PORTO RICAN ARCHÆOLOGY

The Island Once a Meeting Place for Religious Festivals.

Interesting Stone Relics at the Smithsonian Institution — Prehistoric Peoples Came Hundreds of Miles to Worship at This Shrine.

The acquisition of Porto Rico by the United States was a source of the greatest gratification to archaelologists all over the country. By them the island is considered the richest field for research which has been opened to them for many years. Up to the present time the field is practically as it was hundreds of years ago.

Rich amateur archaeologists visiting the island at various times have purchased imperfect relics of a long extinct race, but this class of collectors buy anything offered to them which smacks of antiquity and, as a rule, their collections are not of any great scientific value. The curators of the National Museum are deeply impressed with the importance of Porto Rico as a field for archaeological research and they are anxiously awaiting an appropriation from Congress to begin extensive investigations there.

Porto Rico was the Carib Jerusalem, where the prehistoric West Indians and the people of Central and South America assembled at certain periods to celebrate their religious rites. These people, it is thought, came from the northern and eastern coast of South America and Central America. The opinion of archaeologists is that these people were the Caribs. They lived along the coast line for the most part and were sailors and fishermen. The Windward Islands lying as they do in a curved line from the northern coast of South America offer an opportunity for insular inter-communication, an opportunity which the peoples of the coast lands, extending from the shores of Florida on the north to far below Rio Janeiro on the south, understood and took advantage of as is shown by the pottery and other relics which have recently been found, as well as in their language.

Decorated Stone Collar.

Taken altogether, the ceramic phenomena of the Southern States seem to indicate pretty much the degree of intercourse between the nations occupying the neighboring land areas as would be expected of enterprising peoples well enough advanced in maritime matters to navigate the wide straits with considerable ease, yet decidedly attached through long occupation to definite traditional seats of habitation, the tendency being under such conditions of association for culture elements to pass by infiltration from the higher to the lower culture groups.

MR. CUSHING'S INVESTIGATIONS.

The most significant archaeological investigations, however, in his connection were those of Mr. Frank Hamilton Cushing at San Marco, in southwestern Florida, and the explorations of Mr. Clarence Moore in the sand mounds of Florida. The latter has clearly revealed a culture not akin to that of the Indians found upon the spot when this region was first visited by Ponce de Leon, but Mr. Cushing's explorations in the old canals and artificial lagoons reveal a wealth of archaeological treasures, all of which show that the ancient people of southern Florida were allied to those of the Antilles and of Middle and South America.

Columbus knew Porto Rico as a place of mystery, where religious rites were observed. Herrera, one of Columbus' historians, mentions that a sailor from the discoverer's ship reported seeing a man on the island with a white tunic down to his knees and an old Indian reported a cacique, or priest, who was clad like a Catholic priests of Spain. The history of the strange race which peopled the island centuries ago is all but a closed book to the scientists of antiquities, and they will enter upon their investigations in Porto Rico with the keenest zest.

The remarkable beauty and finish of the stone implements of Porto Rico and other of the Antilles Islands were not wholly unknown to students of American archaeology prior to 1876.

Now and then small collections had found their way to London, Copenhagen, or New York, but they had never been collected in sufficient numbers for a comparative study until the Latimer collection was presented to the Smithsonian Institution. This collection, the finest known, has only served to increase the interest of archaeologists in the prehistoric inhabitants of Porto Rico.

A Mammiform Stone.

Among the specimens are pottery, cuts, smoothing stones, mealing stones, stools, discoidal and spheroidal stones, beads, cylinders, amulets, rude pillar stones, mammiform stones, masks, and stone collars. Many of the objects are very similar to those found in other parts of America and throughout the world, but others are so very rare as to merit the most careful scrutiny and research.

Some of the specimens were found in cases, but the greater part were turned up by the plow and hoe where new lands were put under cultivation. By some scientists it is believed that the makers of these objects were a purely neolithic people; that is, a people who lived at the period when the newest or most recent rocks were formed. The neolithic period began at the latter end of the Stone Age and extended to the time when animal life, some species of which are not yet extinct, existed on the earth.

According to some scholars of anthropology the prehistoric Porto Ricans were not savages, but in the middle status of barbarism. These people lived in round and square houses, with thatched roofs, grouped in villages. They made pottery, the boldness and truthfulness of whose ornamentation attest their skill in that art. Their implements of industry, so far as they have been recovered, are the most beautiful known. Their canoes, capable in the larger forms of holding 200 persons, were exquisitely wrought with the sides raised with canes, daubed with bitumen, and not flat out with a keel. Their artists were prodigies in design and workmanship, as the finer forms in the Latimer collection attest. Their social life is little understood, but probably resembles in the main that of the Florida Indians.

There is not an entire vessel in the Latimer collection, all of the specimens being fragments of various shapes, coarse, red pottery, well baked, and some of the pieces have glassy surfaces. A fragment of the bottom of a cup or jar shows an ingenious labyrinthine design traced on it by a deep furrowing, produced by a sharp pointed instrument when the clay of the vessel was soft. The most interesting objects in the collection are the stone collars and the mammiform stones. Some of these collars are in a rude and primitive state, indicating a stage of manufacture. Others are highly polished and beautifully decorated. They are right and left shouldered as though to be used in pairs.

The decorations or designs on these collars are placed only on one side, the outside. They closely resemble a horse collar, and were used, so Prof. Otis T. Mason, one of the curators of the National Museum and an archaeologist of international reputation, thinks as regalia, such as Odd Fellows use when on parade.

Professor Mason is enthusiastic over the possibilities for archaeological research in the practically unexplored field of Porto Rico.

"Porto Rico," said Prof. Mason, to a Times reporter, "is a veritible paradise. It is destined to be the ideal winter resort for the rich. The island is mountainous, the mountains having rounded tops, few being headed. The foot of one mountain almost touches that of another. The island is of volcanic origin. It seems to have been regarded as an ideal spot for religious festivals by the prehistoric peoples who lived on the adjacent islands and coasts of the Northern, Middle, and

Porto Rican Stone Stool.

South Americas. They would come in their huge canoes to Porto Rico in great numbers at definite periods and celebrate their religious rites. Most of their stone implements were highly polished and richly decorated. They were evidently for show or parade purposes. Those that were intended for use were not so highly wrought nor so elaborately covered and decorated. Take, for instance, their celts, or stone hatchets. With these they dug out the core of large trees from which they made their canoes. The trees of Porto Rico are not characterized by a well-defined fibre, tough, and polishable like most of the trees in this country. They are for that reason more easily gouged out by such celts or stone axes as we find the prehistoric people of Porto Rico used.

"Like all the American Indians, the Caribs, for such I believe these people to have been, believed that the mountains of Porto Rico were each one presided over by a genius or spirit, to which they made votive offerings and images to win the good will of the mountain god. The mammiform stones are interesting as showing this fact. These stones represent a Naman figure with arms and legs curved under the body with the back curved in a hump resembling a mountain. The figure typifies the genius or god of the mountain, and the form or shape of the hump on its back was intended to represent the characteristic shape of the mountain to which the image was dedicated; for instance, if a mountain top was somewhat peaked, the hump on the stone image would be peaked. As a rule the peaked images are to be found only on peaked-top mountains, and rounded-back images only only round-top mountains. These mammiform stones are peculiar to Porto Rico and are unique objects of archaeological interest.

Herrera speaks of low legged stools upon which these prehistoric people sat and strange to relate just such stools as he speaks of have recently been found in caves in the mountains. They are peculiar in shape and are made from stone and wood. The legs are only an inch or so long. The back of the stool, or what would correspond to the back of a chair, extends backward at a great incline, more like the elevated slope of a lounge or couch than the back of a chair. At the front edge of the stool is the face and head of a monkey or other animal. This sticks out from the edge like a knob to a door. These stools are highly ornamented with carvings and designs and are evidently intended for ceremonial purposes only."

These Porto Rican relics for religious and ceremonial purposes convince the student of archaeology that there must have been monuments, temples, and other archaeological remains which have not yet been discovered. It is so evident that the island of Porto Rico was regarded as a holy spot by many peoples living many hundreds of miles away that the thought is irresistible that other and more interesting remains of a past civilization of a religious character await the discovery of the man of science.

The archaeologist wants to find and see where they were set up. He wants to find their quarries and the instruments with which they worked. New York, Boston, and Philadelphia are all eager to enter the promising field offered in Porto Rico and it is hoped that the National Museum will be able by an appropriation of Congress to take an early and an active part in the work.

BIG FORTUNES THROWN AWAY.

Tons of Paper, Coal, and General Refuse Wasted Annually.

(From the Philadelphia Record.)

Vast fortunes are thrown away annually in the waste of New York city. The poor of Paris could be well housed, fed, and clothed with the proceeds from the waste of that city. This statement is not based on mere supposition, but upon facts gleaned from an experiment which was tried by the city authorities last year in caring for a certain portion of the city's waste.

For a period of twelve months the refuse and waste gathered from Street Cleaning Districts Nos. 12, 14, and 16 was delivered at a special station, where it was carefully separated into its constituent parts and such as could be utilized for any good purpose was sold for what it would bring and the balance was destroyed. The area covered includeed a population, according to the census returns, of 116,525. Every class of house, shop, store, and a few factories are to be found within the districts, so that the results of the year's work would form a fair basis for estimating the value of the waste of the whole city.

During the year 12,947 loads of separated refuse from carts holding four cubic yards, weighing 900 pounds per load, or, in the aggregate, 5,826 tons, were gathered from this territory. Of this amount 58 per cent to 60 per cent was burned as useless, and from 5 to 8 per cent was worthless, while about 37 per cent was marketable. The matter reserved for sale contains 3,058,616 pounds of paper, which was classified as follows: Manila paper, 471,385 pounds; news, 503,391; mixed, 442,866; strawboard, 587,208; mixed wrapping, 625,136; books, 18,820.

There was a total of 576,812 pounds of rags, classified as follows: Woolen, 18,637; white, 41,450; mixed, 116,550; black, 195,835; bagging, 48,065; twine, 21,070; soft-back carpet, 18,795; hardback carpet, 79,820; wool carpet, 3,915; linsey carpet, 7,180; old coats, 20,945; stockings, 4,520.

Among other articles there were found 80,840 pounds of old iron; 494 pounds of copper, 2,090 pounds of zinc, 1,667 pounds of brass, 303 pounds of lead, 9,769 pounds of old rubber, 36,169 pounds of old shoes, 400 pounds of hair cloth, 765 pounds of curled hair, 2,190 old hats, 12 loads of tin cans, 40 mattresses, 2,890 barrels and 29,265 proprietary bottles. Besides all this, it must be remembered, there was an immense amount of matter of all classes gathered by the countless number of rag and garbage collectors who do a business independent of the city department.

Taking these figures as a basis for estimating the amount of refuse collected from the boroughs of Manhattan and Bronx for this year, at the same time allowing for the natural increase, it would amount to 112,000 tons for twelve months. About 32 per cent, or 35,840 tons, represents the paper and rags.

It is interesting to note that the daily newspapers in New York consume 350 tons of paper per day, of which, it is estimated, one-half remains in the city and is not sent into circulation through the mails. This one-half will amount to 63,870 tons during the year. To this vast paper heap must be added the immense stack of printed matter, such as circulars, posters, advertising letters, etc., and the refuse from the weekly and monthly publications.

About one-half of this vast total of waste paper finds its way back to the manufacturer through private channels, while much of it is consumed in the furnaces of office buildings, institutions and the like, with most unsatisfactory results. For example, the Federal authorities in their building downtown undertake to destroy large quantities of paper, and owing to the fierce draft due to the tall chimneys and the poor combustion, half-burnt paper is distributed impartially over the neighborhood.

For weeks together last summer the atmosphere of a section, including parts of Broad, Wall, and Exchange Streets, was, at certain hours, loaded with floating ashes and half-burned scraps of paper, and on several days in particular the walks and pavements in the vicinity of the Custom House were literally carpeted with charred fragments of burned Government records.

These crude methods of disposing of this particular kind of waste are bound to become a thing of the past very soon, for steps are now under way whereby a modernized destructor, one which is patterned after an English destructor, will be installed before the year is out. But it is not the intention of the authorities to burn all the waste paper. It will be utilized in two ways: First, by the sorting and saving of that which is marketable.

While the worth of clean paper and rags depends upon the demand and the price upon the market quotations, yet the records of the past few years show the average would be about $8 per ton the season through for a good quality of stock, and the poorest quality, about $6.

Assuming the above figures to be correct and taking into consideration the fact that the waste would be disposed of at a much less cost per ton than by the present system, more than $300,000 would be saved to the city in this item alone.

But after disposing of the salable part of the rags and paper there remains the combustible part to get rid of, which, by following the practice of foreign cities, can be disposed of at a profit by converting the heat obtained from the combustion into horse-power.

This forms the second method of utilizing the waste paper, rags, and other combustible waste. Of the grand total of rubbish collected about 50 per cent is good only for combustion, and is, therefore, to be used as fuel. It has been demonstrated that this class of garbage, in the modernized furnace for its combustion and for utilizing the heat units for the creation of steam, has in it one-tenth the value of coal. This means that New York city towed out to sea last year more than 5,000 tons of coal, which had a money value of $35,000. This rubbish was worse than wasted, for after being dumped into the sea it was blown, drifted and tossed about by wind, tide, and waves, much of it landing on the shores and beaches of the health resorts, there to become a nuisance and menace to humanity.

WHY MEN USE PROFANITY.

Theories Set Forth by an Iowa College Professor.

(From the New York Tribune.)

Prof. G. T. W. Patrick, of the University of Iowa, recently read a paper on "Profanity" before a scientific society in Lincoln Neb. A good deal of it was couched in technical language which cannot easily be translated into popular phraseology. And some of the ideas which he advanced will probably not receive unanimous approval from those who have studied human emotion and its expression with care. Nevertheless, the topic is one in which a great many people besides scientists are interested. What Prof. Patrick set out to do was to answer two questions: Why do men swear? And when they swear why do they use the words they do?

In the first place, the variety of circumstances in which profanity is indulged in is pointed out. It is characteristic of anger, a failure to find adequate expression in ordinary language for an emphatic statement, and an effort to stimulate workmen and horses to extra effort. And the use of oaths is accompanied by a pleasant feeling of relief from some painful stress. On this latter point Professor Patrick quotes a sentence of J. H. Campbell, concerning the physiology of the emotions: "The shouting and gesticulation which accompany an outburst of passion act physiologically by relieving nerve tension, and, indeed, as Hughlings Jackson has suggested, swearing may not be without its physiological justification." The lecturer at Lincoln elaborates the idea still further by remarking that in the primitive and natural form of combat the whole muscular sytem comes into lively action, and any restraint that is put upon this form of activity creates a necessity for other outlets. "Men in anger may perhaps be obliged to repress every overt act and every expression of emotion except facial movements or some form of vocalization. Profanity is therefore a safety valve. * * * If a man did not swear he would do something worse. It may be likened to the engine blowing off steam."

Prof. Patrick insists, however, that this theory is not altogether satisfactory to him. He raises both psychological and physiological objections to it, some of which will impress the average reader as a trifle abstruse. But he also urges that swearing is more than a mere expression of emotion. It is designed to produce an effect on somebody else. He traces its origin back to the animal instinct to fight or fly when attacked. In a primitive stage of existence the creature would, in the former instance, show its teeth, get its back up, and spit or growl. All of this behavior would be intended to put the enemy to flight, says Prof. Patrick, who adds: "The human analogue of the growl or roar of anger is the profane oath."

One can easily recall situations to which this explanation does not seem to apply. When a man's collar button rolls under the bed or the bureau, for instance, and he indulges in unparliamentary language, it can hardly be imagined that he deliberately aims to intimidate the elusive bit of metal. Still, it may be that the Iowa professor is referring only to the evolution of the swearing instinct in man, and does not intend that his theory shall explain each particular manifestation of it.

The hypothesis advanced to acount for the habit of swearing leads naturally to Prof. Patrick's explanation of the form of men's oaths, the reckless use of the names of the Deity, the saints and sacred things. Assuming that this motive is—or was when the practice originated—to shock or startle, it would be hard to find a better way to accomplish the object than the practice which is forbidden by the third commandment.

Here, again, the theory fails to cover all the observed facts, however accurately it may fit a few. There are some oaths the precise significance of which is obscure. But, on the other hand, there are many which distinctly call down the curse of Heaven upon the person addressed, and are meant to do so. And it is probable that a good deal of the swearing that Prof. Patrick has in mind is made up of contractions from what were originally well defined maledictions, the most emphatic form of expressing a wish that evil, bodily or spiritual, might befall somebody. There is more in an oath of this kind than shocking the sensibilities of the subject.

LOPSIDED MEN AND WOMEN.

Differences Between the Legs, Eyes, and Ears of Nearly Everybody.

(From the New York Sun.)

The two sides of a person's face are never alike. The eyes are out of line in two cases out of five, and one eye is stronger than the other in seven persons out of ten. The right ear is also, as a rule, higher than the left.

Only one person in fifteen has perfect eyes, the largest percentage of defects prevailing among fair-haired people. Short sight is more common in town than among country folk, and of all people the Germans have the largest proportion of short-sighted persons.

The crystalline lens of the eye is the one portion of the human body which continues to increase in size throughout life and does not cease with the attainment of maturity.

The smallest interval of sound can be better distinguished with one ear than with both. The nails of two fingers never grow with the same rapidity, that of the middle finger growing the fastest, while that of the thumb grows the slowest.

In fifty-four cases out of a hundred the left leg is stronger than the right. The bones of an average human male skeleton weigh twenty pounds; those of a woman are six pounds lighter.

That unruly member, the tongue of a woman, is also smaller than that of a man, given a man and a woman of equal size and weight. It may be appalling to reflect, but it is nevertheless true, that the muscles of the human jaw exert a force of over 500 pounds.

The symmetry which is the sole intelligible ground for our idea of beauty, the proportion between the upper and lower half of the human body, exists in nearly all males, but is never found in the female. American limbs are more symmetrical than those of any other people. The rocking chair, according to an English scientist, is responsible for the exercise which increased the beauty of the lower limbs. The push which the toes give to keep the chair in motion, repeated and repeated, makes the instep high, the calf round and full, and it makes the ankle delicate and slender.

British women are said to average two inches more in height than Americans. Averages for the height of women show that those born in summer and autumn are taller than those born in spring or winter. The tallest girls are born in August.

As far as boys are concerned, those who first see the light during autumn and winter are not so tall as those born as spring and summer. Those born in November are the shortest; in July, the tallest.

An average head of fair hair consists of 143,040 hairs, dark hair of 105,000, while a red head has only 29,200. Fair haired people are becoming less numerous than formerly.

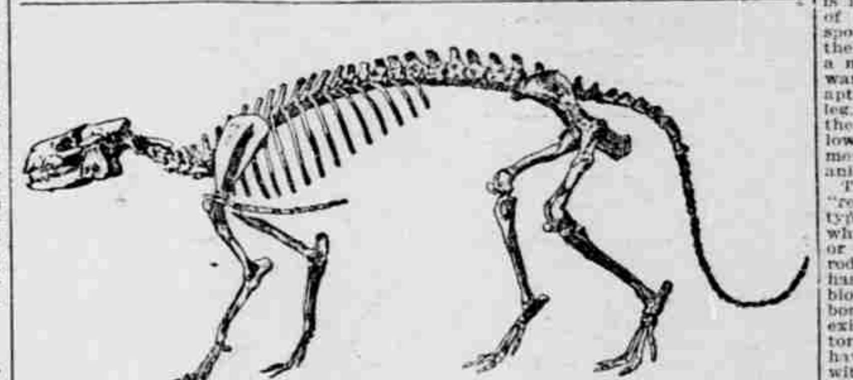
A person who has lived seventy years has had pass through his heart about 675,320 tons of blood, the whole of the blood in the body passing through the heart in about thirty-two beats. The heart beats on an average of seventy times a minute, or 36,792,000 times in the course of a year, so that the heart of an ordinary man, eighty years of age, has beaten 3,000,000,000 times. The heart beats ten strokes a minute less when one is lying down than when one is in an upright position.

ANTIQUITY OF THE HORSE

The First Was About the Size of a Common Red Fox.

Ancestry of the Equine Plodders of the Present Day—A Survivor of Quadruped Denizens of Mountain Ranges—Once Had Four Toes.

He was only an old horse, harnessed to a ramshackle wagon, whose wheels made zigzag markings on the Pennsylvania Avenue asphalt. The harness was a combination of carpet, rope, and leather. One ear drooped listlessly. His bony skeleton

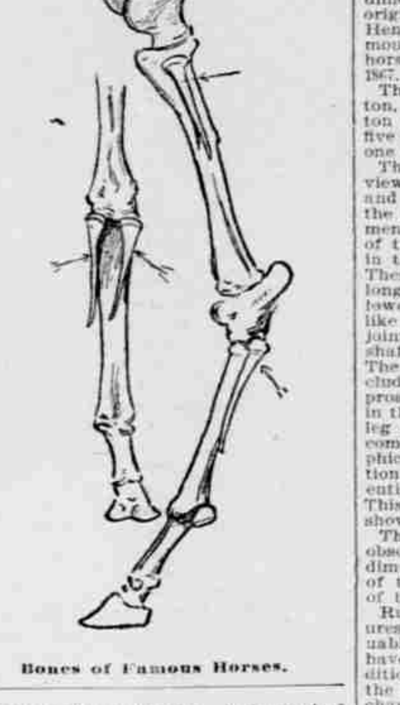


Skeleton of a Prehistoric Horse.

was easily traceable through the rusty hide. The underlip pendulated in unison with the movement of the head. Only an old horse, an epitome of equine despair, yet that horse had a pedigree and an ancestry whose antiquity antedated that of the proudest nobles of Europe by millions of years. The knee-sprung forelegs and sprained joints told a story replete with genealogical interest and the gnarled hoofs gave hint of a glorious history when his ancestry bounded in unbridled freedom over the hills and plains of the world of antiquity. These were the days when the world was young and animal life first made its appearance. The earth was a paradise of beauty, when tree and flower grew and bloomed in rank abundance. The excess of plant life presented the finst conditions for the entrance of a new form of life, that of the living animal.

Among the first of the higher order of animals to people this Garden of Eden was the Hyrocathere, the equine Adam and Eve, the ancestor of the modern horse. He was only a little fellow no larger than our common red fox. He had a long tail, short legs and was four-toed. The earth at that time was low and marshy, and the long grass and tall vegetation completely hid the horse of antiquity from the huge beasts which roamed about the lagoons and marshes around about him. They were huge beasts, whose height and bulk would dwarf the largest elephant of today. They were slow moving animals. Their stout legs and broad feet with numerous toes spreading apart when the weight is borne by them were sufficiently well adapted for plodding deliberation over marshes and yielding surfaces.

But after awhile the surface of the earth began to change. The marshy lands began to rise and the water drained away. The land still continued to rise like some huge giant awaking from a long sleep, until the Rocky Mountains and the high lands of the Continent of America reached the sky and left the flying clouds far below, like flocks of frightened birds.



Bones of Famous Horses.

A new era was now born. A change had come demanding a modification in the animal form and habit. Most of the forms of animal life were adapted so completely to the conditions which prevailed before the elevation of the earth's surface that a new adaptation was impossible with them and they perished and became extinct. For a time, however, they remained confined in the pockets formed by the mountains when they arose. These pockets or valleys continued damp and marshy, but so limited in area, as compared to the pre-mountain period that the unadaptable animals perished by the score. This fact explains why so many fossil remains of prehistoric animals are found in limited areas and in large numbers.

Of these prehistoric animals only three have left descendants which are represented by living creatures today. These are the tapir, the rhinoceros, and the horse. For some unknown reason they were enabled to adapt themselves to the changed conditions and thus were saved from extinction. Of the three types the tapir and rhinoceros remain but little changed. They live under conditions similar to that which surrounded their origin.

They still haunt low marshy spots in hot countries. Their bodies are adapted to such an environment. The tapir has changed the least, the rhinoceros slightly more than the tapir, but the horse has undergone such a radical change as to mark him the one creature possessing the potentials necessary to survive. He was the animal Noah whose ark of potentiality saved him when the flood of change covered the earth and all living forms perished.

Let him who bewails his diminutive stature take heart and learn of the little four-toed horse, for it was because of his littleness, in part, that he was saved and was enable to surround himself with the condition which would make him big. Being a little animal his means of protection from the onslaughts of his larger neighbors was flight. He must run away from them. Speed then was what he most needed. When the earth's surface was flat and low he could not hope to find a spot where he would not be found by his enemies. But when the land arose he found a land condition where he could be practically undisturbed by the marsh-dwelling Titans. To the highlands, therefore, he went. But the change from moist yielding soil to firm unyielding ground demanded a modification in the feet and legs of an animal whose limbs had been molded to suit the former conditions.

Vegetation was rot so rank and abundant on the highlands as in the bottom lands. Hence there was a necessity for the little four-toed horse to do a greater amount of hustling about for his dinner. There was in consequence a greater demand made upon his legs and toes and that increased demand is responsible for the disappearance of the toes and for the development of the hoof of the horse as we see him today.

A glance at the picture of the skeleton of the prehistoric four-toed horse will discover the second toe to be the longest. This toe touched the ground first and sustained more of the weight of the animal than the remaining toes. Use causes development and it is evident, therefore, that the largest toe having a greater amount of work to do grew in size and strength, finally leaving the remaining toes as mere dangling appendages utterly useless as aids to locomotion. A good illustration of this is to rest the tips of the fingers of the hand on the table. It will be found that the middle finger alone touches the table the other fingers suspended in the air. This is precisely the condition the ancient horse found when he stood on hard unyielding ground. The soft muck of the marshes gave ample opportunity for each toe to functionate in the process of locomotion, but on hard ground the second toe did the greater part of the work.

The prehistoric horse did not, however, stand on the tips of his toes, as the cut will show. All of the toes touched the ground and sustained a part of the weight, but to a less degree than the second toe which developed at the expense of the remaining toes in consequence. The principle in animals which produces callouses on parts of the body where friction and wear come was the cause which developed the nail of the second toe into the hoof of the horse. The modern horse now walks upon the tip of the remaining toe, the others either having become obliterated or show in the skeleton as mere splints alongside of the main bone, undergoing

Toes Undergoing Rudimentation.

a process of dwindling away, or rudimentation, as it is called. Some skeletons do not have these splints, but only the articulatory grooves or facets showing where they originally articulated.

In the National Museum can be seen the skeletons of two horses famous in life as racers, which beautifully show the rudimentary remains of the bones of the original toes. One is the skeleton of "Old Henry Clay," the progenitor of the famous Clay family of Kentucky race horses. He was foaled in 1837 and died in 1867.

The other skeleton is that of Lexington, another famous race horse. Lexington was foaled in 1850 and died twenty-five years later, in 1875. He sustained but one defeat in the many races he ran.

The accompanying cut shows the rear view of the foreleg of Old Henry Clay and the hind leg of Lexington. Here at the knee joint in the one are seen the rudimentary remains of the metacarpal bones of two of the original toes still attached in their articulatory facets at the joint. These bones are from six to eight inches long and slope to a sharp point at the lower end. Sometimes the lower knoblike end of the bone is found at the ankle joint, with the lower half or third of the shaft wanting, as is shown in figure 2. The long bones of the higher animals, including man, grow thinner as they approach the centre of the shaft, until, as in the fibula, one of the two bones of the leg from the knee to the ankle, they become somewhat attenuated. In the atrophic or dwindling process of rudimentation the attenuated portion will disappear entirely before the much thicker ends. This accounts for the section wanting as shown in the third cut.

This cut shows a front and side view of obsolete toes undergoing a process of rudimentation due to uselessness on account of the superior length and development of the second toe.

Rudimentary bodies are useless structures which once performed a service valuable to the vital economy, but which have become useless from changed conditions in the body of the animal due to the demands made upon the creature by changed external conditions. The vermiform appendix, that vexing portion of the human anatomy, is a rudimentary organ. Rudimentary or vestigial parts are always in a degenerative state, vestiges of a once more developed condition. The horse in his present condition is one of the most modern of animals.

In tracing the history and affinities of animals, rudimentary organs are regarded by naturalists as far more important than highly developed or functional parts. As Darwin says, they "may be compared with letters of a word still retained in the

Rudimentary Toe Bone, Showing Missing Section.

spelling, but become useless in pronunciation, but which serve as clews for its derivation."

With the development of the foot to one hoofed toe an increase in speed naturally follows. All the strength of the muscles of locomotion is concentrated upon the toe, the bones of which have become longer and stronger, throwing the ankle joint farther up away from the ground, until in the modern horse the original ankle joint becomes the knee joint in the fore leg and the hock joint in the hind leg. By increasing the elevation of the joint from the ground a greater leverage is gained, thus increasing the forward spring of the horse when running. This, it is evident, increases his speed. By the lengthening of the bones the animal becomes larger, which is assisted by the law of natural selection, further facilitated by man, until the modern horse has grown from a little animal about the size of a poodle dog to one of the large animals.

Another rudimentary part which can be plainly seen on any modern horse is the horny wart at the knee and hock joints. These warts are known to horsemen as ergots, and are placed on the inner side of the leg and in some horses project an inch or more from the leg. These are the rudimentary remains of the plantar surface or sole of the foot upon which the prehistoric horse rested. It is identical with the hard rough surface of the sole of a dog's foot and corresponds, in its relation to other parts of the sole of the foot, to the heel part of a man's sole. In high bred horses these warts do not appear large nor are they apt to be found projecting far from the leg. They are attached to the hide; in fact, they are a modified part of the skin. In low-bred animals they are larger and more apparent. This is because low-bred animals are nearer the original type.

There is always a latent tendency to "revert" or "throw back" to original types, and occasionally a horse is foaled which has one or more undeveloped toes or hoofs on one or all four feet. Caesar rode such a freak horse, mention of which has been made by his contemporaneous biographers and historians. The two bones which make up the leg of a horse existed as separate bones in the prehistoric animal, but in the modern horse have grown together. This, associated with gradual increase in speed, especially on firm, hard ground, has made the modern horse one of the swiftest of animals and has added to his strength of limb.

FLOWERS HAVE THEIR RANK.

Sentimental Regards for Floral Glories in the Orient.

(From the St. Louis Globe-Democrat.)

With such titles as "ten thousand times sprinkled with gold, and disheveled hair in morning sleep" fresh in his memory, and coming from a land where the arrangement of flowers is part of the education, it must be something of a shock to the Japanese visiting this country to hear the prosaic names we bestow on our chrysanthemums and to find how recklessly Americans arrange bouquets. He appreciates that as a nation we are much less fond of flowers than are his people, and how little they mean to us in life beyond the pleasing sensations produced by their beauty. In Japan the arrangement of them is pursued as an art, being profoundly studied by men of rank, philosophers and priests, besides learned and literary men, ladies of the aristocracy are allowed to practice the art as being likely to inspire such estimable virtues as gentleness, self-denial, forgetfulness of care and spirituality. A life-time is indeed not too long for the Japanese, either man or woman, to devote to an understanding of the subtile meaning conveyed by flowers, and the rigorous rules necessary to observe in producing with them the best artistic results.

In Japan the peony, although acknowledged to be the royal flower of China, is still the favorite of the upper classes. It is given on occasions of importance the position of honor on the dais in the principal recess; never is it placed in the center of the room, nor on a shelf, and no other flower is allowed to come near its royal presence. Sometimes art dictates that two black twigs shall be grouped behind it, the thought being to enhance by contrast its abundant life and beauty. The lotus flower also is conceded to have royal national/rank, and is called the King of Indian flowers. On festive days the Japanese never use it, as they associate it entirely with the spirit of the dead. The royal flower of Japan, of course, is the cherry blossom. The idea of floral rank is one to which the Japanese are very sensitive and the established laws of precedence must be closely adhered to in the arrangement of their flowers. To an American it seems perhaps inexplicable that they should have placed the purple wistaria high above the white, which they mostly exclude from their compositions.

Irises stand very high in rank, but are regarded as difficult of arrangement, and therefore the most arbitrary rules have been evolved in their composition. With one large flower, but three leaves are allowed; with two flowers, seven or fifteen leaves are used; three flowers are given thirteen leaves, and five flowers are furnished with eleven leaves.

So deftly are thoughts conveyed by the arrangement of flowers in Japan that often verbal messages are unnecessary. In November, the coquette sends to her lover a leaf, or branch, of maple. "Like it," he translates, "her love has changed."

On farewell occasions those called "returning flowers," because they bloom twice a year, are used to subtly express the hope of a safe return. Before people that are ill, blossoms of a sturdy, vigorous growth are placed that health and strength may be suggested. Only very gay flowers are strewn in profusion when supplications are made for those in affliction. Prayers for rain are accompanied by large floral pieces so arranged as to point from right to left that the east wind bringing rain may be honored, and very naturally the reverse order typifying the west wind is employed when fair weather is desired.

Border of the thin mist; shades of the evening sun; waves in the morning sun; companion of the moon; snow on the leaf of the bamboo; moon's halo; spray-capped wave; starlit night; beacon light; the sky at dawn; the first snow, and golden dew are among the many imaginative and pretty names the Japanese bestow on their chrysanthemums, these flowers which appeal so strongly to their poetic natures. In the arrangement of them they are very careful and guard against seven faults, their stems must not be of the same length, a single blossom must not turn its back nor present its full face; three flowers must not appear to form a triangle, they must not be hidden by leaves, nor must they be arranged in the way of steps; an open, full blossom should never be placed at the base of the composition, and one odd one should not fall between two others alike in color.

HEROIC SURGICAL WORK.

Resuscitation Effected by Squeezing a Man's Heart.

(From the New York Tribune.)

A remarkable story is told in a Danish medical periodical relative to the treatment of a patient who had become asphyxiated from the administration of chloroform. The operating surgeon was a certain Dr. Maag, but the method which he employed had previously been suggested by Dr. Prus, of Lemburg.

A laborer, twenty-seven years old, who had suffered from sciatica, was to be operated upon to relieve that trouble. Chloroform was given and the operation begun. The patient struggled, however, and when the process of anaesthesia was carried further he stopped breathing. Several expedients were resorted to in order to restore respiration, but in vain. And there was no longer any pulse.

In this emergency Dr. Maag opened the chest, detached portions of the third and fourth ribs two and a half inches long, and turned them back with the flap of flesh. Through the opening thus made, he thrust his hand. The heart was firmly grasped and compressed rhythmically. After a few squeezes that organ began to beat naturally. It was necessary to employ compression again at times, and also to inflate the lungs artificially. But by these means the patient was kept alive for eleven hours and a half, and Dr. Maag is inclined to believe that the man would have recovered were it not that one of the pleura was accidentally punctured.

Wealth in Forests.

(From the Chicago Inter-Ocean.)

"Fifty thousand citizens of Indiana are employed in the wood industry and receive annually $15,000,000 in wages. The product of this labor brings $50,000,000 each year to Indiana's manufactures." This was the statement of Mr. John P. Brown, Secretary of the Indiana Forestry Association, in a recent address. He believes that the first century of Indiana's history will measure the end of Indiana's forests.

When Indiana was organized as a State there were in her boundaries 28,000 square miles of valuable woods. There are now only 48,900 square miles in all the prairie States; 44,970 square miles in the lake States, and 80,000 square miles in the Central or manufacturing States. Mr. Brown declares that the greater part of the Indiana forests has disappeared; that the State now imports almost its entire consumption of timber; that the walnut, cherry, poplar, maple, ash and other valuable trees are practically gone. He estimates that if the 6,500,000 acres of rough lands and swamps not suited for agriculture in Indiana could be afforested it would add to the State's material wealth $500,000,000. I would double the value of Indiana's land assessment, whereas if the rough lands are to remain as at present no income can be hoped for.

EXHIBIT OF THE SCHOOLS

National Institutions of Learning at the Buffalo Exposition.

Class Exercises Portrayed by Graphophone, Biograph, and Stereopticon Records—Methods of Teachers and Replies of the Pupils Shown.

A novel educational exhibit to form a feature of the forthcoming Pan-American Exposition is in course of preparation here. It is intended to show the form of class exercise employed in every grade of the public schools, from the first to those of the normal school, by means of graphophone, biograph, and stereopticon records, thus appealing to the eye and the ear of the spectator, and reproducing vividly in a life-like manner, the methods of the teacher, and the response of the pupil. National educational systems will be thus represented from the public schools of Washington, Annapolis, Carlisle (Indian School), and West Point. The only portion of the exhibit completed are the graphophone records from the Washington schools. These are now stored in a room at the Bureau of Education Building.

W. C. Boyken, of the Bureau of Education, is the originator of the scheme, and, judging from the results already obtained, he has reason to be gratified with its success. Contrary to expectation, the records of the exercises of the younger pupils are, if anything, the best. The manner in which the talking machine reproduces the replies of the juveniles is both amusing and wonderful, the effect being perfectly natural and realistic. There are some choice specimens of the customary mistakes of young pupils, and every inflexion of the voice is faithfully caught by the instrument, from the burst of shrill confidence of the "smart boy" to the hesitation of the conscious delinquent, together with the demure tone of the sweet little maid. As the classes mount higher and the voices of the pupils become deeper the effect is less diverting, but still very good. In the actual exhibit stereopticon pictures of the respective classes will accompany the sound records, and a more delightful, yet practical method of showing the system employed in the public schools of the District could hardly be conceived.

Twenty-seven classes, including all grades, will be thus represented, in addition to which there will be twelve biograph scenes unaccompanied by dialogue. Each graphophone and biograph record will last but little over one minute in reproduction. The graphophone and stereopticon records of the District schools will comprise the following:

First Grade—Language lesson, Miss Riddleberger, teacher, Dennison School; a number lesson (same grade), Miss Caspari, Tayloe School, and another language lesson, Miss Taylor, teacher, Garnet School, colored. Second grade—A composition reading, Miss Getty, teacher, Dennison School; study of the markets, Miss Breen, teacher, Franklin School. Third grade—Local geography, Miss Goodman, teacher, Wallach School; nature study, subject rodents, Miss Kupfer, teacher, Harrison School. Fourth grade—Literature and old Greek story, Miss Lackey, teacher, Wallach School; history, Miss Williamson, teacher, Tayloe School. Fifth grade—Arithmetic, Miss Lackey, teacher, Dennison School; geography, Miss Dodge, teacher, Blair School. Sixth grade—Physiology, Mr. Riordon, teacher, Greenleaf School; literature, subject, "Evangeline," Miss Hoover, teacher, Force School. Seventh grade—History, Miss Sipe, teacher, Webster School; arithmetic, Miss Ossire, teacher, Grant School. Eighth grade—Civics, subject, "Supreme Court," Miss Rawlings, teacher, Hilton School; literature, subject, "Snowbound," Miss Pattison, Franklin School; technical grammar, Miss Handley, teacher, Seaton School; algebra, Miss Gibbs, teacher, Sumner School, colored.

Among the high schools the following classes will be represented: First—beginners' class in German, Dr. Sanhoofd, teacher; physics, Dr. Roszel, teacher; American history, Mr. Wilson, teacher; literature, subject Macaulay's "Essay on Milton," Miss Helen M. Reynolds, teacher; biology, subject, "Respiration," Mr. Thomas, teacher (colored high school); French, Mr. Fontaine, teacher.

There are two records from the Normal school; first—preparation for lesson on the pine, Miss Brown, teacher; second—songs taught teachers in training, for use in the primary schools, Miss Bentley, teacher.

The biograph pictures will comprise the following: (1) kindergarten "visiting game," director, Miss McKnew, Seaton School. (2) Lesson on the hen, first grade, Miss Riddleberger, teacher, Dennison Building. (3) and (4) Physical training of white and colored pupils. (5) Nature study, "Lesson on the Rabbit," Miss Kupfer, teacher, Harrison School. (6) Cooking lesson. (7) Cutting, fitting and sewing. (8) Physical exercises of high school girls, Miss Walton, teacher. (9) Laboratory scene (in one of physical sciences. (10) Battalion drill of High School Cadets. (11) Wood turning and bench work, Manual Training High School. (12) Forging, Manual Training High School.

The exhibit will be given a separate hall in the Government Building at the Pan-American Exposition, and will form three entertainments daily. It is pretty certain that the Annapolis and Carlisle Schools will be represented, though the same cannot be yet said of West Point.

WARD OF A TRUST COMPANY.

Thrashing a Rascal as Part of the Corporation's Duty.

(From the New York Tribune.)

As the members were finishing their cigars in the club smoking-room the conversation drifted to the soullessness of corporations. "That sort of talk is all very well," said the man from the West, "but I have a story to show that the rule has at least one exception. Some years ago the trust company I represent, through the death of a client, became guardian of the interests of his widow, who was a minor and an orphan. The young woman was impressionable, and soon after her husband's death became infatuated with a worthless fellow, who, though a married man, gained her promise to elope with him. Suspecting some such action on his part, we induced the girl to visit friends who might have been expected to keep a reasonable oversight of her. In spite of our precautions, however, the man made an appointment with her, met her, and was about to drive off with her when an agent of ours, who had been detailed to observe his movements, appeared, administered a sound thrashing to him, and advised him to leave town, lest a worse thing befall him. He chose to stay and cause the arrest of our man for assault and battery. We retained the best counsel available to defend the case and finally won, but at a cost considerably greater than the value of the small trust we held in trust for the widow—and we just charged it to profit and loss and never rendered a bill. We figured that it had been our duty, as the girl's guardian to safeguard her honor as well as her property, just as her father or brother would have done if she had had either, and that's what we did."

"And I suppose she took another opportunity to run away with the rascal, after all," suggested a listener.

"That's the funny part of it. She was deeply grateful to us after the affair was over, and in the course of a year or two married a really nice fellow."

Courtesy Saved Him.

(From London Spare Moments.)

Wit has often saved an offender from punishment in military as well as in civil life.

Not long since a non-commissioned officer entering a barrack gate in Dublin was mistaken by the "fresh one" on sentry, who immediately "came to the shoulder."

The noncom., unaware that his colonel was just behind, returned the salute—a thing not permissible in the circumstances. Arrived at his quarters, he shortly received an order to attend before the colonel.

On presenting himself he was asked how he came to return the salute, knowing full well he was not entitled to it.

Not in the least embarrassed, he promptly answered:

"Sir, I always return everything I am not entitled to."

His ready wit pleased the colonel, who laughingly dismissed him.