

# The Open Court

A MONTHLY MAGAZINE

Devoted to the Science of Religion, the Religion of Science, and the  
Extension of the Religious Parliament Idea

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*Just Published*

# To Jerusalem Through the Lands of Islam

Among Jews, Christians and Moslems

By Madame Hyacinthe Loyson

Preface by Prince de Polignac

Pages viii, 375, cloth, gilt top, 8vo., profusely illustrated, \$2.50

**T**HIS remarkable book, the work of one of the most remarkable women of our time, the joint work rather of a remarkable woman and a remarkable man,—for Père Hyacinthe is joint-author of it from cover to cover though he is not the writer of it,—this remarkable book is beyond the skill of the reviewer. It would be easy to blame it. Men in a hurry for copy, or in a hate at Pere Hyacinthe, will fill their columns with quite plausible matter for blame, and salt it well with superiority. But when the most is said this is what it will come to, that Madame Hyacinthe Loyson remembers the words, "He that is not against us is on our part," and remembers that they are the words of her dear Lord. He who should say that she exalts the Koran above the Bible, that she sees only the good in Islam, only the evil in Christendom, gives himself into her hands. For she writes down what her own eyes have seen; and though she has many examples of Christian prejudice and many of Muslim charity to record, she never for one moment finds Muhammad standing in her thoughts beside Christ. All that it comes to in the end is this, that Christians are rarely true to Christ, Muslims are often much better than Muhammad.—*Expository Times, London.*

This is one of the handsomest books of oriental travel which we know. The book pays special attention to the religious conditions of the Copts, Jews and Moslems of the East. It presents a tremendous indictment of the liquor traffic in Malta and elsewhere. The white man's vices are the greatest obstruction to the mission work in the non-Christian world.—*Methodist Magazine and Review.* She has woven in much of general archæological and anthropological information.—*Records of the Past.*

Mme. Loyson, despite her excessive iteration of rather explosive comments, is a woman who cannot help being interesting, so her descriptions of places and account of personal experiences in Egypt and Jerusalem and elsewhere are immensely interesting, and make the reader seem to see it all.—*Chicago Evening Post.*

Her notes of social visits give interesting pictures of Arab manners. The Arabs she pronounces "the best behaved and most forbearing people in the world," and not unlike "the best type of our New Englanders." She evidently moved in the best society, but even among the common people she noted points in which Christians might learn of Mohammedans. Polygamy, however, is noted as the black spot on the brow of Islam. Evidently the tour of the Loysons accomplished good. It were well if all missionaries were animated by their spirit. The volume is handsomely printed and illustrated.—*The Outlook.*

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COLCUMBUS RIDICULED

*Frontispiece to The Open Court.*

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## A RETROSPECT AND A PROSPECT.

BY THE EDITOR.

WITH the beginning of the year 1907 *The Open Court* celebrates the twentieth anniversary of its existence, and so its editor deems it opportune to submit to the public an exposition of the aims, the methods and the spirit of its work, which by a slow but steady increase has gained a goodly number of friends.

### THE WORK OF THE OPEN COURT.

The Open Court Publishing Company was founded to serve as a center for an earnest and thoroughgoing reformation of religion under the influence of science, and in working to this end it has combined a fearless radicalism with a reverent conservatism. Its founder as well as its manager, together with most of its friends, are convinced that this is the only correct attitude, and that, therefore, the publications of the Open Court Publishing Company are leading in the right direction on the path of progress, foreordained in the history of mankind by the law of evolution.

*The Open Court* discusses the philosophical problems of God and soul, of life and death, and life after death, the problems of the origin of man and the significance of religion, and the nature of morality, occasionally including political and social life without, however, entering into party questions.

Since we can not build up the future without comprehending the present, and since the present has grown from the past and finds its explanation in the history of bygone ages, we deem it necessary to discuss not only philosophical problems but to enter also into the questions of the history of religion, presenting the results of Biblical research, of Babylonian and Egyptian excavations, the religions of Egypt, of India and of China, and kindred topics, all of

which directly or indirectly throw light on the origin and significance of our own religion to-day. None of them, be it ever so remote in space or time, but possesses some intense interest to us, either by having contributed to the makeup of our own souls or by affording a parallel to the development of Christianity, or even constituting a contrast to it, so as to become interesting on account of its very difference.

### SCIENCE THE REFORMER.

This is an age of science. Science is surely though slowly transforming the world. Science reveals to us the secrets of nature and explains the constitution of the universe as regulated by unailing law. Science guides the inventor's hands and makes things possible which in former days were deemed attainable only by magic.

Science is the attainment of truth through methods of exact inquiry. Its aim is a statement of truth verified by rational proof, by experience, and experiment.

The influence of science upon practical life is not limited to the domains of industry, commerce, transportation, and the methods of communication by mail, telegraph, telephone, etc., but extends also to the intellectual and moral fields. It does away with ignorance, narrowness and bigotry, but while it overcomes superstition, it will not usher in an age of irreligion; on the contrary it will make the future more intensely religious, for under our very eyes it is bringing about a salutary and much needed reformation.

Now it is true that science applied to religion has wrought much havoc with the traditional interpretation of established creeds. Philosophy recognizes the anthropomorphism of the old God-conception; psychology discredits the traditional theory of a soul-entity; comparative religion dispels the claim of the unique and exceptional position of Christianity; higher criticism proves the human origin of the Bible and disposes of a belief in special revelation. For these reasons science has been regarded as hostile to religion, and so the old-fashioned religionists look upon science as godless and dangerous, while the freethinkers and infidels triumphantly proclaim that science will make an end of religion and the future will be an age of irreligious science.

To a superficial observer the spread of unbelief may appear to be a symptom of decay, foreboding a final dissolution of religion, but a deeper insight will reveal the fact that we live in a stage of transition, and the disintegration of dogmatism is merely preparatory to a reconstruction of our religious faith on a firmer foundation,

—firmer because truer, and it is a reconstruction because it will discard only the errors of the past, but not the good that it contains, not the old ideals, the moral endeavor, and the serious spirit of religious aspirations.

#### EVOLUTION.

We reject the traditional interpretation of religion because we can no longer believe its dogmas, but we do not join in the hue and cry against religion. While we realize the imperfections of all current creeds, we do not look upon their existence as an evil. On the contrary, we recognize them as powerful factors for good and as an indispensable preparation for the religion of the future. Churches may be deficient in many respects, but they are much-needed organizations, and we cherish no hostility toward them. We are too much convinced of the truth of evolution as a general principle of all life, not to apply it also to the spiritual domains of civilization, morality and religion. We can not begin the development of life over again simply because the present state of things is imperfect. We believe that the future of mankind must be built upon the past, and we must evolve the living present by way of progress and reform; not by a revolution or a destruction of the old traditions and former experiences. The future can not obliterate the past, but must use it as the foundation for a higher and truer religion.

#### FULFILMENT NOT DESTRUCTION.

We must not identify religion with the religious superstitions of the past; we must bear in mind that all progress leads to truth through error. Truth,—in science as well as in religion,—is first groped after in a search which instinctively divines the right solution and formulates it first in a childlike way, then more and more clearly, until finally an exact statement becomes possible.

The path to truth naturally passes through myth and allegory, through a representation in parables, through mysticism and other visionary approximations, to a scientific comprehension of the actual state of things, and this law of intellectual evolution holds good not only for religion, but also for the sciences and the arts.

Science has not originated fully equipped and ready made as Athene came with her entire armament from the head of Zeus. The mythological period was as much an indispensable phase in the history of science, as in the history of religion. Alchemy prepared the way for chemistry, and a close scrutiny of the history of knowledge will reveal that this law of gradual development holds good

for all the sciences, indeed for all the different domains of life and also for religion.

Religious institutions are more conservative than any other of the affairs of human life; therefore it is natural that the magic conception perseveres longer in the religious domain than elsewhere, but as surely as astrology has changed into astronomy, so theology will become theonomy, i. e., a truly scientific conception of God.

#### THE ROOT OF RELIGION.

Originally religion is not clear and conscious. It appears first as a vague impulse, but as a rule (though not always) it is an impulse for good. The religious sentiment develops from a quality inherent in all beings, nay in all things. It is a quality akin to gravity that attracts mass to mass and holds together all material things. An analogous law sways the domain of sentiency, for every living soul is naturally endowed with a longing beyond its own self, a yearning for otherness, and an anxiety not to lose its connection with the whole of which it is a part. This sentiment, which may fitly be called panpathy or all-feeling, is the germ from which spring all our ideals, first social and erotic, then religious and ethical, and also artistic and scientific.

Religion is ultimately sentiment, but it is also thought and will. It is in command of the three H's, the Heart, the Head, and the Hand. As sentiment it resides in the Heart, as thought it directs the work of the Head, as will it guides the Hand. In different men it will manifest itself differently in one way or another, but it will not be perfect unless it dominates the whole man, his heart, his head, and his hand.

#### GOD.

Life is transient and every happening, whether good or evil, pleasant or unpleasant, praiseworthy or detestable, will pass by. Nothing bodily can endure and all things that have originated must come to an end. Man is no exception to the rule, and his individuality rises into being and is doomed finally to dissolution. Yet man possesses the divine spark of reason. He sees the universal in the particular, the eternal in the transient, and the general law in its concrete realization; and so he longs to find his anchorage in the bottom-rock of all existence. Under the influence of the humanity of man, of his reason, and his spiritual comprehension of things, his panpathy broadens into a love of the eternal, the infinite, the all-hood of existence.



This is the ultimate norm of life which dominates the world with the necessity of natural law, irrefragable and without allowing exceptions; this the ultimate authority upon which finally all moral maxims are founded, and this the standard of truth and untruth, of right and wrong, of justice and injustice. We call it God, and we believe that even the atheist will not be prepared to deny its existence. This God is a reality undeniable and as sure as our own being; for without it, reason would be impossible, science would not exist, purposive action could not take place, ideals and moral aspirations would be illusions, and the universe, instead of a law-ordained cosmos, would be a meaningless chaos.

Religion makes man feel himself one with the source of life, it identifies him with the law of being, and prompts him to work for the purport of the whole.

#### THE DUTY OF INQUIRY.

The idea that our knowledge of religious truth is and should be final is characteristic of the period of dogmatism, but it is an error that is gradually disappearing. Dogmatism with its persecutions and heresy trials is fast passing away. We know now that our interpretation of religious doctrines has undergone changes and that these changes are necessary. Even St. Paul confesses of the message which he had for the world, that "now we see through a glass, darkly," and he understands that congregations in a state of babyhood must be fed on milk but that the time will come when they will put away childish things.

The ideal of a perfect religion is most assuredly not, as a few reactionary advocates of the past would have it, blind faith, being a belief in doctrines even though they be a contradiction of science and a condemnation of all that by application of exact methods can be discovered as truth. Our ideal of religion can only be an actualization of truth itself, and by truth we understand truth pure and simple, not a mystical statement of visions and imaginary revelations, purely subjective conceptions and oracular utterances, impressive though they may be to the large masses of mankind, but truth objectively verified by the maturest and most painstaking investigations of science.

Some devout believers resent the investigation of their dearest beliefs; but would it be advisable to investigate all that appertains to our bodily welfare and regard our religious beliefs as exempt, too sacred for inquiry, and thus leave them to the haphazard of tradition? This would be a mistaken policy. If religion is of the right

kind it must be true, and if our religious conceptions are erroneous, it is our most sacred duty to revise them and make them true.

#### THE DIVINITY OF SCIENCE.

It is a mistake to look upon science as secular and profane while religious dogmas are deemed sacred. All truth is sacred and dogmas can be sacred only if in the garb of symbolism they contain truths that can stand the test of scientific criticism.

Science, if it be but genuine science, is not human, but super-human. Science is divine. Scientists do not make science, they search for it and they discover scientific truths. Science is a revelation in the true and original sense of the word.

In the history of mankind the recognition of moral truths such as the wisdom of the golden rule, our need of justice, the bliss of righteousness, the power of a heart animated with universal goodwill, have mostly come to man by instinctive intuition, in a similar way as a poet is inspired to give expression to thoughts prophetic which are grander than his age; and therefore we will not say that science alone is revelation; sentiment, devotion, art, poetry, etc., are also channels of the divine spirit; but science (i. e., genuine exact science) is certainly unique in its way because of the sureness of its steps and the reliability of its results. Therefore it can not be disregarded in our religious life and the time in which it will produce most glorious results is near at hand.

#### THE OLD TERMS IN A NEW SENSE.

Critics of our position in both the ultra-conservative and the ultra-radical fields, blame us for using the old terms of religious nomenclature in a new interpretation, but we answer them that we do so because we are convinced that this is the right method of procedure justified not only by precedent but also by a correct comprehension of the law of progress. Even our scientific terms are an inheritance from a prescientific era. We speak of sunrise still, though every child knows that the sun does not rise, it merely seems to rise; electricians call the oscillations in the ether "currents," as if they were like a flow of water in rivers, yet we know that they are waves passing through a medium that is comparatively stationary. The process is an infinitely rapid transfer of a certain form of motion, but no flow, no current, no streaming of any kind. Yet the word is used and an attempt to discard it would merely elicit smiles for it is next to impossible to have a scientific nomenclature free

from allegory or terms that remind us of the prescientific period of mythical notions.

The truth of the matter is that it is easier to continue using the old terms in a new sense than to invent new terms. It is natural for man to name things as they first strike him and then investigate their nature and describe them in exact definitions.

Religion is not an exception, but in this it simply follows the general law of life. No religious reform will succeed unless the innovations are a product of the past and are felt to be so. In using the old terms in a new sense we are confident that we preserve the old spirit and give it a deeper and better interpretation.

We believe in evolution and believe that man has attained his present position by an intellectual growth which is but the consistent outcome of the old aspirations and an actualization of the ideals of a conviction, formerly regarded as orthodox, of a religion of right doctrine; and the change came about because the salient points of truth, of the attainment of truth, and of the right doctrine were taken seriously.

#### THE GOD OF TRUTH.

The first condition in religion is always sincerity and honesty, i. e., a love of truth, a free acknowledgment of what must be conceded to be true, and above all an earnest endeavor to actualize the truth in our life.

This is an old aspiration and we simply draw the ultimate conclusion of its consistent application. We read in the first book of Esdras a passage which deserves to be quoted and requoted.

“As for the truth, it endureth, and is always strong; it liveth and conquereth for evermore.

“With her there is no accepting of persons or rewards; but she doeth the things that are just, and refraineth from all unjust and wicked things; and all men do well like of her works.

“Neither in her judgment is any unrighteousness; and she is the strength, kingdom, power, and majesty, of all ages. Blessed be the God of truth.”

#### NO SUBSTITUTE.

Sometimes men who observe and regret the breakdown of the traditional forms of faith, express the desire for a substitute for religion. We sympathize with their sentiment, though we would not brook surrogates, for we want the genuine article. But we claim at the same time that the religion of truth is no substitute. On the

contrary, it is the true religion, and all previous religions have been mere temporary makeshifts; they are preliminary statements whose main value consists in the fact that they should develop into a more perfect form. This more perfect form has to be worked out in the slow process of mental growth, and when it comes, it will fulfil all its hopes, as much as the maturity of a perfect manhood actualizes the fond dreams of our childhood.

Upon the principles here set forth, we advocate a religious reformation with new conceptions of God, of the soul, of immortality, of inspiration, of revelation, and all other factors of our religious life.

Religion is not belief of any kind, it is not church membership, not mere devotion, not the performance of ritual, not the lip service of prayer; religion is part of our own being; it is the dominant idea of our soul, and it is characteristic of religion that it comprises the entire man, his sentiment, his will and his intellect. Religion is always a world-conception in which our relation to the All of life finds its determination. As such it consists of ideas, commonly formulated in doctrines. These ideas, however, are not purely intellectual, they possess an emotional character and are rooted deeply in the subconscious regions of our being. They link our life to the All and represent, as it were, the will of the universe. Being a power within us they are mightier than we and govern our will, frequently in spite of ourselves.

#### DIFFERENCE AND UNITY IN RELIGION.

The different religions appear from this standpoint as aspirations all striving to reach the same goal. They are by no means equal, for very few of them approach, much less attain to their common ideal. They differ in many respects, especially in their general attitude toward the world. Sometimes the attitude in religion is a matter of interpretation, and it may happen that two sects of different religions possess the same general attitude and thereby become more akin the one to the other than each of them is to other sects of its own faith. Aside from differences of attitude there is an agreement among the several religions in moral maxims which is well-nigh universal, and has given a strong support to the view that they, the moral maxims, are the essential feature of religious life. It is possible, even probable, that all religions on earth,—nay on other planets also, wherever rational beings develop religion with its cosmic ideals,—the same morality will be preached reflecting the same conviction as to the essential constitution of the universe, though

they may be expressed in different symbols. There are incidental features which naturally diverge in different localities, so we must learn to discriminate between the essential and the accidental and must respect the common religious spirit without taking offense at differences.

#### THE FUTURE.

Mankind is one and has the tendency to become one more and more. Families coalesce into tribes, tribes combine into nations and nations develop international relations from which a cosmopolitan spirit is bound to spring; and as it is in politics so it will be in religion. Rituals and symbols may vary according to taste, historical tradition, and opinion, but the essence of religion can only be one, it must be and remain one and the same among all nations, and they all search for this common ideal, the religion of truth pure and undefiled. The sooner mankind recognizes it, the better it will be for progress, welfare, and all international relations, for it will bring "glory to God in the highest, and on earth peace toward the men of good-will."

We can see as in a prophetic vision the future of mankind; when the religion of love and good-will has become the dominating spirit that finally determines the legislatures of the nations and regulates their international and home politics. Religion is not alone for the churches, but the churches are for the world, in which the field of our duties lies. The churches have to travel the same way as we; religion develops in converging lines with philosophy and science, and at the point where they meet there lies our common goal.

The essentials of religion are always questions of morality, and morality is nothing but an application of truth to the issues of practical life. So far as accidentals are concerned we may without quarrel have as many religions as there are differences in temperament and preferences in externalities, but in all essentials it is possible,—nay it is desirable, and it will finally be necessary to come to an agreement.

Here is the whole religious problem in a nutshell. What we need is truth and what we want is truth; there is no salvation except in truth. The truly religious man is he alone who is truthful, he who seeks the truth, he who trusts in the truth, he who loves the truth, he who identifies himself with the truth, and above all he who lives the truth.

O let us to ourselves be true,  
And true to others ever;

The trust in Truth inspire our souls  
And dominate our endeavor ;

The spirit of Truth descend on us  
With consecrative vigor  
To lift us up, to strengthen us,  
Our whole life to transfigure.

If we're but truthful, O what bliss!  
Life loses all its terror.  
For Godward every step will be  
And Truthward e'en through error.

## ALICE IN THE WONDERLAND OF MATHEMATICS.

BY WILLIAM F. WHITE, PH. D.  
State Normal School, New Paltz, N. Y.

YEARS after Alice had her "Adventures in Wonderland" and "Through the Looking-glass," described by "Lewis Carroll," she went to college. She was a young woman of strong religious convictions. As she studied science and philosophy, she was often perplexed to reduce her conclusions in different lines to a system, or at least to find some analogy which would make the coexistence of the fundamental conceptions of faith and of science more thinkable. These questions have puzzled many a more learned mind than hers, but never one more earnest.

Alice developed a fondness for mathematics and elected courses in it. The professor in that department had lectured on  $n$ -dimensional space, and Alice had read E. A. Abbott's charming little book, *Flatland; a Romance of Many Dimensions, by a Square*, which had been recommended to her by an instructor.

The big daisy-chain which was to be a feature of the approaching class-day exercises was a frequent topic of conversation among the students. It was uppermost in her mind one warm day as she went to her room after a hearty luncheon and settled down in an easy chair to rest and think.

"Why!" she said, half aloud, "I was about to make a daisy-chain that hot day when I fell asleep on the bank of the brook and went to Wonderland—so long ago. That was when I was a little girl. Wouldn't it be fun to have such a dream now? If I were a child again, I'd curl up in this big chair and go to sleep this minute. 'Let's pretend.'"

So saying, and with the magic of this favorite phrase upon her, she fell into a pleasant reverie. Present surroundings faded out of consciousness, and Alice was in Wonderland.

"What a long daisy-chain this is!" thought Alice. "I wonder if I'll ever come to the end of it. Maybe it hasn't any end. Circles haven't ends, you know. Perhaps it's like finding the end of a rainbow. Maybe I'm going off along one of the infinite branches of a curve."

Just then she saw an arbor-covered path leading off to one side. She turned into it; and it led her into a room—a throne-room, for there a fairy or goddess sat in state. Alice thought this being must be one of the divinities of classical mythology, but did not know which one. Approaching the throne she bowed very low and simply said, "Goddess"; whereat that personage turned graciously and said, "Welcome, Alice." It did not seem strange to Alice that such a being should know her name.

"Would you like to go through Wonderland?"

"Oh! yes," answered Alice eagerly.

"You should go with an attendant. I will send the court jester, who will act as guide," said the fairy, at the same time waving a wand.

Immediately there appeared—Alice could not tell how—a courtier dressed in the fashion of the courts of the old English kings. He dropped on one knee before the fairy; then, rising quickly, bowed to Alice, addressing her as, "Your Majesty."

It seemed pleasant to be treated with such deference, but she promptly answered, "You mistake; I am only Miss —"

Here the fairy interrupted: "Call her 'Alice.' The name means 'princess.'"

"And you may call me 'Phool,'" said the courtier; "only you will please spell it with a *ph*."

"How can I spell it when I am only speaking it?" she asked.

"Think the *ph*."

"Very well," answered Alice rather doubtfully, "but who ever heard of spelling 'fool' with a *ph*?"

Then he smiled broadly as he replied: "I am an anti-spelling-reformer. I desire to preserve the *ph* in words in place of *f* so that one may recognize their foreign origin and derivation."

"Y-e-s," said Alice, "but what does *phool* come from?"

Again the fairy interrupted. Though always gracious, she seemed to prefer brevity and directness. "You will need the magic wand."

So saying, she handed it to the jester. The moment he had the wand, the fairy vanished. And the girl and the courtier were alone in the wonderful world, and they were not strangers. They



were calling each other "Alice" and "Phool." And he held the magic wand.

One flourish of that wand, and they seemed to be in a wholly different country. There were many beings, having length, but no breadth or thickness; or, rather, they were very thin in these two dimensions, and uniformly so. They were moving only in one line.

"Oh! I know!" exclaimed Alice, "This is Lineland. I read about it."

"Yes," said Phool; "if you hadn't read about it or thought about it, I couldn't have shown it to you."

Alice looked questioningly at the wand in his hand.

"It has marvelous power, indeed," he said. "To show you in this way what you have thought about, that is magic; to show you what you had never thought of, would be—"

Alice could not catch the last word. A little twitch of the wand set them down at a different point in the line, where they could get a better view of lineland. Alice thrust her hand across the line in front of one of the inhabitants. He stopped short. She withdrew it. He was amazed at the apparition: a body (or point) had suddenly appeared in his world and as suddenly vanished. Alice was interested to see how a linelander could be imprisoned between two points.

"He never thinks to go around one of the obstacles," she said.

"The line is his world," said Phool. "One never thinks of going out of the world to get around an obstacle."

"If I could communicate with him, could I teach him about a second dimension?"

"He has no apperceiving mass," said Phool laconically.

"Very good," said Alice, laughing; "surely he has no mass. Then he can get out of his narrow world only by accident?"

"Accident!" repeated Phool, affecting surprise, "I thought you were a philosopher."

"No," replied Alice, "I am only a college girl."

"But," said Phool, "you are a lover of wisdom. Isn't that what 'philosopher' means? You see I'm a stickler for etymologies."

"All right," said Alice, "I am a philosopher then. But tell me how that being can ever appreciate space outside of his world."

"He might evolve a few dimensions."

Alice stood puzzled for a minute, though she knew that Phool was jesting. Then a serious look came into his face, and he continued:

"One-dimensional beings can learn of another dimension only

by the act of some being from without their world. But let us see something of a broader world."

So saying, he waved the wand, and they were in a country where the inhabitants had length and breadth, but no appreciable thickness.

Alice was delighted. "This is Flatland," she cried out. Then after a minute she said, "I thought the Flatlanders were regular geometric figures."

Phool laughed at this with so much enjoyment that Alice laughed too, though she saw nothing very funny about it.

Phool explained: "You are thinking of the Flatland where all lawyers are square, and where acuteness is a characteristic of the lower classes while obtuseness is a mark of nobility. That would, indeed, be very flat; but we spell that with a capital *F*. This is flatland with a small *f*."

Alice fell to studying the life of the two-dimension people and thinking how the world must seem to them. She reasoned that polygons, circles and all other plane figures are always seen by them as line-segments; that they can not see an angle, but can infer it; that they may be imprisoned within a quadrilateral or any other plain figure if it has a closed perimeter which they may not cross; and that if a three-dimensional being were to cross their world (surface) they could appreciate only the section of him made by that surface, so that he would appear to them to be two-dimensional but possessing miraculous powers of motion.

Alice was pleased, but curious to see more. "Let's see other dimensional worlds," she said.

"Well, the three-dimensional world, you're in all the time," said Phool, at the same time moving the wand a little and changing the scene, "and now if you will show me how to wave this wand around through a fourth dimension, we'll be in that world straight-way."

"Oh! I can't," said Alice.

"Neither can I," said he.

"Can anybody?"

"They say that in four-dimensional space one can see the inside of a closed box by looking into it from a fourth dimension just as you could see the inside of a rectangle in flatland by looking down into it from above; that a knot can not be tied in that space; and that a being coming to our world from such a world would seem to us three-dimensional, as all we could see of him would be a section made by our space, and that section would be what we

call a solid. He would appear to us—let us say—as human. And he would be not less human than we, nor less real, but more so; if 'real' has degrees of comparison. The flatlander who crosses the linelander's world (line) appears to the native to be like the one-dimensional beings, but possessed of miraculous powers. So also the solid in flatland: the cross-section of him is all that a flatlander is, and that is only a section, only a phase of his real self. The ability of a being of more than three dimensions to appear and disappear, as to enter or leave a room when all doors were shut, might make him seem to us like a ghost, but he would be more real and substantial than we are."

He paused, and Alice took occasion to remark:

"That is all obtained by reason; I want to see a four-dimensional world."

Then, fearing that it might not seem courteous to her guide to appear disappointed, she added:

"But I ought to have known that the wand couldn't show us anything we might wish to see; for then there would be no limit to our intelligence."

"Would unlimited intelligence mean the same thing as absolutely infinite intelligence?" Phool asked.

"That sounds to me like a conundrum," said Alice. "Is it a play on words?"

"There goes Calculus," said Phool. "I'll ask him.—Hello! Cal."

Alice looked and saw a dignified old gentleman with flowing white beard. He turned when his name was called.

While Calculus was approaching them, Phool said in a low tone to Alice: "He'll enjoy having an eager pupil like you. This will be a carnival for Calculus."

When that worthy joined them and was made acquainted with the topic of conversation, he turned to Alice and began instruction so vigorously that Phool said, by way of caution:

"Lass! Handle with care."

Alice did not like the implication that a girl could not stand as much mathematics as any one. But then she thought, "That is only a joke," and she seemed vaguely to remember having heard it somewhere before.

"If you mean," said Calculus, "to ask whether a variable that increases without limit is the same thing as absolute infinity, the answer is clearly No. A variable increasing without limit is always nearer to *zero* than to absolute *infinity*. For simplicity of illustra-

tion, compare it with the variable of uniform change, time, and suppose the variable we are considering doubles every second. Then, no matter how long it may have been increasing at this rate, it is still nearer zero than infinity."

"Please explain," said Alice.

"Well," continued Calculus, "consider its value at any moment. It is only half what it will be one second hence, and only quarter what it will be two seconds hence, when it will still be increasing. Therefore it is *nōw* much nearer to zero than to infinity. But what is true of its value at the moment under consideration is true of any, and therefore of every, moment. An infinite is always nearer to zero than to infinity."

"Is that the reason," asked Alice, "why one must say 'increases without limit' instead of 'approaches infinity as a limit'?"

"Certainly," said Calculus; "a variable can not approach infinity as a limit. Students often have to be reminded of this."

Alice had an uncomfortable feeling that the conversation was growing too personal, and gladly turned it into more speculative channels by remarking:

"I see that one could increase in wisdom forever, though that seems miraculous."

"What do you mean by miraculous?" asked Phool.

"Why—" began Alice, and hesitated.

"People who begin an answer with 'Why' are rarely able to give an answer," said Phool.

"I fear I shall not be able," said Alice. "An etymologist" (this with a sly look at Phool) "might say it means 'wonderful'; and that is what I meant when speaking about infinities. But usually one would call that miraculous which is an exception to natural law."

"We must take the young lady over to see the curve tracing," said Calculus to Phool.

"Yes, indeed!" he replied. Then, turning to Alice, "Do you enjoy fireworks?"

"Yes, thank you," said Alice, "but I can't stay till dark."

"No?" said Phool, with an interrogation. "Well, we'll have them very soon."

"Fireworks in the daytime?" she asked.

But at that moment Phool made a flourish with the wand, and it was night—a clear night with no moon or star. It seemed so natural for the magic wand to accomplish things that Alice was not *very* much surprised at even this transformation. She asked:

"Did you say you were to show me curve tracing?"

"Yes," said Phool. "Perhaps you don't attend the races, but you may enjoy seeing the *traces*."

During this conversation the three had been walking, and they now came to a place where there was what appeared to be an enormous electric switchboard. A beautiful young woman was in charge.

As they approached, Calculus said to Alice, "That is Ana Lytic. You are acquainted with her, I presume."

"The name sounds familiar," said Alice, "but I don't remember to have ever seen her. I should like to meet her."

On being presented, Alice greeted her new acquaintance as 'Miss Lytic'; but that person said, in a very gracious manner:

"Nobody ever addresses me in that way. I am always called 'Ana Lytic,' except by college students. They usually call me 'Ana Lyt.' I presume they shorten my name thus because they know me so well."

In spite of the speaker's winning manner, the last clause made Alice somewhat self-conscious. Her cheeks felt very warm. She was relieved when, at that moment, Calculus said:

"This young lady would like to see some of your work."

"Some pyrotechnic curve tracing," interrupted the talkative Phool.

Calculus continued: "Please let us have an algebraic curve with a conjugate point."

Ana Lytic touched a button, and across the world of darkness (as it seemed to Alice) there flashed a sheet of light, dividing space by a luminous plane. It quickly faded, but left two rays of light perpendicular to each other, faint but apparently permanent.

"These are the axes of coordinates," explained Ana Lytic.

Then she pressed another button, and Alice saw what looked like a meteor. She watched it come from a great distance, cross the ray of light that had been called one of the axes, and go off on the other side as rapidly as it had come, always moving in the plane indicated by the vanished sheet of light. She thought of a comet; but instead of having merely a luminous tail, it left in its wake a permanent path of light. Ana Lytic had come close to Alice, and the two girls stood looking at the brilliant curve that stretched away across the darkness as far as the eye could reach.

"Isn't it beautiful!" exclaimed Alice.

Any attempt to represent on paper what she saw must be poor and inadequate. Figure 1 is such an attempt.

Suddenly she exclaimed: "What is that *point* of light?" indi-

cating by gesture a bright point situated as shown in the figure by P.

"That is a point of the curve," said Ana Lytic.

"But it is away from all the rest of it," objected Alice.

Going over to her apparatus and taking something—Alice could not see what—Ana Lytic began to write on what, in the darkness, might surely be called a blackboard. The characters were of the usual size of writing on school boards, but they were characters of light and could be plainly read in the night. This is what she wrote:

$$y^2 = (x-2)^2(x-3).$$

Stepping back, she said: "That is the equation of the curve."

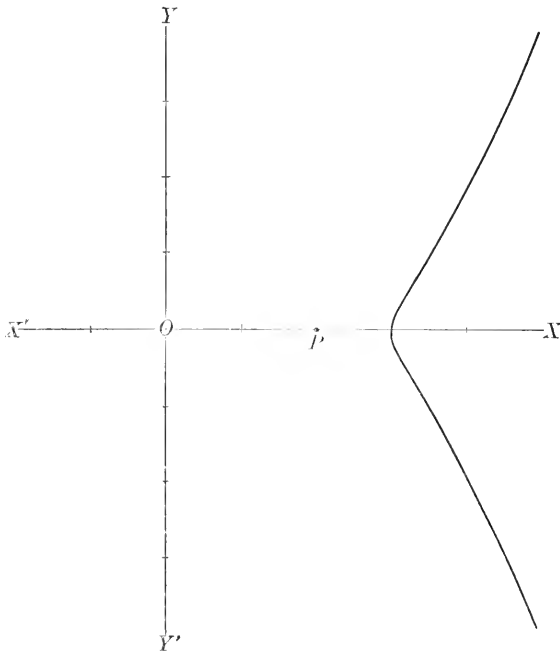


FIG. 1.

Alice expressed her admiration at seeing the equation before her and its graph stretching across the world in a line of light.

"I never imagined coordinate geometry could be so beautiful," she said.

"This is throwing light on the subject for you," said Phool.

"The point about which you asked," said Ana Lytic to Alice, "is the point (2,0). You see that it satisfies the equation. It is a point of the graph."

Alice now noticed that units of length were marked off on the

dimly seen axes by slightly more brilliant points of light. Thus she easily read the coordinates of the point.

"Yes," she said, "I see that; but it seems strange that it should be off away from the rest."

"Yes," said Calculus, who had been listening all the time. "One expects the curve to be continuous. Continuity is the message of modern scientific thought. This point seems to break that law—to be 'miraculous,' as you defined the term a few minutes ago. If all observed instances but one have some visible connection, we are inclined to call that one miraculous and the rest natural. As only that seems wonderful which is unusual, the miraculous in mathematics would be only an isolated case."

"I thank you," said Alice warmly. "That is the way I should like to have been able to say it. An isolated case is perplexing to me. I like to think that there is a universal reign of law."

"*Evidently*," said Phool, "here is an exception. It is *obvious* that there are several alternatives, such as, for example, that the point is not on the graph, that the graph has an isolated point, *and so forth*."

Calculus, Ana Lytic and Phool all laughed at this. To Alice's inquiry, Phool explained:

"We often say 'evidently' or 'obviously' when we can't give a reason, and we conclude a list with 'and so forth' when we can't think of another item."

Alice felt that the remark might have been aimed at her. Still she had not used either of these expressions in this conversation, and Phool had made the remark in a general way as if he were satirizing the foibles of the entire human race. Moreover, if she felt inclined to resent it as an impertinent criticism from a self-constituted teacher, she remembered that it was only the jest of a jester and treated it merely as an interruption.

"Tell me about the isolated point," she said to Calculus.

He proceeded in a teacher-like way, which seemed appropriate in him.

*Calculus.* For  $x=2$  in this equation,  $y=0$ . For any other value of  $x$  less than 3, what would  $y$  be?

*Alice.* An imaginary.

*Calculus.* And what is the geometric representation of an imaginary number?

*Alice.* A line whose length is given by the absolute, or arithmetic, value of the imaginary and whose direction is perpendicular to that which represents positives and negatives.

*Calculus.* Good. Then—

*Alice* (bounding with delight at the discovery). Oh! I see! I see! There must be points of the graph outside of the plane.

*Calculus.* Yes, there are imaginary branches, and perhaps Analytic will be good enough to show you now.

That young lady touched something on her magic switchboard, and another brilliant curve stretched across the heavens. The plane determined by it was perpendicular to the plane previously shown. (The dotted line in figure 2 represents in a prosaic way what Alice saw.)

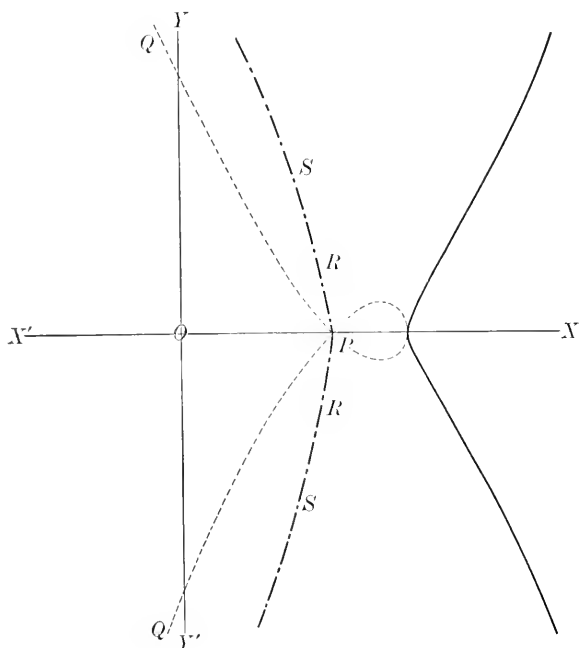


FIG. 2.

“O, I see!” exclaimed Alice. “That point is not isolated. It is the point in which this ‘imaginary’ branch, which is as *real* as any, pierces the plane of the two axes.”

“Now,” said Calculus, “if, instead of substituting real values for  $x$  and solving the equation for  $y$ , you were to substitute real numbers for  $y$  and solve for  $x$ , you would, in general, obtain for each value of  $y$  one real and two complex numbers as the values of  $x$ . The curve through all the points with complex abscissas is neither in the plane of the axes nor in a plane perpendicular to it. But you shall see.”



(The dot-and-dash line in figure 2 represents these branches.)

When Ana Lytic made the proper connection at the switchboard, these branches of the curve also stood out in lines of light.

Alice was more deeply moved than ever. There was a note of deep satisfaction in her voice as she said:

"The point that troubled me because of its isolation is a point common to several branches of the curve."

"The supernatural is more natural than anything else," said Phool.

"The miraculous," thought Alice, "is only a special case of a higher law. We fail to understand things because they are connected with that which is out of our plane."

She added aloud: "This I should call the *miracle curve*."

"Yet there is nothing exceptional about this curve," said Calculus. "Any algebraic curve with a conjugate point has similar properties."

Then Calculus said something to Ana Lytic—Alice could not hear what—and Ana Lytic was just touching something on the switchboard when there was a crash of thunder. Alice gave a start and awoke to find herself in her own room at midday, and to realize that the slamming of a door in the corridor had been the thunder that terminated her dream.

She sat up in the big chair and, with the motion that had been characteristic of her as a little girl, gave "that queer little toss of her head, to keep back the wandering hair that *would* always get into her eyes," and said to herself:

"There aren't any curves of light across the sky at all! And worlds of one or two dimensions exist only in the mind. They are abstractions. But at least they are thinkable. I'm glad I had the dream. Imagination *is* a magic wand.—The future life will be a *real* wonderland, and—"

Then the ringing of a bell reminded her that it was time to start for an afternoon lecture, and she heard some of her classmates in the corridor calling to her, "Come, Alice."

## CONQUEST OF RIVER AND SEA.

BY EDGAR L. LARKIN.

Director of Lowe Observatory, Echo Mt., Cal.

[We are sorry that the work of which Professor Larkin writes in the following article is seriously endangered and may prove a useless expense instead of a victory which at Thanksgiving time could so confidently be predicted. From *The Chicago Tribune* we quote the following dispatch, dated at Los Angeles, Cal., December 10:

"With the breaking of the Colorado River yesterday through a \$1,000,000 dike, just completed by the Southern Pacific, settlers in the Imperial Valley have given up practically all hope of saving their rich farm lands from inundation. As most of these farms lie from 70 to 200 feet below sea level, there is little prospect of the waters being drained off unless government engineers evolve a plan to turn the river back into its channel. Where to-day are rich towns and prosperous farms, the future seems to portend only a huge salt inland sea, hemmed in by mountains. The city of Imperial will be from fifty to seventy feet under water should the waters not be dammed shortly. The transcontinental line of the Southern Pacific is doomed already. Orders were issued to-day to rush 2,000,000 ties and rails to Mecca to build a new line beyond the mountain ranges for a distance of forty miles. Gangs of men have been ordered to begin operations immediately upon receiving instructions from General Manager Calvin. Southern Pacific officials are of the opinion that the railroad will give up the struggle with the waters, as it is estimated that \$2,000,000 more would be required in a second attempt to turn the river back to its old channel. Even then there is no assurance of the permanency of the work. Should the Southern Pacific abandon the fight the entire region is doomed unless the government will take immediate steps. To add to the gravity of the situation, the river may scour its way back through Deep Cañon and carry away the \$3,000,000 government dam at Laguna, ten miles above Yuma. Should this dam go out no human agency can raise water from the river to irrigate the surrounding lands again, for it will speedily cut a channel from 80 to 100 feet deep through the yielding silt, leaving the farms and fruit orchards high above water."

Steps have at once been taken to save the endangered strip of land. The citizens of Imperial propose to give \$1,000,000, the Southern Pacific Railroad \$1,500,000, and it is expected that the United States Congress will assist with \$2,000,000 to repair the dam and prevent further mishaps.—ED.]

"WATER has stopped pouring into the Imperial Valley," said the telephone in a little hut of poles, thatched with willows on the brink of the subdued river. And the twelve thousand people below heard all about it in an incredibly short time. Almost two years of brooding anxiety had been their fate, but suspense and care turned to joy in the space of one-fifth of a second when the

news came. One of the most remarkable engineering problems of this or any other age had been solved.

If the reader will turn to the account of the great disaster—the bursting out of the Colorado River—in *The Open Court* for *September, 1906*, he will secure a faint idea of the magnitude of this work in skilled hydraulic engineering. Here is the problem, and the engineers in charge were frankly told by some of their brother engineers, that the break in the river bank could not be closed. A stream of water saturated with silt, whose width was 3000 feet had to be cut off. The depth of the water was from 9 to 12 feet, with a



IMPERIAL AVENUE, CALEXICO, CALIFORNIA.

5151

This street which crosses the International Boundary line and enters Mexico shows fine silt from Colorado Canyon. Tall trees four years of age stand where once the "desert reigned in solitude." This soil is rich beyond comparison, and vegetation grows in almost tropical luxuriance.

velocity of flow of 12 feet per second. But the bottom, banks and adjacent lands for square miles round about are composed of pure silt. This substance is ground as fine as flour, and dissolves almost instantly when water touches it. The silt is of great, but unknown depth, certainly not less than 2000 feet, possibly 5000. It came from Colorado and Utah and was ground in that great mill—the Grand Canyon of the Colorado, during hundreds of millions of years. Piles driven in it to hold up a railroad, could not be depended upon for a day. The stream was growing wider and deeper minute by minute,

and costly fields of grain, grass and fruit were being hurried away to the Salton Sea. Annual floods in the Colorado were sure to come and make the break miles in width, forever beyond hope of filling.

Epes Randolph, H. T. Cory, E. Corillo and Thomas J. Hinds stood on the bank of silt and wondered how the devastating floods could be conquered.

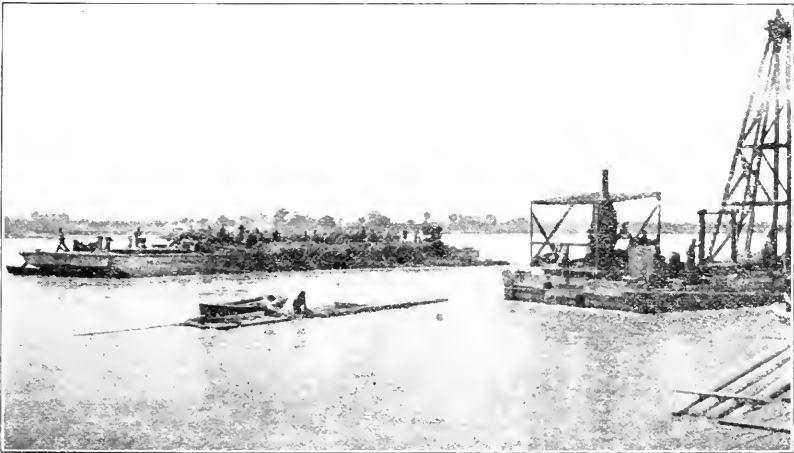
"Central, please." "Hello." "Give me the Southern Pacific, Los Angeles." said Mr. Randolph, speaking into the receiver of the telephone in the now historic hut.

History may never record the words spoken to and fro, but here is what happened right away. Two grand divisions of the Southern Pacific Railroad instantly went out of the goods-carrying business. Every car filled with any kind of freight was unloaded at once, and no more were received for shipment. Telegraphs and telephones everywhere began to speak. Now let us see what other events at once took place.

Thousands of men seized bars and picks, and with steam-drills and great cranes attacked granite mountains in every stone quarry within 350 miles. Dynamite and giant powder thundered at the rocks by night and by day. Every quarry was rushed with cars. Goods-cars, coal-cars, flat-cars, lumber-cars, steel-cars, cars, no end of cars, filled every siding. The entire southwest was stripped of cars. Passenger trains often gave way to monster trains of stone-cars. When the battle with the flood was at its height, stone-laden cars were attached to express trains. Only mail trains had full right of way. Before this, a spur railway from the main line had been laid to the brink of the flood. Before the thousands of cars from the quarries arrived, new sidetracks were put down everywhere on the silt beds on which to store cars for the approaching conflict.

Excitement grew, and so did the width of the river. And then 2200 cords of tall slender willows were cut and piled high on the bank where the end of the enormous dam was to begin. A large flat-boat or barge was anchored by the shore close to the willow heap. A straight row of piles was driven across the stream and five-eighth inch braided wire steel cables were attached to them. These held the barge from going down stream. Twelve "dead-men," great logs, were burried in the silt banks. Twelve colossal spools of cable were placed on the far side of the flat-boat. Skids, or inclined planes, smooth on top, were placed between the spools and edge of the boat near the shore. The ends of the cables were anchored to the "dead-men." Many cords of willows were placed on the boat.

Then hundreds of men made fascines—bundles of willows 20 inches in diameter and 90 feet long bound with wire. Twelve cables nearly eight feet apart were twisted around the bundles in double loops. The fascines were the woof and the cables the warp of a leafy carpet 90 feet wide and 3000 long. When a strip had been woven of suitable length, a steamer pulled the barge into the river. The spools revolved, the cables unwound, the beautiful Brussels carpet slid down the skids, dropped into the water and sank to the bottom, anchored by cables to the row of piles up-stream. A pile driver followed and put down the carpet-tacks—piles from 40 to 60 feet in length—through the willows and tacked this Ax-



WEAVING FASCINE MATS.

5150

At California Development Company's lower heading, Imperial Canal. The fascines are being woven on the flat-boat. When the boat is drawn across stream, they slide into the water and sink to the bottom where they are pinned down by piles.

minster to the soft floor of silt. And then silt began immediately to settle in between the twigs and leaves. Then two rows of piles were set across the river: heavy timbers were laid on the tops, then the ties and rails of a railroad of great strength were placed on this massive foundation, quite necessary, as will be seen later.

#### BYPASS AND THE ROCKWOOD GATE.

Before any of these preparations had been made, a bypass 50 feet wide had been cut around the place where the north end of the dam was to start. A massive head-gate was placed in this pass at a cost of \$55,000. The purpose of this cut was to carry part of

the water from the front to the rear of the dam while building, and relieve pressure as the dam rose higher and higher. The gate was to have been kept open until the big dam was completed, and then closed. This and the dam would cause the water to rise and pour into its original bed and go smiling on its way to the Gulf of California.

#### BUILDING THE GREAT DAM.

When the side-tracks were filled with thousands of cars of rock, activity began. First, a long train moved from the north side of the river across to the south. This was occupied by hundreds of men armed with steel bars and pikes. The huge stones were pried off the cars, when they fell with crash, rattle and roar into the river and settled on the carpet. A train on the north end of the railroad was emptied at the same time; and then more trains, and still more. On they came without cessation, day or night. Thus the dam advancing from both ends kept narrowing the space between the approaching bulwarks of massive stones. When this space contracted the speed of the water began to increase. With more contraction, the river above the dam commenced to rise slowly, and then a little faster.

#### AN APPARENTLY CRUSHING DISASTER.

The water got its shoulder under the Rockwood gate and away it went with rush and roar. Consternation and dismay filled every mind—except those of the four engineers. Gloom spread throughout the Imperial Valley. It is not known what thoughts raced through the minds of the four; but the 1050 workmen could not detect one trace of fear. Instantly every man left the great dam and attacked this unlooked-for danger-problem. For unless the bypass was closed immediately, the silt banks would vanish and the two cuts would join into a break a mile wide or more, and forever seal the doom of Valley Imperial.

Sleep disappeared, piles were driven, and a railroad was thrown across the bypass in haste. And then rocks rained. Trainload after trainload went out of sight in the boiling flood. And trainloads of gravel, clay and sand. Finally, the heap appeared above the water; and then more trains emptied on the crest to bring it up to level with the banks. The floods in the deep cut were thus conquered, and then they backed around in front.

## ALL HANDS BACK TO THE GREAT DAM.

The diverted Colorado River that had been displaying its rage at the dam in low, sullen, but ominous tones, now began to roar. As the ends of the dam drew nearer, the roaring grew louder. The water surged, boiled and seethed in anger. Its speed increased with every trainload of rock hurled into its face. Water weighs 62 pounds to the cubic foot: and when in rapid motion, its momentum becomes one of the most formidable powers in nature. When the gap grew narrower, not only did the velocity of the flood greatly



PILING FOR THE RAILROAD TRACK.  
(Photograph by W. J. Lubken.)

5152

Across the Colorado River, at the California Development Company's dam, just below the old river bed of the Colorado River, which is now 10 feet in elevation above the present channel. The river is to be diverted back into its course again, if possible. Velocity of water as shown striking the piles, is 12 feet per second. The edge of a vast bed of pure silt is seen in the foreground.

accelerate, but the river began to rise: and pressure on the dam became enormous.

At sunset November 3, the time for fear, wavering and faltering came. No hope of help from the bypass; all the water that went through that, now had to be dealt with in the center of the great dam. The destruction of the gate changed every plan. Suppose one to be engaged in building a house by plans made by an architect; and that, when half finished, something should suddenly occur

to prohibit the use of the specifications ; but circumstances were such that the house must be built in haste, or a vast sum of money would be lost. The chances are that the scheme would fail and the loss ensue. The Assyrians and Babylonians in their engineering along the Tigris and Euphrates, and the Egyptians with the Nile, had ample time. But there was not a minute to waste on the Colorado.

Here is the case: 1,500,000 acres of land in the Imperial Valley, pronounced by U. S. Government experts to be as rich as that in the delta of the Nile, were in danger of reverting back to a desert waste, forever deprived of water. The homes of 12,000 people, square miles of rich grains, grasses and fruits, six little cities, hundreds of miles of railway track, and thousands of domestic animals, these and more, were on the verge of destruction. For already the bottom of the diverted river was lower than its primeval bed by 10 feet; and still cutting lower. The fact stared them in their faces that the costly system of canals would soon be destroyed; and that the awful desert conditions would assume dominion; and that every human being and animal must leave the beautiful vale, never to return.

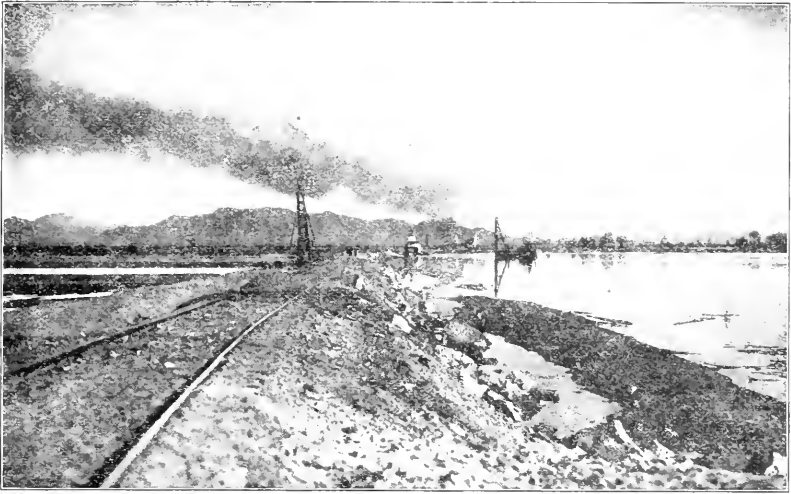
#### SHILOH AND GETTYSBURG AT NIGHT.

Rays from the falling sun just before they were cut off by the vast granite rim of the Salton Sink, fell on four faces and brought out lines of determination set and fixed as though cut in flint and adamant. These were the engineers "cumbered with a load of care." For the eyes of every hydraulic engineer were watching from afar every move to see which would come out victor, man or river. And the sun's fainting light fell on the faces of 600 men of the Caucasian race, and 450 Indians—all selected men, trained like soldiers for this dangerous war: Americans, Spaniards, Mexicans, Frenchmen and Germans, together with Cocopahs, Mariposas, Pimas, Diguones, Yumas and Mojaves, who formed the largest number of American Indians ever at work in one body.

When darkness fell the electric lights flashed upon the weird and entirely unique scene. The river was rising and the impetuous flood roared louder than before. The terrific speed of the pent-up water was fearful to look upon, even; to say nothing of man's audacity in attempting to stop its wild career. No shadow of fear, discomfiture or dismay appeared on the bronzed features of the engineers. For, if there had, it is probable that a panic would have ensued at once. It was just before a real battle, fraught with danger. These men had to go out over the awful flood 1500 feet



from either shore. Who could say but that the dam might go when the water came up to the carwheels and sink every train on the tracks? Burning oil under the locomotive boilers roared hot words of defiance to the floods beneath; and the water hurled back derision and scorn to the roar of fire and hiss of steam, to exploding safety valves, and exhausts of monster engines and the hideous grinding of a thousand carwheels on granite grit. No such combine of noises was ever known on earth. "Go," was a word of command. Two



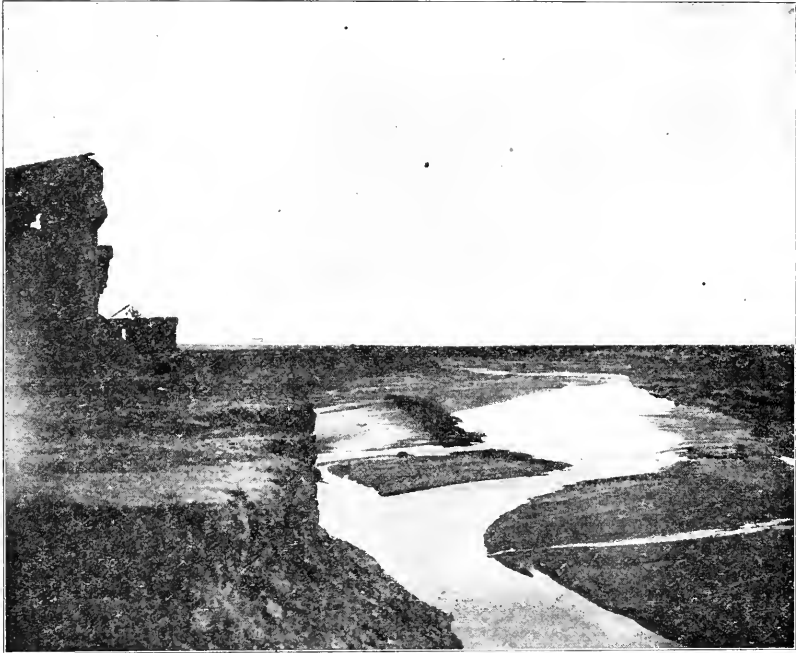
GREAT DAM IN THE BREAK IN THE WEST BANK OF THE COLORADO RIVER, MEXICO.

5149

Looking north. The distant mountain is Pilot Knob, California. Length of dam 3000 feet; height, 44; width at bottom from 250 to 300; cost \$1,250,000; time of building 86 days. The steamer Searchlight is opposite the final gap closed on Nov. 4, 1906. When the view was taken, Nov. 11, the pumps on board were forcing water through a hose, at high pressure, against a trainload of clay under the upper railroad track. This washed the clay into the interstices between great rocks and small gravel in the main dam. The Colorado River is one mile to the right. The water all passed through the break here shown, to the Salton Sink, to the left at a distance of 76 miles.

entire trainloads of rock hailed into the jaws of the torrent. The floods howled in rage and rose a little higher. The empties moved to shore, and two more long trains came over the gap and hurled their loads into the teeth of the dragon below. Pelee was rivaled in the art of stone-throwing and Vesuvius, for a new Gettysburg was raging. Then long trains of enormous weight, of cars called "battleships" loaded with hundreds of tons of gravel rolled over

the tempest of water. These cars are made of steel; and their sides are suspended on hinges. At the word of command, both sides of both trains flared out and a rain of gravel fell, the like of which was never seen. These small stones filled the interstices between the large. This caused the river to rise faster, and the awful current to increase its fury. And pressure grew apace. At midnight a wonderful word of command was heard, "Faster."



GREAT EXCAVATION IN SILT MADE IN MEXICO BY THE COLORADO RIVER. 5153

(Photograph by Litchfield.)

Width 2000 feet, depth from 50 to 80 feet. The village of Mexicali once stood here. The ruin at the left is 300 feet in Mexico from the boundary line. The flood cut backward through this great cut at the rate of one-half mile in 24 hours. The village of Mexicali cannot be found, its debris is in the bottom of the Salton Sea, 40 miles away. The track of the Southern Pacific Railway is in the deepest part of this "scooped-out place."

More oil went into the fires, steam could do no more. Pikes and bars of steel were grasped with renewed energy by many tribes and kindreds of men. Human hands could not move faster. "We must have large rocks now," was the order at 1 A. M. For rocks now began to be deflected out of a vertical line and go down

stream somewhat. "Bring the five-ton rocks." One of these, weighing  $5\frac{1}{2}$  tons was watched when it dropped. The water clutched the mass when it rolled and tumbled over similar rocks down the side of the dam sixty feet. It is still there—a witness to the momentum of running water. "More rocks!" was the incessant cry.

Behold! there was light in the east. It was dawn, the progress of time had not been noticed. More trainloads of heavy rock brought the crest of the dam up to the tracks. Then train after train of "battleships" expanded and thundered down gravel. As the sun rose, so did the river, and faster if possible came the rock and gravel. Here is the record of the battle when at its height. One car of stone was thrown in during each interval of  $4\frac{3}{4}$  minutes! This broke the world's record. The throats of *Ætna* and *Cotapaxi* may have done better at times.

"Oh look! The river is not rising," shouted some one. "The water is stationary," said another. And "it is beginning to fall," another. And then a triumphant shout, a shout of victory was heard in the wilderness. What had happened? Nothing but this: The Colorado River had been hurled back into its original bed by the hands of human beings,—and it was then on its way to the Gulf of California, away from the Salton Sink. Imperial Valley—worth \$100,000,000—was saved. And the Southern Pacific Railroad was saved. And now they are getting up a big International Celebration to be held in Calexico in December. The victorious shout rose above the chained and conquered river on Sunday, November 4, 1906, at exact noon. Let this date be written in every history of the United States; and let the plans of the colossal work be placed in every college text-book on engineering, civil, hydraulic, and geological.

#### ITEMS OF THE DAM.

Length, 3000 feet.

Width at bottom, 250 to 300 feet.

Height when finished, 44 feet.

Cords of willows used, 2200.

Piles 40 to 60 feet in length, 1100.

Feet of railway trestle built, 3800.

Miles of  $\frac{5}{8}$ -inch steel cable, 40.

Tons of rock in dam, 70,000.

Cubic yards of earth by cars, 200,000.

Cubic yards of earth by horses and mules, 300,000.

Locomotives employed, 8.  
Men employed: Caucasians, 600.  
Men employed: Indians, 450.  
Cost of dam, \$1,250,000.  
Time in building actual dam, 86 days.  
Acres of rich land saved, 1,500,000.  
Miles of canals saved, 300.  
Value of all that was rescued, \$100,000,000.

The latest estimates of damages report 30,000 acres of land washed into the Salton Sink; and 30,000 more acres injured by gullies. Part of the land was under cultivation. Eighty miles of railway tracks were submerged. The town of Mexicali in Mexico was four-fifths washed into the sea. Millions of dollars in value of salt in the bottom of the sink is covered by silt. At this writing—on Thanksgiving day, the area of the Salton Sea is 500 square miles; and its greatest depth is 78 feet. The average rate of evaporation is 7 feet per year at Yuma, Arizona. At Calexico, the evaporation in 1904 was 8 feet 8 inches and in 1905, 7 feet 4 inches. So the sea will be with us for some time. And this is the way that man waged a severe battle with Nature.

## GOD AND HIS IMMORTALS.

BY LAWRENCE HEYWORTH MILLS.

### AHURA.

AHURA, the life-Spirit-Lord, existed as a word in its form of Asura from immemorial ages in the common primeval home of Veda and Avesta; and no name could be nobler for a holy God. It is better than Deus,—Zeus, which referred to the shining sky; better than “God,” far *better* in its origin at least; for, curiously enough, it expressed the same supervening ideas that we have in the Hebrew Yahveh which was later thought to mean “the being One,” the “I am that I am.”<sup>1</sup> This is the very same concept which lives essentially and etymologically in Ahura; for He is the source and interior of being, *Ahu-ra*; and, so far as I can remember, this is the deepest epithet that has ever been prominently applied to Deity. With this we have the other name Mazda, “the Great Creator,” or with tradition the “Great Wise One.” No words could be more impressive nor more interpenetrating.<sup>2</sup>

### THE AMESHA SPENTA.

While the six characteristics—virtues would not be the proper word—are absolutely the main laws of a righteous universe, clear and pure. Simple indeed they are, as all things universal must be;—common too, as the breath-air that we breathe, for life is common; they are the most interior and elevating forces in all that we really know, or so to us they should be. Here they are in a sense collected; and in them all that is fittest for expression speaks to us. Not of themselves only do they thus impel us, once merely uttered, and then left wandering, scattered as it were amidst an innumerable host of other similarly treasured spiritual things. Gems of imperishable cost they would be, or they are, even then as so dispersed.

<sup>1</sup> An unquestionably later interpolation of Exilic origin.

<sup>2</sup> Nor have any more impressively effective appeared in history.

and so existing to us, though almost irretrievably hidden amidst the throngs of other beauty from our most eager sight. And so indeed they actually once lay strewn like jewels of first water all dull and unpolished and rarely recognized in the bed-rock of their unwrought mines or buried in their native clay;—vague surmises were they ever even then of the eternal way in which the beneficial powers sometimes work for us for good. But here, as seen, they are gathered up for us; not like the glittering objects in a diadem,—that would be *indeed* too low an image,—not like the flowers upon a full-flushed tree, but like the solar systems around their central orb. Like this these all-pervading order-forces revolve around the throne of their Great Sovereign;—nay more, they actuate the very Person of the God Omnipotent,—in honor—they are not His decorations; far from it,—God forbid. They are His very Nature. He is the self-dividing, all enclosing Prism of them all,—the One of glorious hues that fold and unfold themselves in everlasting light. They are in a word God's character, than which no further thought is thinkable. And as the eternal ideals of all truth and order, they are those essential conditions of well-being, toward which all sentient subjects spiritually gravitate and should forever yearn;—and they are here enthroned,—made dominant,—set over everything in a way pre-eminent, though they have indeed evolved themselves through long preceding ages, nay rather, though they have gathered crystal-like in their clusters through previous cycling æons.

#### ASHA.

Asha, the very first law of all our better consciousness, here even seriously gains in its application, marvelous as such a thing may seem to some of us to be.

It, Asha, is indeed itself and in itself, Heaven's and nature's first moral guide, here declared also to be the first principle of God's eternal being. It is lifted up by all that there is in the conception of the divine personality,—brought into operation,—becoming at once when established among the Six a mighty challenging idea flinging its defiance at that one gigantic, but malign element, its opposite, the Lie, a spirit demon which withers us on every side. It proclaimed the Truth in the post-ultimate meaning of the word, asserting that there was indeed such a thing as a law actual,—and this not as a pointless sentiment, feebly fluttering, but as the very first instinct of God's character. From eternity past it has been the same, so in the vital present, and to all coming futurity will it abide unchangeable.

If we, who struggle to maintain honor, believe God to be indeed a person, here is a support immeasurable for us. The great crucified but risen Christ of faith cheers all our efforts on, for it has an almighty mind to harbor it and to guard it, to assist it, and proclaim it in the very ultimate essence of its worth:—for of such a mind is it indeed an all-controlling, dominant, though merely regulative part.

What a consolation indeed for those who think Truth possible and who believe in God in any sense of Him;—to think that there is at least one person who is True,—and *such a Person!* And we see how beautifully such a creed applies itself. Here we have a God omnipotent to protect us, and to further us, and to bless us;—but He consists, in part at least, of fidelity; and we have no connection with Him save as we are faithful. Abandon honor and He vanishes. There is no God but the *true God, the Asha-God.*

But like all things of its nature the growth of this great but simple principle, in its recognition of course I mean, was, as I say, but gradual.

It developed at first slowly enough indeed, as we may both most readily conjecture and concede, with languid signs of life as its first glimmer shone among the vague dreams of sentient beings, glowing feebly into fuller light. And elsewhere and aside from either, it seems to have been in fact the very last and most remote of all the ideas to be recognized as centered and so elevated in the forms of ancient creeds, as at all in any way a particular trait of any one of all the beings called “divine,” not even of the chief of them, so luxuriantly depicted as they are in the wreaths of our immortal song.

Even in the pre-Gāthic age it, Asha of the Holy Truth, was of course surmised dimly as a universal regulative power;—but only by degrees did it unfold itself into clear consciousness as it grew, as all things like it must. That is to say, the very first idea of it as a concept developed but tardily as our race rose from its animal predecessors.—Some sort of consecutive sequence may indeed have even revealed itself to the instincts of the higher animals; the next beneath us; but it is better to confine ourselves to man.

The observed regularity in the sequence of natural phenomena first riveted attention as we grew human;—especially the heavenly bodies seemed to follow some rule, chief of all and naturally the God-like sun, which was often seen quite unclouded for long periods in lands called Iran. Its august reappearances followed Law even in its supervening changes in situation and intensity, with occasional

eclipse. It never failed, and on its fidelity the balance of all existing necessary objects seemed to hang. Without one phase of it planting would be impossible, without another harvest, without a third the source of tonic health.

Soon the moon, its brother luminary, for the moon is masculine both in Veda and Avesta, took up the tale with his five changes, and with these the reverting atmospheric modifications seemed to harmonize.

The main features of the advancing year-time seemed ever calculable. The great wind-storms of the Marutis, with their driven clouds flying on before them, seemed to arrive at certain intervals in many regions including India, with the return of ice and snow elsewhere and mostly hated,—the periodic rains torrential or soft and fertilizing, the dews and the flowering earth itself:—these all followed one another at seeming regulated intervals;—it was Asha, order. Endeared among all else was the inextinguishable fire not only blazing in the ever self-consuming God of day, but in the very bowels of the earth, known too in the caloric of plants, flaming also in forked lightning in the heavens, snake-like in figure:—again it was the friend of man on hearth and altar. Asha became its very synonym, and so from this its sacredness, from regularity; it was indeed “God’s son.”<sup>3</sup> Then too the great ocean tides, to recall again the waters, with their ever measurable ebb and flood, could not have been altogether unknown to them, our early forebears, through hearsay, though living inland:—so too the spring freshets with swollen streams were ever to be looked for in their times. All was the unvarying circling forms of recurring certainty;—it was Asha, *rita*, “rhythm.” It reigned supreme in the sacrificial as in the genial.

What wonder then that they began to think that the thoughts of God were similar, supposing always that they had at that time any distinct idea whatsoever of a God,—that His law in some of its interior elements would harmonize with this rhythm “as to thought, as to word, and as to deed”;—that is to say, that it should be “perfect, converting the soul.”

All was symmetric in its movements; that is, all was Asha. It was “nature” always and everywhere, *natura* “to be born,” and to be born again, *natura*, not *futura* merely, but *natura*, to be rhythmically born in a reappearance never unreasoned in its process,—seed, stem, leaves, fruit, to seed, stem, leaves and fruit again,—stream, mist, cloud, rain, to stream, mist, cloud, rain again,—spring freshness, summer bloom, autumn harvest, winter frost with cheer

<sup>3</sup> A frequent expression as applied to it in the late Avesta.



or misery—to spring, bloom, harvest, frost again. It was law forever fulfilling itself,—Asha, Rita, Rhythm.

So in the old Veda in those early days, when man had however somewhat begun to form himself; Rita was so distinctly recognized that the very ceremonial service to the Heavenly Spirits followed its course in imitation. "Rite" appeared as Rita; that is to say, regularity in disciplined religious action in a form spectacular, presented ceaselessly and seldom varying, never abruptly, strictly and strenuously carried out by priests with closest care, consecrated for the ceremonial in sacrifice and praise.

But it was only in the stern Gātha, rough and sparse but glorious, that the Rita, Asha, became so exalted as the passionate honor of an Holy God in a sense supreme, a deity whose creature, the very foremost of all the other divine beings it was declared to be.<sup>4</sup> What an exaltation, let me again assert it, for simple but awful justice, the first pure principle of all sane consciousness at least in man, and as we see, the first spiritual force in God. He is not an "infinite person," which could only be the language of inadvertence, for a "person cannot be infinite,"<sup>5</sup> but He is a *universal person* in whom we live and move; the Great Omnipotent, Omniscient, All-holy;—and He is *ashavan*, no liar.

#### VOHU MANAH.

Then Vohu Manah, the "Good Mind," was again a thing enthroned, and for that alone, if for nothing else, made eminent. This was again too a curious thought in a savage age in far off Persia to be placed in such position—for then it was that the gods of Greece wrangled like vulgar households and even our Jewish Yahveh was a "consuming fire."

Vohu Manah:—it was a deep yearning in the universe toward all the good, making what was best in their sentient longings real. It was more than a tame negation, a lifeless acquiescence; it was a warm breath of active sympathy, a passion pervading conscious nature everywhere like a befriending instinct, a slender thread of sweetness in all the intricacies of interior feeling that gives us hope through the maniac jars of this thing which we call life. Vohu Manah:—it was all that is holiest in emotions, fervor in pure breasts and brains; the quiet force in the love of man for his brother; the power in the noble love of man for woman so deep and so trans-

<sup>4</sup> Mithra, a noble God indeed like the most exalted of our Archangels, whose cult rivaled Christianity for a long time.

<sup>5</sup> Definition implies limit; see below.

forming, fierce too also at times, past holding ;—Vohu Manah—it is the father's solemn all-giving watchfulness which makes the name of "son" our deepest word.

Above all else it is the mother-love, that nerve of all controlling tenderness planted in every female soul over a little thing endowed for that very reason with a charm unspeakable,—to win and keep. And this Vohu Manah is again not left,—according to the Gātha,—a blind, unguided force, though beatific, in the world of sentient being ;—it is an attribute and emotion of a Supreme Person (morally supreme)—Vohu Manah,—it meant the deep love of Almighty God for all the righteous living under His holy eye ;—His creatures all the good were, and so was, in a still nearer sense, each one of them His child.

#### KHSHATHRA.

With Khshathra we come upon the deeply fundamental element of *Rule*.

Not men, nor angels can persist without it. Some forceful form of right is needed to control and maintain the Law and Love, shaping their every application.

Khshathra, government, administration!—without it chaos would ensue. With anarchy all property would turn worthless; no man could earn his bread; progress would be imperilled. Khshathra is command, severe indeed at times. Strength must emerge from commonplace while commonplace resists it. Conspiracy is unveiled by government—law put in force, Khshathra as "strength" meant discipline, combination with organization ;—without it rallying points would be difficult, and the dush-Khshathra would sweep the isolated hordes away. Fields could not be cultivated safe from Aeshma, "Raid fury of the bloody spear." And Khshathra rules in fact in every sentient being from the mammoths to the ant-tribes, while man is paramount because of it. And what a satisfaction have we here again, who believe the Gātha. Khshathra is not alone a universal law—though marvelous indeed as such he would be, or he is—part of the moving crystallization of the ever re-forming universe; the forceful way in which things come and hold together, while like the flying blood they circulate. It is more: it is the *rule of our Sovereign God over us*. Where would be, indeed, the Truth—instinct of sincerity though it is? where the Love, to lead us on, if there be no actual accordant *Power*. In Gātha it is *the authority of God*, as universal Monarch, exercising His might throughout His all-world and at every pulse.

We at times indeed lose courage, recalling our human administrations;—but if we believe that *God is King*, our hopes revive. According to the divine doctrine, and in the full implications, every needed office in every government, as well as every official, was and is in the very fact energized and vivified by Khshathra as the controlling force in the Life-spirit-Lord. He stands through Khshathra in every court of justice seeing that the wronged are protected. With His Khshathra He controls the voice of evidence, the judge's faith. He is present in the arm of execution, bars the prison gates, and strikes the oppressor dead. In the wide conflicts of politics He is above all things dominant, as Khshathra. In war He orders the compact mass through it;—straightens the flagging lines. It is His Khshathra that brings on *verethraghna*, victory, saving an imperiled land;—and in the result His authority supports the well-won, or the long established, throne. God is everywhere supreme according to the doctrine, always as implied<sup>6</sup>—through this authority; without His firm grasp all rules would be reversed.

#### ARAMAITI.

And then there was the Aramaiti, the Toil-Mind, the *ara*-thought of God; vivification of the holy, sacred forces just depicted, the self-movement throughout all better things; motion perpetual,—the eternal nerve indeed of holiness never for an instant left relaxed.

The Ara-mind of the Truth and Love and Power,—first stirring the ploughshare in the mould,—to *ar* in *aratrum*,<sup>7</sup>—making fair life possible, displacing murder, theft and arson.

It was in fact in the first keen idea of it, *holy work*,—and above all that of husbandry, first deed of virtue; the very earth itself from this took on the name in both Veda and Avesta. With it she also is Aramaiti, and as such sacred. Aramaiti should be to us the point of everything, the practical application of the other noble three. It was the central open secret of all the Gãthic existence; and it was vital. It was the life, virile thought of effort as against lazy theft. It found the tribes swept by the murderous raids of ferocious neighbors drunk with greed, their homes destroyed, their crops devastated, and their holy herds driven off, by Aeshma. Retaliation threatened to turn them too to murder; but the Gãthic voice arose, as ever fresh, calling for civilization with honest toil. The

<sup>6</sup> Here I treat once for all the mental forces implied everywhere;—seldom are these things actually expressed in Avesta as to their preciser point;—but everywhere *implied* in every line.

<sup>7</sup> This is my suggestion.

armed saint of the Gāthic battle was the *fshushyant* par eminence as against the *afshushyant*.—this distinctly.

He was “the cattle-breeding husbandman” toiling in the field with *ara*—thought, as against Aeshma. Where was the use of the Law, the Love, the Authority with hordes of starving families on land abandoned, derelict,—with savage bands rushing often head-long in, filling their barns with the plundered crops and raided flocks of murdered husbandmen?

How could the Law prevail without something in which the Law could have its exercise,—a nation. Aramaiti in one keen sense of it, and at its first idea was “industry,” as I insist—without it no householder could accumulate the very means of civil life; for it is the persistent, wise, practical and so accumulating citizen, who builds up his country, as we know. Blustering disturbers, even when half well-meaning, waste the bread. The first duty of a human creature is to earn its living; if it does not do that, it eats some other being’s food, makes others poorer, is the cause of famine.

Enough has been said to make my idea clear. It was energetic occupation and first of all for the one thing needful, bread, honest bread for the hungry, tilling the Holy Earth, herself the sacred Aramaiti.<sup>8</sup> This was the idea’s origin, as I think; and it was a worthy and noble one, becoming soon exalted even in that far-off day till it took its place upon the very brow of Deity among the Creator’s attributes. Here too it gave the keynote to the rest.

As it was the sacred instinct of mind-directed labor settling the destiny of man toward manhood, stopping his tendency to remain a beast of prey; so it became zeal, the “zeal of the Lord of hosts” in other cycles of idea—spontaneous instigation, instinctive planned activity. It was the main-spring of the never erring mechanism, driving on the mother-love with ever-living thrills of tenderness, moving on forever keen and fresh the father’s active thoughtfulness. It impelled the fire of mind in the expressed emotions of the singer and composer;—filled out the organizer’s schemes, kept up the ardor of the scholar keen and rapid and maintained it discovering, advancing. It was the quickness of the soldier, combining movements at a glance,—the genius of invention, building out the world’s capacities. It was the *ara-maiti*, self-toiling thought, stirring the hand and ear of creative passion everywhere. It was, in a word, our *Inspiration*.

In God, the divine instinct of activity, the essential force in spirit-motion; in man inspired obedience, in woman, piety, mild

<sup>8</sup> So too in Veda.

indeed, half unconscious, but still strenuous through all. No wonder that in pleasing memory God called it "daughter." It is the burning soul of the other three, the friend of Truth, the sister of Mercy, the handmaid of Command.

## HAURVATAT.

Haurvatat was the completeness of it all, again made here magnificent. She was the realization of the ideal, the wealth of health, and the health of wealth, in fact that very vision of perfection that should float as an ideal on the surface, or above every optimistic scheme to help it on and to make it actual. It was, in a word, *Fruition*. Who has not tasted somewhat of it at fleeting moments? It meant that justice should be more than a delusive subterfuge, hiding the sinister approach of theft forever creeping towards us. It meant that Love's longing should sometime touch their dearest goal, that just power should really reach dominion, that all nature's good instincts should succeed. It was with another's word, "to be satisfied." The name itself means All-ness, Haurvatat, the Vedic *sarvatat*, the great wall of full attainment enclosing the other Four. And goal and aim of all we hope for, we have again the satisfaction of it. *This Allness is again of God*: and if He be the Haurva, sarva, All, surely there is some expectation left to us that we may one day gain what our better instincts wish.

## AMERETATAT.

While Immortality, as ever lifted up in Attribute, should be the permanence. God has no beginning, and so we all shrink with Him from an ending. Death is to some of us, delusively, woe's ultimate. One can scarce refrain from citing the schooldays' rhymes so beautiful, though sad, of Halleck:

"Come to the bridal chamber, Death!  
 Come to the mother's, when she feels  
 For the first time her first-born's breath!  
 Come when the blessed seals  
 That close the pestilence are broke,  
 And crowded cities wail its stroke!  
 Come in consumption's ghastly form,  
 The earthquake shock, the ocean storm!  
 Come when the heart beats high and warm,  
 With banquet song, and dance, and wine!  
 And thou art terrible!—the tear,  
 The groan, the knell, the pall, the bier,  
 And all we know or dream or fear  
 Of agony are thine."

But the holy faith held out its banishment. The glory of the Truth, the deep satisfaction of the Love, the sense of safety from the Power, the Inspiration and the Fruition should not end in inaction. The cup was not to be put to the lip only to excite desire, and to be dashed from it. There was to be an Ameretatat—death-absence. Like the Aditi of the Veda, Ahura was without beginning of days, and so consequently without end of years:—Eternity, Oh Eternity!—this, in another sense. As there was no beginning in God, so there was never a beginning to His works. He had put them forth from past eternity, and He will continue to do the like on to endless futurity, the same;—and so the life of the holy man should be deathless to a degree even here; but it should be also supernaturally immortal;—and this, when pointed, awoke everywhere the deepest hope, “bringing life and immortality to light.” Strange as it may seem to us, the other life came largely from Arya, from Iran from India. Veda with Avesta first pointed its significance. The Semites could at first see little reason in it. The great doctrine however is the vital force of Christianity, and the habitable world, so far as it is Christian, has lived on it for nineteen hundred years. Such are the immortals of the Gātha in their ideas expanded, well-called the “august,” as they are. This only, be it noticed, is their meaning in the first keen conception of them in the first department of the Gātha;—and they are as I need hardly linger to re-asseverate, the sublimest conceptions of their particular kind that the world had till then ever seen,<sup>9</sup> for here they were signally assembled for us,—and doubly re-consecrated, as the essence of all holiness in a pure God personified.

<sup>9</sup> In such remarks I refer, as I always try to make it plain, to well certified written lores.

## A PUZZLING CASE.

A STATEMENT OF DR. O. O. BURGESS, COMMENTED UPON BY  
DAVID P. ABBOTT.

[We have received the description of a curious seance from Dr. O. O. Burgess who suggested that this "Puzzling Case" be submitted to Mr. David P. Abbott. While Mr. Abbott abstains from touching upon mediumistic manifestations which he has not witnessed himself, the comments which he has to make throw light on all performances of the same class. ED.]

### THE STATEMENT OF DR. BURGESS.

ONE would hardly expect any proof of the future life to reach his ear in the dark through an aluminum horn. But if it was not what it purported to be, the puzzle is to know what else it could have been. Like your valued contributor, Mr. Abbott, I have usually had little trouble in arriving at a solution of such puzzles. But this one stumps me, and I should be glad to have him help me out, if he will kindly do so. For I am satisfied that the "spirit" in this exceptional case did not inhabit the medium's body, and Mr. Abbott seems as anxious as I am to be convinced that the spirits of departed friends may really live without any bodies whatever. It is a plain proposition that there can be no life without wear and tear upon the means of its production. To believe in the future life, therefore, one must confess that he believes in something that utterly passes his comprehension. But we not only believe in many uncomprehended things but know them to be true. Just as we will believe in this trumpet affair—that it was done by spirit agency—unless some one can point out how else it could be done. There will be doubting Thomases in any event; but the writer, with seventy-five years of life behind him, cannot help feeling that he will soon be in a position to know the truth of the matter—or else to be lost in the depths of utter know-nothingness.

The puzzling occurrence alluded to took place at a trumpet

seance which, for precautionary reasons, was held at my own house; and the medium and members of my own household were the only persons present. None of those present except myself had ever seen the medium before, and I had simply met her once to make arrangements for her coming. She was an intelligent, middle-aged woman of somewhat reserved but agreeable manners, and she came alone to the seance bringing no paraphernalia with her except the trumpet. She never to my knowledge advertised herself or gave public seances.

She readily consented to be bound to her chair in such a way as to effectually prevent any movement of her hands or body, and the tapes she was bound with were finally tacked to the floor so that the chair itself could not be moved without detection. In fact, in the stillness of the room it would have been impossible for any person to move about without attracting attention. Having taken these precautions, it seemed a foregone conclusion that any trickery or collusion with confederates on the part of the medium was simply out of the question.

The trumpet occupied a position several feet in front of the medium, and after a tedious wait in the dark, we were finally startled by hearing it move. Shortly afterward faint whispers were heard through it which soon became so strong as to be partly or wholly understood. And now jocularity gave place to intense interest, and the anomalous character of the proceedings was lost sight of as the names of friend after friend were feebly given. No one could help sympathizing with them in their heroic efforts to be heard and understood. And not all of these efforts were made through the trumpet. Clearly some of the whisperings were outside and independent of it.

Not much of details will be necessary to my present purpose. Suffice it to say that, one after another, the trumpet came close to every one of us, giving the names of departed friends and relations most of whom had never been within thousands of miles of San Francisco. But the marvel was how the trumpet could move about so rapidly and unerringly in the dark, caressing us gently on the hands, cheeks, top of the head and elsewhere, and occasionally dropping to the floor with a thud as though the force which sustained it was well nigh exhausted. Once, indeed, it fell near me with sufficient force to drive the two sections of it together so that I had to pull them apart again before the performance could be proceeded with. As a further illustration of the mysterious forces employed, raps, some of them loud and jarring, were occasionally heard upon



the doors and walls of the room in various places, and once the tall doors of my bookcases were rapidly swung back and forth a number of times as if to make sure that it had attracted attention. No person in the room was in a position to have swung the doors or made the raps without leaving their seats, and thus attracting attention. Many remarkable things were said by the trumpet voices, but I pass them by as merely cumulative evidence.

The puzzle is to account for the remarkable doings of the trumpet which were as much or more mystifying than its sayings.

It is needless to add that when the lights were turned on the medium was found securely bound in her place as we had left her when the lights were turned out.

#### MR. ABBOTT'S REPLY.

I have read the communication of Doctor Burgess, and it is evident that he is quite critical, and that this case is worthy of attention. I have attended trumpet seances quite recently; also rope- and tape-tying seances, but have not attended a seance where the two were combined.

I take it for granted that the persons present were all so nearly related to the Doctor, that the possibility of confederates being employed was entirely out of the question.

As the Doctor says, I should be glad to prove personal immortality in any manner if possible to do so, yet I should want to be quite certain that there was no resort to trickery in the case. I have investigated so many cases and found so much fraud that naturally I always expect to find it.

It would be no reflection on the Doctor, if he were deceived by a clever trick, for the most intelligent are easily deceived by an art with which they are not familiar.

It would be impossible for me to explain the exact method this medium used, unless I could see her work. I can only describe work of a similar nature with which I am familiar, and explain how it is done. I am aware that this does not prove the present case to have been clever trickery; yet if this work is duplicated frequently by trickery, it is strong evidence that the medium resorted to the same means in this case.

In regard to rope- and tape-tying, I will not enter into a detailed explanation of the various tricks of the kind used by professional mediums and conjurers, as this would require altogether too much space. Suffice it to say that the Davenport Brothers originated the first rope-tying experiments. They were bound in

the most thorough manner, and left in their cabinet; when the most marvelous manifestations would take place as soon as the curtains were drawn. It was supposed that spirits appeared in the cabinet through the occult powers of the Davenports, and performed these maneuvers in order to convince unbelieving mortals. It was many years before the secret of their original tie was discovered. I will refer the reader to the work, *The Spirit World Unmasked*, by Henry Ridgely Evans, for a full account of this.

Soon after the appearance of the Davenports, other mediums experimented and invented many different ties. Finally the conjurers took the subject up, and the secrets of such ties became common property. One has but to witness Kellar, the magician, on the stage using his best spirit tie, to realize the possibilities of this art. The committee tie his hands together behind him very tightly; yet he will instantly bring either hand forward and exhibit it, place it behind himself, and turn his back; when his hands will be seen to be tied together as tightly as ever. The committee think that they tie his hands in their own way.

Yost & Co. of Philadelphia, dealers in magical apparatus, spiritualistic secrets, etc., advertise for sale the secret of a tie which they call "Kellar's Best Tie."

It is doubtful if any rope-tying experiments ever performed were equal to that of the Davenports. Their work was surely the greatest mystery of the kind ever exhibited before the public. The following passages I quote in full from *The Spirit World Unmasked*.

"In the dark seance, flour was sometimes placed in the pinioned hands of the Davenports. On being released from their bonds, the flour was found undisturbed.

"This was considered a convincing test; for how could the brothers possibly manipulate the musical instruments with their hands full of flour. One day a wag substituted a handfull of snuff for flour, and when the mediums were examined, the snuff had disappeared and flour taken its place. As will be understood, in the above test the Davenports emptied the flour from their hands into secret pockets, and at the proper moment took out cornucopias of flour and filled their hands again before securing themselves in the famous slip-knots.

"Among the exposés of the Brothers Davenport, Hermann the conjurer, gives the following in the *Cosmopolitan Magazine*: 'The Davenports, for thirteen years, in Europe and America, augmented the faith in Spiritualism. Unfortunately for the Davenports they appeared at Ithaca, New York, where is situated Cornell Uni-

versity. The students having a scientific trend of mind, provided themselves before attending the performance with pyrotechnic balls containing phosphorus, so made as to ignite suddenly with a bright light. During the dark seance when the Davenports were supposed to be bound hand and foot within the closet and when guitars were apparently floating in the air, the students struck their lights, whereupon the spirits were found to be no other than the Davenports themselves, dodging about the stage brandishing guitars and playing tunes and waving at the same time tall poles surmounted by phosphorescent spook pictures.' ”

Tape-tying was not originated until after rope-tying had become quite common. Annie Eva Fay used a tie called “The Cotton Bandage Test.” She was seated on a stool which was placed against a wooden post, the latter being screwed tightly to the floor. Her wrists were bound tightly with cotton bandages, and the spectators were allowed to sew the knots thoroughly and place court-plaster over them. These bandages were tied tightly together behind her and fastened securely to the post, the knots being sealed. She bewildered a committee of English scientists, yet the secret of her tie is well known to conjurers at the present time.

The reader can find a full explanation of this tie in *Shaw's Magical Instructor*, or in the above-mentioned work by Mr. Evans from which I quote the following:

“One of Annie Eva's most convincing tests is the accordion which plays, after it has been bound fast with tapes and the tapes carefully sealed at every note, so as to prevent its being performed on in the regular manner. Her method of operating, though simple, is decidedly ingenious. She places a small tube in the valve-hole of the instrument, breathes and blows alternately into it, and then by fingering the keys, executes an air with excellent effect.”

There is a celebrated medium in Kansas City who submits to a tie allowing the tapes sewed to the carpet, and corn meal is placed in his palms, where either it or other meal will be found after the performance. The manifestations are very convincing, yet recently a “spirit” was “grabbed” at one of his seances, and it proved to be the medium. This was written up in a daily paper there, as among those who grabbed him was a reporter.

I have an acquaintance, an ex-medium, who is quite expert at the tying tricks. He permits himself to be tied to his chair, yet he can instantly release, and replace himself in the ties. It is very instructive to watch him do this. There is no doubt but that a clever

artist, in the art of rope- and tape-tying, can instantly release himself from almost any tie, and as quickly replace himself.

Such being the case, the fact that the medium was well tied in the Doctor's case can hardly be regarded as evidential. While this lady may not have done so, yet the probabilities are that she either escaped bodily from the ties, later replacing herself; or, that she secured the free use of her hands, so that she was enabled to perform the necessary maneuvers.

In case the lady escaped, she probably slipped around the circle handling the trumpet. She could thus drop the trumpet, recover it, whisper through it, etc. She could also make the raps with it, or with a "telescopic reaching rod." This latter is made of aluminum and when closed is but little larger than a lead pencil. Such appliances frequently extend six feet or more when fully drawn out. Being of aluminum they are very light. They have a hook on the end for hooking into the handle of the trumpet or other objects to be floated.

Sometimes the rod is made as a tube. The medium can then insert a small mouthpiece and whisper or speak in the end of it. The voices will appear to be at whatever location the farther end of the tube occupies at this time. Sometimes this tube is inserted into the small end of the trumpet; and in such cases the trumpet can go very high in the room, even to the distant corners, and at the same time have a voice in it.

The reader will readily see that it would only be necessary for the medium to get the free use of her hands to manipulate this tube; and that she would be able to produce the raps with the end of it, swing the book-case doors, etc. As the tube is but little larger than a lead pencil when closed, it would be very easy for her to conceal such an appliance in her clothing, and as soon as her hands were free, proceed to conduct the manifestations.

It would not be necessary to leave her chair at all. The aluminum trumpets are very light, and for this reason they can be manipulated so that the touches on the sitter's heads are but little more than a caress, and it is very easy to manipulate them. They and the telescopic tubes can be purchased at the mediums' supply depots for a nominal sum.

The mediums who perform the most marvelous appearing work use the telescopic tubes very frequently. They do not all submit to being tied but quite frequently allow a sitter to hold their hands and feet. This is regarded as more convincing than if the medium be trusted beyond the sitter's reach, although he may be securely tied.

In some of my articles I have described these holding tests, and the little deception by which the medium gains the free use of one arm with perfect safety.

In some cases the medium has a cage of iron tubing, or heavy wire large enough to cover his person. He is seated on a stool, and the cage is placed over him and securely screwed to the floor. Wax is then placed on the screw heads and sealed. The trumpet and other articles are placed near the cage and all of the manifestations take place when the lights are put out. He reaches the telescopic tube through the open-work of the cage and manipulates the articles.

I had an acquaintance with a medium who talked through a trumpet very often. She informed me that it requires considerable practice to talk well through a trumpet and let no sound escape near the mouth. It is an art of its own, as it were.

In some trumpet seances the lights are not put out but merely lowered until quite dim. The trumpet is laid on the floor in front of a cabinet, and voices issue from it. This usually occurs at the medium's own home. In such cases a concealed rubber tube lies under a loose rug; and when the trumpet is laid on the floor, this tube is secretly slipped into the small end of it. This tube runs into the cabinet where sits the medium, who inserts a mouthpiece and does the talking. In case of the medium hearing any sudden movement among the spectators, she quickly draws the tube into the cabinet, and conceals it in a pocket under her clothing.

In some cases the trumpet is laid on a chair in front of the cabinet and voices seem to issue from it. In this case there is no connection, but the medium in the cabinet has a second *telescopic* trumpet concealed under her clothing. When the curtain is dropped, she secures this trumpet and extends it, holding it near the curtain directly behind the other one. The sounds seem to listeners outside to issue from the trumpet on the chair. This illusion is perfect, as the sounds have the tone of the trumpet, are in line behind the one in view, and the attention is directed to the trumpet on the chair just as a ventriloquist directs the attention of the spectators to his "figure."

I am digressing some, as these last methods could not have been used in the case the Doctor describes; but I believe the reader will pardon this digression, for the sake of this additional information. While I am dealing with the subject of trumpet seances, independent voices and dark seances, I shall take the liberty of describing some more work of this kind.

When a medium works in his own home, it is an easy matter

to have speaking tubes whose openings are masked by picture moulding or other objects. These lead to the confederate who can, by a system of switches, send the voices into the room through any or all of the tubes at will. Such sound appears to come out of the very air and is difficult to locate. The origin of sound is difficult to locate anyway, and in such cases it is much more so.

At one time I heard a report of a case where independent voices followed a young girl out in the open air, and would on occasions converse with her. A certain party accompanied her to a well, and heard a voice speak out in the open air and address her. I do not know if such report were entirely true or not, as the opportunity to investigate the case was lost when I heard of it; but the idea occurred to me that it would be very easy to lay a small iron pipe under ground from a house, and have it terminate in a well near the surface. Its termination could easily be masked and a confederate in the house could send voices into the top of the well at will. To one unacquainted with the secret, the voice would be extremely difficult to locate. Of this I am certain, from some experiments I once conducted, wherein I sent voices through some hundreds of feet of pipe which ran through a public hitching rack. Passers-by at the farther end would think themselves addressed by some one near them, and would look around in a very foolish manner in search of the speaker. We boys thought this great sport.

By this means, voices can be made to appear on a lawn in the open and will seem very mysterious to a small party. A small half-inch pipe can be laid under the ground near the surface and terminate under an urn, the roots of a tree, or even in the grass just below the level of the earth. It can be kept corked to prevent moisture from entering when not in use, and if the grass be a trifle long and the entrance of the tube a trifle below the surface of the ground, it would escape discovery. Of course it should only be used in the evening, in a dim light, *and then used but sparingly*. If two or three of these were located in different positions, and used sparingly, marvelous reports would go abroad, of the mysterious voices heard in the open air by persons when there. After using, the cork should be re-inserted, a little moist earth placed over it, and the grass rearranged and sprinkled.

I have a letter from a gentleman in Oldtown, Kentucky, who reports to me a seance where in the twilight he saw a trumpet move across the floor, out into the yard and up into the branches of the trees. I have the name of the medium who produced this manifestation. I do not know the means she used, but I know a means by

which I have caused other articles to move across the floor. The secret was a thread pulled by a concealed assistant, and which of course was invisible. If I were producing this manifestation, I should lay a strong black linen or silk thread on the floor, out of the door, on the lawn, and then up over a limb in a tree. From there I should lead it to a concealed assistant, who at the proper time should draw it in. I would have a soft copper-wire hook on the end of the thread, which I should secretly bend around the handle of the trumpet when laying it on the floor. When the trumpet should catch in the branches of the tree, the assistant could, by pulling on the thread, straighten out the wire hook, drawing it in, while the trumpet would drop to the ground. In case the trumpet had no handle, a small hole near the rim would attract no notice. The wire hook could be passed through this hole. I have no doubt that this was the means employed.

At one time I fitted up my home with a number of mechanical rappers under the floor in different positions. The threads that operated them all entered the room through some tiny holes in the floor back of a couch. My wife lay on this couch, apparently resting, and secretly manipulating the threads. I had most marvelous raps which would seem to move to any position asked for by the spectators, and would answer questions intelligently. The effect was very great, although I always afterwards informed my spectators that it was not spirits. I had one set of strings which caused a piano to voluntarily strike chords when I should desire. I have seen nervous ladies greatly frightened by these manifestations.

Mediums claim that spirits have a horror of light-waves and that certain manifestations can only occur in the dark. It is true that the *manipulating spirit has a horror of the light*, and that certain manifestations can only take place in darkness. If any one will have the courage at such times, to suddenly flash a pocket electric light on the trumpet, it will not be necessary for him to be a performer in order to discover the secret of the manifestations. There is not a reliable report in the country, where at any time any one suddenly flashed one of these lights on a trumpet seance, that he did not find the medium or the confederates at work producing the manifestations in a very simple manner. It seems to me that if in any instance such a phenomenon were genuine, there would some time be a case where these exposers would find something not a trick.

A lady medium from Lincoln, Nebr., recently informed me, that the dark seance is rapidly losing prestige since the manufacture of the pocket electric light. She said that these were being used

on the trumpet mediums all over the country with disastrous results, and that the profession would soon have to drift into other channels of trickery. She also told me of a medium who uses his chandelier to bring voices secretly into his room; and that he hangs the trumpet on the chandelier and the voices appear to issue from it, while in reality they issue from a number of tiny holes in different parts of the chandelier.

I look at the question of spirit communion somewhat in this manner: We all have a spirit while we live. This spirit cannot perform a physical miracle. For it to talk, nature has found it necessary to develop vocal organs. Without these no living spirit can talk. To move objects, physical contact and force are necessary. Without these, no living spirit can move objects. Why should any disembodied spirit, (if such exist), be able to execute any act which it could not execute if in the body; or, in other words, why should it be able to perform a miracle?

The theory of certain psychical researchers whom I know seems to be something like this: Spirits of the dead can only manifest themselves through the organism of some person fitted for their control. Such organism is what they term a medium; and they are very doubtful about any physical manifestations being genuine.

As to the information which the voices gave the Doctor, I am not in a position to judge; for I do not know what opportunity the medium may have had secretly to learn the history of those present. However, many tricks are used successfully, even in this feature of the work.

#### EDITORIAL CONCLUSION.

Dr. Burgess having read the proofs of Mr. Abbott's reply writes:

"I like the tone of Mr. Abbott's reply. He is certainly master of the subject in hand. But the puzzle still remains unsolved for none of the tricky methods he speaks of will apply in this particular case. This is not to say that, had he been present, his wide experience and special aptitude might not have uncovered some other fraud. But I doubt it."

On behalf of Mr. Abbott, who cannot see this comment of Dr. Burgess before the present number goes to press, we will repeat that he expressly refrains from explaining any particular seance which he has not himself witnessed, yet he discusses enough parallel cases to indicate that the one in question is no more mysterious than others.



## “PIOUS FRAUD.”

BY THE REV. A. KAMPMEIER.

THE term “pious fraud” often used by advanced thinkers when attacking traditional religious belief, is of course repudiated by those yet holding to traditional religion as entirely unjustified, as only springing from hatred and as being a mean way of attacking religion. But this term is also considered as too hard and strong a term and as an impolitic one by just such advanced thinkers as those using it.

Is the term “pious fraud” then unjustified? I think the term is fully justified in many cases, and will give a few striking examples from the Bible.

The second epistle of Peter in the New Testament pretends not only to have been written by Peter, the intimate disciple of Jesus, but it even says, referring to the story of the transfiguration of Jesus on the mount: “The voice: This is my beloved Son, in whom I am well pleased, we ourselves heard come out of heaven, when we were with him in the holy mount.” (Chap. i. 18.)

It has long been known that this epistle is entirely spurious. Even in the fourth century it was believed by some to be spurious, and these doubts have again and again turned up, till now no unprejudiced Biblical scholar accepts it as authentic.

The general belief in its authenticity, and for which it was taken up into the canon, was very probably due, besides the mention of the name of Simon Peter in the address to the readers, to the before cited words in that epistle, by which the writer fully asserts himself to have been an eye-witness of that miraculous event of the transfiguration related in the Gospels.

Sincere believers in Christianity thus argued: “Would a man have been such a liar as to call himself an eye-witness of that event if he had not been,—a man who wrote an epistle of such religious earnestness and spirituality?” Sincere believers in the truth of

Christianity instinctively felt that the writer of the epistle, if he had not been an eye-witness, would have been a liar. Rather than accept such an immoral act on the part of the author of the epistle, the writing was accepted as authentic in spite of its many contradictions.

It is a well-known fact now that the first centuries were full of such literary productions ascribed to immediate disciples of Jesus and others of his contemporaries, which have deceived people even to our own time, and the so-called second epistle of Peter is one of them.

That this epistle is still accepted as authentic by the majority of Christians is only due to its fortunate admission into the canon and the reason that it is a writing of earnest admonitions only, an epistolary writing, instead of a narrative. In a narration of incidents proofs for unauthenticity could have been found much more easily as any one knows is the case with regard to the apocryphal Gospels which are outside of the New Testament canon. But let us take another example. The book of Daniel in the Old Testament expressly claims to have been written by a certain Daniel living in the time of the Babylonian Exile. It is well known now, that this book was written almost 400 years later during the time of the Maccabees. This was even proven to be so by the neo-Platonist Porphyry as early as the third century, for which reason his books were later burned by order of the Emperor Theodosius, in order that his criticism of the book of Daniel should not become generally known. Since the beginning of the last century, however, the authenticity of the book has been given up more and more, and no unprejudiced Bible scholars accept it any longer. And yet that book has misled the most eminent men since it was written, because it exerted such an enormous influence in the formation of Christianity by being the first of the books of the Old Testament to give prominence to the idea of a kingdom coming from heaven through the appearance of the "Son of Man" in the clouds. We may almost say, Christianity is based upon this book alone. If it had not been for this book and the reverence in which it was held in the time of Jesus on account of its supposedly genuine prophecies, Jesus would very probably never have been moved to his career. We may say that Jesus in believing in the divine character of this book was deluded by it as many others have been since his time. Even such eminently acute minds as Isaac Newton were so misled by the apparently genuine prophecies of the book which predicted the most minute historical details four hundred years ahead, that he spent

much time on this book and considered his calculations based thereon of more value than any of his scientific discoveries. And what an amount of useless work was spent by other men on that book as well as on the book of Revelation which is based upon it! And all this was because the unknown author of that book played his part so well in fabricating fictitious prophecies without the least foundation of truth.

Another example: We all know that Deuteronomy came out about 650 B. C. in the reign of the Jewish king Josiah, (that is, the essential part of it), in order to influence King Josiah to begin that radical reform which made the temple in Jerusalem the only place of worship and abolished all other places of worship throughout the limits of the kingdom of Judah and those of the former kingdom of Israel. That book was given to King Josiah as a writing which had come down from Moses himself, who had forbidden any other place of worship but the one which Jehovah had chosen, and declared that all the evils had come upon the Hebrews because they had transgressed that command—Deuteronomy being filled with curses predicting in detail what ills would come as a consequence of disobeying this command of Jehovah through his servant Moses.

Until the time of the appearance of Deuteronomy even the most pious Hebrews and prophets had worshiped Jehovah without any scruples in other places outside Jerusalem. They never knew of any such command given by Moses, as to worship only in one place and no other. Now with one stroke a matter was introduced, which had never been known before. A book purporting to have been written by Moses was suddenly discovered and brought to light. If this wasn't pious fraud, what was it?

Another example: The Fourth Gospel of the New Testament purports to be a writing of John, a disciple of Jesus, and his most intimate one. Although it does not say this expressly, it is written in such an ingenious way, that any reader receives the impression that that Gospel has come from the most intimate personal connections with Jesus. This book, on account of its seemingly greater spirituality than the other Gospels (though in fact it is very materialistic as witness the resurrection of Lazarus, already in a state of decomposition) and on account of the very mysterious and mystical air surrounding it, has played its part so well, that it has charmed all but the most cool and impartial critics. Only these have seen through its unhistorical garb, and the so-called Gospel of John is more and more accepted as a most ingenious fiction on

the person of Jesus with perhaps very little historical fact underlying it.

Now' what are we to call such writings, as I have mentioned and which every unprejudiced man now knows to be unauthentic?

Can we say, that the pretention of being written by men like Moses and Daniel, centuries ahead and prophesying things to happen many centuries later, or pretending to be eye-witnesses, as the author of 2 Peter and the Fourth Gospel, is only an innocent device, which the author has used to express his thoughts and is of no importance at all? Can we say, that those unknown writers had to use some external machinery or frame by means of which and in which to set forth their ideas? Are we to think that the authors of these books thought that the garb of their books was of no importance at all but only the religious and moral ideas uttered in them? Surely not.

It was not for this reason alone, i. e., to have a suitable frame in which to set their ideas as novelists and poets do, that they chose their special garb, but they knew very well that just the pretence of being genuine prophecies relating events from eye-witnesses, would have a most convincing influence upon the reader; that in fact this seeming genuineness so ingeniously worked out, would be the most important thing to the reader.

And if this is so, what else can we call this proceeding but pious fraud? I at least do not know of any other term which would describe it more correctly and strikingly.

Most believers in these books believe in them because they sincerely consider them as authentic as they appear to be, and because their minds have not been critically trained. But as soon as they discover their unauthenticity and are convinced of it after thorough study, their former sincere belief will change into the very natural attitude of righteous anger, because of having been deluded by only apparent truth and that not only of an insignificant kind but of a kind from which, as long as it seemed to be fact, the most far-reaching and most important inferences were to be drawn.

If, then, the term "pious fraud" is used by advanced thinkers, let us be careful how we condemn them: let us consider that it is the righteous anger of honest, upright and truth-loving minds which leads them to use this expression.

I truly believe, that if the Jewish religion and the Christian also, had not made use of such devices, as I have shown by the examples selected, they would have been of the greatest benefit to the cause of true religion, and would have prevented much of that

bitter controversy between religious tradition and the progress of science.

If there ought to be the most scrupulous conscientiousness anywhere, it is in the field of religion. There more than anywhere else "honesty is the best policy." According to my opinion religious mystification is most to be condemned. To teach religion which pretends to be true, with equivocal means is dangerous. The great majority of Christians believe in the Bible not in the first place on account of the religious and moral truths in it, but on account of the seemingly divine inspiration found in it. An uncritical mind for instance does not know that the whole Hebrew history as represented in the Old Testament as having taken place under the special divine guidance of God, and entirely different from the natural development of any other people, as well as the host of prophecies found in the Old Testament which later were fulfilled, were only a makeup of the Jewish priests after the Exile. I am here referring especially to those many prophecies occurring in the historical books, the Pentateuch, etc., for instance the prediction of the Macedonian empire already in the time of Moses. (Num. xxiv. 24.)

If the origin of these historical books, as the science of Biblical criticism teaches it, would be known to the great majority of Christians, there would be nothing but the unanimous outcry of "pious fraud," and this outcry would be fully justified as things are.

We must admit that the ancient Jewish mind, though deeply religious, lacked an essential of the true religious spirit. Else it would have recoiled from using equivocal means in teaching religious truths. One of the essential things of true religion is scrupulous truthfulness, to teach truth in a straightforward way.

The ancient Jewish mind does not seem to have had the least scruple about manufacturing fictitious prophecies and history. And it was equally so with the early Christian writers. Fiction in the cause of religion, pretending to be true history and fact, seemed to them perfectly justifiable. This trait is also reflected to a smaller degree in another way in the New Testament. It is well known that the New Testament writings are filled to the brim with the most unhistorical and unnatural twistings of passages of the Old Testament to suit any idea that is intended to be expressed. This rabbinical art, which to us now is nothing but pure sophistry, was not even disdained by Jesus. The saying of God to Moses: "I am the God of Abraham, Isaac and Jacob," is cited by him as a proof for personal immortality, although any one knows that nothing of the kind is implied in that passage. But to the times of Jesus and the first

Christian centuries such things seemed perfectly natural and right. The modern mind has evolved to the point of a greater scrupulousness in regard to straightforward methods of teaching religious truth, and this without doubt is due to the influence of science upon religion, for science seeks nothing but pure and naked truth and permits not the least prevarication.

The term "pious fraud" is an outflow of this modern, more truthful and scrupulous spirit. This spirit does not use the term indiscriminately for any myth or legend of ancient times, which has developed gradually and naturally, but it uses it only, when intentionally a false garb has been used for the furtherance of religious purposes, by which consequences have followed which have proved dangerous for the cause of truth.

## MISCELLANEOUS.

### OUR FRONTISPIECE.

In the history of civilization Columbus has become a representative of man's confidence in the reliability of the reasoning faculty. He boldly ventured into the open and unknown ocean never crossed by sailors before him, and he did so against the common belief, firmly established in his days, in the unfeasibility of the undertaking, because he had faith in science. In this sense Schiller praises him in these lines:

"Sail, O thou sailor courageous!  
Ne'er mind that the wit will deride thee.  
And that thy boatswain will drop  
Wearied of work at the helm.  
Sail, O sail on for the West:  
There the land must emerge from the ocean.  
As thy vaticinal mind  
Clearly perceiveth e'en now.  
Trust to the God who thee leadeth,  
And cross the mysterious ocean.  
Did not the land there exist,  
Now would it rise from the deep.  
Truly with genius Nature  
Has made an eternal alliance,  
What he has promised, forsooth,  
She, without fail, will fulfil."

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### BOOK REVIEWS AND NOTES.

DIE WAHRE EINHEIT VON RELIGION UND WISSENSCHAFT. Vier Abhandlungen von J. H. Ziegler. Zurich: Art. Institut Orell Füssli. 1904. Pp. 192. Price 4 marks.

Dr. Ziegler publishes his book on the "True Unity of Religion and Science" because he is convinced that he has something of importance for the public. But we fear that he is over sanguine. In the preface he complains of the indifference of certain representatives of science who showed him the cold shoulder, rejecting them as the fantasies of a *dilettante*. Dr. Ziegler comes to the conclusion that nature is a self-evident substance

(selbstverständliche Substanz), or a substantial self-evidence (substanzielle Selbstverständlichkeit), and his conclusion stated on page 17 is summed up in the sentence that the beginning of true wisdom is the end of all folly.

The second part is devoted to the "True Character of So-called Gravitation." The third treats of the "True System of Chemical Elements" and their combination according to the universal world-formula, and a diagram of concentric circles inserted at the end of the book is the graphic representation of this system of chemical elements. The fourth treatise is on the "Sun-god of Nippar" and has for an appendix a few interesting illustrations, among which we note especially that of an antique German sun-chariot in bronze.

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THE FINALITY OF THE CHRISTIAN RELIGION. By *George Burman Foster*. Chicago: University Press, 1906. Pp. xiii, 518. Price, \$4.00 net.

This book comprises two courses of lectures delivered in 1902 and 1903 before the Harvard Summer School of Theology. These lectures have been enlarged and the popular style of the platform has been replaced for the most part by a more formal treatment. The book, as it stands, portrays the development of the author's own experience. He believes that many thoughtful people are passing through similar experiences and hopes by this record of his own to be of some comfort and assistance to them. For a motto he takes Kant's words on religious criticism: "Our age is, in every sense of the word, the age of criticism, and everything must submit to it. Religion, on the strength of its sanctity, and law, on the strength of its majesty, try to withdraw themselves from it; but by doing so they arouse just suspicions, and cannot claim that sincere respect which reason pays to those only who have been able to stand its free and open examination."

By the criterion of science which "knows no other law than its own and no other authority than truth," the book undertakes to investigate the reasons for believing that Christianity is the ultimate religion of mankind. After a chapter containing the history of thought on the subject, the discussion is divided into two parts, the one destructive, the other constructive: "Authority-Religion (= supernaturalism) and Naturalism," and "The Finality of Christianity and the Idea of Development." In the first part the rise, development, and disintegration of Christianity as authority-religion are treated and also the history and critique of naturalism. This part the author feels may antagonize many of the ministry and in his introduction he enumerates several considerations which he thinks will justify his attitude in their eyes. He says also that "after generous allowance has been made for exceptions, the ministry, in matters where science has the right to adjudicate, is too sure where science doubts. Veraciousness of character, the sense for truth, verity and purity of personal conviction, courage and power of disposition—these are the great desiderata of the ministry in modern culture, and these qualities can be developed and matured, in the case of many, by encouraging them to face, at the cost of honest pain, the scientific doubt as to the finality and indispensableness of our Christian faith." From thoughtful people among the laity he anticipates less opposition.



The second part is devoted to the constructive side of the task. To this end the respective merits of the dogmatic and the religio-historical methods are examined; and finally "in the light of the mystery and underivability of personality, on the one hand, and of evolution, on the other," the problem of the book is discussed. As the discussion in the previous part in its negation of the religion of authority might fail because of its destructive mission to win the support of clericalism, this section, devoted to the religion of personality, the author expects will arouse opposition on the side of "naturalism."

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THE MEDICAL FEATURES OF THE PAPYRUS EBERS. By *Carl H. von Klein*. Chicago: American Medical Association, 1905.

Dr. Carl H. von Klein has published a pamphlet on *The Medical Features of the Papyrus Ebers* in which he gives an account of the discovery of this remarkable manuscript, and point out that at the time when it was written down, about 1600 B. C., the Egyptians must have been in possession of a fair knowledge of anatomy and pathology. He makes reference to other documents of a medical nature, and publishes the pictures of two medicine chests belonging to Egyptian queens, one the wife of Pharaoh Menuhotep of the eleventh dynasty, 2500 B. C.; the other a stone chest the date of which is not determined. Dr. von Klein also refers to the anatomical and medical knowledge of Moses and other Biblical writers, but without making use of the critical apparatus which he could find in the modern theological literature on the Old Testament. His theory that Moses owes all his knowledge to Egyptian priests, will scarcely be tenable.

The author also states that he has translated the Papyrus Ebers into English, and he expects to have established the fact that medicine up to the time of Hippocrates, and from that time until the present day, has been built on the foundations of that of the ancient Egyptians.

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CONTRIBUTIONS TO THE STUDY OF THE BEHAVIOR OF LOWER ORGANISMS. By *Herbert S. Jennings*. Washington: Carnegie Institution, 1904. Pages, 256.

This volume of the Carnegie Institution publications contains the result of investigations which were carried out by the aid of certain grants from the Institution. Some of the subjects treated are as follows: Reactions to Stimuli in Certain Organisms, The theory of Tropisms, Physiological States and Methods of Trial and Error in the Behavior of Lower Organisms, and The Movements and Reactions of Amœba.

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EVOLUTION: RACIAL AND HABITUDINAL. By *John T. Gulick*. Washington: Carnegie Institution, 1905. Pp. 269.

In this volume the author brings together the results of his investigations concerning the factors of organic evolution. The body of the volume contains an exposition of the fact that all evolution as we now observe it is divergent, and that other factors besides natural selection are absolutely necessary for the origin and continuance of this divergence. The appendix contains portions of his theory of divergence, formerly published in the *Linnean Society's Journal* and now carefully revised. The subjects treated are, broadly, Bionomic Laws, Evolution of Natural Species, Divergence Under the Same En-

vironment, The Four Segregative Principles, and Principles Producing Allo-gamic Evolution.

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BEHAVIOR OF THE LOWER ORGANISMS. By *H. S. Jennings*. New York: Columbia University Press, 1906. Pp. xiv, 366. Price, \$3.00.

This work by the Assistant Professor of Zoology in the University of Pennsylvania forms the tenth number in the Columbia University Biological Series, and is the result of a year of uninterrupted research by the author in the Carnegie Institution of Washington. It was designed primarily as an objective description of the known facts in regard to the general bodily movement of lower organisms, especially animals, that would be useful as a companion to actual laboratory experimentation as well as to the general reader. Parts I and II, "Behavior of Unicellular Organisms," and "Lower Metazoa," undertake to present simply biological facts that would include facts required for a refutation of the author's own theories, if such a refutation is possible. These theories are presented in Part III, with an analysis of the facts contained in the first two parts. The book is furnished with a bibliography which includes most of the more important papers on the lowest groups, and a very thorough index.

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UNE LEÇON ÉLÉMENTAIRE SUR LE DARWINISME. Par *L. Errera*. Brussels: Lamertin, 1904. Pp. 85.

The author is professor at the University of Brussels and a member of the Royal Academy. This is the second edition of his "Elementary Lesson on Darwinism" and is considerably revised and enlarged, in order to utilize a number of interesting and suggestive facts which have come to light since its first publication. Most important of these M. Errera considers the results of the investigations of Professor De Vries. He holds that this great scientist's theory of mutation forms a complement to Darwin's evolutionary theory instead of overthrowing its hypothesis as is superficially considered to be the case. This "Elementary Lesson on Darwinism" is preceded by a history of the evolutionary idea and the intellectual crisis which the author claims Darwinism has brought about.

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LA DEROGABILITA DEL DIRITTO NATURALE NELLA SCOLASTICA. Da *Alessandro Bonucci*. Perugia: Bartelli, 1906. Pp. 292.

Professor Bonucci of the University of Camerino presented this work on "The Disrepute of Natural Law in Scholastic Philosophy" as a thesis for his doctor's degree which was unanimously awarded him by the Philosophical Faculty of Rome *cum laude*.

He considers that the history of natural law will show two main periods in its development, the Grecian period where it had its origin, and the period of the Scholastics who disregarded its importance. In his discussion he treats first the predecessors of the Scholastics, Aristotle, Plato, etc., and then the first period of the scholastics. Then follows the period from Alexander of Hales to Albertus Magnus with a chapter devoted to St. Thomas Aquinas and Duns Scotus, after which follows a chapter on the influence of nominalism and another on the jurists and their attitude towards natural law.

THE TRUE DOCTRINE OF PRAYER. By *Leander Chamberlain*. Foreword by *Rev. William R. Huntington*. New York: The Baker & Taylor Co., 1906.

The volume before us is an exposition of the orthodox conception of prayer, which is prefaced by the Rev. Dr. William R. Huntington, Rector of Grace Church, New York. He insists in his Foreword on the paramount importance of prayer, saying: "Gladness goes out of religion just in proportion to the rate at which we lose faith in prayer. It is impossible to serve happily a God with whom we are not on speaking terms."

We are not orthodox, certainly not in the sense of traditional dogmatism, and yet we find much that is good and true in the present volume; yea, in the most important points, there is a great agreement that might appear unexpected in consideration of the difference in our view-points. Though we have replaced the traditional God-conception by one which to the childlike believer appears as pale and abstract, we yet retain the faith in the reality of this omnipresent and all-efficient deity, and we have no objection to a conception which remains "on speaking terms" with God. We have in prior explanations, for instance in our booklet *Religion of Science*, insisted that prayer in the sense of begging is to be abolished, and that practically the Lord's Prayer is a petition for weaning from the prayer-craving. Prayer ought to be no praying at all but a method of self-discipline. It should not be an assimilation of God to us, but an attuning of ourselves to God. In this sense Jesus taught his disciples to pray a prayer that would lead them to dispense with praying for the fulfillment of their own wishes, and it is in this sense that Mr. Chamberlain has written his book, which is sufficiently characterized in the following quotation:

"Suppose that in deference to the suggestion of a 'test' of prayer for physical results, Christians should assemble to pray for rain from a clear sky, or for rushing wind while the normal conditions of wind are absent.

"If they really pray, they must, in effect, sincerely say, 'Our Father who art in heaven, hallowed be thy name. Thy kingdom come. Thy will be done, as in heaven, so on earth. If, in thy perfect wisdom and love, thou dost deem it best to send rain from cloudless skies, or wind from air unmoved by heat and cold, in order that thus, to those who require a 'sign,' may be given the proof which they think will be convincing; then we plead that thou wilt send the rain and cause the wind to blow. Our desire is that to all minds and hearts thy gracious ways may be savingly known. But if the required results are not in furtherance of the highest good of all thy universe, we pray that they be not wrought. Thy will be done.'

"Let it still be remembered that true prayer of essentially other sort than that is impossible; that the divinely imparted and divinely revealed nature of prayer forbids aught else."

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POEMS OF PERSONALITY. By *Reginald C. Robbins*. Cambridge: Riverside Press. 1904.

These consist of twenty-nine imaginary soliloquies, whose speakers vary in time and condition from Moses and Pharaoh of old to Nansen and Tesla. In method they are clearly inspired by Browning's inimitable monologues, although no attempt is made to introduce such external realistic features of

scene or companionship, as help to make analogous poems of Browning a triumph of dramatic art.

The viewpoints taken by Mr. Robbins, however, are often interesting and well-imagined. Pharaoh is represented as Descendant of the Sun, Lord over all, who long had pity on his subject people. He regrets that he did not forbear this one time more to drive them to the deserts and their death, but feels that he was impelled to this unworthy action by the sorceries of their own leaders. He finally sends for his chariot and bowmen with the kind motive of bringing back the Israelites to his protecting power. Buddha, in meditation, conceives a new faith similar to his own, whereby in some future life he might lighten the world's burden by suffering for others. Pilate discusses the conflicting arguments that lead to his final decision, and Judas' remorse causes him to give thanks that others are to be saved "by my perdition through the Master's word!" Hegel is made to discuss whether or not he would wish to be called Christian, Wordsworth still discourses on immortality, Browning comments on over-appreciation of his poems, while Dreyfus is made to accept his doom without petulance or desperation. Each gives the pros and cons of the subject in connection with which he is best known in the world, but all use the same diction, whether prophet, artist or scientist, of whatever century or continent.

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The Right Honourable Lord Reay, President of the Royal Asiatic Society, in the course of his address at the Anniversary meeting, published in the present current number of the *Journal* for July, etc., page 769, made the following remarks:

"It is with great pleasure that I allude to the excellence of our *Journal*, and to the way in which it holds its own among other similar publications. It is the representative of the Society in the world of Orientalists everywhere . . . the number and especially the quality of those who contribute to the *Journal* cannot be said to be upon the down grade. I should like to call attention to the articles by Professor Mills of Oxford on the Pahlavi texts of the Yasna. They are especially valuable as it is now recognized that no further labor upon the Avesta of an exhaustive nature can be attempted until all the Pahlavi texts have been treated in a similar way. . . .

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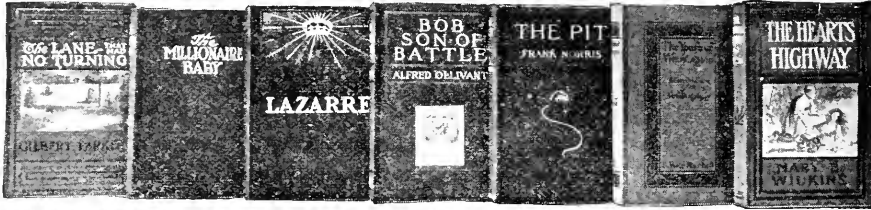
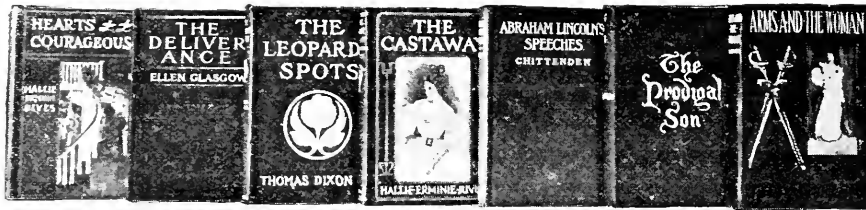
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Dr. Ernst Mach, Emeritus Professor in the University of Vienna. From the German by Thomas J. McCormack, Principal of the LaSalle-Peru Township High School. 1906. Cloth, gilt top. Pp. 143. \$1.00 net. (5s. net.)

In these essays Professor Mach discusses the questions of the nature, origin, and development of our concepts of space from the three points of view of the physiology and psychology of the senses, history, and physics, in all which departments his profound researches have gained for him an authoritative and commanding position. While in most works on the foundations of geometry one point of view only is emphasized—be it that of logic, epistemology, psychology, history, or the formal technology

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**The Vocation of Man.** By Johann Gottlieb Fichte. Translated by William Smith, LL. D. Reprint Edition. With biographical introduction by E. Ritchie, Ph. D. 1906. Pp. 185. Cloth, 75c net. Paper, 25c; mailed, 31c. (1s. 6d.)

Everyone familiar with the history of German Philosophy recognizes the importance of Fichte's position in its development. His idealism was the best exposition of the logical outcome of Kant's system in one of its principal aspects, while it was also the natural precursor of Hegel's philosophy. But the intrinsic value of Fichte's writings have too often been overlooked. His lofty ethical tone, the keenness of his mental vision and the purity of his style render his works a stimulus and a source of satisfaction to every intelligent reader. Of all his many books, that best adapted to excite an interest in his philosophic thought is the Vocation of Man, which contains many of his most fruitful ideas and is an excellent example of the spirit and method of his teaching.

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Paul Carus, the author of *The Rise of Man*, a new book along anthropological lines, upholds the divinity of man from the standpoint of evolution. He discusses the anthropoid apes, the relics of primitive man, especially the Neanderthal man and the ape-man of DuBois, and concludes with a protest against Huxley, claiming that man has risen to a higher level not by cunning and ferocity, but on the contrary by virtue of his nobler qualities.

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**The Sermons of a Buddhist Abbot.** Some Addresses on Religious Subjects by the Rt. Rev. Soyen Shaku, Abbot of Engakuji and Kenchoji, Kamakura, Japan. Translated by Daisetz Teitaro Suzuki. Pp. 218. Cloth. \$1.00 net. (4s. 6d. net.)

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**Aristotle on His Predecessors.** Being the first book of his metaphysics. Translated from the text of Christ, with introduction and notes. By A. E. Taylor, M. A., Fellow of Merton College, Oxford; Frothingham Professor of Philosophy in McGill University, Montreal. Pp. 160. Cloth, 75c net. Paper, 35c postpaid.

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## **Zarathushtra, Philo, the Achaemenids and Israel.**

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**Babel and Bible.** Three Lectures on the Significance of Assyriological Research for Religion, Embodying the most important Criticisms and the Author's Replies. By Dr. Friedrich Delitzsch, Professor of Assyriology in the University of Berlin. Translated from the German. Profusely illustrated. 1906. Pp. xv, 240. \$1.00 net.

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By Prof. Th. Ribot. Translated from the French by A. H. N. Baron, Fellow in Clark University. 1906. Cloth, gilt top. Pp. 357. \$1.75 net. (7s. 6d. net.)

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## **Yin Chih Wen,** The Tract of the Quiet Way. With Extracts from the Chinese commentary. Translated by Teitaro Suzuki and Dr. Paul Carus. 1906. Pp. 48. 25c net.

This is a collection of moral injunctions which, among the Chinese is second perhaps only to the *Kan-Ying P'ien* in popularity, and yet so far as is known to the publishers this is the first translation that has been made into any Occidental language. It is now issued as a companion to the *T'ai-Shang Kan-Ying P'ien*, although it does not contain either a facsimile of the text or its verbatim translation. The original consists of the short tract itself which is here presented, of glosses added by commentators, which form a larger part of the book, and finally a number of stories similar to those appended to the *Kan-Ying P'ien*, which last, however, it has not seemed worth while to include in this version. The translator's notes are of value in justifying certain readings and explaining allusions, and the book is provided with an index. The frontispiece, an artistic outline drawing by Shen Chin-Ching, represents *Wen Ch'ang*, one of the highest divinities of China, revealing himself to the author of the tract.

The motive of the tract is that of practical morality. The maxims give definite instructions in regard to details of man's relation to society, besides more general commands of universal ethical significance, such as "Live in concord," "Forgive malice," and "Do not assert with your mouth what your heart denies."

**T'ai-Shang Kan-Ying P'ien,** Treatise of the Exalted One on Response and Retribution. Translated from the Chinese by Teitaro Suzuki and Dr. Paul Carus. Containing Chinese Text, Verbatim Translation, Explanatory Notes and Moral Tales. Edited by Dr. Paul Carus. 16 plates. Pp. 135. 1906. Boards, 75c net.

The book contains a critical and descriptive introduction, and the entire Chinese text in large and distinct characters with the verbatim translation of each page arranged on the opposite page in corresponding vertical columns. This feature makes the book a valuable addition to the number of Chinese-English text-books already available. The text is a facsimile reproduction from a collection of Chinese texts made in Japan by Chinese scribes.

After the Chinese text follows the English translation giving references to the corresponding characters in the Chinese original, as well as to the explanatory notes immediately following the English version. These are very full and explain the significance of allusions in the Treatise and compare different translations of disputed passages. This is the first translation into English directly from the Chinese original, though it was rendered into French by Stanislas Julien, and from his French edition into English by Douglas.

A number of illustrative stories are appended in all the editions of the original, but the selection of these stories seems to vary in the different editions. They are very inferior in intrinsic value to the Treatise itself, and so are represented here only by extracts translated in part directly from the Chinese edition and in part through the French of Julien, but many are illustrated by reproductions of the Chinese pictures from the original edition. The frontispiece is a modern interpretation by Keichyu Yamada of Lao Tze, the great Oriental philosopher, "The Exalted One" to whom the authorship of this Treatise is ascribed.

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**Spinoza and Religion.** A Study of Spinoza's Metaphysics and of his particular utterances in regard to religion, with a view to determining the significance of his thought for religion and incidentally his personal attitude toward it. By Elmer Ellsworth Powell, A. M., Ph. D., Professor of Philosophy in Miami University. 1906. Pp. xi, 344. \$1.50 net. (7s. 6d.)



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