

The Open Court

A MONTHLY MAGAZINE

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

Editor: DR. PAUL CARUS.

Associates: { E. C. HEGELER.
MARY CARUS.

VOL. XX. (NO. 9.) SEPTEMBER, 1906. NO. 604

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The Gods of the Egyptians

OR

Studies in Egyptian Mythology

BY

E. A. WALLIS BUDGE, M. A., Litt. D., D. Lit.

KEEPER OF THE EGYPTIAN AND ASSYRIAN ANTIQUITIES
IN THE BRITISH MUSEUM



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The Open Court Publishing Co.

1322-28 Wabash Ave., Chicago



WILLIAM SHAKESPEARE.

After an oil portrait now in the possession of the Shakespeare Memorial
at Stratford.

(With kind permission of the Shakespeare Memorial at Stratford.)

Frontispiece to The Open Court.

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THE NEW SALTON SEA.

VAST GEOLOGICAL AND ALLUVIAL CHANGES IN THE SOUTH-
WEST. TURNING ASIDE THE COLORADO RIVER
INTO THE ANCIENT SALTON SINK.

BY EDGAR L. LARKIN.

IMAGINE all these things: that once a very high and massive tower of stone, whose base rested on solid Archæan rocks beneath the primordial Palæozoic sea, lifted its top far above the waves. And that the tower stood from twenty to thirty miles east of a line drawn from Denver southward through Colorado Springs to Pueblo; that the Archæan strata were so thick and rigid that they did not bend upward and downward, so that the top of the tower during millions upon millions of years kept at the same mathematically exact distance from the center of the earth; that a powerful telescope provided with accurate levels, micrometers and graduated circles was set on a level base of stone on the top of the unique observatory; that a man, a skilled observer, lived on the tower during almost interminable ages and kept up lonely vigils, his eye at the instrument, ever making sweeps of his watery horizon, in hope of seeing some object; and that after watching so long and through so many eons that duration to him seemed to be infinite, he at last was rewarded by detecting an object just a few inches above the water in the distant west. Behold! it was land in what is now Central Utah. The tower was high enough to be in a tangent line drawn from its summit to the sea above what is now called the Wasatch range, south of Salt Lake. The telescopist at once measured its azimuth and height above the ocean horizon. His vigilance was increased and he never left the telescope. In a few thousand years, another slight elevation of land rose up out of the waves, and

the first was a few inches higher. Then new wastes began to appear by centuries. And after eons rolled away,—by years. Finally, all Colorado emerged from the Western sea. All of Utah was lifted up and to the southwest, Northern Arizona rose above the horizon. The tower, not being disturbed by this rising, was a place for accurate measurement of rates of elevation. These were exceeding slow. The mighty layers of Archæan rock were loaded with an inconceivable mass of superposed strata. The man saw the Rocky Mountains rise, and Pike's Peak lift its Majestic head above the ancient sea. And he saw the tops of Mounts Powell, La Plata, Harvard, Yale, Princeton, and Ouray, rise inch by inch, century after century. The observatory, the tower of stone having been set on the Archæan, weathered all later ages, until on this eventful and auspicious day when the first land in the west was seen, the day when this story opens—a late Jurassic day. When Colorado, Utah and Arizona were well up, the climate began to change. Rain and wind attacked the land and began the colossal work of beating down the peaks and transporting the debris, the products of the war,—to the sea. Nearly all of the abraded material went to the southwest. In 1900, I wandered in that wonderland of the earth—Central Colorado, and over the "Divide." A little stream here started toward the Gulf of Mexico, and there to the Gulf of California. A number of creeks united to form the headwaters of the Grand River, two thousand miles from their resting-place in the Californian gulf in far away Mexico. I saw waste places, denuded areas and facades and wondered where the washed-away debris might then be. The Grand River rising near Grand Lake in Colorado, flows into east-central Utah and unites with the Green to form the mighty Colorado, flowing through Arizona, through the magnificent canyon, and through desert wastes to Yuma and on southward to the head of the Gulf. All these streams form one of the great river systems of the earth. Their erosive and cutting power is enormous, and transporting of soil, silt and debris likewise.

For Palæozoic times were quiet; there being no high mountains, or elevated continents, to cause changes in climate and set up storm conditions, hence hurricanes, cyclones and raging winds did not obtain, nor rapidly driven rain. Gentle ripples came along Palæozoic beaches, left their tiny marks and these are now traced in stone in our museums. Then came the terrific Appalachian Revolution in the Atlantic States, which crumpled up the strata into mountains and closed the Carboniferous Age. Troubles beneath the waves then over Colorado, Utah and Arizona, came on

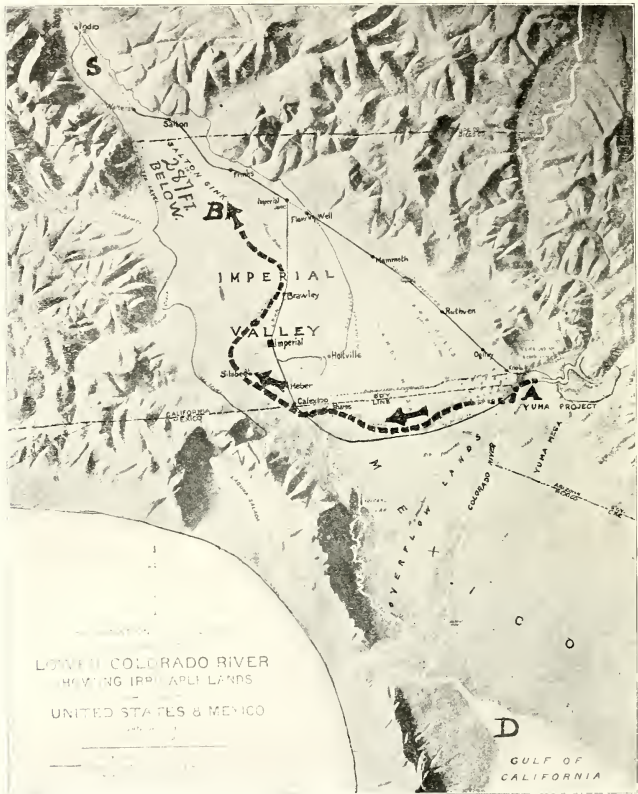
apace and lifted up the Rocky Mountains before the astonished eyes of our faithful watcher on the hypothetical tower. The circulation of winds then began and storms of rain. The age of carving, cutting, wearing, denudation and sculpture commenced and has been at work since, even until the present. And in no part of the world have these artists—wind and rain—wrought more exquisite work than in that vast area drained by the Colorado River. In later eons, frost, ice, snow, hail and more rapid winds came to the giant task of beating down the Rockies, the plateaus of Colorado and Utah, and hurrying the debris beneath the waves of the southern gulf. In Colorado, I gained something of the outlines of the plans and specifications of the primeval sculptors. Beneath the blue of the Colorado sky, I saw as it were, the blue-prints, the plans of the world's first architects. But in outline only.

WITHIN THE CANYON'S MAZE.

Later, I descended the mighty Canyon of the Colorado River in Arizona, and explored its intricate recesses, chambers and caves, hewn in the most obdurate Archæan rock, by swiftly running silt and sand-laden water. I saw the whole stupendous plan, the denudation of the uplands and erosion of the most wonderful canyon on earth. All the materials abraded from two great states had to pass through this canyon, ever grinding and cutting a wider and deeper way. Our man on the tower saw a Cretaceous deposit alone, 9000 feet deep. Its debris since then, has passed through the Canyon.

Those able to handle words as one would sticks and stones, have often climbed down into this canyon even to the edge of the torrental river; and have tried to describe what they saw, so that a distant reader might derive some idea of the gigantic scene, this rocky splendor, this wondrous vision; but words lost their power, and the pen its potency. There is no hope in words, therefore the canyon cannot be described. Artists with paints and pencil have made effort many times; but colors seem to pale and fade—the amazing scene cannot be fixed on canvas. When I entered the mighty chasm—this “abyss of erosion,” light from the sun, the sun of Arizona, was pouring into the terrific labyrinths in a grand supernal flood. Facades, towers, temples, cathedrals and palaces were all aglow. But, when I left, radiant beams came streaming in at a different angle, illuminating columns, pillars, turrets and domes not seen before. I entered a cave of gloom, and with a blade of steel, endeavored to scratch the Archæan strata. It was almost impossible, for the rock is more rigid than solid flint. The

canyon is 300 miles long; and from 3000 to 6200 feet deep, a total of 600 miles of giant walls. The entire abyss has been eroded by



RELIEF MAP OF THE SALTON SINK, THE IMPERIAL VALLEY IN CALIFORNIA, AND ITS EXTENSION INTO MEXICO. 4970

The water of the Colorado now leaves its bed at A and flows along the heavy dotted line to B, where it pours with great velocity into the sink. No water flows from A to D along the original bed. Indio at S in the northwest, is 22 feet below the level of the ocean. The bottom of the sink is 287 feet below the Pacific.

running water since the land was raised above the sea in the Jurassic age. The word soon kept ringing like a tuneful bell while I was

there; with no thought of millions, thousands or hundreds of years. In this awful maze, this labyrinth of duration, the word years has no effect on the mind. If, in the midst of this wilderness of primordial rock, some one had told me that within six years I would see the thousands of cubic miles of matter that once hurried through this gorge, and excavated from its depths, and that I would walk upon it, I would have been astonished. But I saw it all on June 4, and again on July 2, 1906. Fifteen thousand square miles of Permian, Jura-Triassic, Cretaceous, and later layers are absent



VIEW OF THE SALTON SEA BEFORE THE COLLAPSE OF A PORTION OF
THE SALT WORKS.

4966

Looking south; the track of the S. P. R. R. is close to the building at a depth of 50 feet. The second track is also submerged at a distance of several miles on this side of the warehouse.

from the uplands whose rainwaters flow through the Canyon. Their thickness was 10,000 feet. The matter all passed through the giant gorge, whose bottom is now 16,000 feet lower than the first layer carried away. Think of the word eons again.

THE WONDROUS IMPERIAL VALLEY.

On June 4, I ascended a tower in Calexico, California, and saw this same 15,000 square miles of geologic detritus and primeval product of denudation. The tower is 30 feet from the line of Mexico. As far as the eye could reach, to the east, west and south, there is spread out a vast expanse of soil made entirely of fine

silt that once passed through the great canyon. Not the Nile, nor Mississippi ever deposited richer soil. And in this sub-tropical climate, the Imperial Climate, vegetation, grains, grasses and fruits grow and mature with the most astonishing rapidity. The entire area is the garden, the hot-house of the United States. Upon stepping over the international line, one enters the Mexican town of Mexicali. It was then, on June 4, a thriving business town. Four-fifths of it, together with the bodies from the cemetery, are now in the bottom of the New Salton Sea, washed away by the diverted Colorado River. The hastily thrown up levee was cut away and



THE STATION AT MEXICALI, MEXICO, AND R. R. GRADING CAMP ON
JUNE 4.

4967

On July 5 the river was 45 feet below the building which stood on salt, and the building was in the Salton Sea. Track in bottom of the river.

every business house tumbled into the flood, 20 feet lower than the streets. From the tower, on June 4, I saw the river—a shallow stream, eleven miles wide, flowing to the west of the two towns, downward and northward into the wonderful Salton Sink, 287 feet below the ocean level. The eastern edge of the river was then almost to the top of the levee. Great was my surprise on July 2. The great expanse of water was then 45 feet deep in the earth, but only 400 wide. It was running through Mexicali with the speed of a mill-race, undermining buildings and the railroad. The soil, excessively fine silt and of great but unknown depth, melted away as though made of sugar. Trees, grain, gardens, grass, fences and

improvements of all kinds round-about Mexicali, and a few outside buildings in Calexico, plunged into the flood, and traveled with great speed to the depths of the Salton Sink, ruining railroad tracks and salt works.

THE WONDERFUL DEPRESSION.

In remote times the Gulf of California extended to the north-western side or end of the sunken area, just to include the site of Indio on the Southern Pacific Railway. But the head of the Gulf is now 140 miles from Indio. The Colorado once entered the Gulf through a mountain pass 85 miles east of Indio. It poured in silt, formed a barrier across the gulf, cut off an expanse of salt water and then moved to the site of Yuma, Arizona, 35 miles farther to the east, and entered the gulf about 12 miles above where Yuma now stands. The isolated expanse of saltwater evaporated and deposited a thick layer of salt. And then, within a few million years, the Southern Pacific Railroad came through the prehistoric Sink. Ties were placed on the salt-bed, rails were laid, and entire trains were loaded with pure salt and sent to Chicago and New York. The tracks are now 50 feet under the waves of a new sea, the salt is dissolved and warehouses destroyed. A new railroad was laid around the sea. It was soon submerged. Another was built farther to the north, and the sea is drawing nearer and nearer to the rails at this writing. The wide plain now having the present towns of Imperial and Calexico near its center,—since 1845,—has been called the Colorado Desert. Death awaited any living thing making the attempt to cross. I have several times passed the waste area on the cars, always saying “appalling desert.” It is now a luxuriant semitropical garden. Somebody planted seed where water could be had. So rapid was the growth that attention was attracted, great wealth was in sight.

TAPPING THE COLORADO RIVER.

Land and irrigation companies were formed. A vast network of canals, sluiceways, ditches, conduits and waterways was constructed throughout the rich “desert.” At last, every detail was completed in readiness to cut the west bank of the Colorado River, 8 miles below Yuma, and let in the precious water. The cut was made in the autumn of 1900. But rich silt deposited and choked this intake. Another stream was dug lower down. This became clogged with fine sediment. These cuts were made in California. Farmers were meanwhile settling in the valley far to the west, and

the cry for water increased. It was decided to go still lower and into Mexico and cut another intake. The hope was to secure a greater incline with increase of speed of water, so that silt would not deposit. And to get a supply of water at once, with the intention of putting in gates later. The river was low, and was not expected to rise before protection could be put in. But there came a disaster not thought possible. The Gila River suddenly poured a flood into the Colorado at Yuma and the new cut was soon filled with water. Silt, indeed, had no time to settle. Instead, the bottom and both sides, rapidly wore away. Alarm soon spread and at-



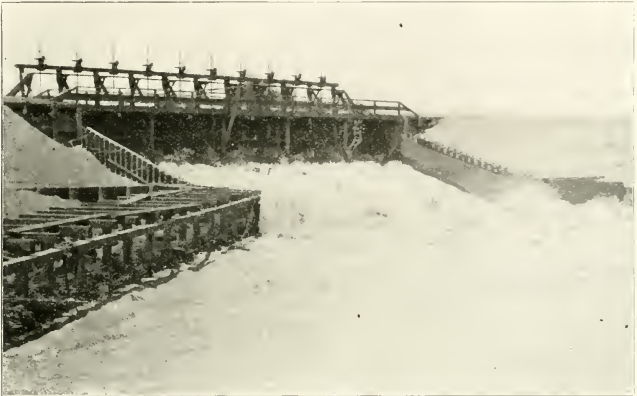
WESTWARD FROM CALEXICO IN THE FIRST STAGES OF THE FLOOD. 4968

River eleven miles wide, but on July 5 all this water was running through a cut 45 feet deep at C, close to the buildings in Calexico, to the left not shown. Mexicali to the left of D, is almost destroyed. At A is shown the top of Signal Mountain to the southwest in Mexico. B is a brick-kiln close to the Mexican lines due west of the two towns. From a photo by Rissinger, Calexico.

tempts were made to control the Colorado. Piles were driven and these were thatched with willows bound by cables, and covered by stones.

The first, second and third engineering attempts were made. But these were swept away as grass; for by this time, the regular floods of the Colorado came. A large island opposite the Mexican intake was washed through it and into the valley. The 50-foot canal soon widened to 100, to 500, to 1000, to 4000 feet, and the floods rushed through with impetuous speed. The entire system of canals was overflowed, Calexico and Mexicali were passed by

the rushing waters. The cut in the bank is 139 feet above sea level, Calexico is at ocean level and the sink 287 feet lower. The advance floods poured into the depression through an ancient river mouth with terrific speed. A mighty work appeared, cutting backward. The water backed up stream at times, with a rate of half a mile in each twenty-four hours. The roar was fearful. The falls receded, passed to the west of Imperial, Brawley and El Centro, and then drew near to Calexico. Levees were erected, Calexico was saved, but Mexicali vanished. The river on July 2 was backing up towards the Colorado cut and was two miles above Mexicali.



WASTE GATE AT SHARP'S HEADING.

4969

This is east of Mexicali, Mexico, and regulates the system of canals belonging to the California Development Company. From a photo by Rissinger, Calexico.

The Salton Sea is now 45 miles long and from 10 to 18 wide. On July 1, I went with a party of civil, hydraulic and railway engineers on the steamer Searchlight from Yuma down the river to the cut. The bed of the mighty Colorado below the cut was dry! No water flowed to the gulf, all went to the Salton Sink. The cut was 4000 feet wide. Trees were falling into the rapid current. I saw the vast plans as drawn up by the engineers. A great dam is to be thrown across the break. These plans are technical and can be explained only in an engineering magazine. The great scheme is in charge of Engineer H. T. Cory, Chief of the California Development Company. It is hoped that the arduous

work will be finished before January, 1907, and the floods controlled. If not, then the entire Salton Sink will be filled to the level of the primeval ocean, even to the ancient beach line. The Colorado in that event would never enter the gulf again, for its new bed is now lower than the old. Climatic changes would no doubt occur with the formation of a permanent new sea. If the dam is a success, then the fierce rays of the sun will again evaporate the water and the sea will vanish, leaving a deep layer of silt all over the layer of salt.

WONDERFUL ILLUMINATION OF THE ANCIENT SINK.

On my first visit, I secured an ordinary view of the Sink and its low down central sea. But on the second journey, it was my good fortune to behold a scene of splendor. The sun was just far enough north to escape a distant peak in the west and pour floods of slanting rays into the entire depression. I saw it all, for five minutes; every outline of the ancient ocean beach and the new sea. The region is simply wonderful. On July 1, I ascended a high place in Yuma and looked at the Sink with a glass from the east. I saw the giant rim of this cup in the earth. The geology of the entire region was revealed in all its scenic splendor.

LOWE OBSERVATORY, August, 1906.

THE DOG'S RACING LEVERS AND BURROWING OUTFIT.

BY WOODS HUTCHINSON, M. D.

ALTHOUGH a dog's teeth are the most important thing in his make-up, his legs and feet are only a shade less so. And their purpose is equally clear, even if we had never seen him use them. They are to run with and to stand upon, and hence naturally placed "one at each corner," as the school-boy explained in his immortal essay.

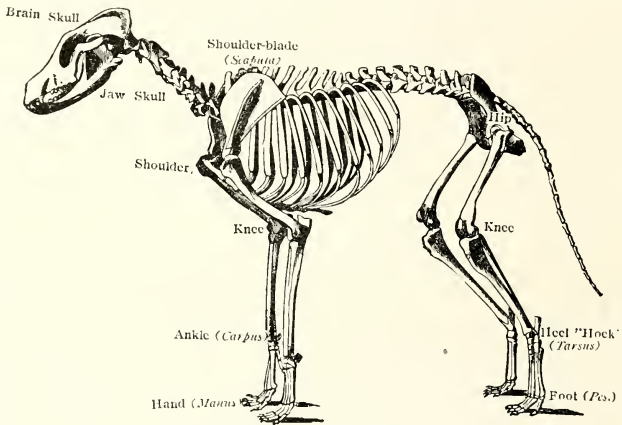
But why are the back pair so different from the front ones? As the dog stands at ease, you can see that his front legs are almost perfectly straight and upright, like props supporting his chest, and the only joint you can make out in them is the "elbow" close up to the body. The hind legs on the contrary slope first slightly forward from the hip to a joint called the "stifle," then a long slope backward to another joint the "hock" and a short slope forward again to the paw. They are anything but straight, indeed "crooked as a dog's hind-leg" has passed into a proverb and you can see two very distinct joints. And as a dog's back is as high at the hips as at the shoulder, and a straight line is the shortest distance between two points (in this case his body and the floor) it necessarily follows, as I think your eye will tell you, though you can measure it if you choose, that the hind legs are distinctly longer than the front ones.

If you will look carefully at this skeleton (Fig 1) you will see that the bones are not only longer but thicker. Now which pair would you say had the heavier part of the work to do in running? You will generally find in animals, that of two similar structures or organs in the same animal, or even in two animals of the same family, the smaller has the less to do, or is of less importance.

Go and watch the dog as he runs and see if this "trial-conclu-

sion" is right. A gallop is the best gait to study first, because this is the only pace in which both hind-legs are moved together. If you can get him to run past you slowly enough, you will see that he is moving in a series of bounds or short leaps, throwing himself forward with his hind-legs and catching, or propping, himself with his front ones.

Get him to jump a fence or over a log, and you will see still more clearly that he brings his long, crooked, hind legs well forward under him for the spring, launches himself into the air by suddenly straightening them and catches himself on the other side upon his fore legs until he can bring his hind legs in under him again.



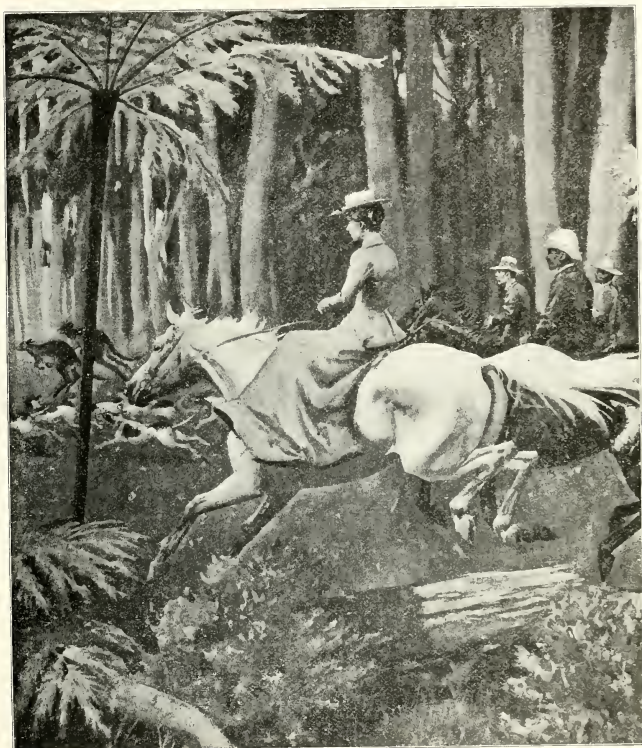
SKELETON OF THE DOG.

Fig. 1.

Now go watch his gallop again and you will be able to make out what part each pair of legs takes. He springs forward from his hind legs, catches himself with the front pair just long enough to "recover" or swing the hind one well under him again for the next spring; another "prop" with the fore legs, while the hind are coming forward into position again; another spring—and that is the gallop. A rapid succession of quick flat-jumps running into one another.

Mind it is only a very slow gallop that you will be able to take to pieces in this way, for if the dog is going at all fast, his jumps melt into one another and his legs make a confused blur,

like the spokes of a wheel. And to make it worse, when his hind feet come forward for the next spring, they do not only swing up to the planted fore feet, but right past them on either side and land



A KANGAROO HUNT.

4217

Showing plunging-forward character of gallop in both horse and kangaroos. The horse must prop himself with his fore-feet each leap; the kangaroo bounds so high into the air that he has time to swing his hind legs in under him before he alights without using his fore feet at all.

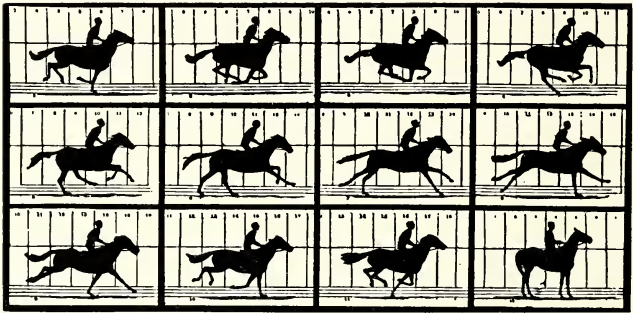
Fig. 2.

well in front of them, so that at one point in his stride the dog is doubled up like a double-bladed clasp-knife with the blades half open or like a boy when he vaults over a post or "takes a back" at

leap-frog. (See instantaneous photograph, the second figure of the first row of Fig. 3.)

In fact when a boy goes over five or six backs in succession at leap-frog, or swings himself forward on a pair of croquet-mallets crutch-fashion, he is going through precisely the same movements as the dog when he gallops, only, of course, in the latter case, his "hind legs" swing forward between his "front" ones, instead of outside of them.

How can you tell that the dog's hind legs swing forward outside of his front ones? In two ways. Go watch him gallop again



INSTANTANEOUS PHOTOGRAPHS OF THE RUNNING GALLOP OF THE HORSE SALLIE GARDNER.

4215

(From M. Muybridge.)

The last figure of the first row represents the hind legs brought under for another spring, and the first of the next row, the spring. The first of the bottom row shows the horse alighting on his fore feet.

Fig. 3.

and stand either directly behind or in front of him, and you will see that his fore feet are held comparatively close together, while his hind ones spread widely apart, just as ours do when we brace ourselves for an effort, so as to give him a broad and steady base for each spring.

The other proof can only be had on a smooth sandy beach or mud-flat in summer, or, best of all, upon the snow in winter. Then you will see that the track of a galloping dog is made up of three parallel lines of foot-prints, the two outer, long, narrow and with ragged scrape-marks at the heels from the plunging hind feet, the

inner round, clear-cut and almost single from the "propping" fore feet.

And if you will take any half-fused pair of the central marks, you will find that they are from two to six inches behind the corresponding pair of outer marks, according to the size of the dog and the rate at which he was going. In fact, this is the case with most animals' tracks, and the way in which sportmen tell which way a rabbit or fox was going is by noticing which way the wide end of the triangle, made by each "set" of the four foot-prints, points and this will be forward. A "set" of foot-prints will seem to be made up of three marks instead of four, but if you will look closely at the middle print, you will see that it is partially double and made by the two fore feet coming down so close together as to often make only one mark.

Now can we get any clue from the foot-prints as to which pair of feet has been doing the most clawing or pushing? I think we can, for the prints of the fore feet are round, clear-cut and complete to the very toe-marks, as if made by a seal in wax, while the prints of the hind feet are long, ragged-looking marks sloping in under the snow at the toes and ending at the heels in a blaze of irregular scratch-marks. And if you happen to notice a big dog running at full speed, you will see that he throws a small handful of sand or gravel, or a little puff of snow, up into the air behind him, with almost every stroke of his hind legs. A pack of hounds, running at full cry in fine dry snow, will raise such a cloud of snow-dust as to almost hide them from view.

Do you think that our "trial conclusion," that from the shape and greater length of the hind legs they did the greater part of the work, was correct? It would be safe to say that they are the "driving wheels" of the dog-engine, while the fore legs are little more than the "front trucks." But why are they so crooked? Partly as you see at a glance, because they have to be doubled up, and brought forward under the body for each spring, so quickly, that one joint or bend in them would not be enough and partly for another reason.

Supposing you were challenged to jump just as far as you could from a certain mark on the ground, how would you go about it? Would you toe the mark, stand up just as straight as you could, and jump without bending your knees? If you did you would not get more than a few inches from where you stood. You would first bend your knees, then your hip-joints, and then lean forward on your tip-toes and bend your ankles, in fact make your legs as

crooked as possible. Then after springing up and down two or three times to "limber up and get the swing" you would crouch down so as to bend each joint to the utmost, suddenly straighten them by a violent effort and thus shoot forward into the air. You make all the curves possible in your legs, then by suddenly straightening them, shoot yourself forward like an arrow by the straightening of a bow.

Now when you have your leg bent, about half-way ready for the jump, it is precisely the same position and shape that the dog's leg is in all the time. He too, when he is getting ready for a leap, crouches down and bends his legs until his body almost touches the ground. When you are standing quietly the whole sole of your foot, of course, from toe to heel rests upon the ground, while in the dog only the toes and a very small part of the sole touch the ground.

Is then his foot quite different from ours? Not at all, only that less of it touches the ground, for if you rise up and balance yourself on tip-toe with bare feet on smooth sand your foot-prints would be very much like his, only your toes are arranged in a nearly straight line across the print and his in a horse-shoe shape round the central "ball." In fact the dog walks as you run, (when you really *run*, not *shog*) always on tip-toe.

Why doesn't he stand and walk "flat-footed" or "heel-and-toe" and why don't we stand on our toes? If you will just try to do so you will soon see. It is very hard work to balance oneself upon tip-toe, because having only two feet to balance on, it requires the whole length of the foot upon the ground to give a broad enough basis to stand on, while the dog has two other legs to prop him up. So that Carlo can stand on his toes, in a way that we cannot at all, and he gets two advantages out of it, first that makes his legs longer, which enables him to run faster, and second, it makes another bend or curve in his legs, so that his gait is more elastic and springy when he runs, and more soft and noiseless when he walks.

And what is most curious, we imitate him in this respect whenever we want to steal along quietly, just as we say "on tip-toe" or when we want to run fast. The moment you get beyond a certain speed, up you go on the tips of your toes and your heels never touch the ground at all. This is both to get the longest possible leverage and to avoid jarring. If you doubt the latter try to run fast "on your heels" and see what a terrific shaking up it gives you, or jump over a bar and light on your heels instead of your toes.

Nearly all animals walk on their toes; some like the horse and the cow, even on their toe-nails and only the bears, the badgers

and a few others walk, like ourselves, on the heel as well. Has the dog got a heel at all? Let us compare one of his hind legs with one of our own and see.

First of all there are the four toes each with a claw on it, which evidently correspond to our five with their nails, then we have a rounded pad just behind these, just like the ball of our own foot. Then comes a straight, slightly-flattened part of the leg which runs up and back to a sharp, almost right-angled bend in the dog's leg, his knee, apparently. Put your hand on this joint and you will readily feel that the "squareness" of its bend is due to a short spur of bone which projects just as your heel does behind your ankle. In fact this *hock*, or apparent "knee" of the dog, is really his heel, and the part of his leg between it and his toes corresponds to the long sole of your foot.

But where then, you will ask, is his knee? Follow his leg on up, as it slopes quietly forward from the hock, and just below the level of the lower line of his body you will find another joint, which points forward and has a bony knee-cap in front of it, just like your own knee. Above this the leg slopes backward again to a hip-joint just like yours, but which seems to be right up in his body, so to speak, at the upper part.

The same is true of his fore leg and our arm and hand, as you can readily verify by comparing. And this arrangement is also found in most animals: the thigh is partly buried in the body, so that the real knee scarcely shows, then comes the leg proper, running down to the hock, which is popularly called the "knee," as in the horse, the cow, the deer, but is really the heel. Probably the best way to remember that hocks are not knees is to notice that they bend *backward*, instead of forward, as real knees would.

And now are we ready for the question what is the use of legs? To move about with, of course. But what of seals and fishes and worms and caterpillars? They all move and some of them very fast. A trout in a clear pool, if you startle him, will dart away so quickly that your eye can scarcely follow him; he *was* there, and he *is* somewhere else, that's all you can say; and yet, none of them has a trace of a leg except some caterpillars, who however move chiefly by "humping" their bodies and straightening out again. So that I think we shall have to add, "on land," to our definition of the use of a leg.

But all these animals we have mentioned, that move at all, have *something* to move with. The fish has fins; the worm has short stiff bristles which you'll easily see if you catch a big one and look

at his under surface with a weak magnifying glass; or still more easily will feel, if you rub your finger gently underneath him or let him crawl over your hand. If you compare the things they move by with another you will find they are all little rods or levers, jointed on to the body, so that their free ends can strike on some substance or surface and push, or hitch, or waft the body forward. And when we remember what substance the lever is to strike against, we will find that the thinner and lighter this is, the broader the lever, or fan of levers.

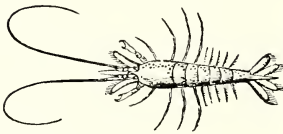
Thus a fish's fin which has to push against the thin, fluid sub-



CATERPILLAR (LARVA) SPHINX MOTH
SHOWING LEGS.



AMERICAN MYRIAPOD, OR GAL-
LEY-WORM, (*Iulus*).



MACRURUS: BAIT SHRIMP,
SHOWING LEGS.



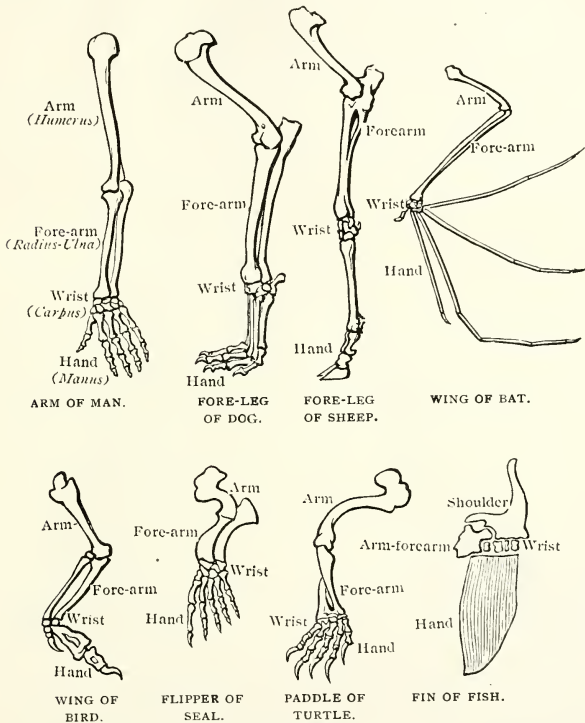
AMERICAN
EARWIG
(*Lithobius*).



GEOMETER,
OR SPAN-
WORM.

stance, water, is broad and paddle-shaped just like an oar or like you make your hands when you try to swim. A bird's wing, which beats against the still thinner and lighter substance, air, is spread out into a huge light fan of feathers just stiffened with bone, like the masts and boom in the sail-spread of a yacht. The interesting thing about all these shapes of levers is, that they are every one, the fin of the fish, the wing of the bird, the paw of the dog and our own foot, made up of precisely the same groups of bones and joints, fingers, wrists, forearms and (except the fish) arms, differ-

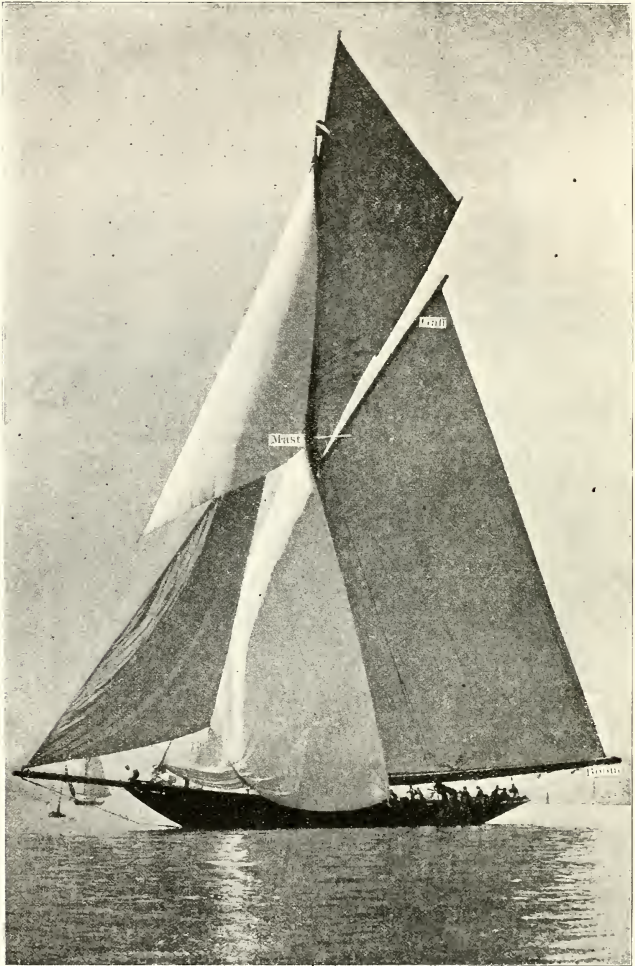
ing only in number of fingers and wrist and hand bones. And still more striking, the "hands" of all these "legs," except the fin, are made up of exactly the same number of finger-bones, or the traces of them, and this number is easy to remember, for it is the one which we have on our own hands and feet, five.



(Wiedersheim.)

Fig. 5.

The dog, as you can readily count, has almost his full number, five in front and four behind, but the sheep has only four, two big ones or "hoofs" and two little shorter ones on each side, the cow only two big ones, and the toe-nails of two others, one on each side of the leg, six inches up, while the horse caps the climax with only one big central toe-nail and finger, or "hoof," and just the



"AILSA," A RACING YACHT.

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Showing similarity of mast, boom and gaff, to bones in bat's wing.

Fig 6.

"splint" of another finger-bone on each side, which you can feel above his fetlocks.

If you look at this drawing of the bones of each of these feet, side by side, you will, I think, see at once why we think that all these forms have grown out of one common primitive type with five toes. Indeed some would carry it still further back and say that all legs, wings, fins and paddles of every sort have grown out of a crop of stiff paddle-like "bristles" or *cilia* (Latin for "eyelashes") such as the oyster is covered all over with, in his kindergarten days, before he grows a shell and settles down for life. These *cilia* are slender, whip-like little hairs, but very active, and by all lashing in one direction at once they send the young oyster flying through the water as if he was an eight-oar racing-shell.

And this is the way that a great many legless creatures move through the water. Then we may imagine that ten or a dozen of

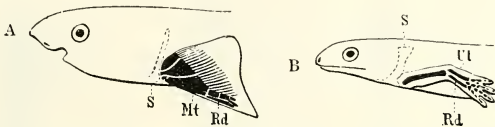


DIAGRAM TO SHOW THE RELATION OF THE ANTERIOR LIMB TO THE TRUNK IN FISHES, AND ITS SIMILARITY TO THE HIGHER VERTEBRATES, MORE OBLITERATED IN A THAN IN B.

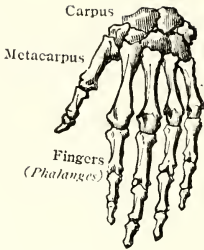
(Wickersheim.)

S, pectoral arch; Mt, metapterygium; Rd, radialis in A, radius in B; Ul, ulna; proximally to Ul and Rd is the humerus.

Fig. 7

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these *cilia* grow longer than the others and get fused together and a soft flap, like an eel's fin, is formed; two or three of these on each side send the animal along faster than the hundreds of tiny lashes did. They soon grow long enough to need stiffening and tiny rods of gristle form and soon turn into bone, by filling themselves full of lime, which sets into tough, living plaster. These are the fingers which in the fish's fin may be ten or fifteen in number, but steadily get fewer until in the frogs and salamanders they become five and never get beyond this number again. This hand, with its wrist-joint, is all the fish needs, because the water floats it off the bottom, but as soon as animals begin to crawl out on shore, then they have to use their fins to lift and help themselves along with, as several sorts of fish do. Soon in the frogs and newts an arm and leg grow out to lift them above the ground, and finally as they get further out



HAND OF MAN.
5 FINGERS



FOOT OF DOG.
4½ FINGERS.

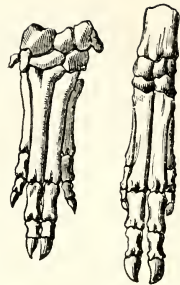
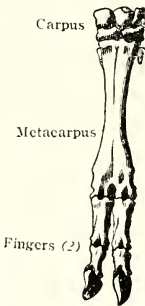


FIG. WATER-DEER.
4 FINGERS,
but 2 side
ones much
smaller



SHEEP'S FOOT.
2 CENTRAL FINGERS
side ones disap-
peared.



ABNORMAL HORSE'S FOOT
(*Bifid*).



HORSE'S HOOF.
1 CENTRAL FINGER.
All others gone but
remains of meta-
carpals of 2nd and
4th fingers.

DIFFERENT FORMS OF "HAND-FOOT".
(*Wiedersheim.*)

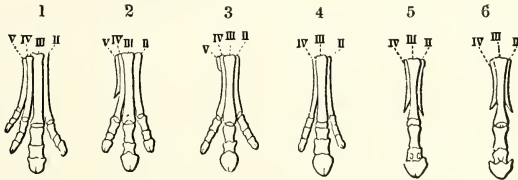
Fig. 8.

of the mud an upper arm and thigh appear, and now we call them lizards and they can run quite fast.

From this on arms and legs continue essentially the same, changing as we shall see according to the uses they have to be put to.

Mind, we cannot say that the fish turned into a frog, by trying to walk on land, and the frog into a lizard by keeping at it, but only, and this is most important if we want to understand arms and legs, *that the legs of each of these animals have been gradually changed from one common type, so as to be suited to the different uses to which they are put, in each given case.* So that if you study an animal's legs you can tell in advance the uses to which they have been put, or contrariwise, if you know the uses, you can guess at the make-up of the legs.

What makes this even more interesting is, that as we grow up



FORE FOOT OF ANCESTRAL FORMS OF THE HORSE.

(Wiedersheim.)

1. Orohippus (*Eocene*). 2. Mesohippus (*Upper Eocene*). 3. Miohippus (*Miocene*). 4. Protohippus (*Upper Pliocene*). 5. Pliohippus (*Uppermost Pliocene*). 6. Equus.

Showing how one animal's foot has gradually lost its toes in the last three geological periods. Roman numerals refer to the original number of the toes.

Fig. 9.

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from the egg, each of our wings, paws or hands, as the case may be, buds out from our bodies, like a blunt flipper or fin, then splits into fingers and toes, even in young birds in the egg, next gets gristle-rods in it, then changes by hardening into bone, so that at one stage we have hands growing out of our shoulders, but no arms. Soon these bud out further and the forearm appears and lastly the arm and thigh. And if, at a certain stage, you were to take a little bird out of the egg, and a young dog or sheep out of its mother and examine the limb-buds or "hands," you could hardly tell them apart.

So then the dog has grown his long, stick-like legs so as to run fast upon dry land, or if you like to put it the other way, he can run fast upon dry land because he has such long and well-

grown-out legs. But why need they be so long? A frog's, or a lizard's, or a rat's are not half so long, even in proportion to their size. But can they run as fast? Of course not. Running, as we have seen, is simply plunging or falling rapidly in one direction and catching oneself before one's body strikes the ground. So that the longer the props that lift you above the ground and the further you can plunge or fall forward without striking it, the longer the levers that drive you forward and the farther you can spring.

All very swift animals, such as the deer, the horse, the greyhound, have long legs for this reason and are good jumpers as well. But now comes a question why have no two of these the same kind of feet, though their legs are practically the same? Which we answer by asking another: "Do they use their feet for different purposes?" Of course they do; they all run, but beyond this their feet are put to widely different uses, and if we remember these we shall, I think, find some reason for each form of foot.

What does the dog do, or need to do, with his feet that horses, cows and sheep do not with theirs? Scratch and dig holes in the ground, for one thing, and if you will look at the paws of all animals that burrow, moles, rats, rabbits, wood-chucks, you will find them all four or five fingered, broad, rather flat "scoop-shovels," with four or five sharp, strong trowel-shaped nails or claws. So that I think we may call this the burrowing paw.

But if this be the meaning of Carlo's many-toed, nail-shod foot, we ought to find his fore-paws broader, stronger and more scoop-shaped than his hind ones, because two-thirds of his burrowing is done with these, the hind paws simply throwing the dirt back out of the hole dug by the front ones. And that is just what we see, five toes on the fore paws and only four on the hind ones. But, some of you may ask, is digging of so much importance to the dog as to really influence the shape of his foot?

You thought the chief use Carlo made of his claws was to dig up the flower-beds and ruin the grass-borders while burying bones in them, or to scratch the polish off the door in trying to get out of the room. Well, that is perhaps about all the use he can make of them in town, but take him into the country and show him a rabbit-hole or a chipmunk's burrow under an old stump and he'll soon show you what his claws are for. Before he was tamed he had literally to dig for his living, and his first cousin, the wolf, and second cousin, the fox, do so still.

You can see how important it must have been to him once, hundreds of years ago, by watching how excited he gets over it,

sending the dirt up into the air behind him in a perfect shower, gnawing at the roots with his teeth, yapping furiously and behaving generally as if he were crazy to eat the whole field up. Though he probably isn't hungry at all and knows perfectly well that he'll get his dinner just the same when he gets home, whether he catches that rabbit or not. Indeed you ought to watch him, and call him off after a few minutes or he'll scratch till his toes bleed and be sore-footed for days afterward, if he hasn't been doing plenty of digging lately. He gets soft-footed in town just as you get soft-handed.

Then, when he used to have to live upon what he could catch, he would often kill more rabbits, or a bigger deer, than he could eat at once and what was left of it he would dig a hole for and bury carefully, to keep other animals from finding and stealing it. Just as he will do in town with his bones and surplus scraps, though he may be so well fed, that he'll often forget to go and dig them up again. But he can't forget that there was a time when strict prudence compelled him to bury everything that was left of his share of the deer at once, as it might be a week before he got another.

Then another important use of his claws when he was wild was to dig a burrow for himself to sleep in, though I am ashamed to say that he usually stole a rabbit's hole and enlarged it, after eating the owner. Then when the warm days of spring came both father and mother dog, or "wolf," as their name probably was in those days before the cave-man adopted them into his family and gave them new names, would fall to work with tooth and nail on the sunny face of a warm, sandy bank, in some snug hollow in the woods and scrape out a splendid cave-nursery, with a tunnel entrance and one or two long side passages with hidden outside doors at the end. Then they line this with grass and leaves, which they carry in their mouths, and mother-wolf scratches off some of her fur to make the nest softer, and all is ready for the baby-wolves.

What else are the dog's feet better fitted to do than the horse's or cow's? To run softly and steal up upon things. You can hear the hoof-beats of a galloping horse a mile away, on a still day, and even at a trot you can tell he's coming long before you can see him down the road, but a dog gallops so silently and springily, that you can hardly hear his foot-falls at all except on a pavement or hard road. Upon a pavement or on hard smooth ice you can hear his claws rattle in the most curious fashion, but upon an ordinary dirt or grass surface you can hardly hear his foot-fall fifty yards away, and when he is creeping up upon a rabbit sitting

in its "form," or a quail in the grass, you can't hear a sound except the faintest rustle.

A dog who is clever at stalking, like his second cousin the fox, will steal so skilfully up the wind upon a hare or a partridge sleeping in its tuft of grass, guided only by the smell, that he will often get near enough to pounce on it before it even suspects he is in the neighborhood. Some dogs are so skilful at this that hunters use them just to point out where partridges, or quails, or prairie chicken sit in the long grass, and they have trained them to stop dead, or "set," when they come within a few yards of the birds, so that the gunner has time to come up to them and be within easy shot when the birds fly up. These dogs are called "pointers" and "setters" from the work they do and we shall see in another chapter what a wonderfully keen scent they have, and why they stop short instead of pouncing on the partridge.

In short, the dog walks continually "on tip-toe," partly for the same reason that you do when you are trying to cross the room without waking the baby, and when he really tries to walk softly he beats us hollow and indeed almost any other animal except the cat whose velvety paws and supple legs are even better adapted for the purpose. He has almost what Kipling says of the wolf, in his splendid "Song of the Seonee Pack."

"Feet that will leave no mark, no mark,
Eyes that can see in the dark, the dark."

If you want a true, living picture of an animal in the fewest and most vivid possible words, go to the *Jungle Books*.

But what of the horse and the cow? Do they need to dig for their food or to steal up to their prey? Of course not, for they eat only grass and corn and leaves which grow right above ground and can neither hear them coming nor run away if they did. So there has been nothing to hinder their feet from growing as hard and stiff and heavy, as may be needed to carry their great bodies over hard level ground, at a high rate of speed. Their toe-nails have turned into thick, hard, stiff cases or "box-shoes," which cover the whole surface of their toes, and no matter how slowly or carefully they walk you can hear every foot-fall a hundred yards away.

Of course they have gained something by this change or it would not have happened. No living dog, except the "manufactured" greyhound, can keep up with most of the hoofed animals, the antelope, deer, horse and even Texas cow for a mile or two-mile dash. In fact they have literally put on thick-soled boots to run

in, just as we have in town, though we can go barefoot very comfortably in the country. And the one that runs hardest and longest, the horse, has grown the hardest and solidest hoof.

A good way to see which is the toughest foot on a hard surface is to start off on an all day drive and let Carlo try to run behind the carriage; you'll find after twenty or thirty miles he'll be very glad to get in and ride, in fact, if you are going more than ten or fifteen miles, you ought to watch him very carefully and take him in for a lift, at least, as soon as ever he seems tired, or he will wear blisters on his feet trying to keep up with you. On natural ground such as grass or fields he will gallop all day, especially if he can get his feet wet and cooled off in some pool or stream every hour or two, but even then he won't cover more than twenty or thirty miles with comfort, while a good Arab, English thoroughbred, or broncho, in galloping trim, will cover from sixty to eighty miles easily and has been known to go a hundred and twenty, when riding for life or carrying despatches.

When we are hunting prairie-chickens, on the dry upland prairies, we always carry a large jug of water and a bucket to cool the setters' feet every hour or so, if we don't happen to find a pond or well. Dogs often suffer great discomfort both on the road and in the hunting-field simply because their well-meaning owners don't realize how tender their feet are, and it is always well to be very careful, when you are driving or cycling with your dogs to give them plenty of chances to run down to every stream they come to and time to lie down for a few minutes afterward. The dear fellows, of course, will keep up with you if it wears out every toe they have, and if they are afraid that you'll go on and not wait for them, they often won't even run down to the streams at all, for fear of being left behind. The best motto in driving or cycling with a dog across country is "fair and easy goes far in a day," and you'll find it doesn't work badly for you either.

The dog's foot is neither a shoe to walk in nor a horn boxing-glove to fight with, as in the horse, but it is just the kind of a foot the dog needs in his "business." A capital entrenching-tool, a pad for highway robbery, a springy, elastic support for the slow but tireless gallop of the blood-trail, up hill and down dale, it is all of these. But it is neither a hoof nor a hand. Our own hands and feet are built on precisely the same principle of meeting our needs out of almost precisely the same raw material of five fingers. We have kept the full number both in front and behind, and our front toes have grown long and well-separated, with the first one

coming round to face the others and form a thumb, so as to grasp things and climb with, while our hind fingers have grown shorter and "blocked" together side by side, to furnish a firm pillar of a strong elastic arch supporting the body. Our fifth ("little") finger is shorter than the others and slenderer both in front and behind, while in the dog you will find that the first or inner toe of the front foot does not reach the ground and in the hind foot has disappeared entirely, except in some breeds where its toe-nail still persists six inches up the leg and is called the "dew-claw."

It is always the "outside" toes on either side of the foot which tend to disappear; the cow has lost the "thumb" or first entirely, and all but the nails of the second and fifth, walking upon the third and fourth or "middle"- and "ring"-fingers, and the horse has lost all but the third or middle one, the toe-nail of which bears his whole weight. If you feel his leg carefully just above the fetlock or "ankle" you will make out a long slender "splint-bone" running along each side of it, which are the last remains of his second and fourth toes. No animal keeps any more toes than it has full use for and nearly all the climbers, burrowers and hunters have kept their full number, while most of the browsers have lost over half of theirs.

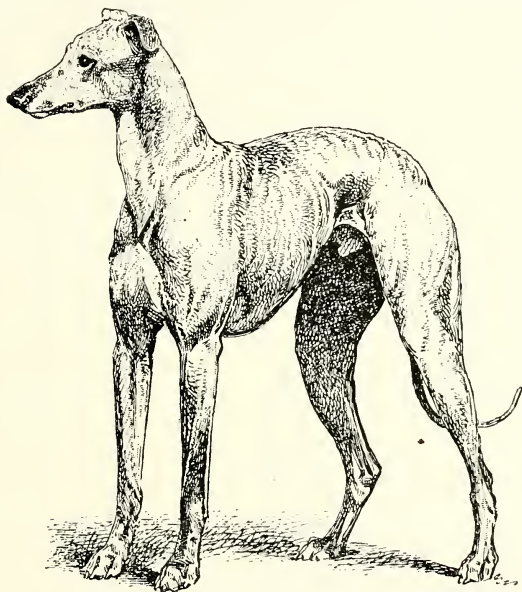
Now let us see how the legs and gaits of the different kinds of dogs and their relatives vary. To begin with the probable father of them all, the wolf. His legs are slender but strong, his feet small and compact so that his foot-print looks as if he had only three toes, and there is a great deal of hair between his toes. His trot is long, swinging, tireless and "eats up the long miles like fire," and his gallop the most beautiful gait the sun shines on. He carries his head up and shoulders erect like a well-bitted cavalry charger, ready to wheel in any direction, on an instant's notice, his legs are kept well under him, his hind feet swing forward to below his ears at every bound, and he sails along like a swallow on the wing, or a balloon on legs, his feet scarcely seeming to strike the ground.

But with all his grace and airy lightness he lacks driving force, and his heavier-boned, deep-chested, sullenly determined descendant, the sleuth- or trail-hound, will wear him out and run him down in the long, stern chase which is given to the music of the baying pack.

Both the wolf and the fox gallop lightly and with a gliding movement close to the ground, while their hereditary enemy and blood-relative, the hound, has a heavy, noisy, plunging gait like a

steam-tug in a heavy sea. He carries his head low to follow the scent of the trail (except when it is warm enough for him to take it breast-high) and his tail up as a signal to the rest of the pack, just the exact reverse of the wolf. But every inch of him, from the end of his nose to the tip of his tail, is working for dear life.

You can see every one of the plunges and props, of which we found a dog's gallop was made up. It is not a graceful gait,



THE GREYHOUND FULLERTON.

Thrice winner of the Waterloo Cup, the most valuable of all coursing prizes. (*Wesley Mills.*)

Fig. 10.

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but it "arrives," as our French cousins say, and will wear out and run down the wolf, the panther, the deer, the antelope, the hare, all of which are capable of nearly double his speed for the first three to five miles.

But the champion galloper of the dog-world is the greyhound. He is scarcely a dog, but a racing machine. His legs, his feet, his tail, even for some unknown reason, his nose, are long, slender and

graceful as a deer's. At first sight he is all legs and chest, his head simply his neck whittled down to a long point, his waist, or as fanciers call it his "coupling," like a wasp's.

But put your hand on the small of his back and you'll find that his loins are one superb, rounded, Atlantic-cable of steely muscle and look small only by comparison with the splendid depth of his chest. His hind-quarters, instead of being square, curve gracefully round in one continuous sweep from his arched back right down to his hocks. In fact all of him behind the last rib forms one great continuous "C-spring," which splits into legs in the lower half. To see him run is a poem, for when that long back-rump-legs spring curls up so that his hind feet are just under his nose and then suddenly straightens itself, as it does every stride of his gallop, the leap he takes is something tremendous. Scarcely do his fore feet touch the ground when forward come his hind spring-levers again for another splendid plunge, so that every inch of his body from his ears back seems to be driving him forward.

His gallop is not so graceful and gliding as that of the wolf, but it is nearly twice as fast, and a good greyhound will overhaul a coyote hand-over-hand, if he can only keep him in sight. There is his weak point, however, he goes at such a pace that he could not possibly catch the scent, even if he had a nose like the hound, so that when he reaches the top of the ridge over which the wolf or antelope has disappeared, he has no idea which way it has gone unless it is in plain sight. You will see him leap madly up into the air four or five feet and stare wildly around in every direction, and if he can catch so much as a glimpse of Brer Wolf off he goes like a shot, but if he can't, that is the last of his chance, for as a matter of fact he has hardly any scent at all and if he had he's too lazy to use it.

And to make it more provoking, it will often happen that you from your seat on horseback can see the game more plainly, but you can't show it to him and he won't stir a step till he sees it, no matter how you wave and shout at him. If you can call him to you and your horse is reasonably steady—which does not often happen on the plains though—you may get him by the collar and hoist him up on to the saddle before you and perhaps succeed in giving him a glimpse of the game, and if so he'll drop off and go like a shot in that direction. But it is only one dog in ten you can do it with, even if your broncho has no objection.

A greyhound has only one sense, his sight, and unless he can bring that to bear he is useless as a saw-horse and ten times as

provoking. You can send a setter or pointer or spaniel half a mile in any direction, simply by a wave of your hand, but your greyhound like Kipling's "Heathen in his Blindness" "won't obey no orders except they is his own," and the more you expostulate with him, the more likely he is to turn sullen and either lie down or start off in precisely the wrong direction, with an expression of utter boredom.

I once galloped at the top of my pony's speed for more than a mile close behind a wolf, shouting frantically to my silly greyhound, who was amusing himself about a quarter of a mile away and who when he did at last come up, just as the wolf was disappearing over the brow of the next ridge, instead of dashing forward, fell calmly behind my pony's heels, just as if I usually exhorted him to follow me in that tone of voice, and with such unprintable adjectives.

But that is the greyhound way, you never can depend upon them, for even if they see the hare or wolf plainly, it is even chances whether they start or not. If they do not like the lay of the ground or the color of the hare or the length of his ears, or the stage of the moon is not quite to their taste, they will calmly look the other way and refuse to budge, which is peculiarly soothing to your temper. They are as fanciful as fine ladies at a lace counter, and I have seen the fastest dog in our pack get "miffed" and for no apparent or imaginable reason whatever, flatly refuse three jack-rabbits in succession, two "jumped" within fifty yards, and one chased by another dog literally almost under his nose, and then dash after the fourth bunny like a rocket and catch it within two hundred yards.

Indeed you never think of going out with less than three dogs, so as to be sure of having *one* start, whenever a hare is put up.

I have given quite a full sketch of the greyhound, because he is an example of a rule that is very common among animals. And that is, that to do one thing extremely well usually means doing certain other things very poorly. The pure greyhound can do one thing superbly, run by sight, but that is about all he is fit for. His name, by the way, means this and has nothing to do with his color which is commonly black, mouse-color, or buff, almost never grey. It was originally "gaze-hound" and has gradually become corrupted to "greyhound," as easier to say, but in some of the old ballads and hunting-songs you will find it spelled "gaze."

By depending on his eyes and speed he has almost lost both scent and sense, so that he can in some cases scarcely recognize his

master by smell, and will lounge after any loafer, who will pat and feed him a little, so that he's never certain to be at home when you want him. A run of three miles at speed is about all he is good for. He has poor intelligence and worse manners, if you try to teach him any thing it is labor lost, and if you take from him the hare he has killed before he can eat it, he is quite likely to fly at your throat.

In short, as I said before, he is a racing machine, instead of a dog, and in spite of his beauty and speed, one of the most disappointing creatures on four legs to try to make a friend and companion of. Notice I say "pure-bred," for there are plenty of half-and three-quarter-bred dogs which are both intelligent and devoted.

My friend Pedro, who could trip up a wolf so cleverly, had one-fourth of bull-dog in him, and in fact on the plains for big game we find it absolutely necessary to use only greyhounds with some bull-dog blood in them, to give them the stamina, endurance and pluck needed. Even though your thoroughbred is faster, he is so easily discouraged that a three-quarter-bred dog, with less speed but more "stick-to-itiveness" will catch many more hares in a week, to say nothing of real heart-straining gallops after antelope or coyote.

For the matter of that, a drop of bull-dog blood improves almost any dog, not only in courage and endurance, but also in intelligence, and some strains of greyhounds are regularly crossed with it every four or five generations.

CHINESE LIFE AND CUSTOMS.

BY THE EDITOR.

Illustrated by Chinese Artists.

THE more our civilization expands, and with it trade and commerce, the closer will be our relations with Eastern Asia, and it is to our own advantage in our dealings with foreign people, to understand their habits and to be as familiar as possible with their main motives in life. Having long searched in vain for a good source of information concerning life in China, we have at last discovered a book, which was published in Japan by a Japanese publisher assisted by Chinese artists, and entitled, *An Exposition of Chinese Life and Customs under the Chin Emperors* (the present Manchu dynasty). The book bears the title *Ch'ing Hsü Chi Wen*,¹ or, as the Japanese pronounce it, *Shin-zok-kih-bun*, and is published in Tokyo.

The book before us is fully illustrated and gives as good an insight into Chinese life as can be had in any special work. The illustrations are simply outline drawings after the fashion of Chinese art, but in this way, too, they become characteristic of the people whom they are intended to portray.

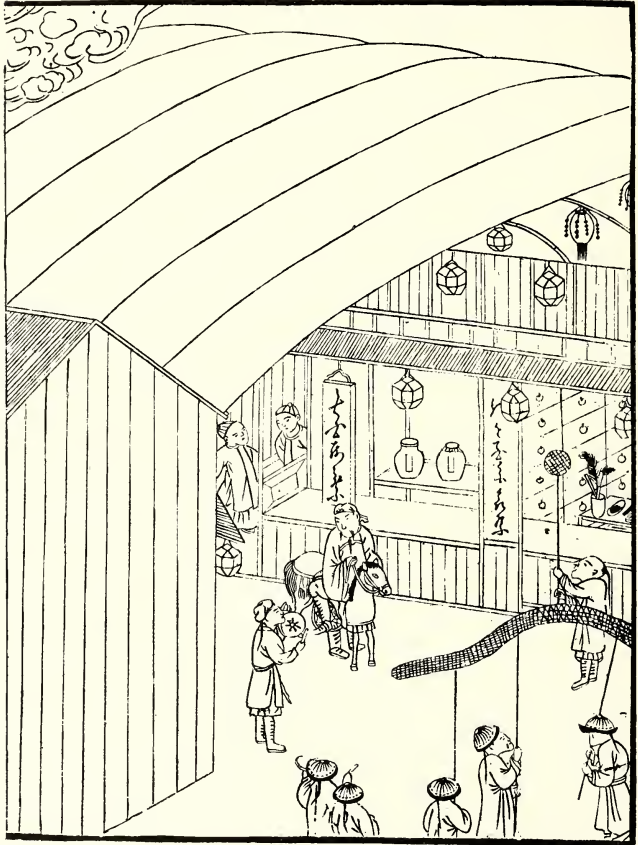
The entire work consists of six fascicles, and we will select from it the illustrations that are of special interest.

ANNUAL FESTIVALS.

The Chinese calendar is lunar, but its beginning is determined by the sun. New Year falls on the first new moon after the sun has entered Aquarius, which will never happen before January 21, nor after February 19. The months are strictly regulated by the moon. The first of every month is new moon and the fifteenth is full moon.

¹清俗紀聞

New Year's Day is a feast of great rejoicing. It is celebrated with paper lanterns and paper dragons, which are hung up in arbors specially erected for the purpose, and carried about in procession.



On the fifteenth of the first month, the Chinese celebrate the birthday of the "Spirit of Heaven." Among the gods he is the chief of a trinity which is greatly respected all over China, perhaps

as much as are the three Magi among Roman Catholic Christians, whose festival also falls in the first month of the year. The two companions of the "Spirit of Heaven" are the "Spirit of Earth"



A FEAST OF LANTERNS.

2249

and the "Spirit of Water." The blessings of all three are much needed. The Spirit of Heaven confers upon us celestial bliss; the Spirit of Water quenches fire, and the Spirit of Earth procures

forgiveness of sin. The birthday of the Earth Spirit is the fifteenth of the seventh month, and the birthday of the Water Spirit is the tenth of the ninth month.



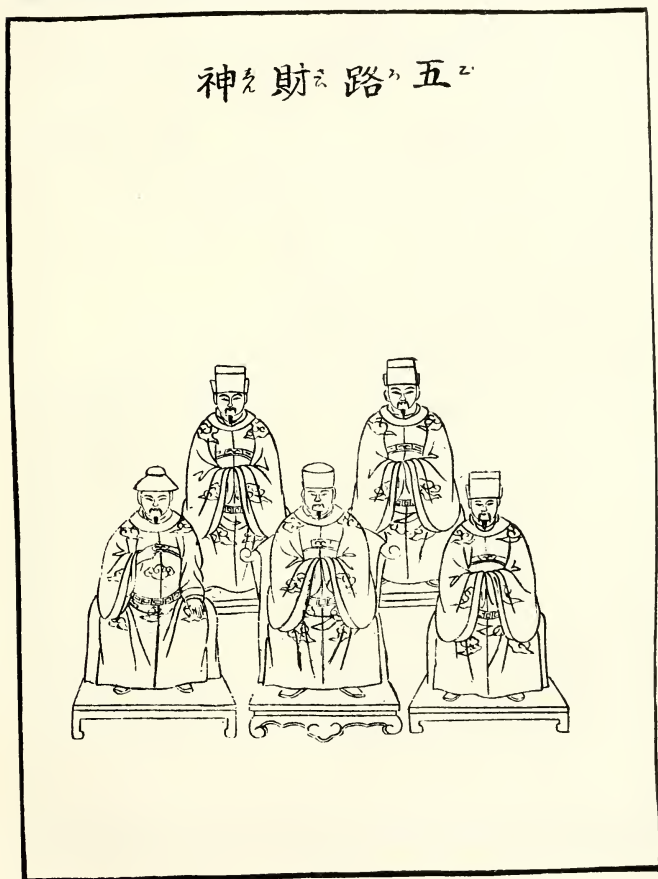
THE THREE OFFICIAL BODHISATTVAS.

2262

The Water Spirit, the Heaven Spirit and the Earth Spirit.

The five gods of wealth naturally play a prominent part in the Chinese calendar, for every one wants to be rich and curries favor

with them. They have a festival on the second and sixteenth days of every month, which is celebrated by candle and incense burning and by sacrifices of pigs, calves and goats.

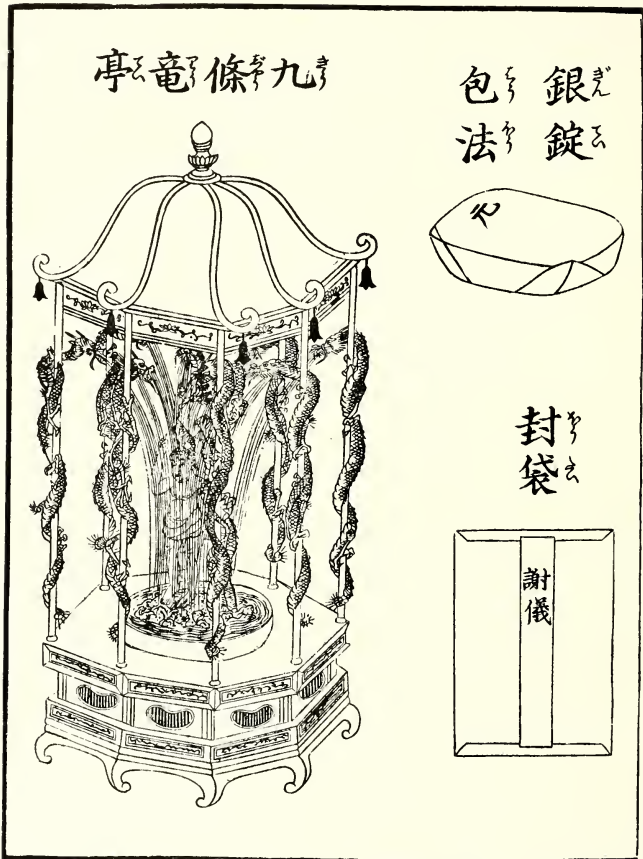


THE FIVE GODS OF WEALTH.

2250

Honorariums for services of teachers, and physicians and other professional men, are sent out five times in a year: in the beginning

of summer, in the fifth month, in the seventh month, at the beginning of winter, and on the last day of the year. The honorarium



BAPTISMAL FOUNTAIN OF THE BUDDHA
INFANT. 2265

PAYMENTS FOR PROFESSIONAL SERVICES.

is wrapped in white paper, as indicated in our illustration, and then sealed in a little envelope.

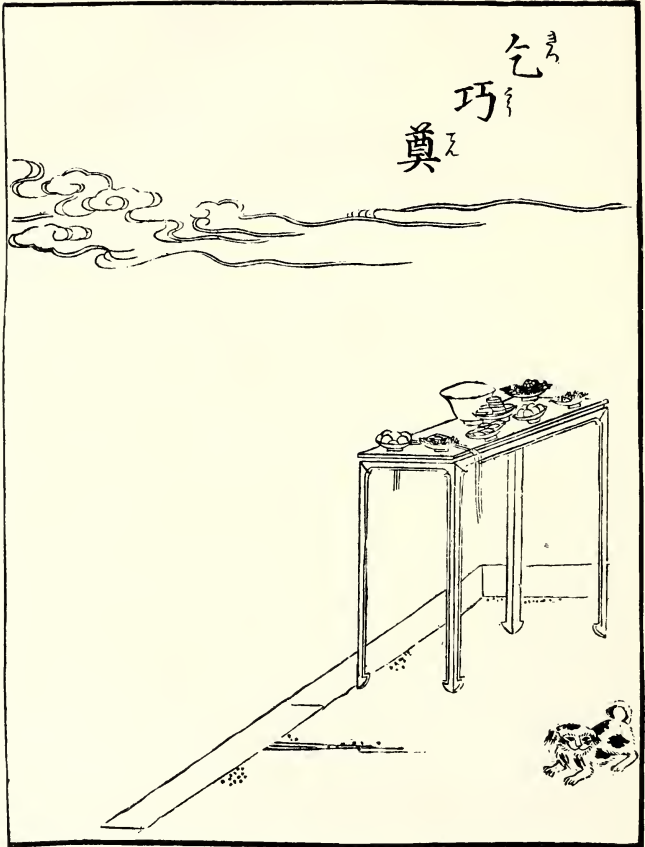
Buddha's birthday is celebrated on the eighth day of the fourth month, and in commemoration of it Buddhists keep a canopied



A BOAT RACE.

bronze statue of the Buddha child, over which eight dragons spout a baptism of scented water—an incident which is told in the legendary life of Buddha.

The Chinese, like the English and the Americans, have their boat races which take place from the first to the sixth day of the fifth month.



On the seventh night of the seventh month the girls have a special festival in which they bring offerings to the "Spinning

Damsel," whose star is *Spica*, the brightest star in the constellation of Virgo.² After the festival, the girls pass a thread into the eye



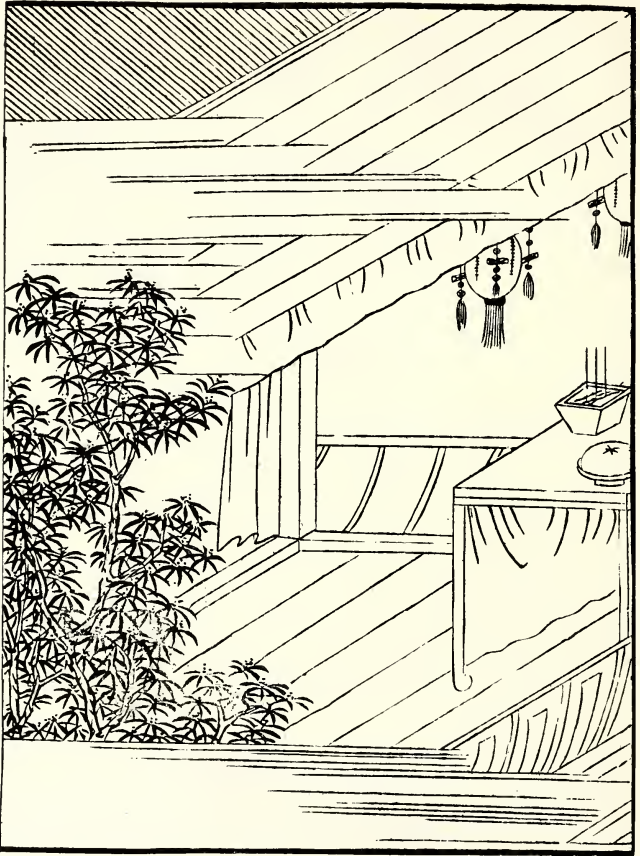
FESTIVAL.—THREADING THE NEEDLE.

2272

of a needle, which is hoped will make them proficient in needle work.

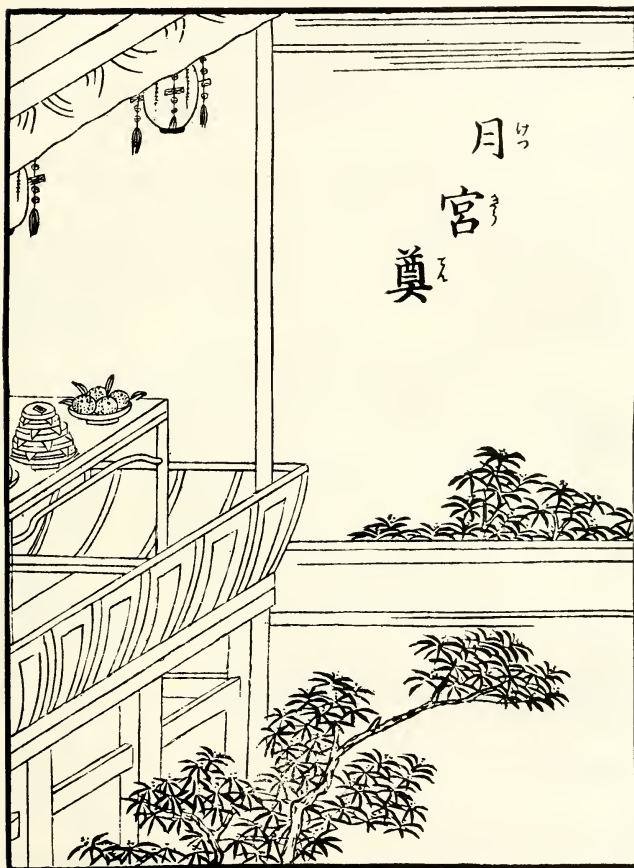
² See the author's article on "Filial Piety in China," in *The Open Court* XVI, p. 759, where the legend of the Spinning Damsel is related

In the eighth month the moon shines brighter than in any other month during the year; so the fifteenth, the night of the full



moon, is celebrated as the birthday of the moon. Fruit and cakes, all of them of a round shape, are offered on a veranda in full sight of the moon and then eaten in company with friends and relatives.

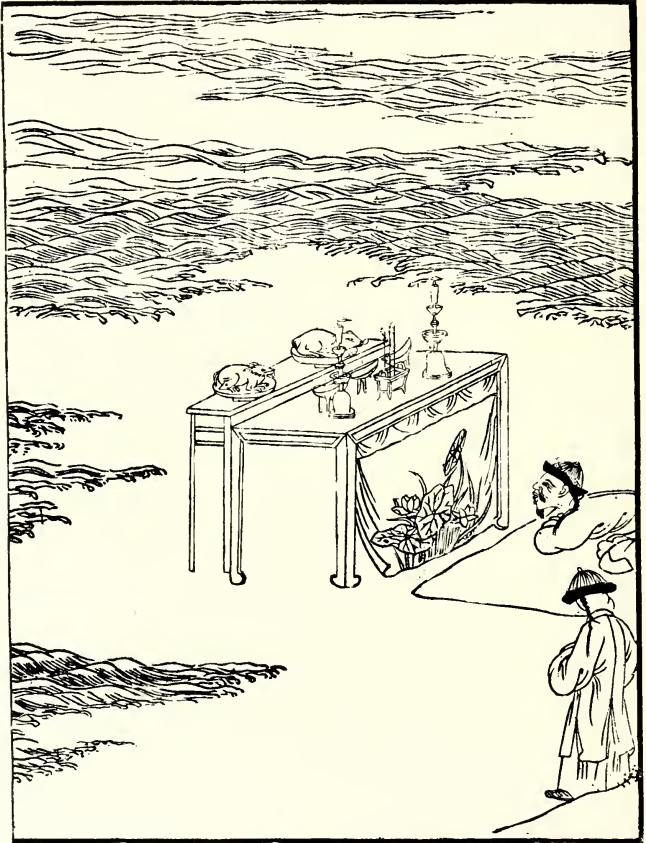
The moon is worshipped as a benign goddess and on her festival people exchange congratulations and presents.



It is generally regretted if the moon is beclouded in the night of her birthday, but the fact is not deemed a bad omen, and is

simply taken as an indication that the following New Year's Day will be bright.

On the coast of South China, a special festival on the eighteenth



day of the eighth month is officially celebrated by the governor of the province in honor of the tide. Offerings are made consisting of a pig and a sheep; however, they are not left to perish in the water,

but after having been presented, are taken away and officially eaten as is customary with all offerings.

On the fifteenth of the twelfth month, the Chinese celebrate

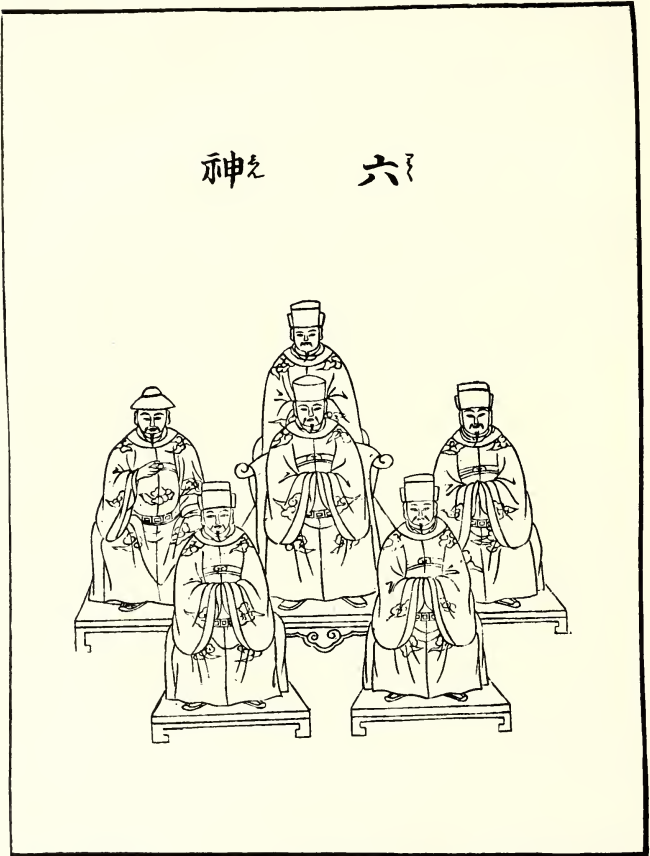


OF THE TIDE.

2269

their Thanksgiving over which six deities preside. The names of four of the six gods of Thanksgiving are the same as four of the five gods of wealth. One of the five gods of wealth, No Chin ("the

digger of something precious") has dropped out and in his place appears the god of the soil who is the local patron of the town ship, and Chin Lun, i. e., "the pure dragon." The meaning of this

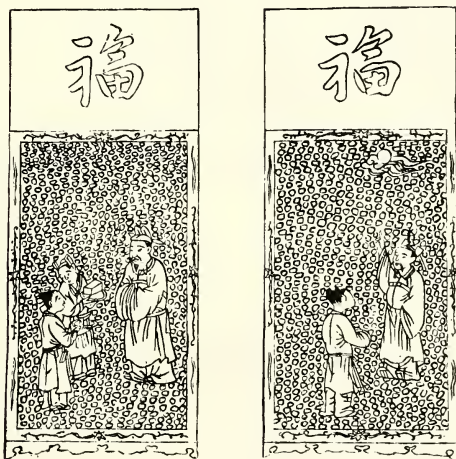


THE SIX GODS OF THANKSGIVING.

change has been lost, but when we consider that the wealth of a primitive people consists chiefly in the produce of the field, we may

understand that the disappearance of the digger of something precious means the loss of the seed corn, while the new comer, Chin Lun, represents the wealth of the new crop, and the local deity joins in the rejoicing of the harvest festival.

紙 樂 歡



DECORATIONS FOR NEW YEAR'S EVE.

On New Year's Eve, the last day of the year, cards of congratulation are hung up in conspicuous places about the house. They

bear the inscription *fu*, "blessing" and picture the heavenly spirit as distributing gifts or pointing to the sun in the heavens. They are called *huan lo tsu*, i. e., "cards of bliss and rejoicing."



There is another custom of New Year's Eve which is celebrated all over China, and must be a very ancient tradition. On a bamboo

frame a paper cow is built and painted in five different colors. It contains inside a paper calf made in the same way and is led by a clay figure representing Tai Tsai, also called Man Shen, the deity



OF NEW YEAR'S EVE.

2270

presiding over the New Year's Eve festival. Tai Tsai means "the great year," and Man Shen means "vegetation god."

This group of the cow led by the god of agriculture is carried in procession under the official guidance of the mandarin into the



fields, which are circumambulated to insure their fertility in the coming year. The children throw peas and beans at the paper cow,

because they believe that whoever hits it is sure to become immune from smallpox and other contagious diseases.

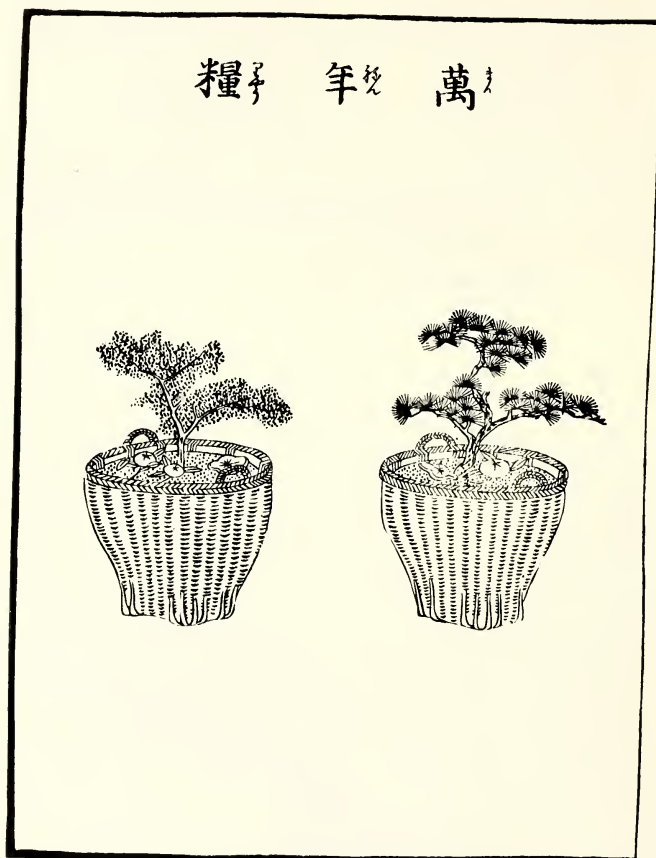


THE PAPER COW.

2255

On the return to the village the paper cow is carried to the temple of Tai Tsai where this symbol of the old year is torn to pieces and the new year in the shape of the young calf brought to light.

The day ends with an invocation for a rich harvest in the coming year.



NEW YEAR BASKETS.

On the same day, baskets are put up filled with rice, nuts, and fruit, in which branches of pine tree and *arbor vitæ* are inserted. They are called *wan wen liang*, or "ten thousand years' provisions."

MISCELLANEOUS.

AKBAR THE ECLECTIC.

BY J. NORTON JOHNSON, PH.D.

To the memory of the Hon. C. C. Bonney, Inaugurator and President of the Religious Parliament held in Chicago in 1893.

PROEM.

O! ye to whom, in quest of truth etern,
Beneath whatever guise it hap to masque,
The simplest cult of some untemped god,
Cathedral mass and gorgeous liturgy,
The feeblest feeling after the divine,
Ingenious systems of theology,
An esoteric unity import,
A world-wide craving to externalize,
In rite or writ, the innate thought of God;
List to this tale of Asian potentate
Who, hampered by no bigotry of mind,
Deemed nothing human foreign to himself.
What time the battle-fields of Europe reeked
With blood of the fanatic devotees
Of Christian sects whose bitter feud in naught
Save sanguinary clash assuagement knew,
The worshipers of whatsoever god
And the philosophers of every school
Equality and liberty enjoyed
Beneath the ægis of his gracious sway.
Akbar the Great was he most justly hight,
And lauded as the Guardian of Mankind.

THE EMPIRE.

Where Junna laves the Agra fortress walls,
Upon the throne of the Great Mogul sat
A ruler sprung from mighty Timur's loins,
Acknowledged lord of all the varied tribes
That dwelt by Indus or Gangetic banks,
In Cashmere vale, Himalaya-begirt,
Or by the Deccanese Godavari,

The Brahman, Parsi and the Mussulman,
The Buddhist and the Jew his word obeyed;
Conflicting claims of hostile tribes and states
Impartial justice, wise administration found.
Full measure and just weight to all alike
Within the market-places were proclaimed.
Throughout the empire well-built roads did serve
The lonely traveler and the caravan;
The highway robber and the petty thief
In vain sought refuge from the keen-eyed law.
Reluctant maid no more was wed perforce,
Nor 'gainst her will need widow mount the pyre.
Not all preoccupied by state affairs,
Great Akbar prized the fruits of intellect,
The painter's vivid portraiture of life,
The sculptor's chiseled block, the poet's dream,
While the creations of his architects
Evoked before the spellbound gazer's eye
The dazzling beauty of Alhambra's halls
Or marvels of the Eastern Caliphate.
Constructions vast as the Cyclopes reared.
They seemed the work of a Titanic hand;
Yet decorations delicate bewrayed
Artistic goldsmith, lapidary deft.
Like birds with wings outspread, the palaces,
In labyrinthine courts and colonnades,
With shady groves and cooling fountains girt,
Recalled what time their nomad ancestors,
A tented tribe, with nature did consort.
The blue enamel roofs did simulate
Celestial azure; on the walls of stone,
Sculptured in bold relief, stood forth to view
The pomegranate, the grape, and every vine
And fruit and blossom that the tropics yield.
In plentitude of life and might, aware
No human king the King of Terror stays,
Where bloomed Sikandra's gardens, Akbar reared
Palatial mausoleum to abide
Imperishable witness to his fame;
In mingled Arabesque and Buddhist styles,
Symbolic of the toleration broad
Enjoyed by votaries of every faith
That lodgment found within his empire vast.
To Akbar's catholic and cultured court,
From north and south, from east and west, repaired
The pilgrim, scholar, and the merchantman.
Of whatsoever men of every race
Were thinking, doing, saying, tidings came;
E'en rumor told of Albion's Queen Bess
And lands new found o'er evening's purpled tide.

THE DIVAN.

'Tis Islam's Sabbath; on this holy eve,
The moon, enskied in full-orbed brilliancy,
Effuses floods of mellow radiance
To enhance the emerald hue of field and grove,
And shed a silver sheen o'er lake and stream.
Within the boscaje trills the nightingale,
While from far jungle sounds the tiger's roar.
The Town of Victory which, from her proud height
Surveys the fertile lowlands, groves and streams,
Is in a rare effulgency enwrapped.
The slender minarets and walls inlaid
Gleam with the lustre of Golconda's gems.
Within the royal hall of audience,
The Emperor is seated on his throne,
Surrounded by his gay and brilliant court,
To hear expositors of divers faiths
Set forth the merits of their several creeds.
The Moslem Mollah, gaudily attired;
The Parsi priest, in flowing, snow-white robe;
The Buddhist monk, in yellow vesture clad;
The Twice-born Brahman with the sacred cord;
The Jew in all his pride of lineage;
Are present to address this court august
As champions of their respective faiths.
The Vizier silence now proclaims and says:
Your Emperor, in royal purple dight,
Extends his sceptre, as a sign of grace,
And deigns to hearken to your spoken words,
While promising to be impartial judge.
With the permission of his majesty,
In order due, set your religions forth.
The Moslem, taking up the proffered word,
Relates the necessary duties five
Imposed on Mussulmans by the Koran:
Belief in Allah, one and only God,
Omnipotent, omniscient, everywhere,
And in his holy prophet Mahomet;
Due distribution to the poor of alms,
And fasting in the month of Ramadan
From daybreak till the going-down of sun;
Prayer with the face to holy Mecca turned.
At dawn, noon, afternoon, at eve and night.
Announced by the muezzin from the mosque:
The Hajj to Mecca and the Kaaba shrine,
Obligatory once in life on all.
Usury, wine, and every game of chance,
Making the likeness of whate'er hath life,
Are to the followers of the Faith forbid.

In Paradise, the least of the redeemed,
 'Mid sweetest music, fragrances most rare,
 Shall be in costliest of raiment clad,
 And evermore on luscious viands feast,
 While those to whom most recompense is due,
 Throughout an endless day that knows no night,
 The Beatific Vision shall behold.
 The Parsi priest, whose ancestry of yore,
 Amid the fair Iranian hills and dales,
 Like sunflowers turned to greet the orb of day,
 Proclaims the sacred and Protean fire
 An emblem of Ahura Mazda's might.
 At war with Ahriman, the power of ill,
 From the beginning; in the latter days
 Will Ormazd found a realm of righteousness
 And all Hell's opposition overthrow.
 To purity of thought and word and deed,
 The prophet Zarathustra recommends
 The soul devout, to reverence of the good,
 Dread of the Evil One, and charity.
 The Buddhist next the might of Karma tells
 Which predetermines each successive link
 Within that misery-entailing chain
 Of mortal births which men must undergo
 Until Nirvana be through virtue gained.
 Desire is the engenderer of pain;
 Pain may be ended through the Eightfold Path
 Revealed to Buddh beneath the peepul-tree;
 Right judgment, language, purpose, practice, faith,
 Right meditation, effort, and right thought.
 To abstain from lying, thieving, homicide,
 And show unlimited unselfishness,
 Such was the message Gautama addressed
 To castes and outcasts hanging on his lips,
 And seeking a release from mortal ills.
 The Brahman with o'erweening pride of caste,
 In Vedas, Brahmanas, Upanishads,
 And philosophic systems erudite,
 Takes up in turn apologetic speech.
 Amid the multiplicity of gods
 And worship rendered beasts and stocks and stones
 By the unlettered proletariat,
 The truly philosophical discern
 A single, all-pervading deity.
 Constrained to sojourn here in many lives,
 The true believer, as the highest goal
 Of life and conduct meritorious
 And end of self, a reabsorption seeks
 Into the Atman, Brahma, the All-soul.
 The Song of the Celestial One reveals

Its special line of duty to each caste ;
 To reverence, rectitude and purity,
 Religiousness of act and speech and mind,
 Doth Krishna, avatar of Brahm, incite.
 Before th'august, imperial divan,
 As last apologist stands forth the Jew,
 Declaring how Elohim viewed the world,
 Newly create, to find that all was good,
 But man through sin from Paradise did fall
 And forfeited his sonship in the skies
 Unless atonement with his God be made.
 With waxing eloquence, the speaker paints
 The great historic moments of his race :
 How Moses did receive, 'mid lightning flash
 And thunder peal, on Sinai's lofty head
 The God-writ marble tablets of the Law,
 And taught of Yahveh, theocratic king,
 Founded the commonwealth of Israel ;
 Egyptian bondage, desert wanderings o'er,
 The welcome entrance to that Promised Land
 Where milk and honey for God's folk should flow ;
 The golden age of Hebrew monarchy
 Beneath the sway benign of Solomon,
 For wisdom far as Sheba's borders famed ;
 The splendor of Moriah's temple cult,
 With sound of trumpet, psaltery, flute and harp,
 With purple-girdled priests that serve in course
 With altar smoke conveying to the skies
 A savor grateful unto the Most High ;
 Within the Holiest, behind the veil,
 The luminous Shekinah brooding o'er
 The wingèd cherubim and Mercy-seat ;
 The Babylonian captivity,
 The imposition of the yoke of Rome,
 The desolation of Jerusalem,
 And the dispersal through the ethnic tribes :
 Yet how a new Jerusalem will rise,
 To be the marvel of the latter days,
 So that all nations from earth's utmost bounds
 With gladsome footsteps Zionward shall haste.
 The speaking o'er, the Emperor applauds
 The eloquence the orators have shown.
 While pleased to note the jealous eagerness
 With which each champions his special faith,
 A higher pleasure has his mind received,
 Since, 'neath exterior diversity,
 Appears a common faith in might unseen,
 A common code of duties ethical.
 As from his presence he dismisses now
 The orators and members of his court,

He would exhort his subjects, one and all,
 To banish from their minds, with firm resolve,
 Religious, race and caste antipathy,
 To seek the welfare of the commonweal,
 And in fraternal harmony to dwell.

BIBI MIRIAM.

Upon the coral strand of Malabar,
 Engirt with spice-trees and with cocoa-palms,
 The Lusitanian emporium
 Of Goa vies in brilliancy of life
 With Mogul Agra, Delhi, Fathipur.
 Da Gama found the ocean highway there,
 While Albuquerque by his sword acquired
 A second Portugal in India
 And second Lisbon, the renown of which
 Inspired the epic muse of Camoens.
 To Goa came the holy Xavier,
 To preach to Ind the Tidings of Great Joy,
 And thence embarking for the farther east,
 He sought to win by his apostolate,
 For Holy Church, Zipangu and Cathay.
 To Akbar's court have travelers brought report
 Of white-winged fleets that crowd its busy docks,
 Or with rich cargoes sail for western seas;
 Of marshalled troops assembled for parade,
 And prancing chargers rich caparisoned;
 Of Goanese hidalgos congregate
 Within the Viceroy's palace to enjoy
 The feast's good cheer or whirl in merry dance:
 Of the cathedral ceremonial,
 The swelling music echoing through the aisles,
 The vested priests intoning Latin prayers,
 And of the mitred metropolitans.
 To Goa Akbar sends an embassy,
 The choicest of his brilliant entourage,
 With greeting to the Viceroy and request
 That he some faithful priests will delegate
 To preach the Gospel to the Agra folk
 And to expound the new Christianity.
 With benison in name of Mother Church,
 The Viceroy sends an apostolic band
 With gifts and greetings unto Akbar's court.
 In Agra now, the cross of Christ is raised;
 The nave and choir resound with organ peal
 And with the canticle antiphonal,
 And fragrant incense fills the peopled aisles,
 What time the priest doth consecrate the Host;
 While holy men, inspired of God, set forth
 In the divans the doctrines of the Church,

The sacred Gospels, and the new command
 That men love one another as their Lord
 Loved the disciples of his special choice.
 'Tis well to hear the weighty words and thoughts
 The erudite and philosophical
 With pregnant emphasis enunciate;
 But sweeter still to learn of love divine
 In silver accents dropped from ruby lips,
 While tendril arms enclasp the listener
 And thrill with gentle touch the pulsing veins;
 To anticipate the joys of Paradise
 And holy fellowship of saints on high
 In soul communion with the best beloved,
 Two lives conjoined in perfect unison.
 Another embassy to Goa hies
 To seek a bride of Portuguese descent
 And by a nuptial bond unite the states
 In close association amical.
 A maid of royal lineage appears,
 A willing representative of Christ
 Amid the glories of the Mogul court,
 With meekness and humility endowed,
 Her comeliness of form and countenance
 A reflex of the purity of soul.
 Become the spouse of the great potentate,
 Her presence doth the whole zenana bless;
 Her queenly charm enthral the monarch's heart,
 And in the hours when passion flames his breast,
 Her quiet will of turmoil brings surcease.

THE DEMISE.

Upon his death-bed lies the King of kings,
 Surrounded by his household and grandees.
 Aware the hour of his departure nears,
 His sceptre he delivers to his son,
 And with these words bids all his last farewell:
 "Religious liberty I have conferred
 Upon the worshipers of every god.
 And thus have welded with a jointure firm
 The sects and peoples of my broad domains.
 Alas! that I, misled by arrogance,
 And the success of my despotic sway,
 While standing on the balcony at dawn
 And worshipping the rising orb of day,
 In course of my eclectic Faith Divine,
 Have let my prostrate subjects render me,
 Mere man, an homage due to God alone.
 In the relentless grasp of Death's cold hand,
 I find a king is to a Sudra kin.
 So, son Jehangir, let humility

And toleration be thy watchwords aye.
 Gifted at death with prophet's prescience,
 Amid the thronging scenes of time to come
 Which pass before my spiritual gaze,
 I see a vision of a future age
 When sons of men no more will meet in war
 To settle questions of theology,
 But, gathered in some peaceful Parliament,
 Will harmonize divergency of creeds,
 And through comparison will come to know
 They worship one and the same deity
 Whose image was in the beginning stamped
 Upon the mind when Godhead fashioned man;
 Unity will plurality replace,
 And thus a universal cult arise,
 To honor, till the ages are no more,
 The sole existent, sempiternal God.

THE ORIGINAL OF THE DROESHOUT SHAKESPEARE.

The Droeshout engraving published in the first folio edition of 1623, seven years after the poet's death, is commonly considered the most authoritative portrait of Shakespeare. That it bore a resemblance to the poet is testified to by Ben Jonson in an adjoined poem; in which, however, he expressed at the same time his dissatisfaction at the poor workmanship. It is certain that Martin Droeshout must have worked after an oil painting, for the young engraver was only twenty-one years of age at the time of its appearance.

Now there is an oil painting in existence to which attention has only lately been drawn, and which is now in the possession of the Shakespeare Memorial of Stratford-on-Avon. Mr. W. Salt Brassington, curator of the Shakespeare Memorial, describes the history of this interesting painting in his attractive book *Shakespeare's Homeland* as follows:

"In the eighteenth century the portrait belonged to a member of the Hart family, and was exhibited in London. It next passed to another owner who sold it to Mr. Clements of Sydenham, in whose possession it remained for nearly forty years, and by whom it was exhibited at the Alexandra Palace, where a fire occurred and the portrait narrowly escaped destruction. Being afterwards sent to Stratford-on-Avon, it remained at the Shakespeare Memorial until after the death of Mr. Clements, when it was purchased from his family by Mrs. Flower of Avonbank, and presented to the Shakespeare Memorial Association.

"The portrait is painted upon a panel of elm wood, composed of two pieces, with transverse braces; and the whole panel is covered with a coating of white, upon the top of which a light red pigment is spread. The face is solidly, but the rest of the picture rather thinly painted, and the detail is much finer than that of the engraving, though the resemblance between the two is obvious to the most casual observer.

"A closer inspection leads to the conviction that this portrait is the orig-

inal from which Martin Droeshout copied when making his engraving for the folio of 1623.

"The chief points to bear in mind are:

"1. That the picture is unmistakably an unrestored work dating from the early years of the seventeenth century.

"2. That in the upper left-hand corner it bears the name 'Willm. Shakespeare,' in characters of early seventeenth-century date, and written in the same pigment as used for the lace and other adornments of the dress.

"3. That below the name appears the date 1609.

"4. That the head is quite life-size, while the body, being in perspective, is smaller in proportion.

"5. That it is the only painting with contemporary evidence of being a portrait of Shakespeare.

"Though darkened by age and of severe aspect, the face is represented as a faithful likeness, not flattering, but with most of its marked characteristics accentuated. The color of the eyes is a dark grey, shaded with brown, corresponding with the Ely Palace portrait. The hair is arranged exactly as in the Droeshout engraving and the Ely Palace portrait, representing Shakespeare as bald from the forehead to the crown of the head. The mustache is upturned, and a small tuft of hair is visible upon the chin. The mouth is full and humorous in expression. When considered in comparison with the engraving, which it nearly resembles, Ben Jonson's lines, and the signature at the top of the portrait, we are led to the conclusion that this is a portrait of Shakespeare painted from life. The evidence in its favor is conclusive, and it must therefore be regarded as the most interesting extant likeness of the poet."

CHARLES CARROLL BONNEY.

Sept 4, 1831—August 23, 1903.

Three years ago the world suffered a great loss in the death of the Honorable Charles Carroll Bonney, best known as the inaugurator of the World's Congresses which were held in connection with the World's Columbian Exposition at Chicago, in 1893; and also as the President of the Religious Parliament Extension which was founded two years later. This season which brings the anniversary both of his birth and his death, seems an appropriate time for the appearance of the poem "Akbar the Eclectic" which in its Oriental imagery furnishes a fitting tribute to the life-work and purpose of that Christian "eclectic," who was the originator of a movement that will prove to have an enduring influence on all generations to come.

JAPANESE EDUCATION.

The modernization of Japan has raised her rapidly to the rank of a modern power, and we can readily understand that she has been greatly benefited by the institution of Western inventions and in general by the practical spirit of Western civilization, but these advantages are not without their drawbacks, and it is noticeable that in many quarters the old stability seems to be lost. The growing generation is inclined to accept with Western views also the looser conception of moral maxims, and the leading statesmen watch this progress not without solicitude. Here is a rescript of his Excellency, the

State Minister of Education, Mr. Makino. It is a denunciation of present tendencies as well as a serious attempt at meeting the danger before it is too late.

"It is scarcely necessary to say that the duty of scholars and students is to have a steadfast mind, to propose to themselves a fixed purpose, and to look forward to achieving great results by zeal and diligence. . . . Nevertheless among the youth of both sexes I detect, to my great regret, a tendency to occasional despondency and to moral negligence. Certain of those now in the schools show an inclination to luxury, or trouble themselves about vain theories, or, in extreme cases, allow their minds to become absorbed in dissipation and, violating the precepts of virtue, lose their sense of shame. . . . Unless steps be presently taken to severely reprimand these errors, their harmful results will be incalculable. There are signs that the trend of a part of society is towards insincerity and that the youth of both sexes are being led astray in increasing degree. Especially is this the case with recent publications and pictures, for these either ventilate extreme doctrines, or inculcate pessimistic views, or depict immoral conditions. . . . Steps must be taken to suppress publications that suggest such danger whether within or without the schools. Again there are men who, advocating an extreme form of socialism, have recourse to various devices for leading astray students and teachers. If such views, destructive as they are towards the very foundations of nationalism and dangerous to the good order of society, obtain currency in educational circles, so as to disturb the bases of our educational system, nothing could be more regrettable in the interests of the country's future. It behooves educators to be specially on their guard and to prepare for checking these evils before they bear fruit. Persons who occupy pedagogic positions should bear these things constantly in mind, and in co-operation with parents and guardians should endeavor to purify the habits of students and to invigorate their spirit, thus aiming at the achievement of good results for education."

BOOK REVIEWS AND NOTES.

APOLLONIUS OF TYANA AND OTHER ESSAYS. By *Thomas Whittaker*. London: Sonnenschein, 1906. Pp. 211. Price, 3s. 6d. net.

Of the six essays contained in this volume, the first three which comprise fully three-fourths of the whole book are historical in character. The first one on Apollonius of Tyana, appeared in *The Monist* some three years ago. It gives a thorough account of the life and teachings of this Greek reformer. Mr. Whittaker's authority is the life of Apollonius written by Philostratus early in the third century and the extant letters ascribed to him, some of which his biographer evidently knew. Whether the letters are genuine is not certain, but the biography is clearly a romance, using the familiar literary device of introducing the memoirs of a disciple as material, though admitting that they had to be worked over into literary form. However, the fact remains that Apollonius was a real person born at Tyana, and there is no uncertainty about the character of his life and teaching. He was a Neo-Pythagorean of the ascetic type, but the interest in his life lies in the parallels of which he was made the subject and which probably never occurred to Philostratus. These tend to prove that the marvels attributed to Apollonius were

similar to those of Christ and are better authenticated historically. This phase makes the study of the life of Apollonius of valuable interest in comparative religion as illustrating how it is possible for new religions to originate.

The next essay treats of an equally interesting subject, being devoted to a discussion of Origen's refutation of Celsus. The only access that we can have to contemporary criticism of the first centuries of Christianity is through quotations in the works of the church fathers who refuted them, since the originals of all such heretical documents were zealously burned when the newer religion came into power. In this way we learn of the arguments of Celsus, a well-informed opponent of Christianity in the second century, who represents the attitude of the governing classes in the Roman Empire at that time. A century later the devout Origen gives the ablest apology for Christianity that could be made in those days in refutation of Celsus, enumerating and answering his objections consecutively. The object of the present article is not to bring into view all the complex issues, but to give a straight-forward account, mainly from the intellectual side, of this particular controversy which throws light on the perennial strife of ideas. The practical object which Celsus had in view in his arraignment was to dissuade the separatist Christians from their new and unreasonable faith; but in case they could not be persuaded, at least let them not set themselves in open opposition to public institutions and withdraw wholly from civic life; the Empire needed their strength and help, civil and military. Origen's replies throughout were in keeping with the ecclesiastical spirit of the time, but when all other arguments fail, he falls back on the unanswerable ethical test that the Christian followers have been led to better lives by their faith than the devotees of other religions,

The third essay deals with the works of John Scotus Erigena, the Irish scholastic of the ninth century. It aims at giving some account of his philosophy. Our interest in him is purely historical as his works recall the light of the past and prefigure the return to it. Erigena could carry forward some of the ideas of Neo-Platonism to what we now recognize as a more modern stage, although he probably did not know it in its genuine Hellenic form. While repeating the mystical position he seems very little of a mystic, and is more explicitly a pantheist, and of a more naturalistic type than the ancient Neo-Platonists.

The three short essays which follow are positive in character rather than historical. Of them "A Compendious Classification of the Sciences" was published in *Mind* for January 1903. In this the author proposes to carry out systematically the completion of Comte's classification by including subjective principles which Comte would have repudiated, but which are recognized by the successors of both Kant and Mill as indispensable for a full account of knowledge.

"Animism, Religion and Philosophy" is an attempt at a kind of philosophical schematism for anthropology which the author thinks will be useful in so new a science, as it may at least suggest points for research.

The last few pages are devoted to a discussion of final causes,—*"Teleology and the Individual."*

SPINOZA AND RELIGION. By *Elmer Ellsworth Powell, Ph.D.* Chicago: The Open Court Publishing Co., 1906. Pp. 344. Price, \$1.50.

This new monograph by a professor of philosophy in Miami University purports to be "a study of Spinoza's metaphysics and of his particular utterances in regard to religion, with a view to determining the significance of his thought for religion, and incidentally his personal attitude toward it." It is an impartial and candid treatment of Spinoza's attitude toward religion, aiming solely to present what he taught and how his doctrine is related to religious consciousness, though the author does not deny that his work is at the same time a polemic in so far as it contends against a mistaken, though traditional, interpretation of Spinoza's philosophy and personality.

ESSAI SUR LES ÉLÉMENTS ET L'ÉVOLUTION DE LA MORALITÉ. Par *Marcel Mauxion*. Paris: Alcan, 1904. Pp. vi, 169. Price, 2 f. 50.

Sociologists have made the term "solidarity" fashionable, and political economists, moralists and teachers have received it with enthusiasm. Founded on the theory of the social organism, solidarity is regarded as the positive form of ethics. The present essay on the elements and evolution of morality is a protest against the scientific pretensions of this doctrine, and a warning against the dangers it presents from a practical point of view. The author seeks the solution of the moral problem from the impartial study of facts without any mixture of metaphysical conception. Submitting the ethical ideal to an analysis he finds therein three primary elements, the esthetic, the logical and the sympathetic, the origin of each of which M. Mauxion proceeds to consider in turn.

LAST WORDS ON EVOLUTION. A Popular Retrospect and Summary. By *Ernst Haeckel*. Translated by *Joseph McCabe*. London: Owen. 1906. Pp. 127.

Although this English version of Professor Haeckel's lectures was translated from the second German edition, it has followed closely upon the delivery of the original at the Academy of Music in Berlin in April, 1905. We made note of the German publication of the lectures in the February number of *The Open Court*. We will only add here that the reason Professor Haeckel, at the solicitation of his friends, departed from his published statement of four years previous not to appear again on the public lecture platform, was because of his interest in the change of front lately taken by the Church militant in which it has been making conspicuous efforts to "enter into a peaceful compromise with its deadly enemy, Monistic Science."

There is no new message in these "Last Words," as they purport to be simply a summing up of the author's conclusions of half a century's investigation.

Maung Nee has edited a little book on Buddhism called *Lotus Blossoms* which was privately printed in Rangoon. It consists mostly of short quotations from the various Buddhist Scriptures with a few small explanatory essays interspersed, and is designed for those who are making their first inquiries into Buddhism.

FOUNDATION OF A LAY CHURCH

WHAT is the reason that so many people, and sometimes the very best ones, those who think, stay at home on Sunday and do not attend church? Is it because our clergymen preach antiquated dogmas and the people are tired of listening to them; or is it because the Churches themselves are antiquated and their methods have become obsolete? To many these reasons may seem a sufficient explanation, but I believe there are other reasons, and even if in many places and for various reasons religious life is flagging, we ought to revive, and modernize, and sustain church life; we ought to favor the ideals of religious organizations; we ought to create opportunities for the busy world to ponder from time to time on the ultimate questions of life, the problems of death, of eternity, of the interrelation of all mankind, of the brotherhood of man, of international justice, of universal righteousness, and other matters of conscience, etc.

The Churches have, at least to a great extent, ceased to be the guides of the people, and among many other reasons there is one quite obvious which has nothing to do with religion and dogma. In former times the clergyman was sometimes the only educated and scholarly person in his congregation, and he was naturally the leader of his flock. But education has spread. Thinking is no longer a clerical prerogative, and there are more men than our ministers worthy of hearing in matters of a religious import. In other words, formerly the pulpit was naturally the ruler in matters ecclesiastic, but now the pews begin to have rights too.

Wherever the Churches prosper, let them continue their work; but for the sake of the people over whom the Churches have lost their influence the following proposition would be in order, which will best and most concisely be expressed in the shape of a ready-made

PROGRAM FOR THE ESTABLISHMENT OF A LAY CHURCH.

GENERAL PRINCIPLE.

It is proposed to form a congregation whose bond of union, instead of a fixed creed, shall be the common purpose of ascertaining religious truth, which shall be accomplished, not under the guidance of one and the same man in the pulpit, but by the communal effort of its members in the pews.

FOUNDATION OF A LAY CHURCH. (CONTINUED.)

NAME AND FURTHER PARTICULARS.

This congregation shall be known by the name of The Lay Church, or whatever name may be deemed suitable in our different communities, and a characteristic feature of it shall be that it will have no minister, but the preaching will be done by its own members or invited speakers.

Far from antagonizing the religious life of any Church, The Lay Church proposes to bring to life religious forces that now lie dormant. Religious aspirations have as many aspects as there are pursuits in life, and it is the object of The Lay Church to have representatives of the several professions, of business, the sciences, the arts, and the trades, express their religious convictions upon the moral, political, and social questions of the day.

The Lay Church will establish a free platform for diverse religious views, not excluding the faiths of the established Churches: provided the statements are made with sincerity and reverence.

Since The Lay Church as such will, on the one hand, not be held responsible for the opinions expressed by its speakers, and, on the other hand, not be indifferent to errors and aberrations, monthly meetings shall be held for a discussion of the current Sunday addresses.

The man of definite conviction will find in The Lay Church a platform for propaganda, provided it be carried on with propriety and with the necessary regard for the belief of others: while the searcher for truth will have the problems on which he has not yet been able to form an opinion of his own ventilated from different standpoints.

It is the nature of this Church that its patrons may at the same time belong to other Churches or to no Church. And membership does not imply the severing of old ties or the surrendering of former beliefs.

The spirit of the organization shall be the same as that which pervaded the Religious Parliament of 1893. Every one to whom the privilege of the platform is granted is expected to present the best he can offer, expounding his own views without disparaging others. And the common ground will be the usual methods of argument such as are vindicated by universal experience, normally applied to all enterprises in practical life, and approved of by the universal standards of truth—commonly called science.

(Reprinted from *The Open Court* for January, 1903.)

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To the general reading public this work will prove a veritable gold mine. To be initiated into the mysteries of the conjurer's art is well worth the while. It is written in a fascinating style, full of anecdotal and historical matter. The

chapter on Cagliostro reads like a romance. This great charlatan of the eighteenth century figured in the diamond necklace scandal, in which were involved the beautiful Marie Antoinette, queen of France, Cardinal de Rohan and many famous people of the old regime. To gather information on this subject, Mr. Evans, assisted by M. Trewey, the French conjurer, delved into the musty archives of the French government and gleaned many facts not hitherto known. In this book are passed in review the prestidigitators of the old world: Pinetti, Robertson, Robert Houdin, the father of modern magic, Robin, Anderson, etc. From the surviving members of the Houdin family, curious and rare data were obtained, making the chapter on Robert Houdin one of vast interest. Few readers, if any, will be able to lay down this fascinating book when once begun, without reading through to the word *Finis*. The unveiling of secrets hitherto kept so sedulously by magicians is of interest to all theater-goers, as well as educators. The more we know about the tricks and deceptions of conjurers, the less apt are we to fall victims to unscrupulous charlatans and impostors like Cagliostro and many of the mediumistic frauds of this century. To the scientific man the book will also be of great interest.

It is a well-known fact that in this country today there are thousands of clever amateur magicians, who welcome with open arms a new book on their favorite theme. The avidity with which magical literature is bought, and the great number of manufacturers of magical apparatus extant who cater to the wants of amateurs, are proofs positive of the interest in the subject of prestidigitation.

Most of the historical matter in this book is new to American readers. For example, there is not a book in English that gives a correct account of the Chevalier Pinetti, the great luminary among conjurers of the eighteenth century. His life story is worthy of the pen of a Dumas, so strange and adventurous is it. Mr. Evans has picked up many rare prints of this gifted artist, which have been reproduced in the book, as well as one of Cagliostro.

We can recommend this book as something really unique in the annals of magical literature; as entertaining as any romance and possessed of real pedagogical value. It should be in every public library and every school in the United States. The illusions of Kellar, the sleight-of-hand tricks of De Kolta, the shadowgraphs of Trewey, and the wonderful handcuff act of Houdini's, are all explained and fully illustrated.

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Dear Mr. Monahan,

I can't refrain from telling you how happy I am to see your sturdy defense of Poe's good name. He has been yelped at by the whole pack of literary jackals nosing the ground for carrion. The man who carried the pure idealities of "Helen" and "The Raven" was not inherently immoral, whatever may be the shell-facts of his life.

I am also delighted by your talk on "Richard Wagner's Romance." You don't need to write anything else to repay us for our valuable dollar. Of course I don't claim that you have said all that is to be said in defense of the inconstant artist. It is all an anxious inexplicable problem, one whose roots go down to the center. Who will give its rationale?

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