all to look into a book and read its most important passages. My critic dispenses with that part of the business. He criticises without reviewing; he judges of a book and makes statements about it without knowing its contents.

* * *

Another reviewer of a similar kind is Mr. John Bascom, who says in the *Dial*: "One sees, in glancing over the table of contents, the greatest variety of the most abstruse and difficult topics "arranged in no formal nor inherent order. . . Any discussion "of them must necessarily be of the most hasty character."

If Mr. Bascom had read the book, he would have perceived that there is a progress in the discussion of topics in "Fundamental Problems." The book starts with Sensation as the basis of Cognition, whence it proceeds to the method of abstraction. The most

important abstract being Form, the philosophy of formal thought, especially of mathematics, is treated, pp. 26—74. The importance of form, in comprehending natural phenomena, is shown in a disquisition on causation. The concept Cause is distinguished from Reason, and thus the errors of a "First Cause" plainly set forth. Cause in its proper sense being a motion, the idea of *vis viva*, of life or self-motion, is treated. The discovery of their causes makes phenomena intelligible. This leads to the topics of Unknowabilities and of Agnosticism. These discussions being in the main the theoretical foundation, the practical application of this philosophy is discussed in the concluding chapters.

Mr. Bascom adds: "The doctrine of monism plays a some-"what important part in the work, yet the author seems to confuse "it with unity—a thing quite distinct. Monism should mean one "form of being, as opposed to two or more forms of being. The "unity of monism is ultimate identity,—oneness, not the coales-"cence of adverse things in one constructive relation. Unity is "utterly distinct from oneness."

In fact, "unity" is the Latin word for "oneness," although unity is sometimes used in the sense of "union," signifying a "coalescence."

Mr. Bascom knows what monism *should* mean. It would have been better if he had known what it means, or if he had taken the trouble to read the chapter "Foundation of Monism," on page 21. Mr. Bascom says: "Real monism has no way out of itself. Di-"versity is lost, and so is unity. All is swallowed up in a one "which we know not how to convert into two, four, a thousand."

The monism of Mr. Bascom is an absurdity. It is a wagon in the mud, it "has no way out of itself." And it must be a deep quagmire in which it sticks, for together with its driver "all is swallowed up in a one, which we know not how to convert into two, four, a thousand." Why, Mr. Bascom desires such a feat of legerdemain, we are not told.

If Mr. Bascom had read the book, he should have known, that Monism cannot mean any "form of being," nor can it mean either "oneness," or "unity," or "coalescence." Monism is the method of arranging our knowledge of facts in a systematic way, so that one fact agrees with all the other facts. Accordingly, Monism is no dogma but a principle.

Every science is Monism in a certain class of natural phenomena. The scientist arranges all facts in a methodical way, so that

all together form one system. Philosophy when doing the same with all the sciences, is called Monism.

Monism, so far as it has succeeded now in its task, teaches that the world is a unity,* not a union. The Universe is no Ohio river which comes from two different sources, from the Monongahela of Matter and the Alleghany of Spirit. Both the concepts, spirit and matter, are abstract ideas which denote certain properties of reality, certain sides or parts of reality. These as well as other abstract concepts do not exist of themselves. Absolute spirit, or absolute matter, cannot be produced in reality. Spirit which is nothing but spirit cannot be found as a tangible and real thing. Matter which is nothing but matter, having no form at all, does not exist. Thus form is an abstract. Form by itself exists only in the minds of thinking beings. Pure forms and the sciences of pure forms, for instance mathematics, as ideal concepts, are of highest and of a most practical significance for human life, but pure forms considered by themselves as realities (like Platonic ideas) belong to the same category as spirits of themselves,—they are ghosts or hobgoblins, woven of the "stuff that dreams are made on."

Some believe that in the beginning Zeus took from three different boxes, matter, and energy, and form, in order to combine them into one cosmos. According to Monism, the world did not coalesce out of our abstract conceptions (matter, energy, and form,) but the reverse, the world is one whole, it is a unity, and our abstract conceptions are derived—are abstracted—from it.

* * *

Reviewers who treat a book unkindly because they start from different principles, must be in my opinion very welcome to an author, because he can as a rule learn most from his enemies. A hostile criticism which points out the weakness of a book, a fallacy in the author's logic, an error in his statements is most valuable and I should thank publicly any critic who would do so. From these two reviewers, however, I could learn nothing.

A wise American says: "If you would lift me, you must be on higher ground. If you would liberate me, you must be free. If you would correct my false view of facts,—hold up to me the same facts in the true order of thought."

* According to Mr. Bascom the word oneness is perhaps the proper term.

IN REPLY TO A CRITICISM OF COL. PAUL R. SHIPMAN.*

1. SENSATIONS, THINGS, AND KNOWLEDGE.

A sensation and the thing that causes the sensation are different. The sensation is an effect caused by the thing upon a living sentient being. The sensation reproduces in its way the form of the thing; and certain feelings correspond to certain qualities of the thing; for instance, the sensation of redness to certain vibrations of ether-waves. Thus, a sensation, or a sum of sensations, represents the thing in the brain of a sentient being.

Cognition does not go beyond sensations, and it need not; it simply arranges sensations until they are all systematized into one great system.

The difference between sensation and the thing that causes the sensation, affords not the slightest reason why the thing should be unknowable or why cognition should be impossible. To illustrate: Knowledge is a representation of things and their relations, in the mind of a thinking subject. The things need not actually enter our brain in order to be represented in our mind. All things and their relations being representable, they are knowable. A thing and its image reflected in a glass are totally different, but this does not make reflection—a representation in the mirror—impossible.

The most pregnant and concise answer to Col. Shipman's argument on the unknowability of things would perhaps be a paraphrase of his own sentences, comparing the representation of cognition to the images of things produced by reflection in a glass.

"Whatever can be mirrored," our paraphrase runs, "can be mirrored in something like a glass only. But the external thing does not appear in the glass as it exists outside of the glass. The thing and the reflection of the thing are different. It follows of necessity that the external thing, as it exists out of the glass is at once real and unreflectible. The thing itself cannot be mirrored."

*The full controversy is contained in Nos. 131 and 133 of *The Open Court*

But why should the thing itself go into the glass? Is it not enough that it is mirrored in the glass? Why should the thing itself be grasped? Why should the thing itself enter and appear bodily in consciousness as it exists? Is it not enough that it is represented in consciousness? And being represented in consciousness, that is knowledge; being correctly and sufficiently represented, that is truth.

The truth that external things remain outside the thinking subject, that the things do not enter consciousness although they may be represented in consciousness is, it appears, the substance of Mr. Shipman's proof of his doctrine that things are unknowable. What does that prove but that Mr. Shipman's view of "knowing" and "understanding" and "comprehending," is totally different from ours. In order to understand something we need not eat it, so as to get the thing within us; it is quite sufficient to have it represented in our minds, for that is the nature of knowledge—that and nothing else.

2. WORDS.

Words must be construed according to their context. By existence we might now understand the abstract and empty idea of existence and then again the concrete reality of existing things. By matter we might now mean the abstract term comprehending those qualities alone which are common to all substances, and then again all the material qualities of a special piece of matter. Every writer can expect that his readers will interpret words in agreement with the connection in which they appear—the only condition being that the author's meaning in each case be unmistakable. But ambiguity lurks in every expression separated from its context.

3. RELATIVITY OF KNOWLEDGE.

Mr Shipman asks: "Knowability by whom—man or moner?" If I declare that a problem is solvable, will you retort the same question: by whom—man or moner? And will you maintain that because it is insolvable by the latter, it must be insolvable generally? A mathematical problem is insolvable to a child; it is beyond the understanding of the cleverest dog, but it is therefore not insolvable *per se*. Many things, many explanations of natural processes were unknowable to former generations; yet they were not unknowable in themselves.

This is my whole objection to agnosticism: *Unknowability is*

not a quality inherent in things. Every thing that exists can be represented in the consciousness of a sentient being. That which is unknowable to me, is not unknowable to a man who has the deeper insight to comprehend it. I do not deny the relativity of knowledge, I do not deny the inexhaustibility of existence for cognition, nor do I deny that with the solution of every problem new problems will constantly offer themselves Yet I do deny that the Unknown is the Unknowable ; I do deny that legitimate problems exist which are insolvable.

4. THE THING AND ITS PROPERTIES.

The thing is the sum total of all its properties and there is not "a thing in itself" behind its properties. The properties of a thing are its qualities. They are not like the properties of a person in the sense of his possessions and belongings, which if all were taken away, leave the person still intact. All the properties of a thing, taken together, are the thing. Accordingly, there are no such things as things in themselves.

5. THE ABSOLUTE AND THE IMPOSSIBLE.

"The relative" and "the absolute" are expressions signifying a certain attitude which we intend to take towards things. If I wish to consider a thing not in the relations which in reality it bears to other things, I consider it absolutely. Considering things absolutely is a mental process, but in reality things never possess any such absoluteness, they constantly remain in relations to other things.

If there is anything absolute, it is the Universe or the All ; reality considered in its totality is absolute. But here again, the absoluteness of the All is an absoluteness in so far only as the All has no relations to other Alls or Universes outside of it. Yet the Universe has certain relations to its parts, as the solar system in its totality comprises certain relations to its different planets. Moreover, if the Universe, the sum total of all the celestial bodies, may be considered as possessing one common motion, would there not be a relation of the All to the direction of its own motion —or to express it in popular terms, a relation between the All and the empty space outside of it ? Are there not also relations of the All as it is in this moment, to the All as it was and as it will be ?

In popular parlance the word absolute is, and we deny not that it may be, used in the sense of a relative completeness, mean-

ing thereby that a thing has no relations in a certain direction only. The theorems of mathematics are absolute in so far as their authority is intrinsic, they are not laws proclaimed by some legislative act. Yet they are not absolute in the sense that their validity and certainty rest in midair or nowhere. They are not absolutely absolute, but may very well be called absolute for the purpose of declaring that in a certain way they are independent.

I repeat: an objectively and absolutely absolute does not exist. "Absolute" expresses not a quality of or in things, but a certain attitude of the thinking subject only. In reality there are no absolute objects, no absolute things, no absolute relations.

Mr. Shipman reasons that "the relative suggests the absolute" as its correlative. But must it therefore, simply because it is suggested, have a real existence? I do not think so. So does the possible suggest the impossible as its correlative. Is therefore the impossible a reality? If it were, then indeed Mr. Shipman's argument that "we could more easily walk away from our shadow than think away from the absolute" is no less true of the impossible.

6. THE INSOLVABLE PROBLEM.

Mr. Shipman uses to a great advantage my concession, as he calls it, that there are problems which are insolvable. I declared that such problems as are *per se* insolvable are not admissible; they are illegitimate and wrongly stated. Mr. Shipman does not accept this view of the subject but claims with great plausibility that the mere existence of insolvable problems proves agnosticism. Indeed, I might define agnosticism as that philosophy which looks upon the basic problems of philosophy as insolvable.

It is true that I concede the existence of insolvable problems; but the existence of insolvable problems proves nothing in favor of agnosticism. Let us see what an insolvable problem is.

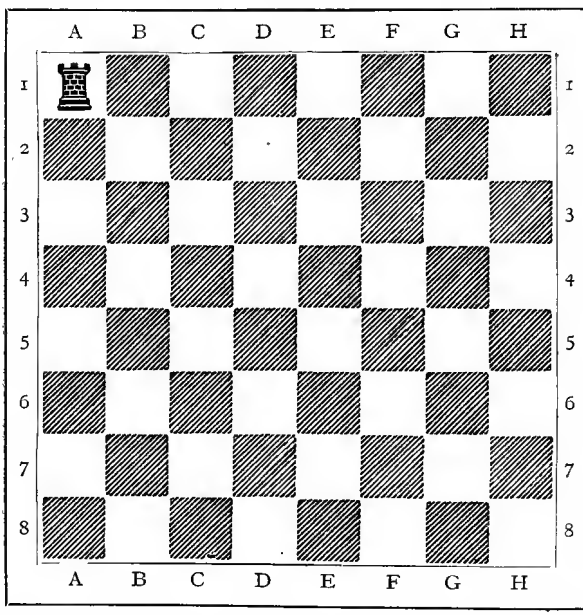
Take as an instance the squaring of the circle. Thousands of ingenious mathematical minds, Hindu sages, Greek philosophers, and modern thinkers, have in vain attempted a solution. Gradually certain mathematicians came to the conclusion that the problem might be insolvable, and recently Professor Lindemann, at present of the University of Königsberg, has taken the immense trouble to demonstrate that the problem *is* insolvable and to explain *why* it is insolvable.* This settles the question. The squaring

* Prof. Lindemann's essay appeared first in the *Berichte der Berliner Akademie*, (June 1882,) then in the *Comptes rendus* of the French Academy (Vol.

of the circle being shown to be impossible, the problem is solved. The solution is negative.

I might explain the nature of an insolvable problem by the following example:

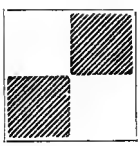
Problem: Take a rook, which can move in lines parallel to the sides of the board only, and, starting from the corner square A1 of a chess-board, pass through all the squares once, but never more than once, and arrive at the corner of the board diagonally opposite (square H, 8).



This problem is insolvable to the extent that the performance demanded can never be accomplished. The problem, however, is to this extent solvable that we can prove that whenever the number of squares in both directions make up an even number, the

115, p. 72–74), and in the *Mathematische Annalen* (Vol. 20, p. 213–225). For a popular discussion of the subject see Dr. Hermann Schubert, *Die Quadratur des Zirkels*, published among the *Wissenschaftliche Vorträge* by R. Virchow and Fr. v. Holtzendorff, No. 67. English translation, *The Monist*, No. 2.

demand is illegitimate. In reducing it to its simplest form, we may state the same problem as follows: Take a board divided into the four squares A, B, C, D, as the adjoined diagram shows.



Start with a rook from A, pass through B and C only once, and arrive at D. This in other words means: go to the left and at the same time to the right, and arrive at a place midway between. Or you might demand this: Move in a circle and describe one complete revolution (only one not one and a half) and arrive at the side opposite to that from which you started.

Problems that are wrongly stated must not be considered as lying beyond our comprehension. They are not unknowable, not incomprehensible—they are illegitimate.

7. THE AGNOSTIC'S PROBLEM.

Every rational thinker who, when working out a problem, arrives at contradictory statements, would confess at once that he must have made a mistake. The agnostic philosopher is an exception. He arrives at a *non liquet*, and it never occurring to him that the confusion might be subjective, he declares that the confusion is objective. Being taken to task, he makes the same mistakes over again, arrives at the same contradictory statements, and triumphantly proclaims his *quod erat demonstrandum!*

The agnostic attitude changes the whole character of philosophy. The philosopher's duty is to present a clear conception of the world. The agnostic's problem is to prove that things are in complete confusion. Happily it is not so. He can only prove the confusion of his conception of things.

That principle is indeed true which Professor Huxley declares to be "the essence of science whether ancient or modern," and which he strangely identifies with agnosticism, namely, "that a man shall not say he knows or believes that which he has no scientific grounds for professing to know or believe"; and taking my standpoint upon that very principle I reject the tenets of agnosticism. There are no scientific grounds, nor are there in fact any philosophical grounds, for believing in such a thing as the Unknowable.

8. WHENCE COME FACTS?

FACTS, we declare, are the data of knowledge; and the existence of things, the existence of nature, must be regarded as a fact. Here Mr. Shipman thinks that he has got me in a fix. Whence do we get the facts?

This question may be viewed in two different ways:

(1) How is the present state of the world to be explained from a former state? Especially, How did its complicated cosmic harmony and manifold variety of form come about? and

(2) How is it that things exist at all? Why is there existence instead of non-existence? Why is there something instead of nothing?

These are the two interpretations of which the question "Whence come facts?" admits. In the former shape the question has found its scientific answer in the Kant-Laplace hypothesis of the origin of the solar system and in the Lamarck-Darwinian theory of evolution which was devised to account for the origin of species. In the latter shape the question has also found a scientific answer. The answer is formulated in the law of the conservation of matter and energy. The answer is that matter and energy are indestructible and uncreatable; they are eternal. "Eternal" does not signify anything mysterious or incomprehensible; it simply denotes something that exists, that has existed, and that will continue to exist.

No other answer can be expected to the question "Whence do facts come?" Mr. Shipman does not seem to consider the law of the conservation of matter and energy a sufficient solution of the problem. He would fain make us believe that the substitution of something unknowable is an answer more satisfactory than the law of the conservation of matter and energy. But it is not. The Unknowable explains nothing; and if one adopts the positive conception of philosophy, the Unknowable becomes quite a superfluous idea, which can most easily be dispensed with—nay more easily than it can be accepted. There is no place for it in a system of positive philosophy.

9. INFINITUDE.

Mr. Shipman tells us that the infinite is "a property abstracted from infinite things." I must confess, (1) that I never met

with an infinite thing in my life, and (2) that I do not believe in the existence of infinite things. Time and Space are infinite to be sure; but time and space are not things; and infinitude is not abstracted from Time and Space, but attributed to them. Space is not, as metaphysical philosophers imagine, a large box possessing the inexplicable property of infinitude, and containing the world within it. Space is the possibility of motion in all directions. If the point *A* moves in a straight line, it is possible for it to continue to move without stopping. We can imagine the process to be continued without a limit. The same holds good for every line in every possible direction. This is all we can mean by the idea that space is infinite.

It is the same with Time. Metaphysical philosophers imagine that Time is a mysterious something in which all events and happenings take place. But Time is not a thing. It is no more a thing than Space is.

We observe changes taking place around us. Time is nothing but a measure of these changes. We employ as measures such changes as appear most regular, such as days and years. But there is no time apart from changes. Since we can imagine that some changes will always take place, and, even if they did not take place, since we could measure the time of a supposed rest by some certain measure, (days, years, millenniums, billenniums, etc.), we say that Time is infinite. This is all that we can mean by the idea that Time is infinite.

If Mr. Shipman means by "infinite existence" the truth that existence will continue to be existence into infinity, (viz., infinite time, or eternity), I gladly adopt the term. If he means that existence in its extension is infinite, I must hesitate to adopt it. If the infinite extension of existence means something immeasurable to us with the means of measurement at our command, I have also no objection. But if it means that the amount of energy and of matter in the sum total of all the sidereal systems of the universe is absolutely infinite, I must ask Mr. Shipman on what ground he makes such a bold assumption.

10. THE THINKING SUBJECT A PART OF NATURE.

If Mr. Shipman's expression, "things are impenetrable to thought," is used in a figurative sense, meaning thereby that we cannot see in our mind the inside of things and the laws that

describe* their formation (indeed, it can not be interpreted in any other sense), the idea is as untrue as that science is identical with ignorance.

We cannot look into the inside of people; yet a good physician who is not an ignorant quack but combines knowledge with ability and sound judgment, can and does penetrate with his thought into the organs of his patient. What would be the value of science, if that were not so!

A philosophy that levels all degrees of wisdom to the miserable *ignorabimus*, will come to the rescue of quacks and comfort their conscience with Solomon's great saw: "All is vanity! Knowledge is vanity! Wisdom is vanity!".

Does not the botanist see more in a tree than people ignorant of the wonders of plant-life? Do not our thoughts penetrate into the ground and do we not know that the roots are there that nourish the tree? Does not the mind of the scientist perceive the activity of the solar light which raises every little drop of sap that enters the leaves and blossoms to build up their structures? And are not the laws that describe* these changes present in the mind of a man familiar with the subject so that he can upon the whole foretell what will happen, if some of the conditions were altered? If that is no penetration of thought into things, pray what is it?

11. UNKNOWABLE MACHINES AND THEIR INVENTORS.

Are those things unknowable also that we made ourselves? Were steam and the laws of steam impenetrable to the thoughts of a Watt and to a Stephenson? Is a watch unknowable to a watchmaker? Is the Eiffel tower and its structure unknowable to Mr. Eiffel? Is the phonograph an unknowable instrument to Mr. Edison? Is he hopelessly ignorant about the materials and their qualities of which its different parts consist? Must he not have a very exact and an exhaustive knowledge of the laws according to which the wonderful little machine acts?

* We purposely use the expression "natural laws *describe*," and purposely avoid the term "*govern*" in this connection. The expression "gravitation governs the motions of celestial bodies" gives rise to the misconception that the law of gravity is a power behind the phenomena of gravity. Thus we mystify ourselves by our own language and look upon gravitation as a metaphysical something that like a wizard rules the behavior of atoms and planets. The so-called natural laws are not laws, properly speaking, but comprehensive formulas which systematically and methodically describe certain natural processes.

Mr. Wake in his thoughtful essay *God in Evolution* (*The Open Court*, No. 121, p. 1998) brings out very strongly this point against agnosticism. We quote the following passage :

"To a philosopher in his study, or even in the presence of the ordinary phenomena of external nature, all our knowledge may appear to be resolvable into states of consciousness, but not to him who uses the qualities of matter or directs the forces of nature for working out some great useful design. The sculptor or artist *can* give outward form to his thought, and so can the engineer who tunnels under mountains or bridges arms of the sea. The discoveries of science, and their application in the manufacture and formation of works of art, are not consistent with the view that external phenomena are not truly represented in consciousness, whatever may be said of astronomy or any other science as the formulation of the laws of nature."

12. REVERENT AGNOSTICISM.

In popular opinion I find that one of the strongest arguments in favor of Agnosticism is the preconceived idea that familiarity breeds contempt. If a schoolboy gains a superficial knowledge of astronomy, the astronomer loses in his eyes the respect he before possessed. The mysterious, the uncomprehended, the unknown alone seem to command man's reverence.

Familiarity with scientific truth breeds contempt in him alone whose knowledge is superficial ; all thorough knowledge will raise admiration and wonder and awe. Knowledge dispels superstitious awe and foolish fear, but the truly religious spirit, the recognition of the sublime in nature, is not lost through knowledge; it receives its only solid food whereon to live and to grow.

The savage will cease to worship a thunderer if he knows that thunder and lightening are produced through electrical tension. In that sense familiarity with a subject will breed contempt. But the scientist understanding the laws and the workings of electricity, will be more impressed with the grandeur of natural laws than the poor pagan, who bows down in the dust before the flash that shoots forth from the clouds.

It is one of the gravest mistakes of Agnosticism as presented by Mr. Herbert Spencer to base religion upon the Unknown, and—in order to give to religion a foundation which even the scientist dare not touch—to assert the existence of an Unknowable and recommend it as the basis of the future religion. The worship of the Unknown is no religion, but superstition, and the proposed worship of a chimera, such as the Unknowable, it seems to me, is no improvement upon paganism. The pagan indeed does not worship the thunder because he *does not know* what it is, but because he *does*

know that it might kill him. He worships the thunder because he is afraid of it, because of the known and obvious dangers connected with it, which he feels unable to control. He worships that which powerfully influences his life and which he cannot alter or fashion as it pleases him. Religion, true religion, is the recognition of the unalterable laws of nature to which we must adapt ourselves. It is above all the recognition of the unalterable moral law which builds up human society and made man a moral being—and the recognition of these laws implies the fear of breaking them and the confidence that a community in which they are obeyed, will flourish and grow and prosper, and its citizens shall enjoy the benefit thereof.

Occasionally I meet with the strange expression "reverent agnosticism." Reverence for truth is certainly better shown by earnest and bold inquiry than by a halting and submissive respect—as if truth were unapproachable.

THE UNANSWERABLE RIDDLE.*

Insolvable problems, such as squaring the circle, are problems that are wrongly stated. The problem to construct a plane equilateral triangle, the angles of which are all right angles, is such an insolvable problem. It is insolvable, because it contains contradictory demands of which the one is inconsistent with the other. Both cannot be realized at the same time. Insolvable problems are illegitimate; they are based upon errors: they are errors. Is the existence of errors, or of inconsistent and unrealizable demands any evidence of agnosticism? Mr. Shipman strangely enough affirms that it is.

Hebbel tells a story about a company on a steamer, in which, for the sake of pastime, riddles were proposed. Every one who guessed right received a sixpence from, and every one who had to give up had to pay the same amount to, the person who had proposed the riddle. A poor Jew, Hebbel tells us, had made good guesses and thus earned several sixpences. When his turn came he asked: "How can you put three fishes in three pans, so as to have two fishes in each pan, and none left?" Everyone of the passengers had to give it up, and paid his sixpence. After the smart Jew had collected the money all round, he was urged to give his solution, and he said: "I don't know it myself; here is *my* sixpence!"

The insolvability of illegitimate problems is the argument with which Mr. Shipman confidently imagines he refutes positive philosophy, and this is the shaky ground upon which agnosticism stands. Agnosticism has wrongly formulated the philosophic problem and consequently finds it as insolvable as the Jew's riddle.

The agnostic plays with his own errors as the kitten does with its tail. He moves in a vicious circle; regarding the fallacies of his own argument, which make the world incomprehensible to him, as proofs that the world is really incomprehensible.

What we demand of a philosophy is not a confounding of all issues, so that we are hopelessly benighted by our own confusion; what we demand is clearness, exactness, and discrimination; positive issues and positive answers!

*Written in further explanation of the nature of insolvable problems.

IRRELEVANT PROBLEMS.

There are some problems which are practically insolvable, because we cannot come into a possession of the facts indispensable for their mere formulation. The question, for instance, whether the inhabitants on the planets about Sirius are as far developed as is man upon earth now, is a problem of that kind. Such problems are irrelevant; and neither science nor philosophy can seriously engage in attempts at solving them. The principle of positivism, it must be remembered, is the maxim to start from facts only. Accordingly any problem that is based on imaginary data and has reference to things which have never entered the scope of our experience, can not as yet be considered as a legitimate problem.

Problems have been proposed which, although very interesting, must be regarded as belonging to this class of irrelevant problems. We do not know whether there is matter outside the universe and the starry heavens; whether this matter, if it exists, is the same ether which, according to our physicists, is the medium of light. If there is no matter outside the milky way (or perhaps outside of the system of milky ways which make up the whole immeasurable cosmos), will the light and the heat of our celestial bodies radiate into empty space, or will they be reflected by what might be called a negative wall? In the former case the universe would suffer a constant loss of energy, in the latter its total amount of energy would remain constant. The former assumption leads to the idea of a beginning and an end of the entire cosmos, the latter assumption involves its spacial finiteness.

These two conceptions do not exhaust all possibilities. The milky ways might be comparable to a comparatively small ripple travelling over an immense ocean. The ripple would be the actual life, beaming forth from the fixed stars as light and appearing on the crust of their planets as the activity of organised beings. The ocean over which it passes would be the Nirvana of inexhaustible potential life, whose rest is temporarily disturbed. The wave passes on, and peace is restored.

Problems of this kind,—irrelevant problems—although some of them possess a great fascination for the human mind, are no real live questions. They are in themselves not more mysterious than other problems, yet they appear more mysterious to us, because we cannot get into possession of the facts which we desire to understand. The data for their formulation are not forthcoming.

If we were in possession of all the facts pertinent to any problem, it would undoubtedly be solvable; there would be a possibility to understand it. Irrelevant problems however deal with merely fictitious propositions. Any discussion of them must remain a mere play of our imagination.

It is true that facts with which we do not come in contact, cannot be stated; and they can not, for this simple reason, be understood either. If the recognition of this truth is to be called agnosticism, agnosticism would be relegated to those spheres alone which we need not care about, because they do not affect us. They will yield no fruit and remain barren to us because we can not till their fields. Agnosticism would have nothing to say to any vital problem that turns up in life, be it a problem of science, philosophy, religion, or political economy.

It is at any rate advisable for agnostics to leave their agnosticism at home whenever they are confronted with the real live problems of the day.

THE AGNOSTICISM OF MODESTY.

AGNOSTICISM is a most praiseworthy position if it signifies Socratic modesty concerning all those problems which we have not as yet solved. But then, of course, it is a personal attitude, not a philosophy; it is simply a confession of private ignorance, which will be of great service in dispelling that ignorance.

Darwin when urged to state whether he was a theist or not, uses the word agnosticism in this sense, saying: "I think that generally (and more as I grow older), but not always, that an Agnostic would be the more correct description of my state of mind," i. e., more than a theist. And even here Darwin feels constrained to add the three little words "*but not always.*"

Darwin was no philosopher, and all his utterances concerning philosophical and religious problems were made most unwillingly and with great reserve. The term agnostic is characteristic of this reserve. It was intended as the expression of his personal attitude and not as a philosophical dogma. In his own province of research Darwin certainly did not adopt the principle that the origin of the species was an inscrutable mystery. He showed his reverence towards truth not in an overawed reserve but in courageous investigation.

Darwin says in his preface to the *Descent of Man*:

"*It is those who know little and not those who know much, who so positively assert that this or that problem will never be solved by science.*"

Who dares to cite Darwin's authority in favor of Agnosticism —save the agnosticism of personal modesty—in the face of that passage?

The agnosticism of modesty is a great thing, for it gives a stimulus to investigation. However, the dogmatic agnosticism which establishes a belief in the Unknowable erects a barrier to scientific inquiry. Agnosticism is truly, as the French express it, a *cul de sac*. It leads us into a blind alley where no further advancement is possible and maintains that there the world is at an end. All great enquirers were agnostics of the former class, but the agnostics of the latter class are the great mystery-mongers of a pseudo-philosophy, such as Plotinus and Jacob Böhme, who may have been very profound dreamers, very original geniuses, but not clear thinkers, not true philosophers.

AN UNTENABLE FORM OF MONISM.

IN REPLY TO A CRITICISM BY DR. EDMUND MONTGOMERY ON THE WORK OF "THE OPEN COURT."*

THE MONISTIC ROOT.

DR. MONTGOMERY'S monism is different from the monism which is presented in Fundamental Problems. He believes that matter and mind, disparate though they are, may have a monistic root, a common origin in one and the same underlying reality. He lays much stress upon the disparity of body and mind, and refers to the history of philosophy. He declares, "the problem has been laboriously cast into a historic mould or 'form,' which one has no right wilfully to neglect."

The history of philosophy, it appears, has taught Dr. Montgomery no other lesson than that the first duty of a philosopher is to set out in search of a magic root, which is supposed to be the sesame of a monistic philosophy. There have been many gallant knights of thought—their adventures are recorded in the history of philosophy—who in their fantastic longing for the magic root that should explain the mystery of matter and mind, wasted their lives in a fight with chimeras. These chimeras are the products of their own imagination; they are the errors in which these knights errant became entangled, and most of these mediæval heroes of thought, it is sad to think of, were slain and devoured by the children of their own prolific imagination.

Dr. Montgomery appears like a wraith of one of these slain heroes, and refuses to recognize as his peer any one who renounces the sacred search for the monistic root of body and mind. Dr. Montgomery kindly informs us what we ought to do in order to become truly monistic; he says:

* Dr. Montgomery's criticism appeared in Nos. 156 and 157 of *The Open Court*.

"The principle effort of my thought has ever been to show that the two "disparate modes of existence known to us under the name of body and mind, "have a common origin in one and the same underlying reality."

On the basis of this statement, Dr. Montgomery claims the title of a monist. But this monism is only a visionary hope, and so the Doctor's attitude remains for the time one of suspense.

We become entangled in inextricable difficulties, unless reality is considered as one indivisible whole. There are sense-impressions and perceptions; there are motions, there are feelings, and there are thoughts. Certain groups of sense-impressions that are related, unite in one concept; and such a group of sense-impressions receives a name. The name thus represents a group of facts which in their totality are called a body. In this way conceptions are formed. There are, however, conceptions of different kinds. When thinking of movements, we omit thinking of feelings; in other words we make an abstraction. When thinking of mental states we omit thinking of bodies; we again make an abstraction. In reality they do not exist separately; but for certain practical purposes it is, for the sake of clearness, necessary to separate them in thought. Body is different from mind, or as Dr. Montgomery says, they are "disparate." They are as much so, for instance, as black and fluid are. But they are not disparate in the sense that their co-existence is any mystery. There may be black fluids that are black as well as fluid in all their parts.

With the assistance of some learned show we might make a very deep mystery of a black fluid. How can two things, we might argue, be in the same place at once? It is impossible, and yet it is maintained that in every part of this substance there is blackness and fluidity at the same time. Is it now the duty of the physicist to show in stilted phrases, "that the two disparate modes of existence, known to us under the name of blackness and fluidity, have a common origin in one and the same underlying reality"?

Mystifications are very easily produced. We need only misunderstand the purport of words in order to produce confusion. We need only consider the words "fluidity and blackness" as representing things in themselves, and the idea of a black fluid will appear as an insolvable mystery. On the other hand we must understand the purport of words and the method by which we have arrived at abstract expressions, in order to preserve clearness of mind.*

*Compare the passages on pp. 146–148 and 148–153.

This is especially so with the terms body and mind. Certain features of a living being are called mind and other features are called body. So long as a living being has been considered as a composition of a living mind with a material body, their interconnection was supposed to be an insolvable problem. Mind was considered phenomenal and the body was considered phenomenal; behind both, it was maintained, lies the reality of which we know nothing. Thus the facts of experience were declared to be phenomenal illusions and a mere sham. Reality was sought behind the facts of experience, it was supposed to be anywhere except in that which is most properly called reality.

Reality is. It is undivided and indivisible. And parts of reality are symbolized in words. In contemplating the meaning of these words and noticing that they are sometimes disparate, i. e., so different that one cannot be compared with the other because they belong to different categories, the philosopher wonders how these "disparate things" fit into each other.

Is that not just like the Polynesian of whom Kant speaks? He wondered not why so much froth came out of the champagne bottle, but how the froth had been put in. Instead of investigating how the soul has been formed, how the "subject," viz., the *ego* in Descarte's *cogito*, has grown, how from a complex of sense impressions ideas have developed, Dr. Montgomery takes the different ideas he has, and tries to put them together again, so as to form the world as "a unitary product (!) of homogeneous co-operating forces." He succeeds as little as Kant's Polynesian could succeed in the attempt to replace the froth in the bottle.

In order to re-combine two such disparate things as "body" and "mind," Dr. Montgomery has recourse to "a common origin," "a monistic root," or an "underlying reality." The underlying reality is the cement with which he tries to unite the disparate pieces of his broken world. But it does not hold together. This kind of Monism is untenable.

FORM NOT INDIFFERENT.

A missionary who had lived among the Zulus, told me that he once overheard the talk of two savages on the witchcraft of the white man. "But look here," the one said, "if I throw a piece of iron into the water, it will sink. The white man brought to our river several pieces of bent sheet-iron, and every single part would sink if we threw it into the water. But the white man put the parts together, and although it was much heavier than our

canoes, it floated. I have seen it with my own eyes, and it is true by my life." The other Zulu replied, "The white man can do this only by witchcraft." These Zulus apparently believed that the forms of things are, as says Dr. Montgomery, "causatively indifferent."

If we misunderstand the importance of form, if we consider it as "a *causatively and ethically indifferent* grouping of material particles," we shall inevitably drop into mysticism, agnosticism, or the belief in witchcraft. The belief in witchcraft develops among theologians as supernaturalism, and among metaphysical philosophers as a theory of "hypermechanical impulses."

THE MECHANICAL EXPLANATION AND THE ORIGIN OF FEELING.

Dr. Montgomery says:

"The intrinsic animation of all matter. ....is wholly antagonistic to the "mechanical conception."

His argument is as follows:

"If material particles were alive, were capable of originating from within "any kind of motion, the entire mechanical world-structure would instantly "fall into chaotic confusion."

Certainly it would, if life is to be interpreted as Dr. Montgomery interprets it in the foot-note, where he says of a brain molecule that it "should wander from its place or path without an adequate mechanical cause."

I have not as yet met among philosophers one whose idea of life consists in the supposition that there is a capability of "originating from within any kind of motion," if by "originating" is meant creating motion from nothing. Kant, with whose criticism modern thought commences, calls every world-conception which stands in contradiction to the mechanical principle "a philosophy of indolence" (faule Weltweisheit.)

Let me quote as an instance the following passage from Kant:

"If people can free themselves from an old and unfounded prejudice as well as from the philosophy of indolence which under a pious mien attempts to hide a lazy ignorance, I hope to found upon irrefutable reasons a sure conviction first that the world has a mechanical development out of universal natural laws as the origin of its constitution, and secondly that the mode of its mechanical origin such as we have represented it, must be true."—

"Reason is exceedingly interested," says Kant, "in not dropping the mechanism of nature in her creations, and in not passing it by in their explanations; because without it no comprehension of the nature of things is possible."

But how is it as to the origin of the organized life of plants and animals? Can the mechanical principle be shown to hold good here also? Kant has not, and with the scientific material at his disposal could not have succeeded in applying the mechanical principle to the origin of organization. He says in another passage:

"I think we can say, in a certain sense and without exaggeration: Give me matter, and I will build out of it a world, which means: Give me matter, and I will show you how a world is to originate therefrom."

Having described the laws that shape planetary systems, Kant continues:

"However, can we boast of the same advantage concerning plants and insects? Are we able to say, Give me matter, and I will show you how a grub originates? Do we not here stop at the first step, hampered by ignorance concerning the true inner quality of the object and the complexity of its internal variety? It must not be wondered at if I dare to say: that rather the formation of all the celestial bodies, the cause of their motion, in short the origin of the whole present constitution of the world-structure will be comprehended, before we understand the generation by mechanical principles of a single herb or grub."

Kant expresses himself very guardedly. He does not deny that science will in time be able to arrive at a mechanical understanding of the origin of a plant or a grub. He does not deny that the process of life, so far as its motions are concerned, takes place in strict accord to mechanical laws. And if he denied it, how could he call any philosophy that attempts to set aside the mechanical principle, *faule Weltweisheit?*

* * *

If the expression "originating from within any kind of motion" means the change of potential energy into kinetic energy, then indeed every particle of matter is alive. The stone in your hand, if you let it go, will originate motion from within. You need not impart to it any energy. The potential energy is in the stone. The stone being of a certain mass, its energy depends upon its position at a certain distance from the centre of the earth. In the sense that under special conditions things change a definite amount of potential energy into its equivalent of kinetic energy (i. e. motion) even stones are alive.—Will Dr. Montgomery deny this?

What is life in the usual and limited sense of the word, viz., the organized life of animals, but motion accompanied with some kind of feeling? Motion everywhere takes place according to strict

and irrefragable laws which we call mechanical. Energy everywhere remains energy, it never produces feeling. Energy may seem to disappear, but it does not, it simply becomes latent and in that case is called potential energy. Feeling however, is not a product of motion, but feeling accompanies certain motions.

Dr. Montgomery's quotations are excellent, and as they corroborate our position we repeat them here. Locke says :

"Body, as far as we can conceive, being able only to strike and affect body ; and motion, according to the utmost reach of our ideas, being able to produce nothing but motion, so that when we allow it to produce pleasure or pain, or the idea of color or sound, we are fain to quit our reason, go beyond our ideas, and attribute it wholly to the good pleasure of our maker."

And Leibnitz says :

"We are constrained to confess that perception and whatever depends upon it, are inexplainable upon mechanical principles ; that is by reference to forms and movements. If we could imagine a machine the operation of which would manufacture thoughts, feelings, and perceptions, and could think of it as enlarged in all its proportions, so that we could go into it as into a mill, even then we would find in it nothing but particles jostling each other, and never anything by which perception could be explained."

We add a passage from Prof. Clifford :

"To say : ' Up to this point science can explain ; here the soul steps in,' "is not to say what is untrue, but to talk nonsense. . . . . But the question, do "the changes in a man's consciousness run parallel with the changes of "motion, and therefore with the forces in his brain ? is a real question, and "not prima facie nonsense."

That which Clifford here characterises as "the stepping in of the soul," Dr. Montgomery calls "the impulses of the hypermechanical," which we shall take occasion to discuss later on.

We need not imagine that the motion of every single atom is accompanied with feeling ; but we can, without commiting ourselves maintain that the motions of all atoms are accompanied with elements of feeling ; and these elements of feeling produce in certain combinations actual feelings.

Nature is not animated in the sense that there is a soul in every stone ; yet nature is alive in the sense that all particles contain the elements of life, so that the organized life of plants as well as animals can and will sprout forth simply by organizing.

Let me add here that "the application of the mechanical principle" is very different from that theory which Dr. Montgomery calls "the mechanical world-conception." The mechanical principle is applicable to all motions. Mechanics explains, i. e. describes in the simplest and most comprehensive way, all kinds

of motion ; but mechanics does not deal with those things which are not motions ; accordingly it does not and cannot be expected to explain them. Mechanics for instance does not explain feelings. But the mechanical world-conception, as represented by Dr. Montgomery, is supposed to explain everything by laws of motion.

The mechanical principle explains the motions of the heavenly bodies ; it explains (viz., it describes in formulas most concisely and at the same time exhaustively) gravitation, but it does not explain gravity. According to certain laws gravity under special conditions makes matter move, or if a special lump of matter can not move, it makes matter exert upon other matter a definite pressure.

THE HYPERMECHANICAL AND THE MECHANISM OF THOUGHT.

Dr. Montgomery says concerning Mr. Hegeler's comparison of the soul to the phonograph :

"The same hypermechanical faculty which selects for reproduction among "all registered marks those intended for a special purpose, this same select- "ive faculty imparts evidently also the corresponding impulses to the vocal "chords. The process transcends altogether mechanical interpretation."

If the word "hypermechanical" means "non-mechanical" we have no objection to the idea that there is something hypermechanical, for feeling is indeed non-mechanical. Yet in that case we must object to the proposition of Dr. Montgomery, that the non-mechanical faculty "imparts impulses." The non-mechanical has nothing whatever to do with the mechanical, it can impart no impulses. The idea of a non-mechanical impulse is a flat *contradictio in adjecto* no less than the phrases 'a living corpse' or 'a non-existent being.'

Dr. Henry Maudsley in his "Physiology of Mind," p. 70, discusses the selective faculty with reference to Mr. Spencer's comparison of the soul to a piano. Maudsley says :

"'Ideas,' Mr. Herbert Spencer remarks, ('Principles of Psychology,' Vol. VII. p. 485,) 'are like the successive chords and cadences brought out from a piano, which successively die away as other ones are sounded. And it would be as proper to say that these passing chords and cadences thereafter exist in the piano, as it is proper to say that passing ideas thereafter exist in the brain. In the one case as in the other, the actual existence is the structure which under like conditions again evolves like combinations..... The existence in the subject of any other ideas than those which are passing, is pure hypothesis absolutely without evidence whatever.' This analogy, when we look into it, seems more captivating, than it is complete. What about the performer in the case of the piano and in case of the brain respectively ? Is

not the performer a not unimportant element, and necessary to the completeness of the analogy? The passing chords and cadences would have small chance of being brought out by the piano if they were not previously in his mind. Where, then, in the brain is the equivalent of the harmonic conceptions in the performer's mind? If Mr. Spencer supposes that the individual's mind, his spiritual entity, is detached from the brain, and plays upon its nervous plexures, as the performer plays upon the piano, his analogy is complete; but if not, then he has furnished an analogy which those who do take that view may well thank him for. There is this difference between the passing chords and cadences of the piano and the passing chords and cadences in the brain—and it is of the essence of the matter—that, in the former case, the chords and cadences do pass and leave no trace of themselves behind in the structure of the piano; while, in the latter case, they do not pass or die away without leaving most important after-effects in the structure of the brain; whence does arise in due time a considerable difference between a cultivated piano and a cultivated human brain, and whence probably have arisen, in the progress of development through the ages, the differences between the brain of a primeval savage and the brain of Mr. Spencer . . . With the brain, function makes faculty; not so with the piano."

If you put the question to me, for instance, of how much five times five is? I shall answer twenty-five. There is no hypermechanical impulse that prompts the answer. There is not a selective faculty in me, as Dr. Montgomery imagines, which among all the numbers selects this and no other number. But there is a memory structure which when innervated says: "five times five is twenty-five." If any one asks: "How much is five times five?" it is this question which as soon as it is perceived, innervates the memory structure "five times five is twenty-five;" and possibly it awakens many other memories associated therewith. I may think of the teacher who first taught me arithmetic; or the picture of my multiplication table may appear before my eyes. The answer "five times five is twenty-five" is under ordinary circumstances accompanied with feeling or consciousness.

Not every instance is so simple. There are of course mental processes that are much more complicated, but there is not one in which the motions that take place in the brain can be thought of as being not strictly in accordance with mechanical laws whether molecular or molar.

Take for instance the present situation of my mind. Dr. Montgomery maintains of thought and also of the muscle-innervation of speech that "this process transcends altogether mechanical interpretation," and he believes that a "hypermechanical faculty" steps in, which for all I know about this most modern interpretation of mental activity, might be the soul. In hearing

or reading these propositions a whole army of memories is aroused in my brain. All my conceptions about mechanics and its rigid applicability to all sorts of motion awaken. There is not a selective faculty in my brain which rouses these conceptions from their latency, but the reading of Dr. Montgomery's words irritates them and sets them in motion. The process, on the one hand, is in its causal nexus as much mechanical as any irritation that produces a reflex action. It is, on the other hand, not mechanical in so far only as these motions in my brain are accompanied with feelings. The word "hypermechanical" finds among the memories of my brain no clear conceptions as to what the word can mean. Yet there is somewhere a maxim registered "Strive for clearness of thought," and there is near by an aversion against words which convey no definite ideas. The maxim and the aversion are registered in my brain in the shape of nervous structures. Both are irritated, the one immediately after the other, so that a reaction takes place which finds verbal expression in a complaint about the doctor's vagueness.

There is a peculiar feature in soul-life which consists in the limitation of consciousness. Similarly as in vision only one object at a time can be in the central field of vision, viz., in the yellow spot where vision is most intense, so in consciousness one idea only, one combination of ideas, one perception, or a thought concerning a perception, one aim, or one activity can at one time fill this centre of mental life. When several ideas are awakened, that which at the time is strongest will attain a state of consciousness. As soon as it has been attended to, it naturally loses its interest, and another idea, which in the mean time has become the strongest will follow. A combination of both may take place and thus new thoughts, discoveries, inventions, ideals, may grow from such beginnings.

The chief progress modern psychology has made, is that it is no more in need of what Dr. Montgomery calls the selective faculty, and which he can explain in no other way than by the supposition of "hypermechanical impulses." "The hypermechanical faculty," he says, "selects for reproduction among all registered marks those intended for a special purpose."

Dr. Montgomery professes "to deny definitely the existence of a separate deity and the personal continuance after death." In one word he rejects supernaturalism. However, what is his

"hypermechanical" but supernatural? Is it not supernaturalism in a new shape? I must confess that the old supernaturalism in its naive grandeur combined with its ethical importance appears to me much more imposing than Dr. Montgomery's artificial view of the hypermechanical.

MORALITY AND NATURE.*

Dr. Montgomery maintains that he can detect "no trace of morality" in the All, neither in the inorganic nor the organic laws of cosmical existence. He adds: "Morality is of human origin."

But is the "human" not a part of the All? If it is not, it must be supernatural, and this is a conclusion which Dr. Montgomery does not accept. Dr. Montgomery looks around the whole universe, he includes in his concept "All" everything—except man.

There is an old Swabian *Volksmärchen* about nine Gothamites who went down to the beach to take a bath. They were bold swimmers and when they returned to the shore, they counted whether their number was complete. Every one of them counted his eight comrades and forgot himself. So they soon agreed that one of them must have been drowned. Their grief was unspeakable until a stranger passed by who enquired into the cause of their lamentations. He perceived at once where the trouble lay, and bade them dip their noses into the sand and count the marks. They counted nine and returned home full of thanks and gladness. The lesson of this story is that if you count all, you ought not in your natural modesty forget to count yourself also.

We agree with Dr. Montgomery that morality in a certain sense is of human origin.† But the laws of human society are nothing outside of the All. Dr. Montgomery must not exclude himself and his fellowmen from the particulars which make up the Cosmos.

How does a man become moral? Simply by conforming to the laws of nature especially to the laws that build up human society.

* Compare with this article the chapters "The Oneness of Man and Nature" and "Ethics and Natural Science" on the pages 207–215 and 216–226 of this book.

† Ethics we should say is human, but morality is found also in the animal kingdom.

Dr. Montgomery detects no morality in a conformity to law and mentions especially the law of gravitation. He says:

"It may at times be moral, or at least be eminently prudent to resist con-
"formity to the law of gravitation; as, for instance, when deadly enemies
"meet at the edge of a precipice. Cannibals who slay and devour their enemies
"conform more directly and completely to the cosmical laws of the All than
"the man who, Christlike, offers no violent resistance to those who attack
"him."

Dr. Montgomery has strange views as to conforming to laws. He means by "conforming" a submission without any attempt to adapt the situation to the occasion: we mean an adaptation to the law so that the same power in nature that threatens to destroy will be used to preserve and to build up. *

Why is cannibalism said to be more in conformity with the laws of nature than morality. The ground on which Dr. Montgomery maintains it, is not stated. However in the scale of evolution the cannibal ranges lowest, while a moral man ranges highest, and the moral man survives the cannibal. † Is a moral man less natural than a beast of prey? Is he not a man, and in addition, a moral man, *because* he understands more of nature's laws and conforms to them?

That all human efforts to improve nature can be made by the means of nature alone, is indubitable and can be disputed only for the sake of controversy. Maudsley says (l. c. p. 525):

"There is going on a recreation of nature by human means, but nature makes the means:

'Yet nature is made better by no mean,
But nature makes that mean; so, over that art,
Which, you say, adds to nature, is an art
That nature makes. . . . . .
. . . . . .
. . . . . This is an art
Which does mend nature—change, rather; but
The art itself is nature!'"—*Winter's Tale.*

* Concerning the moral law of the Christian doctrine "Resist not evil," an explanation will be found in No. 132 of THE OPEN COURT (p. 2123). That the moral law "Love thine enemy" develops naturally Prof. Max Müller has proved in the articles "The Natural Origin of the Supernatural" (No. 143) and "Religion, Natural" (No. 148.) Prof. Max Müller quotes the great moral teachers who lived before Christ, as having uttered the same doctrine as that of Christ. The universality of the evolution of moral ideas proves that morality is of a natural growth.

† Morality and the principle of absolute non-resistance should not be confounded.

MORALITY AND FATALISM.

The last mentioned misconception of Dr. Montgomery's leads us to another error of his. He says that not only Darwinism but also "the mechanical world-conception is absolutely fatalistic." Dr. Montgomery confounds Fatalism and Determinism.*

Dr. Montgomery, who claims to have entered the precincts of modern thought by reproaching *The Open Court* that it has not, seems to be quite unfamiliar with one of our most profound thinkers, who is fully imbued with modern thought. It is Professor William Kingdon Clifford.

Professor Clifford takes exactly the same position as we. That which we define as "Religion," Clifford calls "cosmic emotion." In his article "Cosmic Emotion," he says:

"The social organism itself is but a part of the universal cosmos, and like "all else is subject to the uniformity of nature. The production and distri- "bution of wealth, the growth and administrative machinery, the education "of the race, these are cases of general laws which constitute the science of "sociology. The discovery of exact laws has only one purpose—*the guidance "of conduct by means of them* † The laws of political economy are as rigid "as those of gravitation; wealth distributes itself as surely as water finds its "level. But the use we have to make of the laws of gravitation is not to sit "down and cry 'Kismet!' to the flowing stream, but to construct irrigation "works."

SUMMARY.

In reviewing the whole criticism I am struck with the fact that Dr. Montgomery everywhere criticizes himself.

Dr. Montgomery has struggled in vain to acquire clear ideas about several vital points; his attempts to overbridge the gap that yawns between subject and object are frustrated. The oneness of matter and mind appear from his standpoint as a mystery. He has tried in vain to find the mechanical explanation of mental processes and he has not succeeded in overcoming the fatalism that is apparently attached to the conception that the world is throughout determined by law. Dr. Montgomery aspires to be a monist, and he presents here the difficulties which hinder *him* from realizing that unitary world-conception which *he* understands by the term monism. We fully agree with Dr. Montgomery that the monism which he criticizes is an untenable view, but it is not that monism which is represented in *Fundamental Problems*.

The unsolved problems with which Dr. Montgomery troubles himself are not quite unfamiliar to me. I have to some extent also

* According to *Determinism* everything, human volition included, is determined by law. According to *Fatalism* the fate of a man will be the same whatever course of action he may pursue.

† The italics are ours.

busied myself with the history of philosophy, and I found myself in the same mazes when I attempted to escape from the untenable position of supernaturalism. My orthodox teachers, as well as many earnest searchers for truth in the liberal camp, assented to certain complaints about the insufficiency of monism; and that kind of monism was much the same mechanical world-conception as that of which Dr. Montgomery speaks. It was maintained that from the standpoint of a mechanical world-conception, (1) life could not be explained because feeling is no motion and cannot originate from motion, (2) that ethics was impossible because of the fatalism of the mechanical view, and (3) it afforded us no assistance in overbridging the gap between subject and object. One hope only seemed left, that an unexpected discovery would be made which might serve to reconcile all those contradictions, as there might be a monistic root out of which matter and mind had grown. Body and mind would then be proved to have "a common origin in one and the same underlying reality." This is the phase in which Dr. Montgomery has become stationary.

As soon as philosophy began to despair of ever finding the monistic root it became agnosticism. The verdict was pronounced: The underlying reality is unknowable. When a thinker goes beyond his depth he fondly imagines he has reached the unfathomable. The unfathomable being attained, it appeared as if the last word had been spoken and the history of philosophy was closed. Thus agnoticism brings progress to a halt.

Dr. Montgomery's criticism is a most valuable contribution when considered as the key to the thought of a past period in the history of philosophy. This epoch which Dr. Montgomery represents is most interesting and the difficulties with which human thought was then struggling should neither be forgotten nor underrated.

THE SUPERSCIENTIFIC AND PURE REASON.

Fundamental Problems, we find, has been a surprise to a reviewer of *The Nation*. He says:

"A book of newspaper articles on metaphysics, extracted from Chicago's weekly journal of philosophy, *The Open Court*, seems to a New Yorker something singular. But, granted that there is a public with aspirations to understand *Fundamental Problems*, the way in which Dr. Carus treats them is not without skill. The questions touched upon are all those which a young person should have turned over in his mind before beginning the serious study of philosophy. The views adopted are, as nearly as possible, the average opinions of thoughtful men to-day—good ripe doctrines, some of them possibly a little *passées*,* but of the fashionable complexion. They are stated with uncompromising vigor; the argumentation does not transcend the capacity of him who runs. . . . .

"On the whole, *The Open Court* is marked by sound and enlightened ideas, and the fact that it can by any means find support does honor to Chicago."

Although the reviewer speaks so kindly of *Fundamental Problems*, he has also faults to find. He discovers some inconsistencies:

"If there be here and there an inconsistency, it only renders the book more suggestive, and adapts it all the better to the needs of the public."

It is not the kind praise allotted to the book which prompts me to take notice of this review, it is the inconsistencies with which it is charged. Some of them have reference to the most 'fundamental problems.' Upon the solution of these problems the treatment of many less important problems depends. The critical parts of the review appear to me of sufficient importance to be discussed in detail.

THE SUPERSCIENTIFIC AND THE CONDITIONS OF SCIENCE.

The reviewer says of the book:

"The theory it advocates is superscientific."

Here I must protest against the word "superscientific." It is none of my invention. All the combinations with "super" or

*It is devoutly to be wished for not only that some but that all were a little *passées*. Most criticisms of *Fundamental Problems* prove that it will take some time still until the truth of these doctrines is generally accepted so as to make their teaching *passées*.

"hyper," it appears to me, are very useful words if employed in the domain of ethics. Morality is the constant struggle to higher planes; the moral man is always engaged in improving himself as well as the conditions of human existence. Accordingly ethics must teach us to look above, it points *sursum*. It attempts to raise man to a higher and nobler existence; it instructs him how to transcend the present state and shows to the individual a realm of superindividual interests, in accordance with which the individual must regulate his actions. Whatever be the merit of the combinations with "super" and "hyper" in the domain of ethics, they are in the domain of philosophy dangerous words; for they are full of vagueness and should be regarded with suspicion.

Judging from the context, it is most probable that our reviewer limits the term "scientific" to "empirical" Botany, in that case, would be a science, but logic would not. Botany is a natural science, it rests upon empirical knowledge; logic is a theory of formal thought, it is not properly scientific, for it is not empirical; yet it is superscientific. The superscientific is applicable to all sciences, and it is the condition of all sciences. The reviewer continues:

"'There is no chaos, and never has been a chaos,' exclaims the author, although of this no scientific evidence is possible. The doctrine of 'the rigidity of natural laws, . . . is a κτῆμα ἐς ἀεί.' Yet, emphatic as this is, we soon find the κτῆμα ἐς ἀεί is nothing but a regulative principle, or 'plan for a system.'"

The phrase, "emphatic as this is," contains a tinge of disapproval, as though the statement were made boldly. If there is any boldness in the statement of the rigidity of law, our critic must not blame the philosopher alone, but also science. Science has in these last centuries (nay, it has always ever since science was science) taken its stand upon the rigidity of law. Upon the rigidity of law depends the uniformity of nature, and without the uniformity of nature science would be impossible. The philosopher may either recognize science or he may not. If he does not, he denies the possibility of knowledge and his philosophy dissolves into scepticism. The sceptic declares that we can have no science, we can never know for certain; we can never be sure of anything, not even that 2x2=4; we can have opinions only. Two times two appears to us always to make four; yet it may be that to the people of the planetary system of Sirius twice two appears as five.

Science cared little for sceptical objections; it progressed, and the progress of science has practically justified the boldness of the scientist.

A philosopher who does recognize science may either blindly accept or critically investigate the conditions of science, the premises from which science starts. He who blindly accepts them takes them to be too grand and divine for investigation. Philosophers of that kind are called by Kant "dogmatists." The dogmatist rests satisfied with assertions. Kant followed neither the sceptic nor the dogmatist, he proposed a middle way between both; he proposed the critical method, and herein we followed Kant.

The duty of philosophy is not to construct a system of assertions, nor is its aim to undermine the possibility of knowledge and end in eternal doubt. As the duty of science is to systematize methodically the facts in a certain sphere of experience; so the duty of philosophy is to explain this systematization, to show its conditions, and to analyze the methods by which it is done. The object of philosophy accordingly is mainly an investigation of those "superscientific" premises upon which science is based. The whole interest of philosophy is centred in what we have defined as formal thought; for the analysis of formal thought, as well as an inquiry into its origin and its nature, teach us the ultimate *raison d'être* of the rigidity of law.

The rigidity of law—perhaps the most important superscientific proposition—is indeed a κτῆμα ἐς ἀεί i. e. "an intellectual possession of humanity that has come to stay for good"—not according to the private opinion of the author of *Fundamental Problems*, but according to the procedure of all scientists in all the many different branches of knowledge. The author of *Fundamental Problems* has attempted to investigate the tools with which science works not so much for the purpose of assuring the scientist that his tools are good—indeed, many scientists do not care about such an assurance, for experience has taught them to rely upon their methods, whatever be their philosophical import—but for the sole purpose of supplying the want of explanation concerning a few simple facts with which everybody is familiar, even he who cares little for understanding them. There was, for instance, one very simple question which troubled me even at an early age, the question "Is twice two always four, and if so, why?" That question has found an answer satisfactory to my mind in *Fundamental Problems*. If the statement of the solution appears to a certain

class of readers too positive, I can best excuse it by a quotation from Goethe, who says :

"If I am expected to listen to the opinion of some one else, it must be positively pronounced. I have enough of the problematical myself."

Positiveness in statement is an economy in the exposition of thought, and no fault should be found with emphasis laid upon truths that remain wonderful and great even if they have become most lucid to our comprehension.

My reviewer seems to be disappointed that the κτῆμα ἐς ἀεί is "nothing but a regulative principle or plan for a system." Is this indeed so little as to be called "nothing but"? Consider the importance of a plan, of a regulative principle, of a method informing us how to proceed. Let a man be lost in the wilderness ; let him, then, find some means of orientation, of calculating the place where he is, and the direction he has to pursue. Would he consider that as "nothing but a plan"? This "nothing but 'a plan for a system'" is all-important to science, and can appear only little to him who imagines that science is in possession of a magic key to omniscience.

PURE REASON AND EXPERIENCE.

Further on we read the following criticism :

"Like a staunch Lockian, Dr. Carus declares that 'the facts of nature are specie, and our abstract thoughts are bills which serve to economize the process of exchange of thoughts.' Yet these bills form so sound a currency that 'the highest laws of nature and the formal laws of thought are identical.' Nay, 'the doctrine of the conservation of matter and energy, although discovered with the assistance of experience, can be proved in its full scope by the pure reason alone.' When abstract reason performs such a feat as that, is it only economizing the interchange of thought? There is no tincture of Locke here."

Locke's theory is generally, and perhaps rightly, considered as sensationalism. He proceeds from the rule that nothing is in the mind which was not before in the senses. (*Nihil est in intellectu nisi prius fuerit in sensu.*) Sense-impressions are the origin and beginning of all knowledge. Locke says :

"Whence hath the mind all the materials of reason and knowledge? To this I answer in one word, from experience ; in that all our knowledge is founded, and from that ultimately derives itself. Our observation employed either about external sensible objects, or about the internal operations of our minds, perceived and reflected by ourselves, is that which supplies our understanding with all the materials of thinking. These are the fountains of knowledge from whence all the ideas we have, or can naturally have, do spring—that is, sensation and reflection."

It appears that Kant in the most essential point agrees with Locke. The very first sentence in his "Critique of Pure Reason" declares:

"That all our knowledge begins with experience there can be no doubt. For how is it possible that the faculty of cognition should be awakened into exercise otherwise than by means of objects which affect our senses?"

Locke wrote in a time when the philosophers of mankind were still under the influence of Descartes's theory of innate ideas. So he found it necessary to inculcate the truth, that all knowledge springs from "experience—that is, sensation and reflection."

Kant made a distinction between experience and pure reason. He confined experience to sensation and placed it in opposition to that which Locke calls reflection. Kant says: "Although all our knowledge begins with experience (i. e. sensation), it by no means follows that all arises out of experience (i. e. sensation)." Kant then arrives at the conclusion that there is some knowledge altogether independent of all sensory impressions. "Knowledge of this kind," he says, "is called a priori, in contradistinction to empirical knowledge, which has its sources a posteriori, that is, in experience (sensation)."

Knowledge a priori is a learned expression for that which we would prefer to call "formal thought." Knowledge a priori, said Kant, is the condition of all experience, for there can be no sensation without the forms of understanding. In other words, sense-impressions by themselves are meaningless; they have to be interpreted in order to be conceived as sensations. A sensation is a sense-impression felt to be and interpreted as the effect of some external object. But in order to achieve this mental act of changing a sense-impression into a sensation a sentient creature wants something of that faculty—be it in ever so rudimentary a state—which is called understanding.

John Stuart Mill did not see the difficulty of the situation. He based all experience upon the principle of causation, and when he was required to give an account of the principle of causation, he declared that it was derived from experience. This is called a vicious circle.

Schopenhauer was aware of the fact that the principle of causality is the condition of all experience. "We do not see with our eyes," he said, "but with our understanding." Judging from certain effects, we conclude that there are causes which produce them. Taking this ground, he believes in the priority of the prin-

ciple of causation in mind, and he considers it as a real innate idea in the oldest and most antiquated sense of the term.

The term experience should be used in a wider sense, than is done by Kant; it should be used in the sense of Locke. Experience includes both sense-impressions and reflections, sensations and formal thought, knowledge a posteriori and knowledge a priori. One single sense-impression cannot constitute knowledge; it can not (as Schopenhauer proposes) be conceived as the effect of a cause. It remains a single and isolated sense-impression. But two or several sense-impressions constitute a very weak beginning of that faculty (or rather function) which in its further development is called understanding. The forms of sense-impressions and the relations among sense-impressions are also parts of experience. The formal and the relational are the sources from which springs pure reason. From these insignificant beginnings all the formal sciences, can be and have been developed.

Animals that can frame word-symbols to represent certain mental pictures, develop into rational beings; and rational beings that learn to abstract the formal element of thought and apply the rules of formal thought to experience develop into scientists.

Formal thought not only aids us in the classification of the data of experience; it also assists in the amplification of knowledge. It is this wonderful quality which makes formal thought so valuable. For the laws of formal thought possess universality and rigidity (*Allgemeinheit und Nothwendigkeit*), and again, it is this wonderful quality—apparently mysterious and yet founded in the nature of form—to which formal thought owes that odd name "a priori," because we know of all formal laws that they hold good under any circumstances. We know that twice two are four and will be four as long as cognition lasts and even longer. A reversion of the formal laws is inconceivable; for, verily, till heaven and earth pass, one jot or one tittle shall in no wise pass from the formal laws. They are irrefragable, and all the changes that are taking place around us are nothing but a constant fulfilment of the formal laws.

Locke did not recognize the all-importance of the formal element in experience—for pure reason is nothing but a system of the formal element of experience. Nevertheless, the main principle of his method, viz., that experience is the source of all knowledge, has rather been confirmed than refuted in the further progress of philosophy.

Pure Reason, or the mental function of formal thought does not stand in opposition and still less in contradiction to experience. It has grown from experience and is an integral part of experience in the sense defined above. For we understand by pure reason agreement with the formal laws of existence. The forms of things, the relations among them are also data of experience; they are not shaped by us with arbitrary liberty, they are given to us by experience. We own them in our minds as the forms of our thoughts; we have abstracted the laws of formal thought by reflection and introspection. The formal element was imported into our minds together with the sense-impressions. We do not deny that mere isolated sense-impressions can not generate knowledge; and we must not look for the source of pure reason in the sense element of the sense-impressions, but in the formal and relational element, which is imparted to sentient beings through a constant repetition of sense-impressions of various forms. The formal accordingly is ultimately derived not from sensory sources, but nevertheless from experience. It has been gained by abstraction; i. e., we have arrived at it by omitting in our experience the sensory element and by retaining the formal alone.

SCIENTIFIC THEISM.

COMMENTS UPON AN ESSAY BY DR. FRANCIS E. ABBOT.*

DR. ABBOT correctly says: "The reality of a World-Order is itself the possibility of a World-Science"; and we might have expressed the same idea in the very same words; indeed, we have expressed it in almost the same terms.† Further on Dr. Abbot says, "In the final upshot, what men think of God, must depend on what they know of Nature, and that knowledge is science." We agree with this also, for we declare with Dr. Abbot that God is immanent; God and the Universe are one.

But Dr. Abbot becomes inconsistent with himself when he calls God an Infinite and Eternal Person, by whom all things live. The unity of the universe he declares to be "Omnipresent Self-conscious Energy or absolute Personality." When Dr. Abbot maintains, that "morality could not be the all-pervading law of the Universe itself, if the universe were impersonal or non-moral," we must most emphatically object. The universe, or if you prefer God, is neither moral nor immoral. That power in which we live and move and have our being is simply such as it is. Morality means to be in harmony with that power, it means obedience to the law. Human beings can be moral or immoral, according as their conduct agrees with, or does not agree with, God. But God himself cannot be said to be moral. If we want to find out what He is, we must study nature, we must learn how He works. The Universe is a law unto itself; and concord with that law is

*Scientific Theism, The Ground of all Liberal Religion," published in the December *Unitarian Review*, 1889. Compare THE OPEN COURT, No. 122.

†See "Fundamental Problems," under Definitions and Explanations, p. 254, "Upon the Order of the World depends its Cognizability."

morality. There is poetry in the conception of God as a person, but there is no science in it.

Dr. Abbot says that there are three ultimate types of being: namely, the Machine, the Organism, and the Person. The Machine is mechanical causality, the Organism is organic finality, and the Person is ideal morality. This is, indeed, most beautifully expressed; and Dr. Abbot, standing on the principle of monism, declares that the three are one.

Certainly the three are one. The person is a perfect organism and the organism is a perfect machine. But not *vice versa;* not every machine is a perfect organism, nor every organism a perfect person. The mechanical principle that regulates the motions of the celestial bodies, cannot be considered as personal. Nor, because evolution tends everywhere to develop higher forms from lower forms, can the universe as such be supposed to be a moral being or a person. For this is the great lesson taught by evolution, that life as it is now, can transcend itself; it can transform itself, and *must*, according to nature's laws, transform itself into a higher form of life.

Since we know that evolution is a reality, we can dispense with the anthropomorphic conception of God; we need no longer believe in the contradiction of a personal God, for now we know that God is immanent, that Nature and God are one; or to express it in Dr. Abbot's own words: "Real knowledge of Nature is real knowledge of the immanent God."

* * *

There is another question wherein we cannot agree with Dr. Abbot, and that is his view of "Universals." All philosophical interest in the Middle Ages hinged upon the problem whether Universals are real entities or not. The two parties were the Realists and the Nominalists. The Realists said with Plato, "Universals are real things, they exist independently of things and would exist even if things did not." The Nominalists said, "Universals are not entities, they are not objects (*res*) but mere names (*nomina*). They would not exist if things did not exist, for they are abstracted from things.

The famous Anselm, bishop of Canterbury, said, *Universalia sunt ante res* (Universals are before things); accordingly, they are the real entities, they are *realia*. Roscellinus, on the contrary, said: things are real, and universals are generalizations only, which we acquire by the mental process of abstraction.

We need not mention that the word "Realism," as it is used in modern times, is employed to designate a wholly different direction of thought. Indeed, Modern Realism may be considered as equivalent to mediæval Nominalism, and the scientific method of Realism, in the sense the word Realism is used to-day, is the outcome of nominalistic philosophy. The Mediæval Realists were victorious in their time, for the church threw the weight of her authority into the scales of Realism and rejected Nominalism as a heresy. At the Realistic Council of Soisson the ecclesiastical authorities stood by Realism; but History decided for Nominalism. From the date of that decision the gap between the church and science deepened more and more; and it led eventually to a breach known in history as the Reformation, in which the progressive part of Christianity separated from Rome.

Nominalism, as Dr. Abbot correctly declares, culminated in Kant, and at present all liberal thought stands upon the principle of Nominalism.

* * *

While upon the whole rejecting Dr. Abbot's interpretation of Mediæval Realism and his criticism of Nominalism, we are greatly indebted to him for having called attention to the fact that the Universe does not consist of matter alone. The relations among things, the forms of things are realities also. They are not materialities, not things, but they are real nevertheless. They are most important realities and all higher life, all intellectual existence, and all ethical aspiration depend upon them. *The world of forms indeed is identical with spirituality.*

This is the truth in Dr. Abbot's position, and it is this which is so little understood by those philosophers who imagine that the world can be explained from matter and motion alone. It is this truth which, in "Fundamental Problems," we have endeavored to explain in all its immeasurable consequences.

The human soul is form; it is a special form of life. The human soul is mortal: for every form can be broken. But the human soul can be made immortal; for every form can be built again. Thus Christ spoke plainly about himself: "Destroy this temple and in three days I will raise it up." JOHN. II. 19.

Every philosopher who is not clear about the nature of form, will be unable to account for the problems of evolution. He will end in mysticism; *i. e.*, the belief in some occult principle. He

will end in agnosticism, *i.e.*, in the statement that the problem is insolvable, it is beyond our ken, it is unknowable.

* * *

A few words concerning Kant's position on this question will perhaps greatly contribute to clear the situation—or at least characterize our own standpoint.

Dr. Abbot* calls attention to the stupendous proposition of the great sage of Königsberg: "Things conform to cognition, not cognition to things." And Dr. Abbot adds that, this is tantamount to the assertion that things-in-themselves are utterly unknown."

In his "Prolegomena" § 36, Kant argues that the highest laws of nature (we call them "formal laws") are the very same as the highest laws of reasoning (we call them "the laws of formal thought"). The word "highest" is here identical with "most general." Kant continues: Either we have derived them from nature by experience, or, *vice versa*, nature has derived them from our cognition; they are the condition of the possibility of cognition. The former, he says, is impossible, because the highest laws of reasoning are *apriori*, they are independent of experience. Therefore, he concludes, they are not derived from nature by experience, they do not belong to the objective world, but they are part of the thinking subject. The thinking subject is so constituted that it cannot help but consider reality clothed in the forms of cognition. Cognition transfers its own forms upon the things. Therefore things conform to cognition, not cognition to things.

We do not accept Kant's standpoint. We say:

The thinking subject is a part of the objective world. The same laws hold good for both. It is all but impossible that the formal laws of the one should be different from the formal laws of the other. Thus the extension of our body is tridimensional, and there is not the slightest reason why it should be an exception to the outside world. We do not hesitate to declare that reality in general is tridimensional also.

The highest laws of nature are the laws of form, and the highest laws of reasoning are the laws of the form of reasoning. Accordingly both are identical.

Therefore:

Things conform to the laws of form.

*"Scientific Theism," Introduction, p. 3.

The formal laws of the objective world of nature are not different from the formal laws of the subjective part of the world, of the thoughts of the subject.

The laws of form are the condition of the world-order and the laws of formal thought are the instrument of cognition.

* * *

I here take occasion to call the reader's attention to Kant's "Prolegomena," especially to § 36, headed "*Wie ist Natur selbst möglich?*"

I do not hesitate to consider this chapter as the most important one in Kant's works. He has written many glorious passages which contain truth, and nothing but truth. This chapter, however, contains "the key to the main error of his "Critique of Pure Reason"; and I make bold to say: no one understands Kant who is not familiar with the motive that led him to adopt the strange doctrine of the ideality of time and space, and pronounce that bold sentence: "Things conform to cognition, not cognition to things." Said Schiller:

> "Let but an error be hid in the stone of foundation. The builder
> Buildeth with confidence on. Never the error is found."

I admire the strength of a man who has the courage to accept the logical conclusion, even of a small mistake which he considers as a truth. If Kant had seen his mistake, he would have inquired into the origin of the apriori (which he did not do), he would have found it to be the laws of form, and he would undoubtedly have come to the same conclusions that are laid down in the chapter "Form and Formal Thought" in "Fundamental Problems."

When I read Kant's "Critique of Pure Reason," everything was so bewildering to me, so labyrinthine, so incomprehensible. When I read his "Prolegomena," everything became clear, for then I began to understand Kant's chief fallacy and was thus enabled to pick out the forcible lessons which the great German philosopher teaches us.

IS ETHICS A FORMAL SCIENCE?*

MORALITY is, as it were, the logic of conduct. Morality is based on the laws of formal thought, and ethics, the science of morals, is a regulative science. All regulative sciences are based on the laws of form. Arithmetic is the regulative science of calculation; it contains purely formal statements, and its figures are empty abstractions. But such purely formal statements, as for instance, 'five times five is twenty-five,' hold good under all circumstances; and the empty figures may be applied to apples as well as to suns or planets, and they will ever prove reliable. Thus ethics, as Kant has shown in his excellent monograph on the subject, has its formal aspect; it must, as a logic of conduct, be based upon the laws of form. Nevertheless, I object to calling ethics a formal science, for all formal thought, abstractly considered, is empty. Mere formal ethics, like pure logic or the empty figures of arithmetic, is an abstract "ought" that is applicable to the code of a band of pirates just as well as to the laws of a society of honest men.

The logic of conduct has a special content which is derived from experience. A purely formal ethics would remain without application; it would be like Aristotle's formal logic, in which the most foolish and futile propositions can be made; they remain correct so long as they do not contain contradictions. Yet valuable though purely formal logic may be to free our minds from errors, this science will never help us to find out a positive truth. For that we have to go to the ever-flowing well of facts, we must face the actualities of real life and gather in the treasures of experience. Purely formal ethics has no value, unless it derives its content from, and again applies it to, experience.

Why do we consider it wrong to kill a man, yet eat the meat of oxen and other animals which we know have been slain for that purpose? There is no apriori answer to this question; it is a matter

*From a letter to Dr. Francis Ellingwood Abbot, published in THE OPEN COURT, No. 125.

that has to be decided, not by formal laws, but by experience ; although, as a matter of course, experience must be guided by the calculation and foresight which become possible through an application of formal laws. The thinking subject therefore cannot evolve out of itself alone the moral law by an apriori process of reasoning. The thinking subject must study nature and must then comply with nature's laws. By nature I do not mean here the earth, its mountains and vegetation, but all that is, human society and the laws of human society included.

The question, "Is Ethics a formal Science?" is a question of principle ; it is the principle of method (it is the method how to arrive at a statement of that which must be considered as moral) ; and whether we agree or not, we ought first to be clear about the principles upon which we stand and from which we proceed.

If we understand by "moral" that which is good, or that which has, perhaps better that which ought to have, every one's approbation, we can not hesitate to call the laws of the Universe moral. But in that case we are obliged to explain what we understand by "moral or good"—which is more difficult than at first sight appears. People are not at all agreed upon that which is to be called good ; and certainly sentimental goodnaturedness is not a quality of the Universe. In that sense God is not good.

It seems to me that the simplest method of explanation will be to define "Morality" as the conformity of an individual to the laws of the All. But in that case, we cannot properly call God or the Universe moral. God then may be called the standard of morality ; its objective ground and the determinative measure to which all moral rules must be referred in order to be tested.

But we do not haggle about words. There is no objection to the usage of the word "moral" in the phrase "God is moral," provided you do not attach an anthropomorphic conception to the word. And I hope that these few sentences will suffice to explain my meaning when I say · The All is non-moral ; it is as it is ; and we are moral in so far as we are in conformity with its laws.

THE IDEA OF GOD.*

THE main difference between our positions, unquestionably, is our conception of the idea of God. You call God a person, and I reject the personality of God. God is that power of the All which has produced us, which lives in us, and which commands our obedience. So long as we observe its behests, it will live in us; and so long as it lives in us, we shall continue to live. Although this form of life, the bodies in which we now live, may be broken, God will rise again and again in other and similar forms, undestroyed and indestructible.

God, as I conceive him to be, is not less than a person, but more than a person. The frailty of personality does not apply to him; there is no limitation, no individuality, no distinct idiosyncrasy about him. He is not (as according to my conception every person is) one special form and combination, yet he is the universality of law, inflexible, immutable, eternal. You can adapt yourself to him, but you can never adapt him to yourself. The heathenish custom to attempt an adaptation of God to ourselves, is not yet extinct in Christianity.

It is for that reason that I prefer the expression "God is non-moral," because I look upon God as the highest and ultimate and absolute authority of that which has to be considered as moral. When you call God moral, you imply that he is in conformity with the highest law of the Universe. In that case the moral law is more divine than God, and God would be divine only in so far as he is in harmony with it. A God who is moral, whether he be impersonal or a person, becomes redundant for those who make the highest law of the Universe their God. Let us obey that very highest authority, to be in conformity with which even Gods are endeavoring, and we need not mind the wrath or favor of any divine personality, for that law is the supreme God, it is the only true God.

* From a letter to Dr. Francis Ellingwood Abbot, published in THE OPEN COURT, No. 125.

Certainly the Universe is not mere force, but is force ruled by law. I find that "Law" and "Force" are often called blind by naturalists. Natural laws are called blind, I suppose, because they allow of no exception whatever; because they do not adapt themselves to circumstances, as persons might do. But is not the expression "the blind laws of nature" nevertheless a contradiction, or at least an inadequateness of simile? If natural laws do not adapt themselves to us, we must in our turn adapt ourselves to them. But is that any reasonable pretence for calling them blind? Certainly not; for they make it possible that we need not grope blindly about; being irrefragable, they throw light upon natural phenomena and thus become our guides and teach us how we can adapt ourselves to nature.

We welcome the idea that God is no person, but a law; not a being adaptable to circumstances, but an irrefragable authority, no deified egotism but the omnipotent power of All-existence! This idea is the republican conception of theology which can conceive of order and of law without a Prince, and of religion without the fetish of anthropomorphism.

We have no objection to representing the moral law of the Universe to which we have to conform, as a person. We may compare it to a father, and with Christ call it "Our Father," just as well as we like to speak of Mother Nature. But we wish to have it understood that this expression is a simile only—a simile which, if carried out, will lead to serious misconceptions.

THE ETHICS OF THE NEW POSITIVISM.*

A LETTER TO THE "REVUE DE BELGIQUE" IN REPLY TO THE ARTICLE 'UN PHILOSOPHE AMERICAIN' BY CLEMENCE ROYER.

THE *Revue de Belgique* contains in its April number of 1890 an article on "Fundamental Problems," by Madame Clémence Royer, and I am glad to learn that the author of the article is in sympathy with my opposition to the philosophy of agnosticism which is represented in France by the positivist school, and in Germany by Du Bois Reymond's "ignorabimus." My plan has been to establish a true positivism, the data of which are the facts of reality; Knowledge is the representation of facts in living beings, and the purpose of Knowledge is again its application to facts.

M. Comte is mistaken when he declares that we know neither the first nor the final causes, but only the middle between them. The real world exhibits no such difference in causality. There is but one kind of causes, and this one kind of causes contains the whole of causation. There is but one kind of facts in the world, such as are real facts; and all these facts are representable—also those which we do not as yet know of, those of which our philosophy does not as yet dream. All facts—theoretically considered—can become objects of experience, even those for the perception of which our senses are too blunt; because means can be, and have been, invented for rendering them indirectly observable. Such is the unity of the Cosmos, and the interconnection of all its parts that every thing produces its effects upon every thing; so that for instance, if we possess no organ for perceiving the chemical rays of light, we can invent a sensitive plate on which the effects of the chemical rays are observable.

So far Madame Royer agrees with me, but she makes objections to my position in Ethics. She says:

* This letter appeared in the "Revue de Belgique," June 15, 1890.

"I cease to agree with Dr. Carus where he attempts to reconcile this synthetic view of the world with a remnant of Christian religiosity; for he persists in calling himself Christian."

Mme. Royer is mistaken in this. I do *not* persist in calling myself Christian, although to a great extent I gladly accept Christ's ethics. However, when dealing with philosophical subjects, I deem it under all circumstances inappropriate to use a religious name, and prefer, therefore, to characterise my ethics as the ethics of positivism and monism.

I am in accord with the modern view of psychology, which may briefly be described as a surrender of the ego. There is no metaphysical soul-substance hidden within or behind our thoughts which does the thinking. Our thoughts, physiologically represented in the activities of certain brain structures, are the elements of our soul. The abandonment of the ego is an intellectual act. Yet it is at the same time a moral act, and the ethical rules that can be derived from it have been taught by all the great moral teachers of the world, Confucius, Buddha and Christ. If you choose to call this my attitude Christian, I am a Christian. But you might just as well call me a Buddhist, or an adherent of Confucius.

Mme. Royer is mistaken if she calls my ethics altruism. It is neither altruism nor egotism; it is both. The fundamental principle of ethics, as I conceive it, is the regulation of man's actions in accordance with the facts of nature; yet in the term "nature" I include the laws that shape human society. The maxim of basing the rules of conduct upon positive facts is the principle of positivism in ethics.

The individual man must give up the superstition that he is an isolated ego risen into existence out of nothing, either to continue forever or to sink again into nothingness. He is a part of the great interconnected whole. The soul-life of an individual is the continuation of the soul-life of past generations, which will continue to exist in the generations to come. A man when regulating his actions does not consider the present moment alone, but thinks years ahead, although the material atoms that do the thinking and acting at present will quit his body in a few days. Similarly the single individual must not be swayed by the fleeting moment only, nor by the short span of his own life, but must take into consideration the entire evolution of soul-life so far as he can penetrate into the future. He must renounce his egotism, not for altruism, but for

a higher view which considers our soul-life in its relations with all soul-life, and our existence in its connection with the universe. The maxim of considering man as a part of the whole and indivisible universe is the principle of monism in ethics.

* * *

Concerning the God-idea, Mme. Royer maintains that God always meant a person; therefore, she concludes, that my definition of God is not tenable. Perhaps she is right. If theism is identical with supernaturalism, I must beg to be classed among the atheists. Yet I maintain that the idea of God admits of a purification so as to free it from supernaturalism. I understand by God no person, and no extramundane creator, but the cosmical order that makes this wonderful world possible. God is the immanent and omnipotent power of the universe to which we have to conform, and it is a gross superstition to call him a person, for like the law of a country which is no person but superior to persons, even to kings and to so-called sovereigns, God is superpersonal.

Whether it is justifiable to purify the God-idea in this way, I shall not decide, but I believe that the purification of religious ideas is just as much admissible as the purification of scientific ideas. Is not the idea of electricity radically changed, since the Greek sage considered it as an exclusive quality of amber? And is not the change in the conception of fire within the last century much greater than the change of meaning in the God-idea? We no longer believe that a flame consists of fire-stuff or "phlogistum" but we now know that it is a special mode of motion; and yet we have not discarded the word fire, although we have entirely given up its old definition. We have abandoned our erroneous notion and have adapted our concepts to a more correct representation of facts. I see no reason why we should not do the same with our religious views, especially with the central idea of religious thought, the idea of God.

ETHICS A LAW OF NATURE.

A REJOINDER TO MADAME CLEMENCE ROYER'S REPLY.

MADAME ROYER has a very low opinion of nature and of the world. She says: "The world far from being an undivided totality, is but a collection of individual units in conflict . Such is the true law of nature. It is because nature is not good, that it is not moral, and because it is not divine that precisely it must be endured although with an imprecation. It is while reacting against this wicked law that man has been induced, by the desire for happiness, to conceive the ideas of justice and goodness and to create the concept of God, contrary to all reality, deceptive hope and faith, which have only increased human sufferings."

It is true that strife is the law of life. Living is striving, and striving is fighting. Nevertheless, I can see a grand harmony in this apparent turmoil; I recognise order in the cosmic motions of the celestial bodies and in the development of organised life upon earth; and this order, which results from the necessity of law, indicates that the world is not "a collection" but a totality. The universe is not the sum total of innumerable items, of things and individuals put together; but on the contrary all things and individuals that exist are parts of the whole and indivisible universe.

Nature's ordinances, it is true, are not always pleasant, and the struggle for existence is often very hard. Whenever she gives she will take again, and wherever she endows creatures with consciousness, she fills their lives with joys as well as with pains. There is no unmixed happiness, and the best part of life is our ideals and the struggle for our ideals. Nevertheless, nature is grand, wonderful and divine; and even if we should find fault with her, there is no use in railing at her laws. The laws of nature, if we comprehend them, if we apply them to our advantage, will make us great; if we leave them unheeded they will crush us whenever we come in collision with them.

By nature I do not understand the lowest forms of nature only, but everything that exists, and also the laws that make higher forms of existence grow from the lower forms. The highest form of nature we know of is man with his ideals and aspirations. Nature is neither moral nor immoral, but nature is the condition of all morality. What is morality but obedience to the highest laws of nature, especially to those laws which wherever obeyed will produce higher forms of existence and a nobler state of society?

Madame Royer's conception of nature is too narrow. This narrow conception of nature which considers the features of the lowest types of existence alone as natural, has led to the idea of the supernatural. If justice, goodness, morality are not natural, pray tell me where do they come from? Do they really originate by a reaction against the "méchante" law of nature? If so the belief in the supernatural is fully justified. If by "supernatural" we are to understand those forms of existence that develop from the lower forms of nature, we all, I hope, are believers in the supernatural, we all are co-workers in having as a common aim the further evolution of the supernatural here upon earth. There is one point, however, which we must bear in mind. The supernatural does not come down from above as is maintained by theologians of the old school, but it rises from below. The supernatural is nothing but the higher forms of the natural.

* * *

Whether the *word* God should be retained in the purified sense that I have suggested, is to me a matter of indifference. The terms which we employ have no value apart from their meaning Yet words are excellently fitted for serving as "banners" (to use Mme. Royer's expression) or as party-cries. Thus they become catch-words, which people, according to party, either hoot at or hail. For words people are persecuted. Most discussions are carried on about words, and most creeds are beliefs in mere words As says Goethe:

> With words 'tis excellent disputing;
> Systems to words 'tis easy suiting;
> On words 'tis excellent believing;
> No word can ever lose a jot from thieving.
>
> —FAUST, ACT. I. v.

I have been sufficiently persecuted for being an atheist, why should I not for the sake of a change be reproached for theism? I am inclined to follow the old rule: "In verbis simus faciles, dummodo conveniamus in re;" and it is for this reason that I gladly suffer reproach from both sides.

Those who believe in God establish their faith upon the truth that there is a power in the world which enforces obedience to certain rules. These rules we call the moral laws. Wherever they are obeyed humanity prospers and progresses, wherever they remain unheeded the social conditions deteriorate so as to ruin society as well as all the single individuals of society. Whoever believes in God for this reason, which has been called the moral ground of God's existence, is not mistaken. He is mistaken, however, if he believes that this power is a personal being, or if he imagines that it is supernatural in the sense of "extramundane." Those to whom God is the principle of morality must learn to understand that to speak of God as of a person is a gross anthropomorphism, and to consider him as something different from or outside of nature is incompatible with the most elementary conceptions of science.

Madame Royer tells us that M. Renan had dedicated a book to his deceased sister with the words, "to his sister in the bosom of God," and she adds with a good dose of irony, "with Dr. Carus that would be in the bosom of a law."

I certainly feel an unspeakable quietude, a sentiment of unshaken confidence, when considering that my beloved ones the living as well as the departed, and also I myself, are living, and moving, and being in a cosmos of unbroken and unbreakable laws. The rigidity, necessity and inherent harmony of these laws of form will be understood by a study of form. There is a holiness in mathematics which is more divine than those foolish prayers which Christ called "vain repetitions as do the heathen." (Matt. VI, 7.)

Our dead, it is true, have completed their lives, but (as says Schopenhauer) our dead are still with us; their works, their thoughts continue, and the fruit of their lives is not dissolved into nothingness. They are ever here among us and take part in the discussion which we carry on. Their fates even after death are also bound under the unalterable law.

It might be answered, that the belief in the irrefragability of

law is fatalism; but it is no fatalism; knowledge of the law far from bringing upon us serfdom, liberates us from servitude. Knowledge of the law must not have the effect upon us that we bow in passive submission like slaves under the necessity of the law, but it must stimulate us to conform to the law, to use it, and to master it. Our knowledge of electricity, for instance does not impose upon us the duty to be obedient to fate and to be killed by the flash of lightning; but it helps us to invent the lightning rod; it liberates us from the evil of the law, it breaks fate, and to the degree that man uses his knowledge he becomes the master of his fate. By calling law divine I do not propose to adore nature; the pagan custom of worshiping God by kneeling down in the dust and other self-humiliating ceremonies must go; but I do propose to respect the laws of nature and to consider them as the basis and the condition of all our ideals.

The sentiment of confidence in the irrefragability of natural laws is no less soothing in anxiety and worry than is the "Islam" to a Mohammedan or the Christian faith to a Christian. I might say that it is a perfect surrogate of the religious sentiment; yet it is more, it is the religious sentiment itself; it is that essential something of the religious sentiment which is true, with the omission of those ingredients which science has taught us to consider as superstition.

The idea of God, if purified by scientific critique, so as to represent some reality (namely the reality of the irrefragable law of nature, especially the higher laws of ethics) is no less natural than are the ideas of justice or virtue or morality. As soon as these higher blossoms on the tree of nature are, as Madame Royer proposes, no longer considered as natural we shall inevitably drop again into the old dualism which splits the universe in twain, into the lower sphere of natural existence and the higher sphere of the supernatural. Divinity, Morality, Goodness, Justice, are indubitable facts; they cannot be described as mere illusions.

Some of the most extravagant freethinkers, it seems to me, have, in this respect, not as yet freed themselves of the old dualistic views. While opposing certain terms of antiquated conceptions, they find no time to attain a monistic view of the universe which does not exclude the higher and the moral laws of life from the realm of nature.

* * *

Concerning my view of the renunciation of the Ego as the basis of all morality I must add a few explanations, because I notice that Madame Royer represents my position as ascetic and pessimistic. The system of morality which I propose is far from being either pessimistic or ascetic. I would perhaps call myself a pessimist if, like Madame Royer, I considered nature not as a harmonious totality but as a collection of individual egotism.

Madame Royer says: "The word egotist is therefore in every sense the starting point of all existence, the first condition in the evolution of each living individual, which only grows, develops, and preserves itself because it loves itself."

Before we proceed, let us in a few words answer the question, What is the soul of man? The soul of man is not an ego which is in possession of ideas; the soul of man is a collection of ideas of which now the one and now the other is most prominent, so as to become conscious and thus to constitute his ego. The ideas of man, which form the elements of his soul, are the representations of objects with which he became acquainted through experience. From these ideas grow the ideals of man, which form the most valuable part of his soul. Ideals originate not otherwise (although in a much more complicated way), than reflex motion takes place upon irritations. Ideals are plans of reflex action, which are intended to effect certain impressions of the outside world, in order to improve the conditions of human existence.

The soul of man, accordingly, his ideas and ideals, are a product of the world. It is a representation of the world, which not inappropriately has been called a microcosm. We must consider the soul as a part of the whole universe, representing, as it were, the microcosm in the conscious life of brain-activity. All ethical aspirations tend to make the human soul greater, nobler, and more powerful. Ascetism is an inversion of ethics, it tends to destroy the greatness, nobility and power of the human soul.

When I speak of the renunciation of the ego, I do not mean to introduce asceticism. By egotism I understand the excessive love of self which judges everything solely by its relation to one's own individuality; egotism is a habit of forgetting the social and natural conditions which made an individual grow and keeps it growing still; it creates a gulf between the self and the rest of the world, and thus leads to the practice of magnifying one's own importance.

Love of self and the desire of self-preservation are natural and necessary. But an excessive love of self, which has no regard for the rest of the world, especially for our fellowmen, is not natural. If our actions are dictated solely by egotism, we shall find no satisfaction in life and all our purposes will defeat themselves.

Egotism, or the excessive love of self, is the natural phase of a lower stage in the evolution of soul-life. Those things which are nearest and concern us most, appear of greater importance than others which have no direct influence upon us. It is similar with vision. The objects of our immediate surroundings appear larger than those which are at a remote distance. However, they are for that reason not larger in reality. In a higher phase we learn the laws of perspective. The laws of perspective do not destroy vision; they do not proclaim vision as faulty; they only correct a wrong interpretation of the data of vision; and thus make vision the more effective. If we act as if the things which concern us directly were really larger and more important than other things, if we allow our motives to be swayed by egotism, we are liable to fall into grave mistakes. But if we renounce the error that our ego is the centre of the world, we shall grow in wisdom as well as in moral worth.

Ethics, if based on egotism, will be found to be untenable. The reason is that man is no individual in the strict sense of the term. Man is not an indivisible entity, a separate being for himself. Man has no ego in the sense the psychologists of the old school imagined, and if man through a mistaken conception of his Self, is solely biased by egotistic motives he will have to, and he ought to, renounce his egotism. Man is part of a greater whole; he is a member of society, he is a phase in the development of humanity; and at the same time a phenomenon of the whole universe. This consideration must rule supreme over his motives for actions, not to destroy his soul, not to suppress or dwarf its natural growth, but to strengthen and to elevate it.

SOLIPSISM AND HYLO-IDEALISM.

IN ANSWER TO CRITICISMS OF DR. ROBERT LEWINS.*

Dr. Lewins understands by "Self" the totality of man's soul-life with all its knowledge and aspirations, and builds upon this idea his philosophy of Solipsism which he characterizes as Hylo-Idealism. "Self" includes everything human and "to transcend humanity," he says, "is for humanity a *reductio ad impossible.*"

Every philosopher has a right to choose his own terms and we do not intend to quarrel with Dr. Lewins about terms. A philosopher who chooses terms that are liable to be misunderstood, will not easily find recognition for his views. "Self," according to my terminology, does not denote the totality of man's soul-life, but that group of his concepts and impulses only, which concerns his individuality and his individual interests.

What is the human soul but the representation of the world around us? Why is the "self" of man, to use Dr. Lewins's expression, greater and more powerful than the "self" of animals? Because it represents the world with more correctness, it understands its laws better and can accordingly better adapt itself to the world and different parts of the world to itself. It is a truer image of the All, it is a clearer representation of the macrocosm, and thus it is more of a microcosm.

It is dangerous for philosophers to use words in any other than the common usage. If they are obliged to employ terms in a new and at the same time in a very definite and very concise sense, they should select the most appropriate ones and define them as their case may demand. If words be selected that have acquired a special meaning and to which a kind of an odium has attached, it is not advisable to employ these words to express a great and high

* Compare Nos. 134, 135, 139 and 151 of *The Open Court.*

ideal. We cannot say that they who do so are wrong, but they certainly are most likely to be misunderstood. Thus the words "soul" and "ego" and "self" are terms that in popular speech mean about the same thing, and yet they are different. Miss Naden, in an expository preface to certain letters of Dr. Lewins says: "Self, in common parlance, signifies a little private enclosure, jealously 'walled around'; in philosophical language, it is coextensive with the cosmos. Every man is his own universe. Asœtics taught self to feel its meanness; we teach self to feel its greatness. The ideal here set forth is fulness of life, gained from conscious unity and solidarity with the lives of others." (*Humanity vs. Theism*, p. 10.)

A slight alteration in the meaning of a word may alter philosophies and religions, and *vice versa*, the alteration of religious and philosophical thought will effect the meaning of its terms. Take for instance, the words God and Devil. There was once a sect that worshipped the devil; understanding by the term devil that power which produces progress. And should God come to mean conservatism and stagnation in State and in Church, our clergy ought not to be astonished to see a new sect of serpent worshippers arise and enter the lists against God and the very name of God. But after all their opposition would be a mere matter of definition. The heathenish gods were turned into devils when Christianity succeeded paganism; not because they were real devils, but because their divine attributes had been conferred upon the God of the Christians.

Dr. Lewins says, the idea of God is "a direct inheritance from barbaric medicine men." This is not denied and cannot be denied. But Dr. Lewins should not forget that all our ideas have developed in the same way. Astronomy developed out of Astrology, and Chemistry out of Alchemy. Let us not despise the medicine man, for our present science has grown from his ideals.

If by God must be understood "the Designer of Nature," let us abandon the very word God, just as we have abandoned the notions of the medicine man. But if the word has an ethical meaning, if it means "the ultimate authority according to which man regulates his actions," I see no reason why the word God should be scorned or rejected. Criticize the concept and not the word.

By "self" Dr. Lewins understands the subjective world, viz.,

our conception of the world, *Die Welt als Vorstellung*, as Schopenhauer says. This world must be distinguished from the objective world, the universe of real existence. But this distinction is not sufficiently set forth in Dr. Lewins's writings. The subjective world is a representation of the objective world and may be such with a degree of perfection that varies. Indeed, the subjective world in every man is constantly changing and we can very well imagine our conception of the world to be more exact, more truthful, and more correct than it is. Nay, this idea of constant progress is a part of our self; and we feel, naturally, the need of progress, of improvement, of intellectual growth.

Dr. Lewins says: "Higher than himself no man can think, his own perceptions and conceptions constituting his entire universe" (***Life and Mind***, p. 27). This is said to overthrow the beliefs of "all that has been said or sung, in pre-scientific ages, of God and Gods"; and I believe that all that Dr. Lewins means by it, is correct. But the statement is certainly misleading. In our own self we find conceptions which constantly compel man to think "higher than himself." We call these conceptions 'ideals" and their presence in the human soul is the condition of ethics.

The most characteristic feature of the human is the tendency of becoming superhuman, or in other words, the aspiration to transcend itself. There is an intrinsic impulse in man's soul to grow and to expand. The animal developed to become superanimal; and it became man. Man also has to obey the impulse to advance to nobler heights. Necessity will compel his obedience. What is science but the attempt to transcend the present concepts of mankind; and who among us is so skeptical, so agnostic, so despondent, as to think that these attempts are mere vanity?

We may widely disagree in terminology from Dr. Lewins, yet upon the whole we find many points of contact, and look upon Hylo-idealism as an honest attempt to establish a unitary philosophy.

SOME QUESTIONS OF PSYCHO-PHYSICS.*

I. EXPOSITION.

When a man who has done so much valuable work for the progress of science as Professor Ernst Mach, finds it necessary to change the position he has taken,—a position which has appeared to many thinkers as a satisfactory solution of the most intricate problem in the philosophical and psycho-physical field,—there must exist in the solution some difficulty which has either been overlooked or at least too little appreciated. If there is a flaw in it, I wish it to be exposed.

The main source of most differences, it seems to me, springs from misapprehensions. I shall therefore attempt to elucidate the subject with reference to the objections presented by Professor Mach.

The main idea set forth in my article "Feeling and Motion"† may be briefly recapitulated as follows. Our feelings are phenomena which, to an observer who could see all the processes taking place in our brain, would appear as motions of a special kind. Motions and feelings are two aspects of one and the same reality. But feeling cannot be explained as transformed motion. Accordingly, the elements of the conscious feeling which now exists and now disappears, must have existed before. The presence of elements of feeling must be an additional feature of the processes of nature not included in the term motion, and not observable in motions, yet inseparably bound up in motions. Or, in other words, feelings and the elements of feeling are the subjective aspect of what objectively appears as, and is called, motions.

* Written in answer to Professor Ernst Mach's article "Some Questions of Psycho-Physics" in *The Monist*, No. 3.

† The Open Court Nos. 153 and 154; republished in "The Soul of Man" pp. 1-15.

The term "elements of feeling" employed in this sense has been adopted from Clifford. The idea that feelings and motions are two aspects of one and the same reality has been held by several psychologists, among whom are the founders of the science of psycho-physics, especially Fechner.

II. MOTION AND FEELING.

Professor Mach says: "Putting together motion and feeling goes as much against me as would, say, the co-ordination of numbers and colors."

The putting together of two concepts depends upon the purpose of our investigation. Motion and feeling, in spite of their disparity, have one quality in common which justifies their juxtaposition. Both in their spheres are terms of the most general circumscription.

By feelings I understand those features of our experience which constitute what may be called the awareness of the present state. Feeling comprehends all the many degrees of awareness in pleasures and pains, sensations and thoughts, emotions and ideals. It constitutes the subjectivity of our existence and furnishes the basis of all psychic life. Feeling is the most general term of its kind.

By motion I understand all kinds of changes in the objective world that can either be directly observed or are supposed to be observable. Indeed all changes taking place must, objectively represented, be thought of as motions.

Feeling and motion being each the broadest concept of its kind, the question, In what relation do motions stand to feelings? appears to be quite legitimate.

* * *

Concerning the relation that obtains between feeling and motion, Professor Mach objects to the use of the expression "feeling accompanies motion." "Material processes," he says, "are not accompanied by feeling, but both are the same." And in another passage, "The parallelism stands to reason, since everything is parallel to itself."

I grant most willingly that the term "accompany" is inadequate; and I admit that a certain feeling and a certain motion form one inseparable process. There is no duality of feeling and

motion, both are different abstractions made from one and the same reality. I do not say that feeling and motion are identical, not that they are one and the same; but I do say that they are one There is no such thing as pure feeling; real feeling is at the same time motion. Feeling by itself does not exist in reality. Pure feeling is a mere abstraction. And whenever the expression parallelism between feeling and motion has been used, it can mean only a parallelism between the two spheres of abstraction.

Professor Mach continues: "They [motion and feeling] are not two sides of the same paper (which latter is invested with a metaphysical rôle in the simile), but simply the *same* thing.

For the same reason Professor Mach objects to Fechner's comparison. Yet it seems to me that Fechner hit the mark when he compared feeling and motion to the inside and the outside curves of a circle; they are entirely different and yet the same. The inside curve is concave, the outside curve is convex. If we construct rules relating first to the concave inside and then to the convex outside, we shall notice a parallelism in the formulas; yet this parallelism will appear only in the abstractions which have been made of one and the same thing from different standpoints and serving different purposes. The abstract conceptions form two parallel systems, but the real thing can be represented as parallel only in the sense that it is parallel to itself. If we consider the real thing, it represents a parallelism of identity. There is but one line, and this one line is concave if viewed from the inside, it is convex if viewed from the outside.

The simile which I introduced of the two sides of one and the same sheet of paper was devised to convey no other meaning than this construction of Fechner's comparison. The paper is invested with a metaphysical rôle only in the case where the simile is otherwise construed. There is no page which exists of itself as a mere mathematical plane independent of the paper of which it forms a side. Thus there can never be in reality a page without its counterpage. The paper, its size and color, belong to the page and constitute its properties.

Thus the abstraction 'feeling' represents my looking at the one side of reality. I leave, and from the subjective standpoint I have to leave, the other side out of account. Yet the other side of the sheet is inseparable from the one at which I am now looking, just as much as feeling is inseparable from motion. And I

am constrained to admit the truth of the reverse also: motion is inseparable from feeling, but with the limitation that motions need not be on their subjective side actual feelings; they may be only elements of feeling which under certain conditions become actual.

I am aware that my comparison of feeling and motion to the two sides of one sheet of paper may be easily misinterpreted. But is not that a danger to which all comparisons are subject? A comparison is always imperfect, or as the Romans used to say, it limps: "Omne simile claudicat." And is not reality liable to be misinterpreted in the same way? Have not some philosophers thus introduced the metaphysical explanation of the unknowableness of things in themselves? Such philosophers conceive the two sides of a sheet of paper (the abstract mathematical planes of the pages) as phenomenal and the paper as their metaphysical essence. The size of the sheet, the color of the paper, and all its other qualities are in a metaphysical world-conception represented as properties of which the thing is possessed—not as constituting the thing, but as essentially different from it.

It appears to me that Professor Mach in spite of his opposition to Fechner's simile and to the expression that feeling and motion are two aspects of one and the same reality, entertains the same view. At least his words: "Only the relation in which we consider them makes them at one time physical elements, at another time feelings," are to that effect.

III. SENSATIONS AND THOUGHTS.

The difference between Professor Mach's view and mine may appear greater than it is, because the problem which Professor Mach treats in his article "The Analysis of the Sensations,*" lies in quite a different field from that of the problem of the relation of feeling to motion. The problem being different, the same and similar terms are not only used for different purposes but demand also different comparisons. I introduced the symbols A B C . for representing motions, and $\alpha\beta\gamma$ for representing feeling or the elements of feeling. Professor Mach's symbols $A\ B\ C$ and $\alpha\ \beta\ \gamma$. represent a contrast different from that of feeling and motion. They represent the contrast of sensations and thoughts.

* *The Monist*, No. 1.

Sensations such as green and hard, are colors, pressures, tastes, etc ; thoughts are memory-images, concepts, volitions, etc.

Professor Mach says: "How the representative percepts of imagination and memory are connected with sensations, what relations they bear to them, as to this I dare venture no opinion . . Monism, as yet, I cannot thoroughly follow out; because I am lacking in clearness with regard to the relation of $\alpha\beta\gamma$ to $A\ B\ C$.; but I believe that the first step towards a competent monism lies in the assertion that the same $A\ B\ C$. are both physical and psychical elements.

My symbols $A\ B\ C$ . . and $\alpha\ \beta\ \gamma$ represent the contrast of physical and psychical elements, not of sensations and thoughts. Concerning thoughts, Prof. Mach says he is much inclined to co-ordinate them with sensations so that his Greek symbols might differ from his Italic symbols not otherwise than the latter, viz. $A\ B\ C$ . ., differ among themselves. Taking this ground, I believe it would be preferable to symbolise them accordingly among the Italic letters, perhaps as $X\ Y\ Z$. In the diagrams on page 342 they are called $M\mu$, $N\nu$, $S\sigma$.

According to my terminology, feeling, as explained above, is the most general term expressing any kind and degree of subjective awareness. A sense-impression is a single irritation of one of the senses, the irritation being a special kind of motion plus a special and correspondent kind of feeling. A sensation is a sense-impression that has by repetition acquired meaning. A later sense-impression, when felt to be the same in kind as a former sense-impression, constitutes, be it ever so dimly, an awareness of having to deal with the same kind of cause of a sense-impression; thus giving meaning to it. By sensation, accordingly, I understand sense-impression which has acquired meaning. And feelings that have acquired meaning, I should call mental states. Representative feelings (feelings that have a meaning) are the elements of mind.

By thinking I understand the interaction that takes place between representative feelings. Such are the comparisons of sensations with memory-pictures, or of memory-pictures among themselves, the experimenting with memory-pictures so as to plan new combinations, etc. The products of thinking are called thoughts; and by thought in the narrower sense is commonly understood abstract thought which on earth is the exclusive privilege of man.

If I am not mistaken Prof. Mach understands by sensations (represented by him as *A B C* . .) what I should call sense-impressions; while thoughts, memories, and volitions (represented by him as $\alpha\beta\gamma$ . .) form what I should call mind, or all kinds of mental states, that is, the domain of representations.

The higher spheres of thought, or representative feelings, grow out of and upon the lower spheres. Sense-impressions, as I have attempted to explain in the article "The Origin of Mind" (*The Monist*, No. 1 and *The Soul of Man* pp. 23–46), are the data which are worked out into concepts and ideas; they are the basis upon which the whole structure of mind rests. The reflex motions of simple irritations, being modified in higher spheres by the rich material of experience consisting of memory-images, and by the possibility of forethought created through experience, become volitions.

A monistic explanation of the rise of mind from elements that are not mind is possible only on the supposition that the objective processes of motion are not mere motions but that they are at the same time elements of feeling.

Is this not the same position as Professor Mach's where he says that "the first step towards a competent monism lies in the assertion that the same *A B C* . . . are both physical and psychical elements"? and again: "The same *A B C* are both elements of the *world* (the 'outer'* world namely) and elements of feeling.'

IV. THE ELEMENTS OF MIND AND THE ELEMENTS OF THE WORLD.

Considering the two last-quoted sentences of Professor Mach, it appears to me that all differences vanish into verbal misunderstandings. Yet since I am not at all sure about it, I may be pardoned for becoming rather too explicit. The adjoined diagram may assist me in making my ideas clear.

* Professor Mach here says "outer world." I should prefer to replace it by the expression "objective world," because the motions of a man's brain belong to the outer world of all other men. To make sure of including the actions of my own body in this outer world, I should prefer the term "objective world," making feelings alone (to the exclusion of the subject's own motions) the constituents of the subjective world.

Let the large circle of both figures represent a sentient being, a man. The periphery is his skin. The small circle enclosing K and L is a sensory organ; the other small circle enclosing M and N represents the hemispheres of his brain. A and B are processes taking place outside of the skin of this man. A produces an effect in K; B in L. The line R represents a reflex motion. M and N are concepts and abstract ideas derived from such impressions as K and L. The line S represents an act of volition

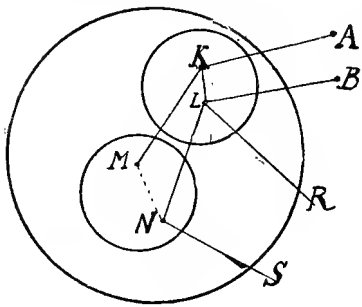


Fig. I.

All these symbols represent motions in the objective world. We know through physiological investigations that K, L, M, and N are motions; in our individual experience they appear as feelings.

The second figure represents in agreement with my system of symbols the states of awareness, in Greek letters. Certain physiological processes (K L R, M N S of Figure 1) appear subjectively as states of awareness (i. e. $\varkappa$ λ ρ, μ ν σ of Figure 11).

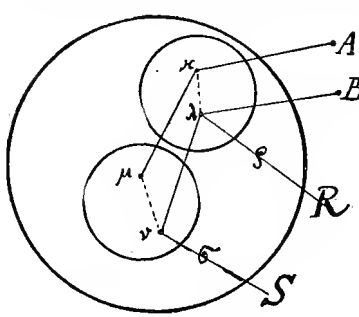


Fig. II.

Yet A and B remain to the thinking subject mere motions. If they possess also a subjective side, although only in the shape of potential feeling, it does not and it cannot appear.

Professor Mach calls green, hard, etc., which in a certain relation are our sensations, "the elements of the world." These processes characterised as "green," "hard," etc., are in my opinion too special and at the same time too complicated to be con-

sidered elementary. I grant that they are elements of mind, because if further analysed, they cease to be mental phenomena. But they are not elements *per se*, not elements of the world. It remains doubtful to me whether Professor Mach understands by his term "sensation" only $K\,\varkappa$ and $L\,\lambda$ or the whole relations $A\,K\,\varkappa$, and $B\,L\,\lambda$. Taking it that he represents $A\,B\,C$. as both elements of the world and sensations, it almost appears certain to me that his term "sensation" stands for the whole process $A\,K\,\varkappa$, and that he considers the scientific analysis of this process into A the outside thing, into K the nerve vibration corresponding in form to the outside thing, and $\varkappa$ the feeling that takes place in experiencing the sense-impression $A\,K$, as an artificial procedure that serves no other purpose than that of familiarising us with certain groups of elements and their connections. The processes $A\,K\,\varkappa$, $B\,L\,\lambda$, in that case would be considered by Professor Mach as the actual facts, while the A and B, the K and L, the $\varkappa$ and λ represent mere abstract representations without real existence, invented by scientists in order to describe the realities $A\,K\,\varkappa$, $B\,L\,\lambda$, etc., with the greatest exactness as well as economy of thought. In their separate abstractness they are the tools of science only and we must not take them for more than they are worth.

If this be so, I understand Professor Mach very well, and I agree with him when he looks upon all M and N with their respective μ and ν as being "noumena, *Gedankendinge*, things of thought." They are mental tools. Sense-impressions are realities, but mental representations are implements; they are auxiliaries for dealing with realities; they are "the augers and saws" employed in the different fields of cognition. The elements of mind are realities, but the elements of the world are noumena, abstract ideas which serve as mental tools.

Professor Mach says in his article "The Analysis of the Sensations": "When I (the ego) cease to perceive the sensation green, when I die, then the elements no longer occur in their customary, common way of association. That is all. Only an ideal mental economical unity, not a real unity, has ceased to exist." The term sensations, it appears to me, can in this passage be interpreted neither as $K\,\varkappa$ only, nor as the whole relations $A\,K\,\varkappa$, but as any $A\,B\,C\ldots$ relations; and since Professor Mach has not excluded from them the element of feeling, I should have to represent them by $A\,\alpha$, $B\,\beta$, $C\,\gamma\ldots$. Sensations as I under-

stand the term (viz. $A\ K\ w$, $B\ L\ \lambda$), are elements of mind; if they are further analysed they cease to be mental states. Says Professor Mach: "If I close my eye (K) withdraw my feeling hand (L), $A\ B\ C\ldots$ disappear. In this dependence $A\ B\ C\ldots$ are called sensations." Should we not rather say they cease to be sensations, if this dependence ceases? Accordingly, sensations and sense-impressions are for this and for other reasons not indecomposable, not ultimate atoms. The elements of mind can be further analysed into the elements of the elements of mind. The elements of mind do not persist; but the ultimate elements of the elements of mind, whatever they are, do (or at least may) persist.

V. NOUMENA AS MENTAL TOOLS.

When speaking of the elements of the elements of mind we cease to deal with objects of actual experience as much as a physicist or chemist does who speaks about atoms. Nevertheless the analysis is as legitimate in our case as it is in the chemist's. If in the above quoted passage I am allowed to replace Professor Mach's term "sensations" by "elements of sense-impressions," I should not hesitate unreservedly to accept his idea. These elements of sensations would be all kinds of natural processes, all kinds of motion. They would be physical actions which are not mere motions but also and at the same time elements of feeling.

It is true that abstract concepts, and especially scientific terms and theories, are mere contrivances to understand the connections among, and the qualities of, real things. Ideas are not the real things, but their representations, and some ideas are not even representations; they are solely of an auxiliary nature and comparable to tools. They are used as working hypotheses wherever the real state of things is in part hidden from us, until we have found the actual connections. As soon as the actual connections are found we can and must lay down our tools.

In a certain sense all words and concepts are tools for dealing with the realities they represent. But some words are tools in a special sense. They have been invented for acquiring a proper representation.

Professor Mach says: "The implement is not of the same dignity or reality as $A\ B\ C\ldots$" It appears to me that these implements (if they are of the right kind) have almost a higher dignity (although not reality) than the material to which they are

applied. My respect for tools is very great, for tools are the most important factors, perhaps the decisive factors in the evolution of man. The usage of tools has matured, nay created the human mind, and words,—scientific and abstract terms and theories not excluded,—are the most important and most sacred tools of all.

Some ideas, it is true, have to be laid aside like tools that are no longer wanted; but there are other ideas which we cannot lay aside, because they have more value than the ideas of a mere working hypothesis. Some ideas are indispensable and will remain indispensable; we shall always have to employ them in order to represent in our mind the connection between certain facts. If we see a train pass into a tunnel and emerge from it at the other end, we will connect in our mind these two sensations by the thought of the train's passage from one end to the other. This idea is not a sensation; it is a noumenon. Shall it therefore be called a *mere* noumenon, a tool that has to be discarded as soon as we are accustomed to expect a train to emerge from the one end of a tunnel soon after it has disappeared into it at the other end?

There are scientific concepts which, for some reason or other, can never become objects of direct observation; they can never become sensations. Nevertheless we must think them together with certain sensations as indispensable connecting events taking place behind the stage and hidden from our eyes. Our conception of a train hidden from sight in a tunnel, it is true, is a noumenon, but it is a legitimate noumenon, it represents a reality. So also many scientific ideas, although undoubtedly things of thought are legitimate noumena. If they contain and in so far as they do contain nothing but formulated features of reality or inevitable conclusions from verified and verifiable experiences, these things of thought represent something real, which means that if we were in possession of microscopes of sufficient power, or if we could look behind the veil that hides them from our sight, we should see them, just as we should see the train if the rock through which the tunnel leads were transparent.

VI. THE ORIGIN OF FEELING.

Concerning the origin of feeling Professor Mach says: "The question how feeling arises out of the physical element has for me no significance." I agree that we cannot ask how feeling arises out

of the physical element. But feeling being a fleeting phenomenon, to propose the problem of the origin of feeling *has* a significance.

Some physical elements—namely, those of our own body—are indubitably possessed of the subjective phenomena of feeling. And as to certain other physical elements, observable in our fellow creatures, that is in men and animals, no one would think of denying their presence either. But there are physical elements which we regard as bare of all feeling. The wind that blows, and the avalanche that plunges into the valley are not supposed to be feelings. Yet the energy of the wind and the energy of the avalanche may be utilised and ultimately stored up in food. The food may be changed into human energy and then the element of feeling appears as if called forth out of the void. We agree that feeling has not been changed from motion. But if feeling was not motion before, what was it? Feeling cannot be a creation from nothing. Consequently it must in its elements have existed before. Feeling, namely actual feeling, must be regarded as a special mode of action of the elements of feeling. If all that which we can observe in motion, all that which the term motion comprises, constituting the objective changes taking place in nature, contains nothing of feeling or of the elements of feeling, we must yet attach to every motion the presence of this element of feeling.

That the potential subjectivity of the physical elements, namely the elements of feeling, cannot be seen, as motions can be seen and objectively observed, is not a reason that militates against this view; for it is the nature of all subjective states to be felt only by the feeling subject. If all feelings are objectively unobservable except by their correspondent motions, the elements of feeling can form no exception to the general rule.

VII. THE ANIMATION OF ALL NATURE.

Professor Mach says: "Some years ago I should have agreed *in toto* with the passages in which Dr. Carus speaks of the animation of all nature and of the feeling that accompanies every motion.

Let me here emphasise that I have termed nature "alive" not in the sense that every motion is supposed to be accompanied with sensation, nor with any kind of feeling, but with an element of feeling only. I am aware that the term element of feeling may be easily misunderstood, and it seems advisable to guard against

such misconceptions. Actual feeling I suppose originates from the elements of feeling similarly as an electric current originates under special conditions. Sulphuric acid dissolves zinc and sets energy free which appears in the copper wire as electricity. It is an instance of the transformation of potential energy into kinetic energy.

To use the expression "elements of feeling" is no more or less allowable than to speak of the stored up energy from which electricity is produced, as elements of electricity. The latter expression is inappropriate, because we are in possession of better terms, because our range of experience in the subject is wider. But suppose that among all molar and molecular motions we were only acquainted with electricity and knew nothing of potential energy, could we not for want of a better word form the term "elements of electricity"?

The elements of feeling should not be supposed to be feelings on a very small scale. The elements of feeling may be and for aught we know are as much unlike actual feelings as mechanical motion, or chemical dissolution is unlike electricity. The essential features of feeling may be, and I believe they are, produced through the form in which their elements co-operate. Similarly the different pieces of a clock and the atoms of which it consists contain nothing of the clock; and if we should call the heaviness of a weight, the swinging property of the pendulum, the tension of the spring, etc., etc., elements of chronometry, it might appear ridiculous, because we know so many other processes, viz.: all different ways of performing work, for which these qualities can be used. The action of a spring, of a suspended weight, of a mere pendulum are not by themselves elements of chronometry; they become a chronometrical arrangement only by their proper combination with a dial and hands attached, and by being correctly regulated in adaptation to temperature and many other conditions.

VIII. VITAL ENERGY A UNIQUE FORM OF ENERGY.

The kinetic energy liberated in our actions, in brain-activity as well as muscular motions, is produced from the potential energy stored up in our tissues. This energy, *qua* energy, is the same energy which we meet everywhere in nature. All kinds of energy are interconvertible. Yet we must bear in mind that the vital energy displayed in animal organisms is a special and indeed a

unique form of energy. It is as different from other forms of energy as is, for instance, electricity from molar motion.

In former times physics and chemistry were considered as applied mechanics, and physiology as applied chemistry. This position, however, is wrong and had to be abandoned. Mechanical, chemical, physiological, and psychical processes exhibit radically different conditions. The student of mechanics, the chemist, the physiologist, the psychologist, each one of them attempts to solve a different problem. They accordingly deal with different sets of abstractions. The processes which constitute the subject-matter of the physiologist's and psychologist's work are different from those of the mechanical philosopher and of the chemist. The abstraction of the so-called purely mechanical excludes such processes as chemical combinations; it is limited to molar mechanics only. The term molecular mechanics is an attempt at widening the domain of mechanics. But the terms of neither molecular nor molar mechanics contain anything of the properly physiological nature observed in vegetal and animal life. The latter is a very complicated process which may briefly be described as assimilation of living forms. The laws of molar and molecular motions are not annulled, yet they are superseded; they remain, yet some additional important traits appear. Different conditions and complications show different features and the characteristics of organised life are not the molar or molecular mechanics of their motions but their properly physiological features.

Mechanical laws accordingly cannot explain physiological action, and still less have they anything in common with ideas, or thoughts, or feelings. Accordingly, the attempt to apply mechanics to any other than mechanical considerations is *prima facie* to be rejected. We must never forget that all our scientific inquiries deal with certain sides of reality only.

The abstractions of the mechanical philosopher as well as those of the physiologist and psychologist are one-sided aspects only of reality. Yet it is quite legitimate to take a higher standpoint in order to classify our notions so that the general views comprise the special views and to determine the relations among the several in their kind most general views. In this way we can shape our entire knowledge into an harmonious world-conception representing the whole as a whole. This I tried to do when, following the

precedent of Fechner and Clifford, I proposed the problem of the origin of actual feelings from the non-feeling elements-of-feeling, the former depending upon a special combination or form of action of the latter, and the latter being a universal feature of reality.

The mechanism of the motions that take place in human organisms is one aspect only of the reality, called man. The other aspect is a subjective state of awareness. But the mechanism of gravitating things is no less a limited view of one special abstraction. This special abstraction represents one feature only, and we can be sure that this one feature does not cover the whole of the real processes. There must be some additional feature which in a further development will appear as man's consciousness.

THE ERROR OF MATERIALISM.

IN ANSWER TO A CRITICISM BY COL. PAUL R. SHIPMAN, IN SECULAR THOUGHT. *

COLONEL PAUL R. SHIPMAN wields a vigorous pen, and his onslaughts appear overwhelming. Yet I do not see that his crushing verdicts have any reference to me, since the monism criticised by him is not my conception of monism. Accordingly, in spite of my best intentions to enjoy another philosophical tilt with a man whose name is so honorably known among the authors of this country, I cannot rise in self-defence because my views have not been attacked at all.

Did I ever speak of the "duality of atoms?" I rarely speak of atoms, and if I do I am careful in pointing out that the term "atom" is a mere symbol to denote chemical equivalents whereby to describe the proportions in which the elements combine. The existence of real atoms, i. e. of ultimate indivisible units, is not only unproved but even unthinkable. The philosophical idea of atoms is as untenable as, for instance, that of a round square, for it contains in itself contradictions. Rejecting atoms (not in a chemical but in a philosophical sense) still more must I consider "dual atoms" as an absurdity.

Col. Shipman charges me with crude dualism, because I reject the idea that feeling is material. I do reject the idea that feeling is material, but did I ever declare (as Col. Shipman repeatedly maintains) that "consciousness is immaterial, and will material?" The contrast of these two propositions is just as nonsensical as

* Col. Shipman's criticism appeared in February and March, 1891.

each proposition in itself. There is no sense in calling consciousness and will either material or immaterial. Neither consciousness nor will has anything to do with matter; both are non-material. We might just as well propose a discussion of the problem whether ideas are green or blue. Any issue concerning the color of ideas would be no less futile than to speak of the materiality or immateriality of the will or of consciousness.

It appears to me that the difference between Col. Shipman and myself is primarily a difference of reasoning rather than of opinion. The Colonel overlooks the fundamental rules of philosophical propædeutics, and this oversight produces as a secondary symptom a difference of opinion. Col. Shipman propounds a few very strange maxims which have been held for some time as axioms by the materialist school, but are now only to be found in the lumber-room of the history of human thought or in the curiosity shops of philosophy.

Col. Shipman, speaking of the "omneity of matter," says among other curious things:—

"Mind is material."

"Immaterialise consciousness and you abolish matter."

"With immaterial things, if there are such things, science has nothing to do; to deny this is to cut loose from the sheet anchor of fact."

"Matter is the sheet anchor of fact."

Col. Shipman's propositions about the "omneity" of matter and the materiality of mind remind me of a most interesting episode in the history of philosophy. Feuerbach, the enthusiatic prophet of an idealised materialism, confounded thought with the phosphorous substance of the brain. His dictum has become famous. Without phosphorus, no thought. He declared that man is what he eats. *Der Mensch ist was er isst.* The elevation of the soul, accordingly, should not be expected to be accomplished by the church, but by the kitchen; *die Küche* and not *die Kirche* will save us. Why not feed on fish if in that way man can become a genius? The progress of mankind would depend on more phosphoric diet than meat. This was a queer perversion of thought in a brilliant mind which was aglow with a holy fervor for a religion of mankind! Yet Feuerbach's materialism was outdone by Carl Vogt, one of the most ingenious, witty, and sarcastic writers of the nineteenth century, if not of all ages. Carl Vogt had a peculiar knack of being pointed in all his utterances, and he formulated his philosophy in words which stuck in the minds of the people, and

have become famous all over the world. He said: Thought is a secretion of the brain. Thought stands in the same relation to the brain as gall to the liver and urine to the kidneys."

Lotze wittily remarked in answer to this comparison, he had not known that the origin of thought was so unpoetical. Wolfgang Menzel, however, a champion of the darkest orthodox Christianity, but no less sarcastic than Carl Vogt, and often even more malevolent in his criticisms (for instance, of such men as Goethe and Schiller), declared he did not wonder that kidney secretions and thoughts were equivalent, at least in Carl Vogt, and he called him an untranslatable name which, mildly expressed, reminds of the famous fountain-statue in Brussels behind the Hôtel de ville—so shocking to the English lady travellers.

Incidentally it may be mentioned that Carl Vogt's idea had been expressed in almost the same words by Cabanis, who spoke of the brain as producing "*la sécrétion de la pensée.*"

Before we expose the absurdity of this proposition, we must recognise its truth. Thinking, objectively considered, is as much as any other activity of the human organism, a physiological process. When a man thinks, we know that at the same time some material particles of his brain are in motion. Herein lies the correctness of Vogt's comparison, and herewith it ceases. For thought, unlike gall, is not a secretion. Gall is a substance, but thought is not a substance. Gall is a special kind of organised matter, but thought is no matter. If it were, we might bottle it or preserve it in tin cans. What a fine prospect to buy canned thought at the grocer's!

The fact is that thoughts are the subjective states of awareness which are felt when certain physiological processes take place in the brain. A pain which I feel when my skin is pricked is not a material thing; it is not substance. Pains, pleasures, sensations, perceptions, thoughts, cannot be handled like pebbles or other material objects. It is true that pleasures and pains do not exist in absolute abstractness. There are no pains hovering in empty space like the ghouls and ghosts of old legends; there are no ideas flying about in immaterial nudity. All the ideas, the pains, the pleasures we know of are certain states of mind in real and actual creatures.

We must not forget that our method of cognition rests on abstraction. All our concepts, matter and mind included, are only

symbols to represent certain features abstracted from the facts of experience. Our abstract concepts are not realities but ideas, mere noumena, things of thought, invented for the sole purpose of comprehension. When making abstractions, we limit our attention to one special feature of a thing and exclude other features. When speaking of the matter of a thing, we exclude all its other properties. By the matter of which a human body consists, we do not understand its form, nor its life, the display of its activity, nor the feelings which ensoul its active brain, but simply the materials of which it consists. If we speak of matter, we do not mean force. If we speak of force we do not mean matter. If we speak of form, we mean nothing but relation. If we speak of consciousness, or of feeling, or of thought, we have no reference to either matter or force nor even to form. All these terms are different abstractions of one and the same indivisible reality. There is no force without matter, no matter without force, but matter is not force and force is not matter. A motion is a change of place; and force is expended wherever a change of place occurs. The thing moved is material, but the motion itself is not material. When we speak of a man's ideas, we mean his ideas and not the material particles of his brain. If science had nothing to do with immaterial things, psychology would be no science, mathematics would be no science, logic and arithmetic would not either. And what is Col. Shipman's sheet-anchor of fact, as he is pleased to call matter, but a mental symbol for certain features of our experiences? It appears to me that mental apprehension, the most immaterial part of man's experience, is after all the "sheet-anchor of fact." To speak of the omneity of matter, to declare that force and feeling and consciousness and thought are material does not prove the boldness of freethought, it betrays an immature mind. To define matter as an all-comprehensive term which has to include all features of reality is an unjustifiable license. Wherever this license is indulged in, it will be followed by a confusion of thought; for it is an oversight of the most elementary rules of philosophical propædeutics.

It is for this reason that one of the greatest chemists, a man who should know what matter is, (Baron Justus Liebig), designated the materialists as philosophical dilettanti. And this judgment is partial in so far only as the same is true of the spiritual-

ists who make spirit, and the Platonists who make pure forms, the all-embracing realities of the world.

Matter, force, mind, spirit, form, feeling, are mere abstractions. To look upon any of these in their kind most general terms as something else than terms or mental symbols, to look upon them as "omneities" or all-comprehensive realities, is a self-mystification and will lead either to occultism or to agnosticism. Indeed Col. Shipman's materialism is agnosticism. He looks upon matter as a mystery, and the mystery of matter, he says, is absolute. Yet this absolute mystery is to him the condition of knowledge; it is the "sheet-anchor of fact."

THE ORIGIN OF ORGANISED LIFE.*

Dr. George M. Gould's proposition is contained in the following:

"Certain confused and confusion-breeding philosophers, in the interests of a theoretical monism or pantheism† pretend to find, or to believe, that the organic is born out of the inorganic, that the physical world shows evidence of design, that life and mentality were implicate and latent in pre-existent matter. Yet they will accept the evidence against spontaneous generation derived from the fact that if you kill all organic life by intense heat and then exclude life from without you will never find life to arise. But it is plain that in the condensation of the dust of space into suns and planets, all organic life was killed in the hottest of all conceivable heat. But as the planets cool, life appears. It must have come from without, and must therefore be a universal self-existent power."

The idea that "life must have come from without" is not quite clear. Does Dr. Gould mean "from without our planetary system, out of other planetary systems"? If so, the same objection holds good: In other planetary systems also when they were in a nebular state "all organic‡ life was killed in the hottest of all conceivable heat." Shall we perhaps consider the cold interstellar regions as the place whence life does come? And if "from without" means

* Written in answer to Dr. George M. Gould's article "Immortality" in *The Monist, No. 3.*

† My position has often been characterised as Pantheism; this, however, is not correct. I do not accept pantheism and should prefer to designate my view as entheism. I do not propose to worship the All or to confer the honors of Deity on the Universe as the totality of all existing things. The abstraction "God" is not the All, not Nature, not the Universe. God is the All, or Nature, or the Universe in its ethical importance. God is the unalterable world-order as the ultimate authority for the regulation of moral conduct. Worship and adoration, no less than sacrifices, are a pagan phase in the development of religion. The only true worship in pure religion is obedience to the laws of God.

‡ Dr. Gould does not seem to make a distinction between "organic" and "organised." We should here prefer the expression "organised life." Carbon is an "organic substance" but not an "organised substance." A cell and its protoplasm, however, are "organised substance."

"from without the whole universe," we should be driven back to the old supernaturalistic dualism which regards nature as dead and life as a foreign element that has been blown into the nostrils of material forms so as to animate them.

Dr. Gould proposes his theory of the external origin of life, with great confidence, in the name of modern science. Must we add that modern science is very far from sustaining his view? Professor Clifford touches the subject of spontaneous generation in his article "Virchow on the Teaching of Science." He says:

"Why do the experiments all 'go against' spontaneous generation? What the experiments really prove is that the coincidence which would form a *Bacterium*—already a definite structure reproducing its like—does not occur in a test-tube during the periods yet observed. . . . The experiments have nothing whatever to say to the production of enormously simpler forms, in the vast range of the ocean, during the ages of the earth's existence. . . We know from physical reasons that the earth was once in a liquid state from excessive heat. Then there could have been no living matter upon it. Now there is. Consequently non-living matter has been turned into living matter *somehow*. We can only get out of spontaneous generation by the supposition made by Sir W. Thompson, in jest or earnest, that some piece of living matter came to the earth from outside, perhaps with a meteorite. I wish to treat all hypotheses with respect, and to have no preferences which are not entirely founded on reason; and yet whenever I contemplate this

simpler protoplasmic shape
Which came down in a fire-escape,

an internal monitor, of which I can give no rational account, invariably whispers 'Fiddlesticks!'"

Suppose, however, Dr. Gould's assumption were accepted, suppose that life had come from without, matter were of itself lifeless, and life, the "self-existent power," had ensouled some dead organic substances so as to cause their organisation, would we be any wiser through this hypothesis? The assumption instead of diminishing the difficulties in the problem of life, would increase them. New questions arise: What must this "self-existent power" be conceived to be? Does it exist without a physical basis (to use Prof. Huxley's phrase)? How does it differ from energy? Is not all power energy of some kind? And are not all kinds of energy interconvertible? Has this self-existent power the faculty of changing other energy into itself, into life, or is it only supposed to utilise it? In the latter case it would be a *Ding an sich*, not in but behind the functions of organisms; and in both cases it would form an exception to the law of the conservation of energy, for "the self-existent power of life" would be an ever increasing power.

One life-germ only may have come from spheres unknown into the universe, and by utilising the mechanical energy of the material world has animated at least our earth, and may animate in a similar way all the globes in the milky way. That life-germ, however —if it was anything like a real life-germ, such as our naturalists know of,—must have consisted of organic substance. What a strange coincidence, that outside of the world also organic substances are found! Life-germs are not simple substance, but highly complex organisms. Accordingly, the question presents itself, how has this life-germ been formed? What conditions in another world radically different from ours have moulded it and combined its parts into this special life-germ so extraordinarily adaptable to our material universe? Or must we suppose that the first life-germ was formed out of the cosmic substance of our universe by a non-material spark of life (whatever life may mean,) that had dropped in somehow into the material world from without?

If life is a self-existent power, why does it always appear dependent upon, and vary with the organisation which it is supposed to have formed? Why has life never been observed in its self-existence? So far as we have ever been able to observe life, it is matter organised and organising more matter. All the difficulties disappear if we say, Life does not produce organisation, it is organisation.

* * *

Dr. Gould, in appealing to the latest scientific researches as proving "the dependence of all organisation upon life," especially mentions his friend Dr. Edmund Montgomery and also Professor Frommen's article "Zelle" (Eulenburg's "Realencyclopädie der gesammten Heilkunde," 1890). Now it is true, as Dr. Gould says, that "the body of animals is not an aggregate of cells." It is as little a mere aggregate of cells as a watch is a mere aggregate of metal, or as a hexagon a mere aggregate of lines. The body of animals is an organism; which means, it is an interacting whole of a special form built of irritable substance. A highly complex organism is not and cannot be considered as a compound of its diverse organs, but as a differentiation. Its unity is preserved in the differentiation, yet this unity does not exist outside of or apart from the differentiated parts.

I fully assent to Professor Huxley's proposition, approv-

ingly quoted by Dr. Gould, that "materialism is the most baseless of all dogmas." I also believe in the *omne vivum ex vivo;* but I do not consider it with Dr. Gould as "an axiom," nor can I accept the consequence which Dr. Gould derives from it, "that life [viz. organised life] is more certain and enduring than matter, soul than sense." It is true that "matter and life" are "as far apart as heaven and earth." Farther indeed, for they are two abstractions of an entirely disparate character. No passage through spacial distance, be it ever so large, could bring both concepts together. They are and remain as different, as is for instance the idea expressed in a sentence from the ink with which it is written. Ideas contain no ink and ink contains no ideas. Yet this does not prove that ideas exist by themselves in a ghost-like abstractness apart not only from ink, but also from feeling brain-substance. Nor does the disparity of the terms life and matter prove the abstract or independent existence of life outside of matter.

If life for some such reasons as hold good only in so far as they refute the old-style materialism, could or should be considered as being some self-existent power having come into the world "to bite" at matter, we might also consider the hexagon as a something that came into the mathematical world from without. The hexagon cannot be explained as a mere aggregate of lines, accordingly hexagoneity must be a self existent power; it must have come from without, utilising lines for its hexagonic existence.

Organised life must have originated from non-organised elements by organisation, and thus a new sphere is created which introduces new conditions. The laws of organised life are not purely mechanical laws, nor physical laws, nor chemical laws, but they are a peculiar kind of laws; just as different as chemical laws are from purely mechanical laws (the latter not including such phenomena as are generally called chemical affinity).

Natural laws are formulas describing facts as they take place under certain conditions. Accordingly if special conditions arise we shall have a special set of laws. Monism assumes that all the laws of nature agree among themselves; there is no contradiction among them possible. Yet there may be an infinite variety of applications. The processes of organised life are not mere mechanical processes. The abstractions which we comprise under our mechanical terms do not cover certain features of vital

activity and cannot explain them. Physiology is not merely applied physics; it is a province of natural processes that has conditions of its own and the physiological conditions are different from physical conditions. This however does not overthrow monism. We believe none the less in the unity of all natural laws and trust that if the constitution of the cosmos were transparent in its minutest details to our inquiring mind, we should see the same law operating in all the different provinces; we should see in all instances a difference of conditions and consequent thereupon a difference of results that can be formulated in different natural laws, among which there is none contradictory to any other.

INDEX.

ERRATA.

Page 60, line 13, read *75 and 142* instead of '67.'
Page 75, line 17, read *certain* instead of 'ceartain.'
Page 75, line 19, read *Ansicht* instead of 'Absicht.'
Page 155, line 16, read *identity* instead of 'indentity.'
Page 205, line 15, read *they can* instead of 'it can.'
Page 236, line 16, read *a speedy* instead of 'as peedy.'
Page 121, line 20, read *need not* instead of 'cannot.'
Page 214, line 29, omit 'which.'
Page 237, line 28, read *an* instead of 'on.'