

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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CHICAGO

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THE THREE FATES.

From a Painting by Michael Angelo in the Gallery of the
Palazzo Pitti in Florence.

Frontispiece to The Open Court

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ON GREEK RELIGION AND MYTHOLOGY.

BY THE EDITOR.

THE DAUGHTERS OF ZEUS.

THE deeper philosophical significance of the Greek idea of God is only dimly foreshadowed in the mythology of Zeus, but is not as yet contained in it. Almost all the ideas that played a prom-



ATHENA.

Gem of Aspasios in Vienna.
(Eckhel, *Choix de pierres
gravées*, pl. XVIII.)



EUROPA ON THE BULL.¹

Ancient Cameo.

inent part in Greek religion, be they personifications of the powers of nature or the ideals of life, were represented as children of Zeus; and thus there are many legends of the various marriage relations of the great son of Kronos. We are told that Zeus was first wedded

¹Europa, according to Hesiod a daughter of Okeanos and Tethys *Theog.* 357, is a form of the earth-goddess, and Zeus abducted her in the shape of a bull. Her children are Minos and Rhadamanthys, the judges of Tartaros; or, by another version, Minos and Sarpedon.

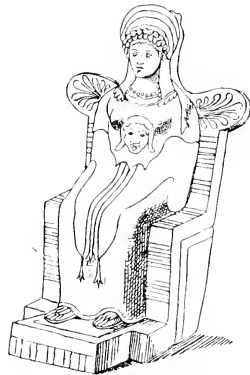
to Metis, i. e., wisdom, a daughter of Okeanos; but Moira, the goddess of fate,¹ warned him that the son of Metis would be mightier than his father, and so Zeus divorced himself from his first spouse, taking the infant which she was about to bear him, and hiding it in his own head until it had grown to maturity. When the time arrived, Pallas Athene, the goddess of science and art, fully dressed in armor, sprang forth from his forehead.

Having divorced himself from Metis, Zeus married Themis,



PALLADION.

The statue of Pallas Athena as protectress. (After Jahn, *De ant. Min. simulacris*, tab. 3. 7.)



PALLAS ATHENA² (Archaic).

After Stackelberg, *Gräber der Hell.*, plate 57.

the goddess of justice, whose daughters are Astræa, the goddess of the zodiac, and the Seasons or Horæ and the Fates. — — —

¹ Moira, i. e., allotment or destiny, is an important conception in Greek mythology, but it has never been personified into a concrete deity. The same idea is represented sometimes by Nemesis (retribution), sometimes by Ker (doom). Zeus determines the decision of fate, as to the lives of Hector and Achilles, by consulting the balance and weighing the chances of both heroes in its scales. Adrastos (i. e., the inevitable) is a male representation of Nemesis in the sense of destiny and death, who is also called *Néμεσις Ἀδράστεια*.

² The oldest statues of Pallas Athena show the goddess seated on a throne without armour and sometimes adorned with the Aegis (the Gorgon-head) on her breast. This type is frequently found in the ancient tombs at Athens. Cf. Roscher, *Lexikon der römischen und griechischen Mythologie*, I., pp. 687-688.

The number of the Seasons and their names vary. In Athens, two were worshipped under the names of Thallo (Budding Time)



PALLAS ATHENA CARRYING A NIKE IN HER HAND.
Discovered in 1880 near the Varvakeion Gymnasium at Athens.¹



Hephaestos² Zeus Nike Athena The three Fates

THE BIRTH OF ATHENA AND THE THREE FATES.

(After Schneider, *A. A. O.*, pl. I., 1.)

and Karpo (Harvest). They are frequently represented as three in number, and philosophical speculation describes them as up-

¹This statue is an imitation of the famous statue of Phidias, which was built of ivory and gold, the eyes being precious stones. See *Die Athena Parthenos des Phidias* by Th. Schreiber, Leipsic, 1883, and Charles Waldstein. *Essays on the Art of Phidias*, Essay VIII.

²According to Apollod., I., 3, 6. Prometheus (not Hephaestus) acted as obstetrician to Zeus.



ATHENA WRITING.

Vase picture. (From *Élite céramogr.*, I, 77.)



THE THREE GRACES.

(Torso preserved in the Academy of Siena.)¹



ATHENA SLAYING A GIANT.

(From *Élite céramogr.*, I, 8.)

¹ The oldest Graces are always dressed and dancing or walking in step. The name of the artist who was the first to represent them naked and standing in a circle is not known, but the great number of copies preserved proves how very popular this conception became. The torso preserved in Siena is commonly regarded as the most beautiful copy of this group. (See p. 582.)

holders of the divine order under the names Eunomia (Good Law), Dike (Right), Eirene (Peace).

The nine Muses, the representatives of the arts and sciences, are said to be the daughters of Zeus and Mnemosyne (i. e., Mem-



ATHENA OF ALBANI.

(Colossal bust now in the Glyptothek at Munich. From a photograph.)

ory). They are Klio (History), Melpomene (Tragedy), Thalia (Comedy), Kalliope (Epic), Euterpe (Music), Polyhymnia (Song and Oratory), Erato (Love Lays), and Terpsichore (Dancing).

Grace and loveliness are represented in the three Graces, who are reputed to be daughters of Zeus and Eurynome, the goddess



THE PALLAS ATHENA OF VELLETRI.

Colossal statue now in the Louvre. (Braun, *Vorschule zur Kunstmythologie*, pl. 60.)

of universal law, a daughter of Okeanos. Their names are Aglaia, Euphrosyne, and Thalia.

The fates are Klotho, Lachesis, and Atropos. Klotho (i. e., the Spinner) starts the thread of life; Lachesis (the Receiver)



BIRTH OF PALLAS ATHENA.
(Gerhard, *Auserl. Vasenbilder*, I., 1.)



APOLLO MUSAGETES AND THE NINE MUSES.

Florentine Museum. (From Taylor, *Elusianian and Bacchic Mysteries*, p. 10.)

measures its length, and Atropos (the Inevitable) cuts it off. It may be interesting to note in this connexion that Hesiod (i. e., the



EUTERPE.



POLYHYMNA.



ERATO.



TERPSICHORE.

unknown author of the *Theogony*) forgets that, in the passage quoted in the last number of *The Open Court* he made the Fates daughters



URANIA.



KALLIOPE.



THALIA.



MELPOMENE.

of the Night. In giving their present genealogy, he speaks highly of the Fates, saying that "counselling Zeus gives them most honor," and that "they dispense good and evil to men."

HERA, THE WIFE OF ZEUS, AND HER CHILDREN.

The chief wife of Zeus is his sister Hera ; she is worshipped as the queen of heaven, as the virgin goddess, as the protectress of marriage, as the wife in all her dignity and nobility.



KLIO.



MNEMOSYNE.



THE THREE SEASONS (HORÆ).

(After a bas-relief on the *Ara Borghese*.)

That Hera is at once virgin and mother is an idea which is quite common in mythology; it can be traced back to older sources



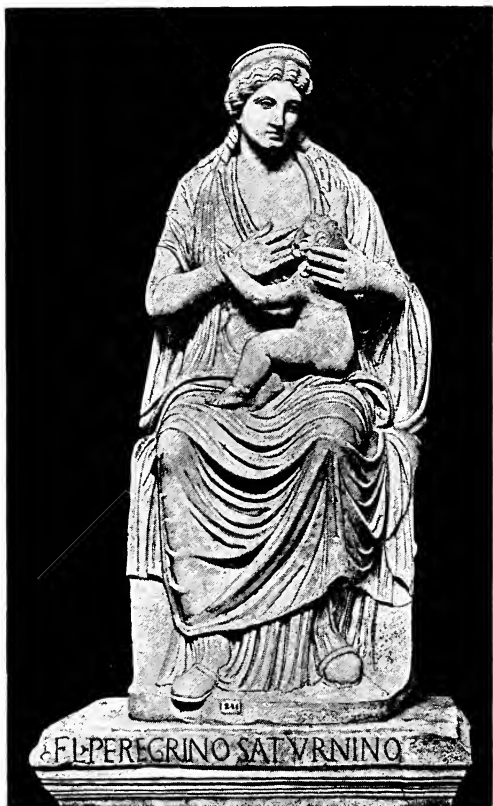
THE THREE GRACES OF SOCRATES.¹
Group at the entrance of the Acropolis.



HEAD OF HERA.
From a mural painting in Pompeii. (*B. D.*, I, 649.)

¹ None of the older representations of the Graces are naked. A group of the three Graces at the entrance to the Acropolis in Athens is said to have been sculptured by Socrates the philos-

and has been perpetuated in Christianity to the present day, where it found definite expression in the dogma of the virgin mother of



THE NURSING MOTHER.

Supposed to be a statue of Hera. (Vatican. *B. D.*, I., 650.)

Christ, who in artistic representations is still depicted the same as Astarte, standing on a crescent with a crown of stars on her head.

opher (*Paus.*, I., 22, 8; IX., 35, 2; *Schol. Ar. Nubb.*, 773). Müller (*Arch.*, § 336, 7) does not believe that the philosopher ever became an expert sculptor. Fragments found on the place prove that the group here reproduced, discovered in Rome and preserved in the Museo Chiaramonti in the Vatican, is an exact copy of the so-called Athenian Graces of Socrates.

Hera bore to Zeus, Hebe, the goddess of eternal youth; Ares, the god of war; and Hephæstos, the smith among the gods.

Aphrodite was married to Hephæstos, but some legends make her the wife of Ares, the god of war, which again produced the story of the jealousy of Hephæstos, as told by Homer.

Ares, according to Homer, fights on the side of the Trojans against the Greek and represents bellicosity and truculent courage



WEDDING OF ZEUS AND HERA.¹
Fresco of Pompeii.

rather than the art of warfare, the latter belonging to the domain of Pallas Athena.

Hephæstos, the god of the fiery forge, is described as lame, probably on account of the flickering of the flame which seems to ascend to the sky with a limping gait. Myth-lore, the gossip of the gods, offers another explanation. We are told that when the heavenly parents of Hephæstos were once quarrelling, the faithful

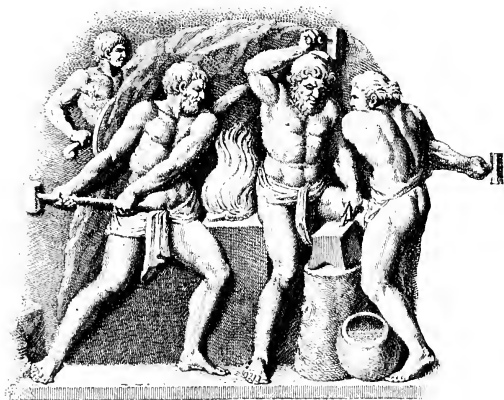
¹Formerly regarded as the wedding of Kronos with Rhea, but now since Helbig's study of the picture in his *Wandgemälde*, N. 114) firmly established as the marriage of Zeus with Hera. Iris, the winged messenger of the gods, is leading the bride.



ARCHAIC ARTEMIS OF POMPEII.
Now in the Museum of Naples.



HEBE.
(See page 589.)



HEPHAESTOS ASSISTED BY THE CYCLOPS.
Sarcophagus relief. (From *Mus. Capit.*, 4, 25. Cf. Roscher,
Lex., I., pp. 2070 ff and II., p. 1679.)

son came to the aid of his mother, and father Zeus seizing the boy by one of his feet threw him out of a window of the divine palace

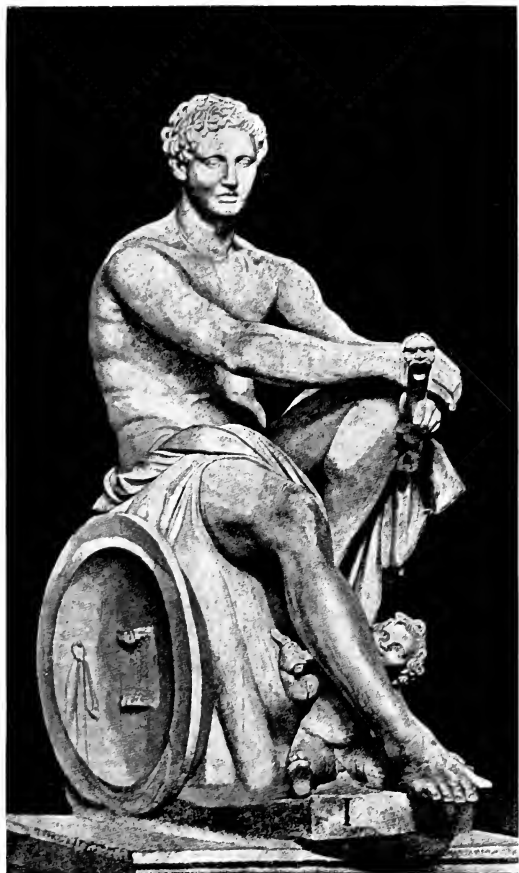


LETO FLEEING WITH HER CHILDREN, APOLLO AND ARTEMIS, FROM PYTHON, THE DRAGON.
Vase-picture in red figures in Nolan style. (From *Étude céramogr.*, II, 1.)

on Mount Olympos. Hephæstos, being a god, survived the fall but sprained his ankle and remained lame for the rest of his life.

* * *

While the children of Hera are important deities, there are other children of Zeus some of whom are superior to them in rank



ARES, COMMONLY CALLED MARS LUDOVISI.

Supposed to be made either after an original by Scopas, or after the Apoxyomenos of Lysippos.¹

¹ For archaeological details see Wieseler, *Alte Denkm.*, II., No. 250.

or at least are of greater significance. Their rise is mainly due to the parallelism of several similar myths with different names and a



ARCHAIC APOLLO.

Vase-picture. (*Mon. Inst.*, III., 44)

varying local coloring; but their relation to the great father of gods and men is throughout the same.

As the life of Christ is the most essential part of Christianity.

because it reveals the nature of the Christian God, so the legends of the sons of Zeus contain the most essential conceptions of the religion of classical Greece, and these sons are all, each one in his own way, prototypes of Christ. All of them are saviours; they have come into life to reveal the truth, to bring liberty, to redeem



HEAD OF THE APOLLO BELVIDERE.
(After a photograph.)

mankind from sin, to atone for guilt, to ransom the weak from the powers of evil, to liberate those that are in the bondage of the body from the curse of materiality, to endow them with spiritual life, to rescue men from death and grant them immortality.

APOLLO AND ARTEMIS.

Leto (that is, the hidden one, the deity of the night) bore to Zeus on the Island of Delos, the manly Apollo, the god of the sun



THE APOLLO BELVIDERE.

and of poetry, and Artemis, the goddess of the moon and of the chase. This legend is not an isolated one. Light is frequently



APOLLO KITHARODES.

Vatican. (After the type created by Scopas.)¹

¹Augustus placed a statue of Apollo, playing the cithara, by Scopas, in the temple on the Palatinum. Nero imitated the costume of this statue in his own dress, and the Vatican statue, a copy of this Apollo Kitharodes, allows us to judge of the beauty of the lost original.

supposed to be a child of darkness. Thus we read in Goethe's *Faust* of :

"Finsterniss die sich das Licht gebar,
Das stolze Licht, das nun der Mutter Nacht,
Den alten Rang, den Raum ihr streitig macht."



THE VATICAN ARTEMIS OF EPHEBUS.
(After a photograph.)

But though the legend of Leto and her children in the form in which it is preserved in Greece can scarcely be ancient, it contains features which point back to prehistoric mythological ages and re-

mind one of the story preserved in the Revelation of St. John, chap. xii. Leto wanders from place to place, but finds no asylum



THE TORCH-BEARING ARTEMIS.
(Vatican.)

from the pursuing dragon Python, because people are afraid of the mighty god whom she will bear, until she reaches the place of

revelation (Delos), the rocky island in the sea, which formerly floated about upon the waters but now is made stationary.

Apollo is the solar deity of Greece. As such he represents light in every form. He is the revealer and the dispenser of oracles. His weapon is the bow, his instrument the lyre. As the god of poetry and music, he is Musagetes, the leader of the Muses. He



ARTEMIS, DISCOVERED IN DELOS.
(Collignon, *Myth. de la Grèce.*)



ARTEMIS EPHESIA.
Alabaster statue now in the museum at
Naples. (Roscher, *Lex.*, I., p. 588.)

is called Phæbos, the Bright One, Pæon the Healer, Pythios the slayer of the dragon Python. His birthday was celebrated in May on the island of Delos, and his most famous temple stood in Delphi. There a tripod was placed over a chasm from which vapors arose, and whenever the oracle was consulted the Delphic priestess, called

Pythia, was seated on the tripod. The vapors caused her to fall into a trance, and her utterances while she was in this condition were reduced to verses by the priests.

The Delphic priests as a rule were well informed and gave



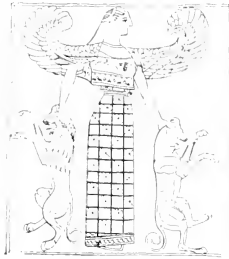
ARTEMIS OF VERSAILLES.¹

Now in the Louvre. (Bouillon Musée, I, 20.)

their patrons good advice. The influence of the Delphic oracle over Greece was very great and undoubtedly beneficent.

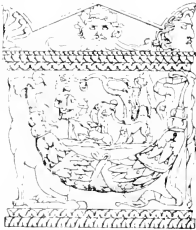
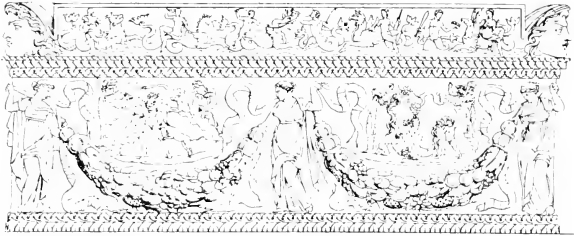
Apollo's twin sister is Artemis, the goddess of the moon. She loves to roam through the forests and is the protectress of the

¹ Found in Hadrian's Villa near Tibur.



ARTEMIS.

The winged deity holding dominion over the animal world.¹

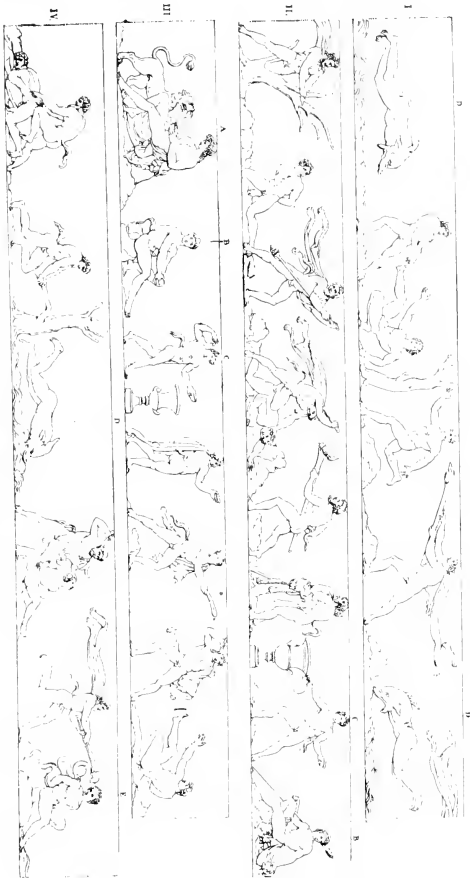
ACTÆON SARCOPHAGUS.²

Found in the neighborhood of Rome, now in the Louvre
Clarac Musée, pl. 113-115.

¹ Fragment of the François vase. *Mon. Inst.*, IV., 58. This type of Artemis is pre-Hellenic and reminds us strongly of similar Assyrian monuments.

² In one scene Artemis is represented as taking a bath watched by Actæon, in the other the punishment of the indignant goddess is represented, Actæon being torn to pieces by his dogs. One side shows the preparations for the chase, the other the lamentations over the dead Actæon. The lid is decorated with sea-nymphs riding on hippocamps.

chase. Her main temple stood in Ephesus, on the coast of Asia Minor, where under Eastern influence she was worshipped like Astarte, as Mother Nature and the nurse of all beings.



THE LYCERATES MONUMENT AT ATHENS.
 The bas-relief represents the legend that Dionysos was once caught by Tyrrhenian pirates who were changed into dolphins and then driven into the sea by satyrs. Hence the dolphin was sacred to Dionysos.

The picture of the properly Greek Artemis in Athens and other cities of European Greece is different. There the goddess of the chaste moon is conceived as a virgin, whom at her request Zeus, her father, had granted the privilege that she should be at

liberty to remain forever unmarried. She punishes severely every trespass against decorum. She, as does also her brother Apollo-



DIONYSOS BETWEEN TWO SATYRS.

Central scene in the Lysicrates monuments at Athens.



APOLLO ON THE TRIPOD, FLYING OVER THE OCEAN.

(Picture on a water-vessel in the Gregorian Museum of the Vatican.

Étude céramogr., II., pl. 6.)

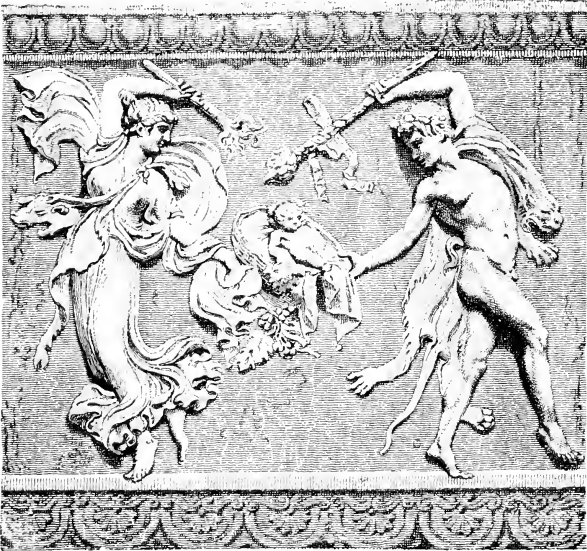
represents sudden death, especially if caused by heat in the days of the dog-star, the hot season of the year. There are contradic-

tory legends as to how she slays the hunter Orion and changes Actæon into a stag to be torn to pieces by his own hounds.

The stories of Iphigenia, and Orestes and Pleiades prove that the custom of offering human sacrifices to Artemis was not forgotten in historical times.

DIONYSOS.

By Semele, a form of the moon different from Artemis, Zeus begot Dionysos or Bacchus. Semele, anxious to see her lover in



DIONYSOS LIKNITES.

The Bacchic child in the winnowing basket. Terra-cotta relief.¹

all his divine glory, made Zeus promise on oath to fulfil her wish, but unable to bear the awful majesty of his presence, she died, leaving the care of her as yet unborn babe to his father. Zeus took the child (as he had taken Athene before) and, maturing it in his thigh, bore it a second time and had it reared by nymphs at Nysa under the superintendence of Seilenos.

Dionysos, the Liberator, the gay god of wine and salvation from the bondage of the body, stands next in dignity, but not less in

¹After Combe, *Terracottas*, 24, 44. B. D., pl. XVIII.

importance, to Apollo. Trances and ecstasies, as well as dreams, were accepted as evidences of the spirituality of man's nature, and as wine produces an artificial ecstasy, the god of wine was worshipped as the saviour who delivers the soul from the bondage of



ARIADNE SLEEPING.¹
(Vatican. After a photograph.)



THE WEDDING-PARADE OF DIONYSOS AND ARIADNE.
(Sarcophagus in the Glyptothek at Munich.)

the body. It is noteworthy that the symbol of the vine is common to both Christianity and Greek paganism, and Christ, like Dionysos, makes his entry riding on an ass.

¹ Formerly regarded as a Cleopatra on account of the serpent which serves as a bracelet on her arm. Winckelmann proposed to regard the statue as a sleeping nymph, but by comparing the statue with a number of reliefs on sarcophagi Visconti succeeded in convincing archaeologists that we have here an Ariadne in the moment before she is surprised by Dionysos.

Dionysos dies and is resurrected. Under the name Zagreus he is torn to pieces and parts of his body are devoured by his murderers, the frenzied manads.

The spouse of Dionysos is Ariadne, originally a goddess of spring, another form of Persephone. When through the influence of the Athenian drama the legend of Ariadne's deliverance through Theseus became firmly established, the ancient tradition was modified and so interpreted that Theseus at the instant of divine interference, commonly attributed to Athena, left Ariadne sleeping in Naxos where she awakens at the approach of Dionysos.



DIONYSOS SCUDDING OVER THE SEA.¹
(Gerhard, *Auserl. Vasenb.*, I., 49.)

The Dionysian Mysteries were celebrated by many, but few only were able to understand their significance. Plato said :

"There are many partakers of the sacred rites who bear the Thyrsus (the sacred staff of the god), but few are true Bacchi."²

Εἰσὶ δὲ, φασὶν οἱ περὶ τῆς τέλετας, ναυπηγοκόρη μὲν πολλοὶ, βᾶκχοι δὲ παῦροι.—Plato, *Phaedo*, 69.

We have little positive knowledge about the Mysteries of Dionysos Bacchus, but we know that they implied a belief in the spirituality of the soul and a resurrection to renewed life.

[TO BE CONTINUED.]

¹ The picture was broken in the middle, the rent crossing the sail and the face of Dionysos.

² βᾶκχος in Greek means not only the God Dionysos, but also his followers, i. e., those who have been initiated into the Bacchic mysteries.

THE CURBING OF THE SPIRIT OF INQUIRY.

BY CARUS STERNE.

ON high authority we are told to day that there are a number of world-enigmas which the human mind has never solved and never will solve. If we also recognise these enigmas as apparently the most important and most worthy of solution, we are overcome for a moment by despondency, in which comes the suggestion: forsake the hopeless path of investigation; be content; believe in what the Church offers you as irrefutable and certain truth, and be happy in your ignorance. Nowhere is the inscription over the gates of Dante's Inferno, "All hope abandon ye who enter here," more appropriate than over the portal of the proud temple of philosophy.

For such discouragement there is but one remedy: the study of the natural sciences in their historical development, a retrospect from their present attainments to their beginnings; not because "such splendid progress we have made," but because we can now for the first time fully appreciate how much we have been expected to accept on faith as irrefutable truth, and recognise under what enormous difficulties we have been compelled to labor in gaining the modest store of knowledge which constitutes the present glory of the race. It is as instructive as it is remarkable that those who were the first to propose giving up the Sisyphean task of investigation, have always been the least inclined to act accordingly. Thus it was, for instance, with Socrates, who liked to boast of his own ignorance, and who according to Xenophon called all foolish who labored to investigate natural laws and celestial phenomena. And yet he himself was never weary of learning, to the great displeasure of the populace, whose point of view is represented by Aristophanes who pictures Socrates seated in a basket high above

¹ Translated from the German by Prof. L. L. Jackson, State Normal School, Brockport, N. Y.

the heads of the people, discussing useless questions. Surely such occasional utterances will lead no one to include Socrates among those *beaux esprits* of whom Propertius says :

"None of these crave to know the inner truth of the cosmos,
Nor how from her radiant brother Luna deriveth her light ;
Whether beyond the Styx extendeth the span of existence,
Nor whether the thunder-bolt with deliberate purpose is aimed."

Such reflexions on the inadequacy of human understanding have arisen inevitably whenever reason and growing knowledge have conflicted with a system of religious views which had originated in earlier times and been regarded as final. Even Cicero in his dissertation *De deorum natura* has his academician, Balbus, condemn in a similar way the Danæan gifts of the human understanding and the misleading speculations of philosophy, just as the Apostle Paul a hundred years later did from his point of view.

"Everything," says Balbus, "goes to show that quite as much evil as good is accomplished through reason ; the good by few men and rarely, the evil by most men and often ; so that it were actually better had the gods denied men reason altogether, since they are constrained to combine with it so much evil. Wine is seldom beneficial to the sick, and generally injurious, so that it is safer not to give it at all than to risk life in the uncertain hope that it may be useful. Just so I am convinced that to have withheld from the human race altogether that activity, keenness, and precision of thought called reason would have been better than to give it in the abundant measure which is so destructive to most people and useful to very few."

Now if Cicero, who was tolerably free from religious prejudices, expressed himself in this way, how can we blame the teachers of Christianity if they occasionally inveighed against the philosophical productions of human reason which they could not harmonise with Scriptural accounts. "Beware lest any man spoil you through philosophy and vain deceit," wrote Paul to the Colossians when he saw that his arguments were no match for those of the philosophers at Athens and elsewhere. The Christian fathers accordingly felt forced to avoid strife, and to deny to unbelievers the right of research, asserting that they themselves possessed the truth. In this connexion there is nothing more instructive than the principles which Tertullian (died A. D. 220) advanced in his treatise *De Præscriptione Hæreticorum*, the heretics having appealed to the Scripture, "Seek and ye shall find." Even "if the heretics," said he, "were not enemies of the truth and we were not warned before-

hand to avoid them, how under any circumstances could we bring ourselves to dispute with men who themselves confess that they are still investigating? If they are still seeking for truth, it is surely because they have found nothing certain, and by their further investigation they merely show that they regard all previous conclusions as doubtful. . . . For us Christ has made all inquiry unnecessary, and the Gospel has made all search for truth superfluous. . . . With faith all seeking and finding cease. . . . No one is wise but the believer."

These utterances are more significant than the declarations of the same Church Father, spoken in wrath and half ironically, "I believe because it is absurd" (*credo quia absurdum*), and, "It is true because it is impossible," for they indicate the attitude which later apparently justified the Church Fathers in their opposition to the demands of investigators for a hearing. I say apparently, for they would really have been justified only in case they themselves had also given up the investigation and disingenuous interpretation of the Bible and placed childlike faith in every word as it stands. Then only would they have been justified in concluding, as Tertullian does in the same dissertation, "Hence we establish first of all this principle: heretics are not to be permitted to take part in any disputation concerning the Scriptures."

In sharp contrast to this Church Father's opinion that believing Christians possess the truth and need not investigate, is the fact that the Church Fathers never wearied of searching the Scriptures and vexing their poor brains in the attempt to comprehend the incomprehensible things contained therein, instead of simply believing them. What infinite labor and fathomless ingenuity did the theologians waste on the first chapter of the Bible alone, instead of straightway recognising with Faust the uselessness of such efforts, and furthermore they subject themselves to the reproach of carelessness, in creating difficulties where none existed. Thus, for example, John Chrysostom from the mere order of the words of the first verse of the Bible, "In the beginning God created heaven and earth," drew the conclusion that the creator did not begin the universe with a foundation, as men begin their houses, but began with the roof; or, as the Mansfeld priest, Simon Musæus, (died 1576), expressed it in his drastic way, "But God just reversed [man's method] and made first the sky for an arching roof, and left it swinging unsupported until on the third day he placed the earth beneath it."

Endless discussions were called forth by the circumstance that

in verses 3-5 the creation of light and of day and night occurs several days before the creation of the sun and the moon, of which it is said that they are to divide the day from the night and to number the days and years. With the limited intelligence of a savage who believes that the heavenly luminaries are daily kindled and extinguished, Basil the Great in his commentary on the six days of creation conjectured that the first days of the world, before the appearance of the sun, were divided into day and night by the alternate expansion and contraction to the vanishing-point of the original light. Fortunately a converted Neo-Platonist of the early Middle Ages, whose writings appeared in the sixth century over the name of Dionysius, the Areopagite, helped his fellow-believers out of their difficulty. Using certain ideas of Gregory of Nyssa, he devised the idea of original and formless light out of which, on the fourth day of creation, the sun was fashioned, but which by revolving about the earth had already produced day and night. It was a lucky thought which the mystics of the Middle Ages eagerly took up and expanded. With this interpretation there was no longer any difficulty in reading that the plants sprang out of the earth before the sun had been created, and this dogma gave St. Basil especial satisfaction, because it utterly confused the idolatrous sun-worshippers, who maintained that the sun should receive supreme worship, because all earthly life is developed by its rays.

The unquenchable thirst for investigation carried the interpreters of the Bible to the farthest extreme, and they could not be content until they had determined the hour and season when the world was created. Since on the very first days of creation herbs and trees sprang up from the new earth, Damascenus, Theodoret, Ambrose, Gregory of Nazianzus, and the majority of the earlier Church Fathers held that the world was doubtless created in the spring, the loveliest season of the year. And Petrus de Alliaco added in his *Imago Mundi* (A. D. 1410) the more precise time, claiming that the formless light, as well as the sun itself, was created when at zenith in the sign of Aries, that is on a March noon. Concerning the moon Ephraem Syrus had already expressed the opinion that it was created at full, as it appears on the fifteenth Nisan at the time of the vernal equinox. Scarcely a zealous theologian of later times who spoke or wrote concerning the creation ventured to pass over this weighty question without forming an opinion. Among the authoritative Catholic Churchmen Duns Scotus, Cajetan, Molina, and Cornelius a Lapide held the opinion that the world was created in the spring. Luther and Melancthon besides most of

their followers accepted this view, as also did the Calvinists, Isaac Vossius and Scaliger. On the other hand there were distinguished Catholic scholars who advocated just as ardently the autumn; among these were Arias Montanus, the editor of the Antwerp Polyglot Bible, Pererius, and Père Mersenne. Among the followers of Luther the view was held by Calvisius, the famous chronologist of Leipsic. Their reason was that the trees of Paradise instead of bursting into bud and blossom, immediately after their creation had borne fruit, and Hogel, rector of Gera, figured it out that God had begun the work of creation on the evening of October 26th. Gerhard Mercator, the famous geographer, advanced a third view, that the creation took place in mid-summer, but he seems to have secured only a meagre following.

From all of this we see that the theologians were not by any means so hostile to the investigation of nature as they are often represented to be, and as they must needs have been had they held Tertullian's views. While in the above-mentioned questions it mattered little which side one took, yet there were more serious subjects on which it was not safe to have a different opinion from that of the leaders and rulers of the day. We will pass by entirely in this connexion theological and even purely philosophical questions, as, for example, whether the earth was created out of nothing, and confine ourselves altogether to purely physical things in order to show how quickly rational thought was suppressed on the authority of a document which reflects the far from imposing scientific knowledge of the Jewish scholars of the fifth century B. C. Furthermore, views which do not appear in the Bible at all, nay, are not even hinted at, were read into it and embodied in established articles of faith merely because it seemed to certain theologians that certain passages admitted of one and only one definite interpretation. Not only the authors but also the expounders of the Bible came to be considered inspired.

Such a notion could not fail to lead to strange conclusions. In the first verse of the Bible, the all-encompassing sky is mentioned, and very naturally, before the earth, but the author certainly did not dream of interpreters so childish as to compare the creation of the world with the building of a house and say that it was begun at the roof. Familiar and universal expressions, used only in a figurative sense, such as the four quarters of the earth, the four winds and the four corners of the earth, because they had by chance found their way into the Bible, were forced to serve as proof that the earth has four corners, and cannot therefore be a

sphere. Popular notions which reflect, the world over, the immediate perceptions of the senses, and consequently found expression also in the Bible, for instance that of the apparent motion of the sun about the earth, were thought by this fact to have become indisputable evidence that the earth actually remains firm and immovable in the center of the sun's plane. Doubtless the worst of it all was that the opinions, which the Church teachers with their limited understanding of natural science had expressed concerning the uncertain meaning of certain Scripture passages, were afterwards pronounced to be as unimpeachable as the Bible text itself; and that consequently it became the most dangerous heresy to believe in the existence of the antipodes, in opposition to the opinion of St. Lactantius, to believe that death is the natural end of life, in the face of the opinion of St. Augustine, or to believe that the earth moves about the sun, in opposition to the conviction of the entire body of Church Fathers.

The significant feature of the whole situation is that the Church was endeavoring to establish for its schools a fixed system of doctrine which should fetter reason in matters of belief by trying to exempt definitively from all future criticism not only those doctrines which might be regarded as derived from direct revelation, but also those resulting from human interpretation. When the Church had once spoken through a council or through the mouth of the Pope, no opposition based on reason, no hesitation or doubt based on better information as to the actual facts, was to be permitted; the "sacrifice of the intellect" was demanded without distinction of every one. The knowledge of natural phenomena, still so limited, was not considered a science which was to grow, but as a store from which all succeeding generations were to draw. This is the explanation of the remarkable fact that under the sway of Christianity the natural sciences made no progress worthy of mention for nearly fifteen hundred years, that all research was confined to the comparison and working over of old texts. Belief based on authority, which expected truth only in what had already been thought and written, was carried to dangerous excess, for it was considered heresy to search for additional truth in nature or in one's own understanding. But inasmuch as doubts and varying views occasionally arose and were fostered even among Christians, by the writings and expositions of heathen philosophers and investigators, there developed among Christian teachers a hatred and contempt for all investigation not emanating from the Church, which appear the less justifiable since the system of Church doc-

trine had been built up only by means of diligent investigation and ardent discussions of the most subtle questions.

In this spirit Eusebius, the father of Church history, the learned but uncritical bishop of Cæsarea (died 340), called the inquiry of heathen philosophy into the nature of the soul "a useless, misleading, and vain waste of time," adding: Christians whose thoughts turn toward higher and better things, think lightly of such studies, not so much from ignorance as from contempt for useless labor. Basil the Great, several decades later, gave his opinion concerning the worthlessness of science even more unequivocally: "Christians have something better to do than to investigate the utterly trivial question whether the earth is spherical, flat, cylindrical, or cup-shaped." We have already seen how profoundly ignorant he was, and that he preferred the barbarian's theory of the heavenly luminaries to all others.

The Christian fathers, most notorious for their lofty contempt of science are Lactantius (died 330), who on account of his polished language was called the Christian Cicero, and St. Augustine (died 430), both of whom were probably sometimes rebuked by their contemporaries on account of their blind zeal against the theory of the antipodes. The former relieved his mind in the treatise *Concerning False Science*, as follows: "To investigate the fundamental causes of natural things, or to try to learn whether the sun is as large as it looks, or whether it is many times as large as the whole earth, or whether the moon is spherical or hollow, whether the stars are fixed in the firmament or move freely through the air, what are the dimensions of the heavens themselves, or out of what material they are made, whether they are fixed and motionless or revolve with infinite velocity, how thick the earth is, and upon what foundation it is balanced or suspended,—to wish to settle all these things by disputation or speculation is like trying to give a complete description of a remote city, which one has never seen and knows only by name."

This judgment contains the false assumption that the ancient mathematicians and astronomers arrived at their conclusions concerning the size and distances of the heavenly bodies by guess only and not by exact observation and measurement. We shall later have occasion to compare it with the assurance with which Lactantius decided questions concerning which he had not even presumptive evidence. When St. Augustine in a similar strain speaks of the "horrible zeal of the surgeons, who are called anatomists" and thinks that they have discovered none of the mysteries of life,

“although they have dissected the bodies of the dead, and have even inhumanly probed into the bodies of the dying with knife in hand,” we are reminded of the opposition to the vivisection of animals in our own day.



ST. AUGUSTINE.

(354-430.)

After a painting in the Uffizi Gallery.

Of course a complete exclusion of the opinions of heathen philosophers was the more difficult, because the principles of many philosophical schools were most excellently adapted to form the

foundation of the prospective ecclesiastical structure. Platonism particularly (introduced by Philo, the Jew, born 20 B. C.) was sponsor for certain New Testament dogmas; and Plato's notion of archetypes or "eternal ideas" (which were considered as real things present in the supernatural world of the Demiurge even before their embodiment in plant, animal, and human form) appealed the more to Augustine and other Church Fathers, since by means of these they could evade Origen's somewhat bold idea that God had created everything at once in one creative day, "in a trice," as Luther expressed it, and could base upon it all sorts of cunning subterfuges of a mediate creation or gradual embodiment of the archetypes, as, for example, in the case of those animals supposed to have sprung from the blood or decaying bodies of other animals. Neo-Platonism, with its ideas of ecstatic exaltation, intermediate beings, and emanations from the Godhead, was also not without important influence upon the doctrines of the new Church, although its pantheistic elements were for the time being excluded.

Somewhat later than Plato, and in a disconnected way, Aristotle acquired an influence upon the Church tenets, first by his cosmology, in the simplified form given it by Ptolemy, and afterwards through the other parts of his system for which Arabic and Jewish scholars served as interpreters and expounders. Despite the fact that the physics and metaphysics of Aristotle had been condemned by the Synod of Paris (1209), Albertus Magnus owed his extensive learning and his title, Doctor Universalis, chiefly to the study of Aristotle, and soon after his pupil, Thomas Aquinas, with open arms received the old heathen into the bosom of the one saving Church. Aristotle was soon considered the great light in the darkness, and even a very John, the forerunner of Christ on earth (*præcursor Christi in rebus naturalibus*). If we consider that in the cosmology of Aristotle, everything was arranged in accordance with design (the earth and man at the center of all things, the *ideas* of Plato no longer flitting about but still living innate within substance, the soul preceding the body, the idea, the form, and back of all terrestrial motion God as the primal and only immovable source of motion), then we can easily understand how Aristotle, soon after his re-discovery, inevitably became the favorite philosopher of the Church and the official philosopher of the Pope. We thus see how the present Pope, Leo XIII., could even dream for a moment of galvanising this philosophical corpse into life and setting him up in opposition to the wicked Darwin. Of course, the salty old pagan was thoroughly freshened and disinfected by Thomas Aquinas, but now

his authority re-established orthodox scholasticism, although under the assault of new ideas it did not long enjoy undiminished supremacy.



ARISTOTLE.

(384 B. C.—322 B. C.)

Bust of the statue of the Palace Spada in Rome.¹

The Church had unquestionably made a great stride forward in adopting the teachings of Aristotle, which after all were based upon the most careful observation and the keenest interpretation

¹ See the previous number of *The Open Court*.

of nature. But with this the Church considered that it had given all due consideration to earthly things, for had not Aristotle investigated all nature? Now he was to be cleaned from dust and put under a glass cover; no one was again to lay hand upon his reorganised system, which had been brought into the most beautiful harmony with the doctrines of the Church, for his works had been raised to a rank next to the Bible, as an almost equally authoritative source of knowledge. But the fresh breeze of the dawning Renaissance soon penetrated every crack and crevice of the system and hastened the gradual decay of the mummy.

[TO BE CONCLUDED.]

CERTAIN ASPECTS OF THE ELEUSINIAN PROBLEM.¹

BY THE REV. CHARLES JAMES WOOD.

I. PRIMITIVE RITES OF PURIFICATION.

THE Mysteries of Eleusis are among the few secrets of this world that men have never blabbed. We know somewhat of the outer form of the cultus. The ruins of the great hall of initiation (*τελεστήριον*) have been inspected,² and ancient writers recorded some notes of the ranks of membership, or degrees of progress in the occult learning. We know also how the society of Eleusis controlled the affairs, political and social, of all Greece. But the occult teachings and ceremonies of Eleusis were never divulged.

Greek dramas, the plays of Æschylos, Sophocles, Euripides, and Aristophanes, were written for the celebration at Athens of what was known as the Lesser Mysteries of Eleusis. The Lesser Mysteries were partly public, and the dramas presented six months later at the conclusion of the Greater Mysteries, echoed the Lesser Mysteries and concluded the rites. After initiation at Eleusis the Athenian returned home, and in concluding the ceremonies of his membership in the secret society he witnessed dramatic representations. Into the Greek theatre were gathered the uninitiated as well as the enlightened. Therefore, while the dramatic author would aim to impress upon the minds of the initiates some of the lessons which they had just before secretly learned, he would do so in a guarded way that he might not be guilty of revealing to the profane any of the secret elements of the Greater Mysteries. The penalty of this was death. It is reasonable therefore to turn to the Greek plays for some hints of the nature of the secret doctrines and liturgy of the Greater Mysteries of Eleusis.

¹ A paper read before the Classical Club of the University of Pennsylvania in 1897.

² Dyer, *The Gods in Greece*, Cap. V.

First of all let us define the function of the Eleusinian Mysteries in Greek social and religious life. The Eleusinian Mysteries constituted the Church of Attica, if not of all Greece. Its claims were arrogant, no less than this: *nulla salus extra ecclesiam*. This feeling is expressed in the Homeric *Hymn to Demeter*:

"Blest is he of mortal men who has beheld these; for he who is uninitiated and he who partakes not in these rites, have by no means the same fortune although both be dead, beneath the murky darkness."¹

Plutarch gives the later idea of the *opus operatum* theory of the effect of the initiation at Eleusis:

"When a man dies he goes through the same experiences as those who have their consciousness increased in the Mysteries. Thus in the terms *πείρωσιν* and *πέσιθαι*, we have an exact correspondence, word to word and fact to fact. First of all there are wanderings and wearying journeyings and paths on which we look with suspicion, and that seem to have no end; then, before the end, every kind of terror, shuddering, trembling, sweating, stupor; but at last a marvellous light shines out to meet us, pure spots and fair fields welcome us, with song and dance and the solemnities of sacred sounds and holy sights. In which state he who has already perfected himself in all things and received initiation, reaches his full freedom, and passing everywhere at his will, receives the crown and accomplishes his Mystery, in communion with the holy and pure, gazing down upon the unpurified multitude of the uninitiated who are still in life, wallowing in the deep mire and mist [of matter], and herded together, below him, abiding in misery from fear of death and want of faith in the blessedness of the soul-life. For you should know that the intercourse and conjunction of the soul with the body is contrary to nature."—*Fragment*, v, 9, Didot.

The rabbins of the school of Hillel were not more pharisaic; no close-communication Christian sect could be more arrogant. Yet, such is the character of religious secret brotherhoods anywhere in the world. There is a pleasure in the possession of knowledge, or rank, or power not generally distributed.

The association at Eleusis aimed to select the best men of Greece, and to teach them matters not suitable to the receptiveness of the common herd, truths too solemn and holy to risk profanation, ideas too spiritual for the books, doctrines too transcendental for clods to understand, and traditions which were at once incalculably ancient and belonged only to the descendants of heroes to learn. Later, foreigners and women were initiated, even slaves were admitted at public cost.² The Homeric *Hymn*³ says of Demeter as founder of the Mysteries at Eleusis:

"And she went to the law-administering kings, Triptolemus, and horse-goad-ing Diocles, and the might of Eumolpus, and Celeus, leader of the people, and showed them the performance of her sacred rites, and she appointed her hallowed orgies for all, for Triptolemus, and Polyxenius, and, moreover, Diocles,—orgies which it is in no wise lawful to inquire into, or mention; for a mighty reverence of the gods restrains the voice."

¹ The outcome of this thought will appear in Epitaphs quoted later.

² Foucart, *Le culte de Pluton dans la religion hellénique*. Lenormant, *Cont. Rev.*, 1880.

³ Compiled about 600 B. C. of ancient materials.

The purpose of the Mysteries was ethical, and the motives spiritual. The association was a sort of Gnosticism, a Freemasonry, a Nagualism, a secret society of the most conservative spirit, clinging tenaciously to customs, and rites, and beliefs which progress was then rendering obsolete in the ordinary or public life of Greece.¹

The ideas and ceremonies which were thus being driven into the secret shades of Eleusis, there to be cherished as august and sacrosanct, were such religious observances as belonged to the psychic constitution of the people,—we might say of mankind at large, as I expect to show. Evolution had advanced the Greeks but had not entirely abolished the psychic basis of savage observances.² Therefore in hidden places and recondite ways these strange and ancestral customs survived,—as I expect to demonstrate: and the sanctuary of their survival was at Eleusis. Consequently the Eleusinian Mysteries were, accurately speaking, superstition, lurid smoke in the clear sky of Hellenic reasonableness. They were, in fine, the survival of certain religious beliefs and ceremonies that a dominant race and a dominating culture were driving out of common life, and Eleusis was not sole shrine of Greek mysteries.

The ancient folklore of the Hellenic tribes crystallised into Mystery-cults in several localities, of which Eleusis is the most notable. For a long period the rites must have been local in their acceptance, though germane to the springtide and the vintage or harvest festivals at other places. Hesiod speaks of the cult of Demeter at Eleusis (*Frag.* 201, Didot Ed.), but says nothing of any Mysteries. As late as the Persian war it was necessary to explain to a Spartan the meaning of an Eleusinian procession. (Herod., VIII., 65.)

But to return to our search after the secret of Eleusis.

The sixth book of Virgil's *Æneid* and the *Golden Ass* of Apuleius do not reveal the secret ceremonies at Eleusis. And it is of small import if the hierophants did actually cry *Konx om pax* (which corresponds to *ita missa est*) to the mystæ who were thus dismissed after having passed through the ceremonies of initiation. Neither did the Christian fathers, St. Hippolytos for instance, reveal any esoteric wisdom of Eleusis. What we are to know of the

¹ Mr. Dyer, whose opinion in his text is different, virtually concedes the truth of my position *Gods in Greece*, p. 194, note.

² Foucart, *Recherches sur l'origine et la nature des mystères d'Eleusis*, mentions Arcadia and several Ionian islands as early homes of one or another feature of the cult of Eleusis, but M. Foucart thinks that Egypt was the ultimate source of the Eleusinian Mysteries. Cf. Gerhardt, Taf. I., *Bilderkreis von Eleusis*.

character of these ceremonies we must acquire by inference and by analogy.

The theory of the mode of the development of the Mysteries at Eleusis set forth by M. Lenormant has been generally accepted. Provisionally let us assume it for a working plan.

M. Lenormant says that the Eleusinian Mysteries passed through three stages of growth. Of these stages, the first corresponds to the Homeric *Hymn to Demeter*. For that poem was the earliest attempt known to us to formulate a myth to account for the Eleusinian rites. At the same time it follows that both the hymn and the rite at Eleusis prove that an age had arrived when the origin of these customs had been forgotten.

To resume Lenormant's theory: At this first stage the chief point of the Mysteries was the celebration of the phenomena of vegetal life, under the myth of Persephone.¹ The primitive form of this cult was simply the corn festival. In the sacred shrines of the Zuñi Indians the holiest object, as Mr. Cushing told me, is an ear of corn. Demeter is the Corn-Mother. We find folklore full of her. The sacred corn-dances of our American aborigines are representative of the same idea. The Corn-Mother or Rye-Woman continues to be a personage of importance in Germany of the peasant. In the markets of York the country people expose for sale about Easter time small cakes baked in the form of a woman. The Harvest Queen in English folk-custom is another form of the Proserpina myth, a form not borrowed but autochthonous.

The myth of Proserpina appears in a Christianised form in the Sicilian popular tale of Spadonia who baked bread every day and sent it to the souls in purgatory. The tale includes a description of the ghost land. A similar custom of eating the god, of baked bread, occurred in the ancient Mexican cults. Both Creuzer and Frazer will afford many other analogues.²

Associated with the Proserpina myths of vegetal life have always been some primitive notions of purification by fire. The Old Testament writings refer many times to the custom. In the Eleusinian legend it seems that this was figured by the fire baptism of Demophon. Several of the plays allude to this, often obscurely.

¹ St. Hippolytus, *Refutation of all Heresies*, V., 115, tells us: "When the Athenians are celebrating the Mysteries of Eleusis, as the grand and marvellous and altogether perfect spectacle to the spectators, in silence, they exhibited a harvested ear of wheat."

² Crane's *Italian Popular Tales*, p. 367. An interesting Teutonic analogue to the Proserpine myth may be found at page 295. Simrock, *Deutsche Mythologie*. The immemorial sowing and reaping rites of the Malay's may be believed to throw some light upon the unrevealed ceremonies of Eleusis. Cf. Skeat, *Malay Magic*, pp. 227, 239 and elsewhere.

The peasantry of Europe long preserved this notion by building fires about their fields and then jumping through the fires. In my part of the country children still observe the custom "for good luck!"

It seems probable that at this earlier state of the Eleusinian Mysteries the Dionysiac rites—which are symbolised by blood and fire—fire and the drink of the gods, constituted a small or no element at all, of the liturgy and theology of Eleusis.¹ As the Greek theatre was a consequence of the Dionysia, the Greek drama corresponds to a later stage of development. The Proserpina element continued to play its part, that of a glorified farmers' festival, down to the end.

The second stage of the evolution of the Mysteries at Eleusis is marked, as I have intimated, by an attraction and absorption of such folklore and special common customs of a religious character belonging to the vintage, as the intellectual and social advance of the people was rendering archaic and obsolescent. So the Mysteries of Eleusis became a Dead Sea of folkfaith and folklore, of prehistoric ceremonies and primitive religious notions. No doubt the hierophants and mystagogues of Eleusis did develop parallel with this folklore some abstruse, transcendental, and rationalised theology,—just as the Gnosticism of the early Church gathered up the occultism, theology, and magic of a dying age and mixed it with abstruse and metaphysical speculations, also as Freemasonry at the present day conserves obsolete symbols and forgotten ceremonies of extinct religions. In addition to this, the psychic development of the Greek tribes had left behind it much crude material not yet assimilated, and so most of what was intense and orgiastic, similar to the hysteria of a religious revival and fierce nervousness of the Salvation Army, flowed down into Eleusis and was there conserved.

With the third stage which began about the time of Alexander the Great, we shall not now concern ourselves. Merely let me observe that Mr. Percy Gardner must surely be wrong in assigning the incorporation of the myth of Dionysos Zagreus to this third period. The topic of that myth is primitive and psychically aboriginal.

We now turn our attention to the first stage of the growth of Eleusinian Mysteries. Here we need be at no painful effort to infer their nature. In the myth of Demeter and Persephone we have the universal mythos of germination and fruitage.

In the Homeric *Hymn to Demeter*, Rhea says to her daughter:

¹ Cf. A. Kühn, *Feur und die Göttertrinken*.

"Hither, child, loud-thundering, far-seeing Jove calls thee to come to the tribes of the gods. . . . And he has consented that thy daughter shall pass the third part of the rolling year beneath the murky darkness, but the other two with thee and the other immortals . . . but come, child, and obey. Nor be thou immoderately wrathful against the dark-clouded son of Saturn. But straightway increase the life-bearing fruit for men."

"Thus spoke she, nor did well-crowned Demeter disobey; but she straightway sent forth the fruit from the rich-soiled fields. And all the wide earth was weighted down with leaves and flowers."

Back of this myth lies the folklore of a world. It is not necessary to suppose that this element of Eleusis was imported from Syria, or Egypt, or Babylon. Such theories are erudite but superfluous. The sacred dances of negroes on the banks of the Congo, the whirling dervishes, the ceremonial circuit of the Mayan and of the Aztec tribes (if we rightly decipher their grotesque and complicated art), the spring festivals and harvest homes of India, China, and England, the old Hindu cults such as we find in the Rig Veda, —all these set forth in dramatic-lyric fashion the substantial identity of the folkfaith of "all peoples who on earth do dwell," and that folkfaith is the substance of the Mysteries of Eleusis.

The solar course which has its simplest form of dramatisation in the ceremonial circuit of the North American Indian, and in the *Pradikshna* of the Hindu, had their later and more highly developed form in the dorian, pyrric, gymnopædic, and hyperchematic dances of the Greeks, and in the evolution of the chorus of a Greek play.

Perhaps these various dances, answering to the modes of music, and later to the measures of poetry, were in the beginning but the primitive steps and figures of the war dance, the serpent dance, the torch dance, the corn dance, and so on, which in the secrecy of Eleusis continued to be performed with a half belief in their magic efficacy. From the secret rites they passed into the open drama. Besides, the ceremonial circuit had not only the virtue of propitiating the gods of the world quarters, and thus ensuring good harvests, good health, and good luck in games of chance, but, connected with these dances at the beginning, there was a general attempt to fix divisions of time and to establish a kalendar.

Rome does not appear to have transferred her primitive and archaic ceremonies altogether to secret observance. The Salii and the Arval brothers were secret societies, but their ceremonies together with the Lupercalia, continued to be publicly performed.

The sword dance early dropped out of Hebrew worship. In the fourth chapter of Genesis there is a relic of a "song of the sword" interpellated. The sacred dance among the Hebrews continued probably throughout their history. The Feast of Purim was

celebrated with an orgiastic torch dance. Miriam, the sister of Moses, is said to have taken a timbrel and with her attendant maidens to have celebrated the passage of the Red Sea by a sacred song and dance. David, removing his voluminous robes, clad himself in an ephod and danced mightily before the ark in a public procession through the streets. Probably there was always in the Jewish temple what would answer to a ballet. These girls took regular part in the services of the sanctuary and in the sacred processions. Allusion is made to this ritual in one of the psalms:

"It is well seen how thou, O Lord, goest [in the procession], the singers go before, the minstrels follow after, in the midst are the damsels playing on the timbrels."

The play of *Thesmaphoria* has for a theme this women's dance.

It is at this point that we may profitably begin to scrutinise the Greek plays for hints of doctrines and ritual of the Mysteries.

Two pressing questions, which even primitive peoples endeavor to answer, arise here. First, what are the rights of property, and how settle boundaries in time and space? Allusions to this as a most holy institution may be found in *Philoctetes*, 722; *Ajax*, 602; *Antigone*, 608; *Trachiniae*, 648, and elsewhere.

We read in *Agamemnon*, 507:

"Ye do well to reverence him [Agamemnon] who hath levelled Troy with the spade of equity—dispensing Zeus (τοῦ δικηφόρου Διός)—the spade with which the earth's bounds are measured off" (μακίγγη, τῆ κατεργασται πεδόν).

The second question is the same that occupied the writers of the Book of Job, namely, Does benevolence or malevolence rule the world? Are the gods kind or malicious? Is God stronger than the Devil? Does good or evil dominate in the constitution of things? Is the world an environment suitable and fit for man or no? The one question in several forms. Important to material interests as was the first problem, the second absorbed most of the interest of men, and the tragedies of Æschylos, Sophocles, and Euripides are devoted to the solution of the great spiritual problem,—the problem of evil. Turning to the scenic poetry, I note how the *Choëphoræ*, *Agamemnon*, *Antigone*, and *Philoctetes* make such allusions as appear in these citations:

"Clytemnestra: Fate, my son, had somewhat to do with these things.

"Orestes: Nay, this very destiny hath Fate ordained" (*ἑπέσσανεν*).

—*Choëphoræ*, 890.

ἀλλ', ὃ μεγάλοι Μοῖραι, Διόθεν τῆδε τελευτᾶν,
ἦ τό δίκαιον μεταβαίνει.

"But, O mighty fates, do ye accomplish this according to Zeus, in whatsoever way is just."—*Choëphoræ*, 297.

τρόμος μ' ὑφέρπει κλίονσαν εἰγμάτων
τὸ μόρσιμον μένει πάλαι,
ἐγχομένους δ' αἶ' ἔλθοι.

"Trembling comes upon me when I hear boastings. That which is fated abideth of old; but to those who pray may it come.—*Choëphoræ*, 450.

"I call upon the gods, who preside over strivings (*ἀγωνίαν ὄσαν*), and especially upon Hermes, my Redeemer,¹ the Beloved Herald, the Holy One of Heralds."—*Agamemnon*, 495.

"Zeus, the Mighty, sent the sons of Atreus against Paris,—Zeus, the avenger of outraged hospitality" (*Ζεὺς ξένιος*).—*Agamemnon*, 61.

"For a basis of justice is set up, and on it Fate forges the swords she makes (for the punishment of transgressors), and offspring upon offspring of former murders (wherewith they are defiled) doth she introduce into houses: the Fury, whose deep counsels become known in time, aims and executes the (heaven-sent) curse.'—*Choëphoræ*, 629.

Compare Isaiah xxx. 33:

"For Tophet is ordained of old. . . . He hath made it deep and large, the pile thereof is fire and wood; the breath of the Lord, like a stream of brimstone, doth kindle it."

Says the *Philoctetes* of Sophocles (446-452) on hearing that Thersites was still alive:

"Be it so,—since naught of evil perisheth, so well do the divine ones fence it round; yea, how gleefully they do turn back from Hades, the cunning and the crafty, and send below the just and the good! How shall I dispose of such facts as these, how offer praise, while even in my prayers to the gods I find the gods to be evil?"

These cardinal doctrines of Eleusis teach that this is the best possible world, which is the same as to say, "Justice rules," God is King. Of the many lines of Greek plays that might be cited to this point, I quote but one passage, typical if difficult. It runs from line 51 to line 57 of the *Choëphoræ* and says:

"Prosperity among men is god and more than god. But if the swift sweep of Justice watches over some in broad daylight, yet others punishment awaits wearing away the time, delaying in the middle way of darkness, these impracticable night holds fast."

These words remind me of 1 Tim. v. 24:

"Some men's sins are open beforehand going before to judgment, and some men they follow after. Likewise also the good works of some are manifest beforehand, and they that are otherwise cannot be hid."

There emerge here and there through the language of the Greek plays certain and clear allusions to ideas which are involved in the chief element of all dramatic Mysteries, i. e., the sacred dances, of every primitive tribe from Alaska to Lake Van, from Greece to Guatemala. I mean such elements as: (1) Reverence for the gods of the world-quarters (which from the beginning has made the cross a holy symbol); (2) Conjectures touching the origin of the world; (3) Beliefs about the origin of the tribe or of mankind; and (4) Guesses about what will happen to man after death.

¹ Τιμᾶορον Ἐρμῆν. See Hebrew Goel. Job. xix. 25, Ruth. Judges, pass.

For instance, the *Choëphoræ*, 314-316, 343-350, 503, insists upon human consciousness after death :

"You, the ferocious maw of the fire devours not the consciousness of the dead, but back of it shines the meadow."—*Choëphoræ*, 314. (Cf. Plutarch, cited above.)

"With thine own dead there in peace thou, as an august prince, art preëminent in the under world, hierarch of the greatest earth-lords there, for king thou wert whilst thou lived, over those who in their lands administered what fate appointed them, even the scepter which claims the submission of mortals."—*Choëphoræ*, 343-350.

Certain knowledge of immortality was sought in the mysteries. Verbal instruction alone was not adequate. Orgiastic or frenzied dances took place, because they induced trance and vision. Allusions are common to these exciting dances which resemble the dance by which the Mongolian shaman seeks ecstasy and clairvoyance. Akin to this was the dancing mania of the Middle Ages, the holy dance of Eisenach, the convulsionaries of St. Médard and the early phenomena of the spiritual life of the Shakers and Quakers. In primitive sacred mysteries another common method of gaining a vision into the unseen world and of having revelations, is by means of some narcotic or spirituous drink. The very words spirit, spirituous, embalm the primitive idea. Intoxication is regarded by primitive people as inspiration or divine possession. The tribes of the Gold Coast, the American Indians, the Tibetans, and South Sea Islanders initiate by the use of maddening drinks. The fast, the mystic drink and meat, and the consequent visions are esoteric to some extent among all savages. The American Indian takes his name (appellation) at this time. Some such a custom belonged to Eleusis. The Negro also becomes a citizen of his tribe through this initiation. It belongs to this experience to see visions of gods or devils, and by them faith in God, immortality, and future retribution are confirmed. There as at St. Patrick's Purgatory is the hallucination of descent into the lower world. Whether all this was shown the initiates, mystæ, or the beholders, epoptæ, is undetermined. At all event there were visions both direct and in a mirror.³ The curious reader may further consult Plato, *Phædros*,

1 τεκνον, φρόνημα τοῦ θανόντος οὐ δαμάζει
πυρὸς μαλερὰ γνάθος,
φαινει δ' ἵστερον ὄργας.
—*Choëphoræ*, 314.

2 φίλος φιλοισι τοῖς ἐκεῖ καλῶς θανούσιν
κατὰ χθονός, ἐμπρέπων
σεμνότιμος ἀνάκτωρ,
πρόπολος τε τῶν μεγίστων
χθονίων ἐκεῖ τυραννῶν·
βασιλεὺς γὰρ ἦσθ', ὄφρ' εἴης,
μύριμον λάχος πηλάντων
χεροῖν πεισιβροτόν τε βᾶκτρον· κ. τ. λ.

—*Choëphoræ*, 343-350.

³Cf. 1 Cor. xiii. 12; 2 Cor. iii. 18.

for the "beatific visions," *ἑνδαίμονα φάσματα*, Plutarch (*Frag.* VI., 1), for "holy phantasms," "sacred representations," *ἄγνα φαντάσματα*, *ἱερα δεικνύμενα*, and Aristides (*Orat.*, XIX) for the unutterable apparitions, *ἄρρητα φάσματα*, and Dio Chrysostomos for the "mystic sights," *μυστήκη θεάματα*.

Clement of Alexandria quotes from the Eleusinian liturgy a passage, possibly pronounced near the close of the ceremonies, which is interesting in this connexion :

"I have fasted, I have drunk of the cup; I have received from the box; having done, I put it into the basket, and out of the basket into the chest"

"And what are these mystic chests?"—Clement goes on—"for I must expose their sacred things and divulge things not fit for speech. Are they not sesame cakes, and pyramidal cakes, and globular and flat cakes, embossed all over, and lumps of salt, etc.?"

Upon the stage of the Attic theatre appeared strange masks and customs; goat skins and leopard skins were worn. Dionysos appeared as a bull. Birds, frogs, and serpents came singing. In these and their like I suspect we have vestiges of an original totemism.¹

A visit to any ethnological museum, such as that at Berlin and our National Museum at Washington, will bring all these masks of the sacred dance dramas of tribes in various stages of culture before you. It will suggest the genesis of Greek comedy, the origins of Aristophanes and Plautus, of the Mediæval Miracle-Plays and Mystery-Plays, of Hroswitha, and of the Dance of Death. In another direction the line of development will reach to the Javanese puppet and shadow plays, the Chinese opera, and the Persian Mystery-play of Hassan and Hussein. Here was no borrowing or loaning, but various developments from the one psychic basis of humanity.

The most comprehensive, typical mystery-play of a primitive folk which is accessible is the creation-myth as it is dramatised by the Zuñi Indians. Taking Mr. Frank Cushing's account² of that cycle of sacred dances, we detect therein most of the ethical elements of the Greek drama. Œdipus and Medea are there, Orestes and Demeter are characters of the Zuñi cycle of creation-plays. The same may be truly said of the characters in Mr. Jeremiah Curtin's *Creation Myths of the New World*.

¹ Brinton, *Myths of the New World*, p. 269.

² *Thirteenth Annual Report U. S. Bur. Ethnology*, p. 325.

THE PENITENT THIEF:

EXHIBITING BUDDHA'S DOCTRINE OF THE NEW BIRTH AND
THE FORGIVENESS OF SINS.

Now first translated from the Pāli by ALBERT J. EDMUNDS.¹

Middling Collection, Dialogue No. 86.

Luke xxiii. 39-43.—And one of the malefactors which were hanged railed on him, saying, Art not thou the Christ? save thyself and us. But the other answered, and rebuking him said, Dost thou not even fear God, seeing thou art in the same condemnation? And we indeed justly; for we receive the due reward of our deeds: but this man hath done nothing amiss. And he said, Jesus, remember me when thou comest in thy kingdom. And he said unto him, Verily I say unto thee, To-day shalt thou be with me in Paradise.

John iii. 5.—Jesus answered, Verily, verily, I say unto thee, Except a man be born of water and the Spirit, he cannot enter into the kingdom of God.

Mark ii. 5.—And Jesus seeing their faith saith unto the sick of the palsy, Son, thy sins are forgiven.

Cf. also Eusebius H. E. iii. 23 (the story of the Apostle John pursuing and converting the robber).

Thus have I heard. At one season the Blessed One was staying at Sāvatti, in the Conqueror's Grove, the cloister-garden of the Feeder of the Poor. And at that season there was a robber named Finger-garland (Angulimālo) in the realm of Pasenadi, the

¹ There is a corrupt version of this story in Spence Hardy, translated from mediæval Ceylon sources, but the present is its first translation from the Pāli. Its antiquity is attested by the Pāli Great Chronicle, which tells us that it was sculptured, together with other leading stories from Buddha's life, upon the great Tope at the capital of Ceylon, in the second century B. C. The sculptures of similar scenes at Bharhut and Sānci forbid our rejecting the Chronicle's list of Ceylon sculptures as fiction. [Owing to lack of time, the proofs of the present article have not been read by the author.—*Ed.*]

King of Kosalâ; and he was barbarous, red-handed, devoted to killing and slaughter, unmerciful to all who live. By him towns, villages, and districts were made as though they had never been. He slew men all the time, and wore a garland of their fingers.

Now the Blessed One, having dressed betimes, took his bowl in his robe, and went to Sâvatthi for alms. When he had gone round it, and had returned from the quest of alms in the afternoon, he rolled up his mat, took his bowl in his robe, and entered upon the high road where Finger-garland the robber was. Then the herdsmen, cattle-tenders, and farmers, who were working, saw the Blessed One going thither, and called to him: "O philosopher! Go not upon that road; for a robber named Finger-garland is thereon, who is barbarous, red-handed, devoted to killing and slaughter, unmerciful to all who live. By him towns, villages, and districts are made as though they had never been. He slays men all the time and wears a garland of their fingers. O philosopher, men go upon this road only in companies of ten, twenty, thirty, or forty; and they go armed for fear of Finger-garland the robber."

When they had said this, the Blessed One went on his way in silence. And a second and a third time they said so, but still the Blessed One went on his way in silence.

Now Finger-garland the robber saw the Blessed One coming from afar, and seeing him he thought to himself: "This is wonderful, this is marvellous: men go upon this road only in companies of ten, twenty, thirty, or forty, and they go armed for fear of me; but this philosopher, it seems, is alone, without any one, open to attack. What if I now take the life of this philosopher?" Then Finger-garland the robber took his sword and shield, got bow and quiver ready, and walked behind the Blessed One. But the Blessed One put forth such an effort of psychical power that Finger-garland the robber, going with all his might, could not overtake the Blessed One going by his inner force (*pakati*). So the robber thought to himself: "This is wonderful, this is marvellous: hitherto I have chased and caught an elephant running, a horse, a chariot, or a deer; but now, going with all my might, I cannot overtake this philosopher going by his inner force." He stood and said to the Blessed One: "Philosopher, stand! Philosopher, stand!"

"I am standing, O Finger-garland; stand thou also!"

Then Finger-garland the robber thought to himself: "These Sâkya philosophers tell the truth and keep their promises. And yet this philosopher, even while he is going, says, 'I am standing, O Finger-garland; stand thou also!'" What if I now ask him [what

he means]?” Then the robber addressed the Blessed One with a stanza :

“Philosopher, thou sayest, ‘I am standing,’ while thou art going, and thou callest me standing when thou art not so ;

“I ask thee, philosopher, this question : How art thou standing when I am not standing ?”

“I am standing, O Finger-garland, always among all beings, having laid aside the staff ;

“But thou art unrestrained among living things : therefore I am standing, and thou art not.”

“Long has the great Seer (*Isi*),¹ this philosopher debating in the great Wood, been revered by me ;

“I myself will renounce evil for long, having heard thy stanza that is linked with religion.

“Even thus does a robber resemble² a sword or a weapon at the pit and precipice of hell.”

The robber bowed at the feet of the Auspicious One, and begged of him ordination on the spot.

Then Buddha, the compassionate Seer, he who is master of the world with its angels,

Said to him : “Come, O monk ;” and this was all there was to make him a monk.

* * *

Now the Blessed One, with Finger-garland for an attendant philosopher, went on his journey towards Sâvatthi and in due time arrived there ; and there the Blessed One stayed at Sâvatthi, in the Conqueror’s Grove, the cloister garden of the Feeder of the Poor. Now at that season a great crowd collected at the palace-gate of Pasenadi, the King of Kosalâ, and there went up a hue and cry : “Your Majesty, there is a robber in your realm named Finger-garland, who is barbarous, red-handed, devoted to killing and slaughter, unmerciful to all who live. By him towns, villages, and districts are made as though they had never been. He slays men all the time, and wears a garland of their fingers. Let your Majesty arrest him.”

Now Pasenadi, the King of Kosalâ, departed that day from Sâvatthi with some five hundred horses and proceeded to the cloister-garden. He went by chariot as far as the ground was passable for chariots, and then alighted, and went on foot to where the Blessed One was. Going up to the Blessed One, he saluted him and sat

respectfully on one side. While he so sat, the Blessed One said to him: "O great King, is Seniyo Bimbisâro, the King of Magadhâ, provoked at you, or the Licchavi [clan] of Vesâli, or other rival Kings?"

"Nay, Lord: none of these Kings are provoked at me. But, Lord, there is in my realm a robber named Finger-garland, who is barbarous, red-handed, devoted to killing and slaughter, unmerciful to all who live. By him towns, villages, and districts are made as though they had never been. He slays men all the time and wears a garland of their fingers. Lord, I fear I shall not arrest him."

"But, great King, if you saw Finger-garland with his hair and beard cut off, having put on the yellow robes and gone forth from domestic life into the homeless one; abstaining from taking life, from theft, and from lying; eating one meal a day, chaste, moral, with a glorious religion,—what would you do to him?"

"Lord, we should salute him respectfully, or rise in his presence, or offer him a seat, or present him with robe and alms-bowl, a lodging-place, the requisites for sickness, medicine and conveniences; and we should appoint for him the protection, toleration, and defence that are due to religion.¹ But, Lord, how could there be such moral restraint in an immoral, wicked man like him?"

Now at that time the venerable Finger-garland was sitting not far from the Blessed One. Then the Blessed One, stretching out his right arm, said to Pasenadi, the King of Kosalâ: "This, great King, is Finger-garland!"

Then the King was seized with fear, consternation, and horror, and the Blessed One, seeing him afraid and agitated with horror, said to him: "Fear not, great King, fear not; there is nothing for you to fear any more." So the King, who had been terrified, became calm again, and went up to Finger-garland, saying to him: "Surely your Reverence is not Finger-garland?"

"Yes, great King."

"What is the clan of your Reverence's father, and what is the clan of your mother?"

"Great King, my father is a Gaggo, and my mother a Mantânî."

"May it please your Reverence Gaggo-Mantânî-son, I shall supply you with robe and alms-bowl, with a mat to sit and sleep

¹Rhys Davids translates the same phrase in the *Long Collection* thus: "watch and ward and guard, according to the law." The "or" in our present translation of this paragraph arises from a difference in the text.

on, and with the requisites for sickness, medicine and conveniences."

But at that season the venerable Finger-garland was a forest-dweller, with an alms-bowl, and wearing three robes taken from dust-heaps. So he said to the King: "Enough, great King: three robes are my full outfit."

Then Pasenadi, the King of Kosalâ, approached the Blessed One, saluted him respectfully, and sat on one side. And so sitting, the King said to the Blessed One: "Wonderful, O Lord! Marvellous, O Lord! is it even until now, O Lord Blessed One: men are tamed among the untamed, pacified among the unpacified, and among those who have not attained, they are brought to Nirvâna (literally, extinguished among the non-extinct). He, Lord, whom we could not tame by staff or sword, is tamed by the Blessed One without staff and without sword. But now, Lord, we must go: we have much to do, much business on hand."

"Just as you think fit, great King."

So Pasenadi, the King of Kosalâ, rose from his seat, saluted the Blessed One respectfully, and keeping him on his right hand, departed.

Then the venerable Finger-garland, having dressed betimes, took bowl in robe and went into Sâvatthi for alms. And going through Sâvatthi from house to house for alms, he saw a woman in the agonies of travail, and thereupon thought to himself: "Alas, how beings suffer; alas, how beings suffer!"

Now the venerable Finger-garland, having gone to Sâvatthi for alms and returned in the afternoon, approached the Blessed One, saluted him, and sat as usual, and said: "Lord, to-day on my begging rounds in Sâvatthi, while I went from house to house, I saw a woman in the agonies of travail; whereupon I thought to myself: 'Alas, how beings suffer; alas, how beings suffer!'"

"Well now, Finger-garland, go to Sâvatthi, go up to that woman and say this: 'Since I was born, sister, I do not remember that I ever purposely took the life of anything that breathes. By this truth be there safety to thee and safety to thy womb.'"

"But, Lord, that would surely be for me a deliberate lie: by me, Lord, have many breathing things been reft of life."

"Well, then, Finger-garland, go to Sâvatthi, approach that woman and say: 'Sister, since I was BORN OF THE NOBLE BIRTH I do not remember that I ever purposely took the life of aught that breathes. By this truth be there safety to thee and safety to thy womb.'"

“Even so, Lord,” said the venerable Finger-garland, in assent unto the Blessed One; and going into Sâvatthi, he approached that woman and said: ‘Sister, since I was BORN OF THE NOBLE BIRTH I do not remember that I ever purposely took the life of aught that breathes. By this truth be there safety unto thee and safety to thy womb.’”

Whereupon there was safety unto that woman, and safety to her womb. And forthwith the venerable Finger-garland, dwelling alone, retired, earnest, ardent, and strenuous, for a little time, realised by his own supernal Knowledge, and even in this world, that incomparable goal of the religious life, for the sake whereof do veritable gentlemen go forth from the domestic life into the homeless one: he perceived that birth was destroyed, the religious life was lived, and duty done, and for this existence there was naught beyond. And so the venerable Finger-garland became one of the Arahats.

Now the venerable Finger-garland, having dressed betimes, took bowl in robe, and went to Sâvatthi for alms; and on one occasion a clod of earth was thrown and hit his person; upon another occasion a stick, and yet again a stone. Then the venerable Finger-garland, with his head broken and the blood flowing, his bowl broken and his robe rent, approached the Blessed One. And the Blessed One saw him coming from afar, and said to him: “Bear up, O Brâhman, bear up! *You are feeling in this world the effect of some deed for which you would have been tormented in hell for many years, for many hundreds and thousands of years.*”

Then the venerable Finger-garland, when secluded and solitary, felt the bliss of deliverance, and on that occasion gave vent to the following Udâna:

[The Dialogue ends with a page of verse. The words italicised are important. This is the doctrine of the forgiveness of sins. To the Arahats all the past is wiped away, and he only suffers such physical effects of evil as those described; but no retribution can follow him beyond the grave.]

MISCELLANEOUS.

EXPERIMENTAL MATHEMATICS.

While the best mathematical minds have always gathered their knowledge as well as their power from observational and experiential contact with the forms of reality, the empirical method has not until recently been applied so systematically to instruction in mathematics as it has been to instruction in the natural sciences. Advancement is always more rapid by the lecture method, or by that of continuous exposition from a text-book. The truth is here presented ready made, the pupil absorbs it easily and is not put to the trouble of seeking it anew. Hence, these methods have always been preferred by educational machinists, and students have, as a rule, been left to their own resources in acquiring solid and enduring knowledge.

But we know from history that geometry was originally a body of empirical knowledge; that it began, in the case of the Egyptians and the Greeks, with the observation of the forms of real things and of individual relations; that the empirical knowledge, thus observationally discovered, was systematised and classified; and that by induction the empirical facts were subsequently organised into a science.

The induction in the case of geometrical discovery is, it is true, of an entirely different character from what it is in the case of discoveries in the classificatory natural sciences. The induction, the guess, the divination, in geometry, usually proceeds from a *small* body of suggestive hints gathered from a *narrow* and *thoroughly determined* field of experience. But, so far as the *development* of the science is concerned, it is induction nevertheless, and it would seem that a sound method of instruction should require that the development of this knowledge in the individual should proceed pretty much along the same lines as the development in the race. Not that the pupil should retrace all the tortuous steps through which the science has been gradually and laboriously brought to its present stage of perfection; as a matter of fact, the instructional development will have to depart in many respects widely from the actual development; but it will always receive its natural support, its guidance, and its general trend from that development. Short-cuts, abridgements, and all the devices which economy of mental effort may suggest are permissible, and all will lead in the end, not to a method of re-discovery, but to a method of genetic and logical reconstruction. Results will always be preceded by investigation, always be provoked by actual inquiry.

To quote the words of Dr. Paul H. Hanus, Assistant Professor of Teaching in Harvard University, and the author of the little pamphlet entitled *Geometry in the Grammar School*, which we are now considering, "To present the 'net pro-

duct of an inquiry without the inquiry which led to it,' is to cultivate a reliance upon the verbal memory to the neglect of the power of overcoming difficulties and of assimilating experiences; moreover, the accumulation of such unrelated mental stores is merely transitory,—they are soon forgotten; there is no permanent gain of either knowledge or power. A method of continuous exposition is productive only with minds already developed, not with those *to be developed*. By its exclusive use with minds at all degrees of maturity the best results can never follow. Self-activity, interest, self-reliance, the power to be useful, these will never follow a method of instruction by which mental stores are imparted as so many free gifts. Fortunately such gifts are really impossible; there is no inheritance of knowledge and power. Only capabilities are inherited. There is but one universal inheritance,—*ignorance*; one universal means provided by nature of rising above this inheritance,—*self-exertion*. Who does not employ the means Nature has provided remains unlearned and helpless, though he may for a time simulate attainment and intellectual strength."¹

Professor Hanus is merely repeating what hundreds of thinkers and educators have time and again insisted upon, when he says that principles of conduct and rules of procedure, whether in life or in science, do not become real possessions until experience has verified them and shown their efficacy; that it is a well-known mental law that intelligence always proceeds from thing to name and symbol, from facts to principles and rules, and that in conformity with this law the facts of geometry must enter the learner's mind *through experience*. The learner must see and feel material bodies, their surfaces, their bounding lines, their corners; he must see that two vertical angles or two triangles under certain conditions are equal, by actually superposing them; must see by placing them side by side with their vertices coinciding that the three angles of any triangle together form two right angles, etc., etc. The generalisations will then follow. Above all, it is essential to develop the questioning attitude, and then to satisfy the inquiring mind by furnishing it with the *opportunity* of reaching the truth. "The attitude of a boy who has measured heights and distances by using the propositions concerning the equality of triangles, toward those propositions themselves, is very different from the attitude of the boy whose first experience with those propositions is drawn from a text-book or from a formal presentation by the teacher. The formal statement of the propositions and their logical proofs are to be introduced gradually and after the facts have been presented empirically."

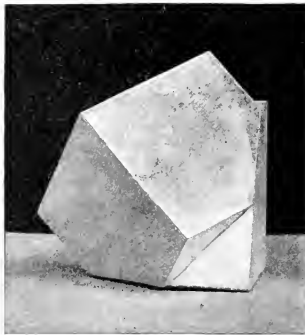
Affirming the psychological truth that "clear mental perception can only follow clear physical perception." Professor Hanus then proceeds to indicate in large outlines the course and methods of instruction which are to be followed in the teaching of elementary geometry in the grammar school, and he has appended to his little pamphlet a synopsis of the simple experimental work which might be done in geometry in the last three years of the grammar school course. The nature and subject of the work only are indicated; the development is left almost entirely to the teacher. The method is altogether object teaching. Records of observations are kept by the pupil, who is led to express himself by drawing, by construction, and in words, and to convince himself of geometrical truths primarily through measurement, drawing, cutting, superposition, and construction. Every

¹ *Geometry in the Grammar School*. An Essay together with illustrative class exercises, and an outline of the work for the last three years of the grammar school. By Paul H. Hanus, Assistant Professor of the History and Art of Teaching, Harvard University. 1898. Boston: D. C. Heath & Co., Publishers. Pages, ix, 52.

opportunity is to be taken of making the pupil's geometrical knowledge bear directly upon life. The use of the foot-rule, tape or chain, with some form of the goniometer, is recommended for obtaining data and for imparting to theoretical results body and significance. "Nothing can exemplify the value of class-room instruction like a practical application to construction in the shop, or measurement in the field. *For geometry as for geography 'field work' is well-nigh indispensable.*"

* * *

The methods which have been roughly indicated in the preceding paragraphs have been carried out, so far as the elementary features of the subject are concerned, with almost superfluous detail, in an attractive and profusely illustrated book entitled *Observational Geometry*,¹ by William T. Campbell, A. M., instructor in mathematics in the Boston Latin School,—a work which forms part of the Phillips-Loomis Mathematical Series. The elementary "laboratory work" and "field-work of geometry," noted above, are here developed to the utmost extent, and even carried out in cases where with average pupils it would seem almost un-



CARD-BOARD MODEL OF A TWIN-CRYSTAL OF CALCITE.
(From Campbell's *Observational Geometry*.)

necessary. Aiming to give to the hand dexterity and skill in making drawings and models of geometrical figures, it devotes 125 pages to the consideration of elementary forms and the construction of models. The uses of the main geometrical and mechanical instruments are taught, and directions given for the construction from thin cardboard of all the principal geometrical solids. In the annexed cut will be found a representation of a model of a twin crystal of calcite consisting of two interpenetrating cubes, made from a single piece of cardboard so outlined, cut, and folded as to take the shape seen in the figure. The second part of the book is devoted to plane geometrical construction (lines, angles, polygons, and circles), the measurement of areas, similar figures, and surveying.

Dr. A. W. Phillips, the editor of the series in which this book appears, remarks that the revolt against the old arithmetic problems, which resulted in the substitution of nature studies for arithmetic drill, was due to a want of careful and

¹ Published by The American Book Co., New York. Pages, ix, 240.

systematic development of the subject as a means of cultivating the faculties of observation. Now this want, he contends, is supplied by observational geometry, which "combines the training of the nature studies, so far as these educate the eye to keen and intelligent perception, with the training which the more valuable problems of the old arithmetics furnish, and so gives a mental discipline at once rigorous and entirely free from that one-sidedness which either of these systems fosters when taken alone." The truth of this may be readily gathered from the exercises and problems of the second part of Mr. Campbell's book. The measurements are all actually carried out here in connexion with real objects, and the instruction thus takes on the character of a serious and intrinsically interesting investigation, as contrasted with that of a purely theoretical study. The second illustration, showing the method of determining the height of a tree by means of surveying instruments and the theory of similar triangles, has been taken from Mr. Campbell's book, and is typical of the character of the work there outlined. It is one only of a large number of similar illustrations.

* * *

In his *Advanced Arithmetic*,¹ Mr. William W. Speer, District Superintendent of Schools, Chicago, has extended to the general theory of fractions, proportions

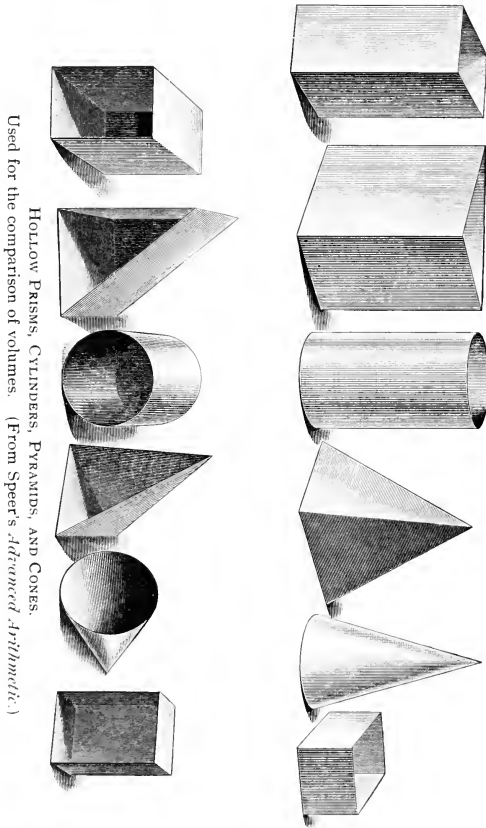


MEASURING THE HEIGHT OF A TREE.
(From Campbell's *Observational Geometry*.)

and elementary mensuration the same principles which guided him in the preparation of his *Primary and Elementary Arithmetic*. We noticed Mr. Speer's books at length in No. 504 of *The Open Court* (May, 1898), and little remains to be said here upon his latest work. In his system the great body of arithmetical truths is not differentiated and split up into arbitrary chapters and divisions, as it is in the common run of arithmetics, but is developed genetically as a connected organic whole. Sense-training is throughout made the basis of the development of arithmetic thought, and *concrete* relations of magnitude are made the foundation of all mathematical inferences. Every possible variety of quantitative relation in nature, industry, science, and art, is employed for this purpose. Sets of blocks, bundles of fagots, and sets of geometrical solids accompany Mr. Speer's books, and are indispensable for the concrete instruction which they require. Coins, clock dials, liquid and dry measures, and metric forms of every conceivable kind, are also em-

¹*Advanced Arithmetic*. By William W. Speer. 1899. Boston: Ginn & Co. Pages, xx, 261.

ployed or recommended. The comparison of volumes is made by the actual measurement of contents, as shown in the appended illustrations of prisms, cylinders, pyramids, and cones taken from Mr. Speer's book. Paper-cutting and modelling are also extensively used in the present book. The two illustrations which we have reproduced on page 639 are instances of the determination of rela-



HOLLOW PRISMS, CYLINDERS, PYRAMIDS, AND CONES.
Used for the comparison of volumes. (From Speer's *Advanced Arithmetic*.)

tive volumes and surfaces by experimental measurements. In each case the cylinder is the circumscribing cylinder of the sphere represented in the figure. The lateral surface of the cylinder is shown to be equal to the surface of the sphere by comparing the length of the cord which covers the curved surface of the hemisphere with that which covers one half of the lateral surface of the cylinder. In the other

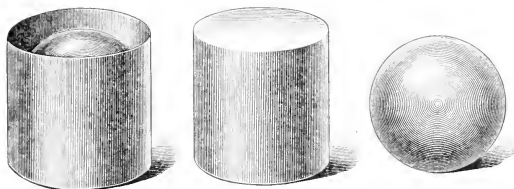
figure, the volumes of the sphere and the circumscribing cylinder may be compared by filling them with water, and the volume of the sphere shown to be two thirds of the volume of the cylinder.

Mr. Speer's system is being used with great and merited success in the schools of Chicago and elsewhere. There is but one serious criticism which suggests itself in connexion with it, and that is that the introductions and the directions to teachers which are psychologically sound in the main, are put in too abstract and disconnected a form for readers of general training, and that for this reason many teachers who have not had the advantage of personal initiation into the method might



EXPERIMENTAL COMPARISON OF THE SURFACE OF A SPHERE AND THE LATERAL SURFACE OF THE CIRCUMSCRIBING CYLINDER.

(From Speer's *Advanced Arithmetic*.)



EXPERIMENTAL COMPARISON OF THE VOLUMES OF A SPHERE AND ITS CIRCUMSCRIBED CYLINDER BY MEASURING WITH WATER.

(From Speer's *Advanced Arithmetic*.)

find the books difficult to use and perhaps fail therefore to appreciate the power of the system to its full extent. If the exposition of the subject were as concrete and continuous as the system itself aims to be, we believe that nothing could stand in the way of its widespread introduction.

T. J. McC.

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I dreamed my spirit broke the bars of sense
That hold the gates of consciousness shut fast,
Threw off the prison garb of self, and passed
Into the wonder of Omniscience.

As mists that rise from ocean and condense
In clouds, in million rain-drops melt, at last

Through brooks and rivers join again the vast
 Primeval sea,—so do I read the Whence
 And Whither of the soul.

When stream meets sea,
 Is the swift river-wave forever gone?
 When souls rejoin All-Soul, cease they to be?
 There where the All is Thought, and Thought is One
 Within the Infinite All, eternally
 The thought once bound in one, lives boundless on.

BOOK-REVIEWS.

THE OLD FAITH AND THE NEW PHILOSOPHY. Lectures delivered before the Canadian Summer School for the Clergy, in Port Hope, Ont., July, 1899. By *G. J. Low, D.D.*, Canon of Christ Church Cathedral, Ottawa, and Rector of Trinity Church, Billings' Bridge. With an Introduction by Principal Grant, of Queen's University. Toronto: William Briggs. 1900.

Our readers may remember the genial and pleasant discourses which Canon Low published in *The Open Court* some three years ago entitled "In Nubibus; or The Cogitations of a Smoking Philosopher." This thoughtful clergyman has now attempted something more systematic in the way of reconciling the teachings of his Church with the conclusions of science, and has given to the world the results of his lucubrations in the work before us. He accepts in full the established truths of modern scientific and critical thought, which in its grand total he calls the "New Philosophy," while he abates not one jot or tittle of his faith in Christianity. He says: "We shall not argue that this or that is only an hypothesis at present, and therefore to be ignored, or that this or that link is missing. We will, for the sake of argument, assume or concede the whole system, and then strive to show that the great doctrines of the Christian faith are consonant with the evolution which pervades the works of God—that the 'Natural Law has been projected into the spiritual world,' to adopt Drummond's happy phrase; or, in the language of that grand master of metaphysical theology, Bishop Butler, we shall endeavor to establish 'the analogy of revealed religion to the constitution and course of nature,' as interpreted by the New Philosophy."

In this spirit and by this method Canon Low has treated such topics as "The Trinity," "The Holy Ghost," "The Person and Work of Christ," "The World's Great Sacrifice," and "The Holy Catholic Church." Certainly, as Principal Grant affirms in his Introduction to his friend's work, he has combined boldness with reverence and godliness with brotherly kindness and mutual trust; and we cannot but believe that his book will be productive of much intellectual good among the brethren of the Church.

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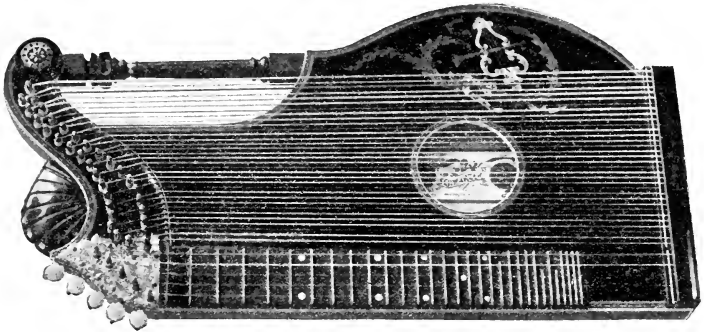
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