The Open Court

A MONTHLY MAGAZINE

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

Editor: DR. PAUL CARUS. *Associates:* E. C. HEGELER. MARY CARUS.

VOL. XXI. (No. 7.) JULY, 1907. NO. 614.

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EDITOR

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An Unpartisan Organ of Religious, Ethical, Philosophical, and Scientific Expression, Contributed to by the Leaders of Science in all Countries, and by the Leaders of Religion of all Denominations.

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THE SEVEN GODS OF BLISS.

Frontispiece to The Open Court.

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ANCIENT MYSTICISM AND RECENT SCIENCE.

BY CHARLES KASSEL.

INGRAINED with us all,—wrought into our innermost fibers,—is an abiding love of mystery and marvel. From the shadowy ages before the earliest glimmer of history, stories of the weird and the wonderful have exercised a surpassing charm over the imagination of man. Who does not recall how deeply in his nursery days the tales of conjurors and wizards, of fairies and genii, of magic swords and enchanted palaces, appealed to the childish fancy, and how vivid and life-like seemed the image of Ali Baba and Cinderella and Red Riding Hood when the lessons of the school-room and the Sabbath-class faded almost as fast as learned. Even in a devouter generation, when church and creed and sacred page were held in deeper reverence, few children knew their Bibles nearly so well as they knew their Arabian Nights, and the rich coloring literature everywhere has taken from those fictions of the Orient is token of their no less singular fascination for the adult mind.

It is a striking truth that science, in its triumphs hitherto, has been realizing one by one the fancies of fairy lore and magic. The picture that moves and speaks—the chariot that bounds like a fiery meteor through the air—the wizards catching each other's thoughts across a continent's space,—all these have found themselves actualized in the phonograph, the kinetoscope, the electric car and the wireless telegraph. Scarce a century ago these wonders would have been deemed a fakir's story, and a century earlier the idea of a steam railroad, a sewing-machine or a cotton gin would have been ranked with the magic lamp of Aladdin and the flying horse of Prince Feroze-shah.

When modern science dawned the world was dark with superstition. Everywhere, notions fantastic or barbarous fettered the

human intellect. Witches, foul and hideous, that flew through the air or lurked about the threshold, weaving with their bony hands the spells of death and ruin,—black sorcerers, with their magic signs and incantations, who cast enchantments over the reason or changed to brutish forms the objects of their spite,—astrology with its traditions and dogmas,—charms and amulets with their transforming influence upon the affections,—omens with their boding messages of blight and blood: these and other superstitions no less grotesque and crude held the common mind in thrall.

Mingled with these ruder notions, however, were beliefs of a nobler character which had come down from forgotten ages and which made a strong appeal to the imaginations of the learned. Such was the tradition of the Golden Age, with its universal goodness and innocence, in the far eras before recorded time. Such, too, was the faith of the alchemists in the transmutability of the baser metals into the more precious, and in the magic elixir which should confer the boon of perennial youth. Such, again, was the belief in mesmeric influences. Such, also, was the idea of an invisible world, permeating our own and interpenetrating our very flesh, in which lived and moved, though viewless to the natural eye, the spirits of the departed. Such, finally, was the belief in seers and magi within whose ken it lay to commune by inter-projection of thought across mountain chasms and pathless deserts, and who, in the last triumph of their art, could vanish into air and re-appear, like a flame puffed out and re-lit.

Against these ideas of the learned, no less than against the gross superstitions of the vulgar, science declared war. The belief in the transmutability of one element into another was opposed to its fundamental conceptions. The transmission of thought through leagues of barren space was cried out upon as impossible. The casting of spells was sneered at contemptuously as unworthy of discussion. The notion of a world of reality, interpenetrating the natural world yet defying the grasp of the natural senses, was brushed aside as a poetic fancy. The idea of physical matter being rendered invisible at will was laughed away as making against the principles upon which all physical and chemical science rested,—the principles of inertia and of the conservation of mass.

It is noteworthy that during the past century, though our material philosophers have remained steadfast in their attitude of fixed resistance to the claims of the mystics, the march of discovery has been tending more and more toward the occult. Beliefs once sneered at by the savants have ripened into recognized truths, or have found

such striking analogies in modern research that scholars of the old school have been given pause. Those familiar with the history of hypnotism may recall the impatience of the scientists with early believers in this now well-attested phenomenon, forming, as it frequently does, an aid to surgery and medicine. The principles of science afforded no basis for so strange an influence of one mind over another, and, with something of the dogmatism of theology, the material thinkers denied what they could not explain.

Little less marked than the difference between the early and the present attitude of science toward hypnotism has been the silent and gradual change of sentiment toward the phenomena of telepathy. Time was when the idea of thoughts flying from mind to mind across stretches of barren space seemed wild and grotesque. There was no law known to physics which would lend probability to so strange a claim, but the triumphs of invention and discovery, which give to the nineteenth century so splendid a page in history, supplied analogies that have removed telepathy from the realm of the improbable and have made the idea familiar to our thought. The electric telegraph suggested faintly the mysterious powers with which legend clothed the ancient seers, but it was with the birth of the telephone,—an invention which, before its discovery, would have been pronounced impossible,—that the analogy grew striking; and with the advent of the wireless telegraph, pulsing its messages through vacancy, the suggestion of the legends of old becomes complete.

The belief which, perhaps, exercised the greatest fascination over the inquiring minds of old was that which taught the possibility of lengthening out, far beyond the natural span, the years of man's sojourn upon earth. Intoxicated with the idea, some sought under strange suns the fabled fountain of youth whose magic waters should unbend the drooping frame and fire each failing sense with perpetual life. Others, less credulous, strove to wrest from alchemy the divine elixir which should yield this priceless gift. How singular that the dream of the mediæval philosophers should find an echo in the utterances of one of the gravest of modern scientists,—one whose teaching and temperament is without a touch of mysticism and whose thought is the crystallization of a lifetime of patient research. In his volume *The Nature of Man*, recently translated into our tongue, Elie Metchnikoff, the Russian bacteriologist, and successor of the great Pasteur in the French Institute so long identified with the name of the latter, pronounces old age abnormal and no part of "healthy physiological function," and holds

it well within the bounds of probability that in the fulness of time the life of man upon the planet may be indefinitely prolonged.

The ancients knew nothing of the larger truths of physiology, being ignorant, even, of the circulation of the blood, but the modern student of that fascinating science, where he has paused to reflect upon the mystery which enveils the processes of life, has been struck by a singular phenomenon. From childhood to manhood, and thence through the years of the bodily prime, the heart and lungs and digestive machinery replace as fast as lost the wasted particles of the frame; but with the advent of old age the vital processes begin to lag, the form droops, the eye dims, and the whole organism falls slowly into decay. Why is it that the work of physical rejuvenation so perfect in youth and manhood does not persist far beyond the common span of life and that man's sojourn upon earth is not reckoned by centuries? Bacteriology, the latest great legacy of science to the world, has let in the light upon this engrossing problem. In the eyes of a Pasteur or a Metchnikoff, the body of man is the theater of perpetual conflict. During every moment of earthly life, and throughout every limb and organ, a deadly warfare wages between the bacteria which battle for the preservation and renewal of the organism and the microbes which battle for its destruction; and old age, as the later researches of Metchnikoff and his confreres would seem to show, is but the giving way of the defenses of the organism before the assaults of these swarming infusoria. If this be true, it needs but to learn the habits of these tiny pillagers of the frame, and to curb or neutralize their action, when the prophecy of Metchnikoff and the beautiful fancy of the ancient mysticists flowers into fact! Who shall say that even this magnificent accomplishment is beyond the pale of possibility when he recalls the splendid conquests already won by science over the primal forces of nature?

A figure familiar to the student of history is that of the alchemist, pale and bent, watching with eager and sleepless eye the fiery crucible whose glow Hope tinged with a resplendent possibility! The philosopher's stone! How richly interwoven is this fancy of the elder day with poetry, romance and history! How many fine souls grew wrecked in health and maddened in brain in the wild quest for the principle which should turn worthless metals into gold! With the dawn of modern learning, the belief in the possibility of transmutation passed, like thousands of superstitions, into the limbo of forgotten creeds and systems; yet, strangely enough, with the advent of a still riper knowledge, the supposed delusion

of the ancients begins to stir in its charnel-house and to show signs of returning life! "It is interesting to observe," says a writer in *Chambers's Encyclopedia* (Lippincott's American edition, 1901, Vol. I, page 131), "that the leading tenet of the alchemists' creed, namely, the doctrine of the transmutability of other metals into gold and silver,—a doctrine which it was thought modern chemistry had exploded and which was rejected as an impossibility by Sir Humphry Davy,—receives not a little countenance from a variety of facts now coming to light, especially in connection with allotropy." Were the author of these lines writing at this hour he would find his language much too moderate. The progress of discovery since these words were penned has lent to the once derided theory of the ancients a dignity which, but for the unfoldments of the past few years, it could never have worn. "A strange confirmation of the faith in transmutation entertained by the alchemists of old," exclaims George Iles in his introduction to the *Little Masterpieces of Science,* (Doubleday, Page & Co., 1902), referring to the interesting facts disclosed by the delicate lines of the spectroscope; and, twelve months after, another writer could speak of new grounds for the increasing respectability of the old alchemists' teaching. In a volume issued by Harpers in 1903, devoted to a sweeping survey of the latest marvels in science, Carl Snyder observes: "Prof. J. J. Thomson, of Cambridge, shows that ions, electrons or corpuscles are at least one thousand times smaller than the smallest and lightest atom; and from whatever source they come they are all alike identical in every way. Is this primal matter at last? Is here the stuff from which all known substances are compounded? May we look forward to a time when we may build up any substance,—gold, for example,—from the elements of any other? Have we realized the philosopher's stone?"

As yet, however, science was without an actual demonstration, though it had not long to wait. Carl Snyder's pages were scarce dry from the press when the announcement was flashed across the Atlantic that in studying the phenomena centering about the new metal radium, Sir William Ramsey had found the gaslike, luminous emanation from that metal transfusing through its singular changes into a distinct element, itself discovered but a few years before though known for a quarter of a century to exist in the sun,—helium! The birth of one element from another! The scientific brain reeled! The whole philosophy of chemistry and physics, so laboriously built up, seemed tottering, and the very pictures of the old alchemists appeared to mock and jeer from their frames! Now

comes Professor Rutherford, the eminent specialist in the investigation of radio-active phenomena, and ventures the idea that the emanative changes of uranium, another of the radio-active substances, will be found to ultimate in the common metal *lead*! If this be true, then we have but to find the radio-active mass the successive offbirths of which end in the King of Metals, and the dream of the ancient alchemists is within our grasp!

The mention of radium and radio-activity leads naturally to a discussion of these absorbingly interesting phenomena, with their shock to the accepted principles of chemistry and physics, and their startling confirmation of ideas and theories which have long rested under the taboo of science. The annals of discovery are without a parallel for the consternation which has prevailed among the scientists ever since Mme. Curie's remarkable discovery. The very central teachings of chemical and physical science,—teachings so long unchallenged they had crystallized into axioms,—have been rudely shaken; and tenets of mysticism long treated with contempt by the savants have leaped into the pale of scientific truth. "We have been taught," says Prof. A. E. Dolbear in the *Popular Science Monthly* for July, 1905, "and have probably had no misgivings in saying that matter is indestructible. Much philosophy is founded upon that proposition. But we are now confronted with well-vouched-for phenomena from two independent workers that under certain conditions a certain mass of matter loses weight not by mechanical removal of some of its molecules but by physical changes which take place in it. This is a piece of news that is almost enough to paralyze a scientifically minded man, for stability of atoms, unchanging quantity and quality, seems to be at the basis of logical thinking on almost all matters." How complete has been the overturn wrought by the new phenomena may be inferred from the tone and tenor of scientific statements written before radio-activity had disturbed the assurance of the scientific mind. Thus, in a discussion of the doctrines of indestructibility and inertia appearing in *Chambers's Encyclopedia* under the title of "Matter," it is said, "One of the most remarkable of these (properties of matter) what has been called conservation of matter, is the experimentally ascertained fact that no process at the command of man can destroy even a single particle of matter. Still less can it create a new one. It is on this basis that the great science of chemistry has been securely built." And in the same article, "Quantity of matter, or mass, as it is technically called, is measured by inertia, which (as expressed in Newton's first law of motion) may be looked upon

as the fundamental property of matter....It is in virtue of its inertia that a body can possess energy of motion and that work is required in order to set in motion even the smallest particle of matter."

It was with these principles, now so much discredited, that scientists met the spiritualists and the investigators of psychic phenomena. *A priori,* and with manifest impatience, they stamped as a fraud or an illusion every phenomenon which violated these laws. Here and there, it is true, a lone thinker, like Camille Flammarion, the astronomer, or Alfred Russel Wallace, the naturalist, remembered that science had already touched the fringe of mysticism in its theory of the universal ether, and paused from his labors to inquire what seeds of truth there might be in the claims of the psychics; but for the most part, the savants drew the mantle of their learning about them and invoked the venerable maxims of their science. It was left for a brilliant French woman, working patiently in her laboratory, to shake them from their self-assurance into a newer realization of the mysteries amidst which they stood, and of which their science had caught but a faint and erring glimpse.

The discovery of radio-activity has flung wide the doors to a new world of phenomena. The researches of the Curies, following out a hint afforded by the discoveries of Becquerel, lifted the veil from a species of matter wholly new, and possessing characteristics strange, if not weird. These characteristics, as was first thought, applied only to radium and its kindred metals, but, as investigation proceeded, scientists, to their amazement, found indications of radio-activity in the common air and soil.

Nothing could be more extraordinary than the behavior of radium. With no exciting cause, so far as investigation has disclosed, this element gives forth steadily an amount of energy enormous when compared with its mass; nor is the amount of heat emitted lessened or interrupted by plunging the radium into liquid air or sealing it within a leaden vessel. It has been estimated by Professor Rutherford that one pound of radium emanation would give forth energy corresponding to many thousand horse-power, and Sir William Crookes, in the language of a recent writer, "sees in radio-activity a possible source of light, heat and power sufficient to supply the world,—possibly giving rise to a mighty industry like electricity."

The gas-like emanation of radium, like the Röntgen ray, possesses a penetrative power which enables it to pass readily through substances opaque to light. The distinctive feature of radium rays consists in their visibility to the natural eye, but before their discov-

ery the Becquerel radiations of uranium, which are invisible to the eye, had been known for some years. All these radiations, science has clearly established, are a form of matter and not merely etheric vibrations of an order such as result in the light familiar to our senses; and the problem which confronted the scientists was to reconcile the phenomena of radium, its power of penetrating substances and the successive emanations to which the radiations give rise, with the accepted notions of physical matter. The effort at a reconciliation has been abandoned, and investigators have been forced to adopt a wholly new theory of matter,—the corpuscular or ionic theory.

It is now taught that the ultimate atom, once supposed to be simple in substance and indivisible, consists in reality of a multitude of tinier atoms or corpuscles in rapid motion, all swinging about a common center much as the orbs of our planetary system revolve about the sun; and that by reason of some disturbance a number of these particles escape from the atom and, in conjunction with like particles from contiguous atoms, make up the emanation which the eye beholds. These corpuscles, moreover, being much smaller than the atom which has heretofore been looked upon as the unit of matter, pass readily through the interstices between the atoms of grosser matter.

The following passage from an article in a recent issue of the *Popular Science Monthly,* written by Professor Rutherford, the author of the most authoritative work yet published upon radio-activity, presents some interesting observations upon the characteristics of radium: "Radio-activity is always accompanied by the appearance of new types of radio-active matter which possess physical and chemical properties distinct from the parent element. Radium emanation is a transition substance which disappears and is changed into other types of matter. It emits during its changes about a million times as much energy as is emitted during any known chemical change." The fact that radium emanation remains active for more than a thousand years, according to the estimate of the scientists, suggests to us the ever-burning lamp of the ancients, which in the light of the latest marvels of science may, perhaps, not be wholly fanciful.

How far toward the doctrines of the ancient mystics science has been pushed by these discoveries may be seen when we place side by side an utterance of the most celebrated of the alchemists with that of a recent scientific authority. "He," says the writer of the article "Alchemy," referring to Paracelsus, in the Encyclo-

pedia from which we have already quoted, "inculcates the dogma that there is only one real elementary matter,—nobody knows what. This one prime element of things he appears to have considered to be the universal solvent of which the alchemists were in quest." After centuries of experiment and discovery science seems now to have made its own this once absurd teaching. Says Prof. Edward L. Nichols, of Cornell University, in the November issue, 1904, of the *Popular Science Monthly*: "The evidence obtained by J. J. Thomson, and other students of ionization, that electrons from different substances are identical, has greatly strengthened the conviction which for a long time has been in process of formation in the minds of scientists that all matter is in its ultimate nature identical. This conception, necessarily speculative, has been held in abeyance by the facts regarded as established and lying at the foundation of the accepted system of chemistry of the conservation of matter and the intransmutabilty of the elements. The phenomena observed in recent investigations of radio-active substances have, however, begun to shake our faith in this principle. If matter is to be regarded as a product of certain operations upon the ether, there is no theoretical difficulty about the transmutation of elements, variation of mass or even the complete disappearance or creation of matter. The absence of such phenomena in our experience has been the real difficulty, and if the view of students of radio-activity concerning the transmutations undergone by uranium, thorium and radium are substantiated, the doctrines of the conservation of mass and matter which lie at the foundation of the science of chemistry will have to be modified." Just how would this "variation of mass" or "complete disappearance or creation of matter" take place? Perhaps, the following passage from Professor Rutherford's work on radio-activity, quoted by Professor Nichols in the same article, may afford a clue: "The electron or corpuscle is the body of smallest mass yet known to science.... Its presence has only been detected when *in rapid motion*. This apparent mass *increases with the speed* as the velocity of light is approached."

Professor Nichols's article, it will be observed, was written in 1904, before the phenomena of radio-activity had become as fully or widely known as they became in the year following. That all doubt as to the character or significance of the new phenomena had disappeared within less than a year may be seen from the paper contributed to the July issue, 1905, of the same periodical by Prof. A. E. Dolbear, a portion of which will be recognized as having been already quoted: "We have all been taught, and have probably

had no misgivings in saying, that matter is indestructible. Much philosophy is founded upon that proposition. But we are now confronted with well-vouched-for phenomena from two independent workers that under certain conditions a certain mass of matter loses weight, not by mechanical removal of some of its molecules, but by physical changes which take place in it. This is a piece of news that is almost enough to paralyze a scientifically minded man, for stability of atoms, unchanging quantity and quality, seems to be at the basis of logical thinking on almost all matters. In the Arabian Nights we may expect that the unexpected will happen,—genii may be summoned to do this or that, and matter may be annihilated at will,—and the conception gives one pleasure though one knows it to be impossible, and one thinks it impossible because he has never known such changes in matter because one has been taught that matter is indestructible."

We could scarce have believed a few decades ago, as we thumbed the pages of Eastern lore and read of the mysterious enchanters who moved objects at a distance by gesture, or who professed the power of communing with the beings of other planets and, indeed, of transporting themselves to those spheres, that the sober judgment of science could ever lend countenance to ideas so far-fetched. Such, however, in some degree seems the case, and it is fit matter of marvel that scientific speculation should venture upon ground so long resigned to the chimeras of superstition. We can not refrain from quoting another passage of the highly interesting article by Professor Dolbear from which we have already drawn so liberally. "It seems," he says, speaking of the latest deductions from the observed phenomena, "as if the atoms acted as transformers of ether energy into ordinary and familiar forms, such as heat and electricity, and, *vice versa,* transforming the latter into ether energy. When we learn this secret we may likely enough be able to artificially extract from the ether as much energy as we may need for any purpose, for, as I have said, it is inexhaustible, and every cubic inch of space has enough for all the needs of a man for many days." We may close this portion of our paper with the following remarkable sentence from an address on "Astro-physics" by Prof. W. W. Campbell, Director of the Lick Observatory, University of California, published in the February issue, 1905, of the *Popular Science Monthly*: "The actual transport and interchange of matter in the form of small particles from one star to another seems to be a plain and unavoidable consequence of recently established physical facts."

How impressively do these utterances bring back the stories upon which, through all the ages, the imagination of man has loved to dwell! The adept, causing himself to grow visible before the eye and fading as rapidly into vacancy,—the wizard with his magic rod, weaving about him a sphere of light or impulsing from his hands a nameless energy before which animate beings fall away as before a furnace flame,—the medium lending his atoms that the spirits of the dead might be clothed upon for a brief hour with a shadowy garment of flesh: these beliefs, and many others, borrowed by modern spiritualism from ancient tradition, and long laughed at by science as disproved by the simplest principles of physics, have gained a singular dignity from the scientific unfoldments of the past few years. The doctrines,—or, as they may now be more fittingly called, the dogmas, of the indestructibility of the atom and of the inertia of matter,—dread weapons as these have ever been in the hands of the scientist against the claims of the spiritualist,—have suddenly lost their potency, and science stands now abashed and swordless in its age-long battle against the psychics!

Why, the thoughtful mind must ask, these successive triumphs over science of ancient notions disowned by the learned and which we have been taught from infancy to rank with the superstitions of the rudest and most barbaric ages? Whence the strange foregrasp of truths but just now breaking upon us and which we find germed in the hoary beliefs that have formed the mental heritage of the race in every age and under every sun? The same enigma has puzzled those who in studying the religions, mythologies and customs of the world are startled by singular likenesses in ideas and practices between widely sundered peoples. Who can fail to recall the astonishment of the Spanish priests when they found the cross a religious emblem in the land of the Incas,—a spectacle which they could only explain as the work of the Devil; and the universality true of religious rites and symbols is equally true of magical rites and symbols. "These instances," observes the writer of the article "Magic" in the *Encyclopædia Britannica*, "are selected to give an idea of the sorcerers of the lower races and their modes of working, which are remarkable for their uniformity in the most distant regions, among tribes who can have had no communication or connection since remote ages."

May it be that the beliefs which have clung so tenaciously to the race through all its history, and which in so many instances have been justified by the later researches of science, are but broken gleams of truths once known to man but since lost and forgotten?

Is it possible that in its ascent from the brute plane to the human, mankind, scores of centuries ago, upon a continent now sunk, perhaps, beneath the sea, reached a pitch of civilization and psychic culture far more splendid than it has ever known since, but that in some huge lapse from its high estate, long before historic time began, the race sank back in night; and that the stories handed down to us of magicians who made pictures to move and speak and strange fruits and plants to grow,—who rode the air in fiery chariots,—who thrust aside the laws of heat and cold and overcame the laws of gravitation,—and who, finally, could have converse across unmeasured leagues of space and bring within sight and touch the spirits of the departed,—are but faint and failing memories of faculties and powers possessed by man in that far-off time? He might be bold who would venture to assert that such is true, but such a theory would assuredly gather into order and connection phenomena which hitherto have given pause to the thoughtful, and yet would accord with the leading facts of evolution. The Atlantis of the Grecian sages which went down beneath the sea may be more than a myth,—though it is hardly in the Atlantic that we must seek the submerged continent which afforded the race its birth-place; and the tradition recorded in our scriptures of a great prehistoric cataclysm, when every vestige of civilization was blotted from the earth, may be but another facet of the same truth. Who can forget that the story of a buried city at the foot of Vesuvius was deemed a fable and a fancy until the spade of the scientist in modern times disentombed from their long oblivion the art and architecture of Pompeii and Herculaneum; and no lover of Grecian life and Grecian thought can remember without a sigh that the civilization of that surpassingly great people,—the highest, perhaps, to which historic man has attained,—is but a memory and a tale, and that through the Dark Ages, until the re-birth of learning in Europe, Athens with its matchless marbles, its oratory, its poetry and its philosophy, was almost as much a myth as is for us the lost Atlantis!

It would be interesting to pursue in detail the theory of a prehistoric continent, the birth-place of the race and the seat of its forgotten splendor, and to show how many facts familiar to science and philosophy range themselves about the idea; but space forbids. Recalling, however, how much our amazement has been wrought upon by past discoveries, shall we feel surprise if the science of the future show that the race in very deed is but re-climbing, painfully and tardily, a height which far back in the lost ages it reached and passed?