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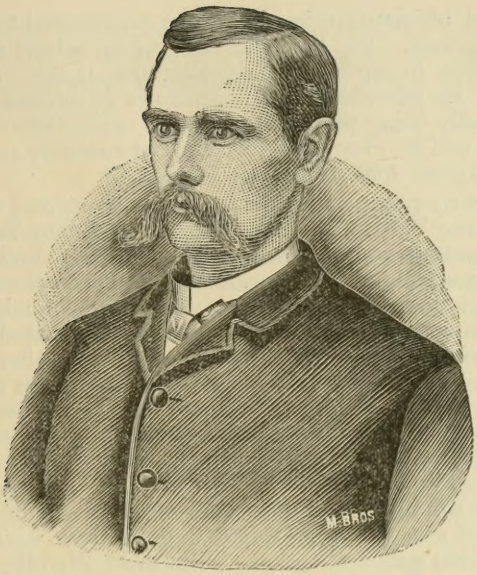


EDWIN WORTHAM DORAN.

Well-directed and sustained effort is always followed by success. Many times a varied preliminary preparation, with its broadening educational influence, is necessary to enable one to properly directed effort; but when one is blessed with a reasonable amount of talent, a large quantity of tact, together with a good education, such an one is expected to arrive at distinction.

Edwin Wortham Doran, son of Samuel C. and Eliza A. Doran, first saw the light April 28, 1856, in Grayson county, Kentucky. When Edwin was four years old his parents removed to Coles county, Illinois, and purchased a farm five miles north of Mattoon. His school life began at the age of eight, attending the district school about three months each year until he was nineteen, when his course as a teacher began. He taught in the district schools of the vicinity winters, farming during the summers, at the same time pursuing, independently, the study of the natural sciences and reading some Latin. In this manner he was enabled to obtain information necessary to secure a first grade teacher's certificate.

Mr. Doran began a course of study at Lincoln (Ill.) University which was interrupted from lack of funds. Later he attended Westfield (Ill.) College where he spent some time, and afterwards he read law for some months. But a change having been made in his religious views, after some preliminary preparation, he began to preach, receiving a license to do so from the Vandalia Presbytery of the C. P. Church. In that line of work he gave

promise of ultimate success, and was encouraged to continue by eminent divines. But he could not give up school work, though he continued to preach occasionally, and is now regularly ordained. He attended normal institutes in various parts of the State, usually being placed in charge of some department of instruction, and in every possible manner specially prepared himself for a higher sphere of educational labor.

In the early part of 1884 Prof. Doran was elected General Secretary of the Y. M. C. A., at Mattoon, resigning later to accept the principalship of the Ancona (Ill.) Public Schools. At this time he occupied his leisure moments in the systematic study of entomology under the direction of the writer, acquainting himself with entomological literature and rearing and classifying insects. The following year he was associated with a brother at Edwards Academy, White Pine, Tennessee. Later he was placed at the head of London (Tenn.) College, soon afterward becoming a benedict. He was married December 31, 1885, to Miss F. E. Beale, of Humboldt, Ill., an accomplished musician. During the year he continued his entomological studies, prepared popular articles for the press, and delivered addresses on economic entomology before various agricultural gatherings. These labors soon attracted public attention. November 18, 1885, he was appointed State Entomologist of Tennessee by Commissioner McWhirter, and during his incumbency of nearly three terms he has formed a collection of the insects of the State, published one valuable report, many bulletins, a catalogue of the Insects of the State, and prepared a second report which is soon to be published. These publications have been reviewed by various critics and always mentioned with commendation.

While State Entomologist, Prof. Doran occupied the following positions consecutively: Professor of Natural Sciences in Cumberland Female College, Monteagle Summer School of Science, and Bethel College. As an instructor his reputation has steadily increased and the best positions in the State were open to him.

For a year he conducted a department of entomology in the *Spirit of the Farm* in which he gave, weekly, the results of his investigations in Tennessee entomology. In August, 1890, he resigned his office to accept the professorship of Natural Sciences in Pritchett Institute, Glasgow, Missouri, where he now resides.

In 1887 he received the degree of A. M., from Grant Memorial University, Athens, Tenn., and of Ph. D. in 1890, from Cumberland University, Lebanon, Tenn.

In personal appearance Prof. Doran is rather under size, of slight figure, medium complexion, and sharp penetrating brown eyes. He is active, nervous, and rapid in his movements and thoughts.

While State Entomologist of Tennessee, Prof Doran did some grand good work in an almost unknown field, which will be greatly appreciated by those who follow in his footsteps, and

should the office be continued—and it now appears that Professor H. E. Sommers, of Knoxville, Tenn., will succeed him—his successor will find a good groundwork upon which to erect a substantial superstructure. *F. W. Goding.*

STAR TULIPS.

(From the Pacific Rural Press, XXXIX. 11.)

Though they belong to the same genus, Calochortus, the Mariposa or Butterfly Tulips, and the Star Tulips are distinct enough in general appearance to be thought quite separate. While the Mariposa Tulips are marked by a stiff, erect stem, and erect cups of flowers, brilliantly colored, the Star Tulips have a drooping, flexuous habit, and flowers more delicate in form and color than brilliant. In these attributes, delicacy of flower and grace of form, the Star Tulips are excelled by no other flower in cultivation. The general appearance is similar to the well-known snowdrop. They have only one leaf, a glossy green, lance-shaped leaf, often a foot long, proceeding from the bulb. The flowering stem is slender and drooping, branched in most species into many flower pedicels, with no leaves, and the bracts often colored like the flowers. The strongest growing species are as much as a foot high, in good specimens, while some of the small species are at perfection at three inches. Most of the species find their most congenial home in Woodland.

In describing the species they can best be grouped. Calochortus albus and C. pulchellus are strong growing species, bearing numerous blossoms. The petals curve together and close, forming a flattened globe, which hangs pendalous. On the exposed edges of the petals is a fringe of silky hairs. The blossom of C. albus is of a pearly white. The inside is filled with silky white hair. It has sometimes been called the 'Lantern of the fairies.' A well-grown plant of this species will bear from ten to twenty or thirty flowers, one to two inches in diameter.

Calochortus pulchellus differs from the preceding in its blossoms being a golden yellow and hardly so large. Both species grow in dry, loose soils in open woods and are easily cultivated.

In another group can be placed C. Benthamii, C. maweannus, C. elegans and C. coeruleus. In all of these the average specimen is quite low and the flowers wonderfully delicate. A well-grown specimen is three to five inches high, but the single root leaf is often much longer. The slender flower stem bears a few pendulous, open, bell-shaped flowers, filled with long silky hairs. All are plants of the cool woodlands. C. Benthamii is golden yellow, the others white to blue, and filled with hairs of the same color.

In my last group of Star Tulips I would place a few species of plants growing in wet places, having the same long, glossy root leaf, but a stouter, more erect stem, and open, cup-like flowers in

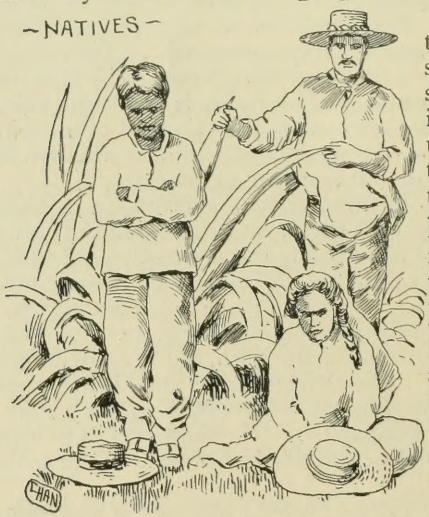
solid colors, and but slightly hairy. These are C. Tolmii, with lilac flowers, and stem a foot high; C. nudus, with white flowers, a few to ten inches high; C. lilacinus, with pale lilac flowers, a strong grower; and C. uniflorus, with lilac flowers and low.

In cultivation most of the Star Tulips will do well in a clay or sandy loam with a little mold, and dryness, shade or moisture, as I have hereinbefore indicated. *Carl Purdy.*

EASTER ISLAND.

(From the Washington, D. C., *Star*, July 27, 1889.)

THE hideous stone images and carvings in stone and wood at the U. S. National Museum attract attention to the curious people who inhabit the Easter Island. The island was the home of the image makers, and the products of their skill and imagination are emblems of hideous idolatry. Paymaster Thompson gives an interesting description of these curious people and their relics. It is doubtful, he says, whether the present race are descendants of the image makers. He is inclined to think that there was an earlier prehistoric race. One of the most noteworthy facts discovered through their archæology is that they had a written language.

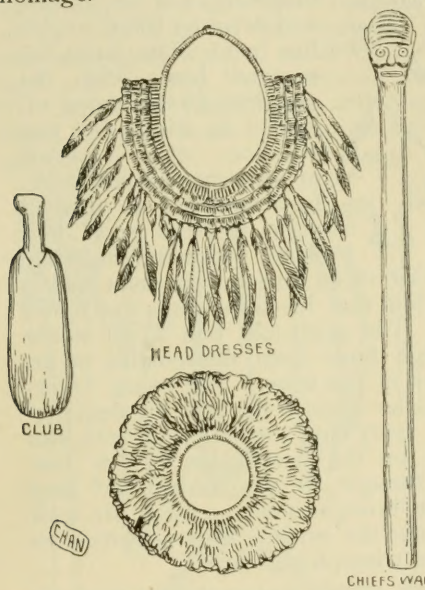


The collection from Easter Island includes images, stone and wood carvings, stone spear heads, various implements, weapons and utensils of industry illustrative of the 'civilization' of the people. In his description of the relics of the Easter Island collection Mr. Thompson states that it does not appear that the ordinary stone and wooden images, in which the island abounds, were in any sense idols. They seemed rather to be erected as our bronze is erected in the parks, to commemorate individuals.

Be this as it may, the visitor at the National Museum must be strongly predisposed to look upon these monstrosities in carving

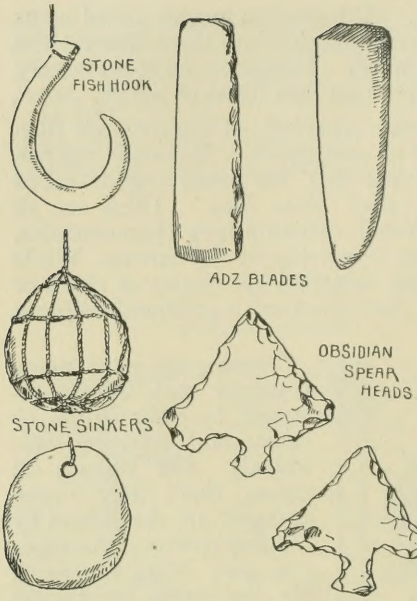
as the idols of a heathen race. The wooden images are of comparatively recent date. They are divided into three classes—the male, the female and the ribbed. The stone images are very rudely carved and are of earlier date than those of wood.

There are three stone idols, however, of higher rank than these—nothing less than that of stone gods. These are the fish god, called by the natives '*Mea Ika;*' the bonit's god, called '*Mea Kahi;*' the fowl god, called '*Mea Moa.*' These are all ill-shaped and apparently without distinguishing characteristics, but they are considered worthy of worship by the natives. While the various other images were intended as effigies of chiefs or other persons of importance, these received a profound religious homage.



These gods were never common and were possessed by communities or clans, and never by individuals The legends all claim that they were brought to the island by the first settlers. An especial god being set apart for the bonits, as distinct from the other fish, is attributed to the fact that fish has always been abundant and highly prized as food. Fish always constituted an important article of diet with the natives, and the abundance in which they were found is ascribed to the faithful and constant adoration to the stone fish gods. The fowl god was believed to ward off evil influences by being placed at night near where the chickens were accustomed to roost. It was moved about from one house to the other as the necessity for its services was felt. These stone gods show no attempt at carving in their construction.

The primitive sinkers and fishing hooks of these islanders shown in the collection are of stone. Some of the sinkers are fastened in a network of twine, while others are attached to the fishing line by means of a hole bored in the stone. The hook is a crude sort of contrivance, forming about three-quarters of a circle, the security of the hold when a fish is caught depending upon the inward turn at the point. The manufacture of one of these hooks was an immense labor. Other hooks are made of a man's thigh bone. Tradition on the island describes how the



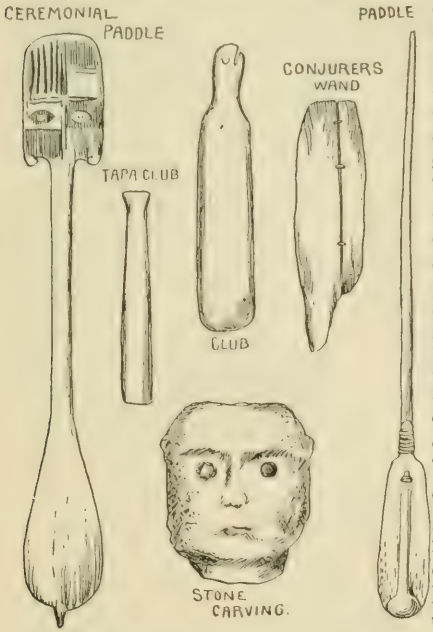
first bone hook happened to be made. In the prehistoric period of the image makers a youth named Ureraius was apprenticed to a fisherman of Hauga Pico. After having mastered the profession he obtained a canoe and went regularly into the business for himself. Somehow he was not successful. He worshipped the fish gods diligently, but his prayers and devotion failed to give him luck. The finest fish escaped him. *Mea Ika* and *Mea Kahi* seemed offended at him. On one occasion, after a period of particularly bad luck, he determined to pray all night by the god *Mea Kahi*. At midnight, while still at his devotions, the spirit of an ancient fisherman named Tirakaka appeared and told him that his ill-luck was due to the imperfections of his hooks. The spirit told him to go to the tomb and get a piece of thigh bone from the remains of his father, and to construct a hook of this bone. The young fisherman was much frightened, but he went to the cave the next day and got the thigh bone. For many days the time usual with him for fishing was spent in labor on the construction of this 'enchanted' hook. His friends thought he was fishing, and they used to ridicule him because he bronght home no fish. He took this with more complacency than the modern fisherman receives such taunts, for his moment of triumph was near.

When he finished his hook he sought a place distant from his companions and in a few minutes had his canoe full of fine fish. The extraordinary success of the youth caused many questions to be asked of him and provoked jealousy, but he refused to impart his secret. His stubbornness led to serious quarrels and finally an attack was made upon him to force the secret from him, and in maintaining it he lost his life.

In the manufacture of these bone hooks the material used is invariably the thigh bone of an old fisherman. They are provided with barbs and are cunningly contrived.

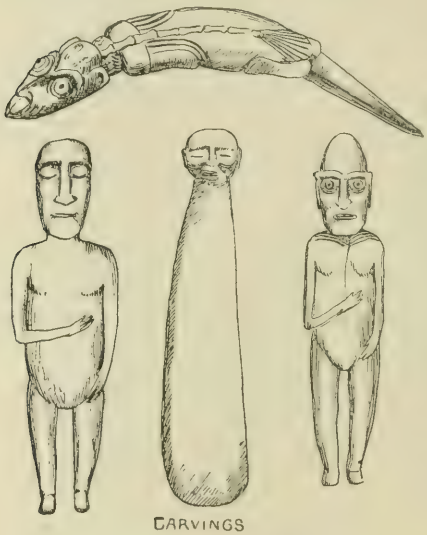
The stone axes of the Easter Island are made of hard slate—black, red and gray—called maca toke. Granite is used also for axes. The hardest and finest stone implements are made of

the flinty beach pebble, known as maca keng-rengo. The images were constructed of a stone called maca matariki, and the obsidian, from which the spear heads were made, is known as maca mataa. The spear heads of obsidian were roughly chipped and varied in form. Nine different forms are given by Mr. Thompson, some of which are strikingly like in shape to the old battle-axes of our early ancestors. These stone heads were lashed on shafts eight feet long and formed the chief weapon of the ancient islanders. They were thrown at a distance as well as used to thrust with. These spear heads were got chiefly from old tombs and caves. A few were found on old battle grounds. Tradition imparts that the use of these stone spear heads was brought about by an accident. The natives used to make ineffective war armed with spears with heads of dried calabash. On account of the character of the weapon they used to fight long and desperately without much result. A man returning from a hard and fruitless battle stepped on a stone that cut his foot. He carried the stone home and discovered it to be a material suited for spear heads. Weapons were at once made with points of this material and the enemies of the clan were quickly routed. Clubs from four to six feet long made of heavy wood are another class of weapon or baton shown in the collection. The points of the clubs of one class are slightly widened, and the handles are ornamented with double faced images. These were the batons or badges of office of the chiefs, and the handles were supposed to represent the effigy of the owner of the club or one of his illustrious ancestors. The clubs used as weapons of defense were from 20 to 30 inches in length and from the handle are widened out into a broad heavy blade. They were used with great dexterity in battle. A wand carried chiefly by the women in their dances has upon its flattened side the effigy of some woman noted for her grace and skill in dancing.



The hats of the Easter Islanders were crownless. They wore headdresses of feathers for ornament and to shade the face, perhaps. The collection shows six different styles. They are made

of chicken feathers, secured by the quill end to a foundation of knitted hemp, intended to fit around the head closely. The hat worn by the dancing women is small and narrow with fine feathers of bright color overlapping all the way around. The hat worn by married women upon the occasion of a ceremony connected with a betrothal is large and broad, made of black feathers about six inches long, clipped evenly all the way around. The men at their food feasts wore a small hat of feathers with long tail feathers hanging behind. The hat of the chief worn as an insignia of office is very large and heavy, the front made of short feathers set up on end and clipped evenly like a garden hedge, and the back ornamented with the largest and finest tail feathers to be had. The minor officials and chiefs ex-officio wear a lighter hat, made of short black feathers, with four tail feathers on end and tending outward at regular intervals. These headdresses are highly regarded by the islanders.



CARVINGS

From an early period the natives of the Easter Island have used large fish nets, which are very well made of wild hemp. The nets used for fighting purposes and the strong ropes used in handling the gigantic stone images were made of this wild hemp. Wooden needles, called hika, were used in making the nets. The paddles used by the Easter Islanders for their canoes were eight feet long, made with double blades, frequently decorated with carving or painted heads, and for superstitious reasons made of drift wood whenever it could be had.

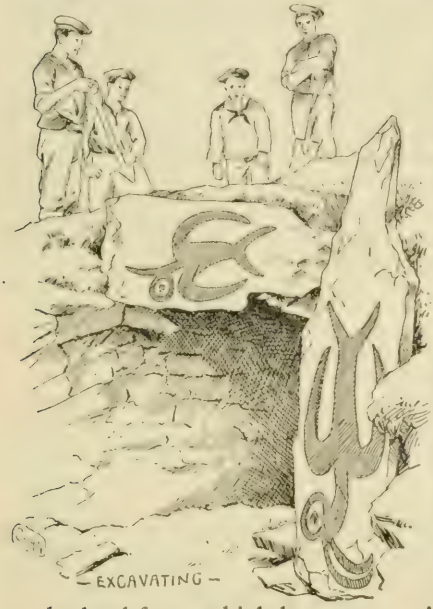
Two curious relics are the fetish boards. The '*timoika*,' or ordinary fetish board, is a broad flat paddle made of bone, 14 inches broad and 30 inches long. It is supposed to possess rare powers in working a charm upon an enemy. The individual working the charm performs a convulsive sort of dance, making mysterious movements with the wand and muttering incantations in a monotonous tone. Such a charm is supposed to bring speedy death upon its victim.

A special potato fetish called '*raha*' has ascribed to it the power to protect the potato crop from insects, drought and evil spirits that might be interested in the injury of the crop.

These fetish paddles are only 24 inches long, with a blade at each end, and are painted a bright red.

The baskets and mats of the Easter Islanders were made of bullrushes. The mats are used to sleep upon.

Mr. Thompson secured two inscribed tablets of wood inscribed with hieroglyphics. These give to the island an especial interest as showing that the image and platform makers possessed a written language. These tablets are in a good state of preservation, and were supposed to be the only perfect ones to be found on the island The larger one is believed, from its shape, to have formed at one time a section of the side of a canoe. These tablets were common on the island until a few years ago, when Catholic missionaries, through excessive zeal, had them destroyed. The characters carry their signification in the image they represent, and the manner of reading them is to begin at the left hand lower corner on the particular side which will bring the figures erect. Finishing the lower line with the figures turned toward the reading, and going to the next line above, the reading is continued from right to left. In order to have the images face the same way it is necessary, in reading a new line, to turn successively the right side of the tablet to the left. Arriving at the top of the first face of the tablet, the reading is continued just over the edge to the nearest line at the top on the other face. The tablets vary in size from a few inches to four or five feet in length. The hieroglyphic characters are about half an inch in height, and are beautifully engraved in regular lines. The engraving is supposed to have been done with sharks' teeth. The native traditions about these tablets are very doubtful, simply asserting that the first king possessed the knowledge of this language, and brought with him to the island sixty-seven tablets containing allegories proverbs and traditions, relating to the land from which he came. A certain number of youths from each clan were instructed in the reading of these tablets, and once a year the people assemble to hear them recited. This was regarded as their most important fete day. These tablets are of undoubted antiquity. Some of the oldest platforms and



the door posts of some of the ancient stone houses are inscribed with hieroglyphics that appear occasionally upon the tablets. The tablets secured by Mr. Thompson were, one 9½ inches by 3½, and the other 24½ inches in length by 4½ in width.

STONE IMAGES.

The houses found on the island were of the most primitive style of architecture, built close together in parallel streets, facing the sea. They are built of small slabs of stratified rock, piled together without cement. They are not of uniform size. The average interior measurements would be about 14 feet in length by 6 in width, but a few were found of double that size. The walls are about 5 feet thick and the roofs are composed of long flat slabs of granite upon which mounds of earth have been piled. They have no windows and the doorways are on a level with the ground and so small that it is difficult for a large man to gain an entrance. The distance between the floor and roof is about 5 feet 2 inches, and the interiors are generally lined with slabs, upon which are painted figures of birds and animals.

The natives who occupied these houses were small of stature and the contracted entrances are believed to have been designed as a protection against their enemies.

The most important sculptured rocks were found in the vicinity of these houses. The hard rocks are cut to represent human faces, figures, birds, fish, and animals. These sculptured rocks are very much decayed by time and they are evidently more ancient than the houses. One figure, reproduced upon almost every rock, seemed to be half human and half beast, with bowed back and long claw-like legs and arms. Some slabs taken from one of the houses which was torn open represented some sort of marine animal with a bird's head and beak. Another represents the same sort of an animal with another head. Another represents the animal with two heads, turned toward each other. The natives say there is a significance in the position in which these heads are placed. A number of roof and wall slabs were taken from these houses carved with nondescript figures. Some ancient skulls were found among the ruins with mystical figures carved on them. These were supposed to have come from the king's platform. The workshops where the great stone images were

made were in the craters of the volcanoes where the stone was had.

The present race upon the island is almost extinct. It is said that at one time there were 20,000 people there. At present there are 155 natives on the island, who are supposed to bear relationship to the Malays. The interest of the place is in its relics of antiquity, its tablets preserving a written language in hieroglyphics, and in the immense stone 'platform' and gigantic stone images, which are found in great numbers and are of great antiquity. Mr. Thompson found 153 of these platforms, the largest of which was 150 feet long. These are regarded as burial places. They are rude structures of stone, varying in height, not above 9 feet and very long and narrow in form. Upon these were placed the gigantic stone statues. On the largest platform were found 15 of these images. This platform was 150 feet long, 9 feet high and 9 feet wide. With the original wings it would have been 540 feet long.

The images on these platforms are regarded as effigies of chiefs or distinguished persons. Some 552 of these images were found by Mr. Thompson and his party. The largest of these was 70 feet high.

ANCELLA-BEARING STRATA OF OREGON.

The genus Ancella belongs to the family Aviculideae. The species have recently been discussed at considerable length and a few notes at this time on the Ancella-bearing beds may be of interest.

The genus is of wide distribution, extending in the northern hemisphere from far within the Arctic circle to north forty-five degrees north latitude in Asia, and as far south in California as the thirty-fifth degree. The genus has also been recorded from two localities in the southern hemisphere.

The distinguishing feature in the genus is the short and peculiarly infolded anterior ear. It somewhat resembles Lima and Inoceramus, but lacks the transversely grooved hinge area and prismatic structure of shell of the latter genus. The numerous

described forms pass from one to another by such insensible gradations as to render it doubtful whether we have in southern Oregon more than one true species.

The Ancellas are generally distributed through the sandstone and limestone in the vicinity of Riddle, Oregon, at an elevation of about 2,500 feet—the lowest exposure known in this section. The rock is extremely hard, with a metallic ring, sometimes almost wholly composed of fragments of these shells, none of which are found entire. The exposures of these shell-bearing limestones are water-worn in appearance, the beds full of pot-holes, grooves and channels, like the bed of some mountain stream at a low stage of water, where the rocks are unequal in hardness and unequnally worn by the running water.

This exposure is about three miles west of Riddle, about three hundred feet above Cowcreek valley, on the crest of a considerble ridge with a deep gorge on either side. If running water caused the erosion noted it must have been at a very ancient date. The sandstone for some distance around contains numerous shells, imperfectly preserved.

Above these exposures are vast bodies and huge cliffs of conglomerate, composed entirely of quartz pebbles. Adjoining and usually above the conglomerate are the nickel mines and the country rock known as olivine, with large masses of serpentine and chromite in many places. Seven miles further west on the top of Big Buck mountain beds of coarse, soft sandstone occur, containing usually only the casts of these shells.

The Ancella-bearing strata of Alaska and British Columbia are considered of the Cretaceous age. Some of the beds in California have been referred to the Jurassic. Riddle is about twenty miles south of Roseburg, on the Oregon division of the Sonthern Pacific Railroad. The shells in the exposure nearest Riddle, where they are most abundant, resemble those from near Knoxville, California. The shells from Big Buck mountain are allied to A. erringtoni; some from the east of Riddle appear to be be A. piochii, while others look like A. pallassii.

Fine impressions of fern leaves occur in a shale of the carboniferous (?) age not far beneath the shell-bearing sandstone.

Aurelius Todd.

A NEW RHAPHIOMIDAS FROM CALIFORNIA.

The Dipterous genus Raphiomidas was founded by the Baron Osten Sacken (Western Diptera, page 281), who placed it in the family Midasidæ. No mention of this genus is made by Dr. Williston in his excellent 'Synopsis of the Families and Genera of North American Diptera;' in his Table of Families (l. c., pages 9-15) it would fall into the division (26) which contains the Asilidæ and Midasidæ, agreeing nearest with the characters accorded to the latter but differing in that the labella are not distinctly fleshy and the antennæ lack the terminal lamella. From

the characters accorded this latter family (l. c. page 33) the genus Rhaphiomidas further differs in that the third antennal joint is no-composed of several segments, and the ocelli are sometimes prest ent. Still this genus has evidently more affinity with the Midasidæ than with any other family.

The only described species, Raphiomidas episcopus, Osten Sacken, occurs sparingly in Los Angeles county in midsummer, hovering over flowers like a humming-bird. Only the female was known to Osten Sacken; the male agrees in all respects with his description of the female (Western Diptera, page 282) except that the last three abdominal segments are destitute of black pile; in both sexes each abdominal segment is bordered posteriorly with yellowish. In perfect specimens the proboscis is not cleft, as stated in the generic diagnosis (l. c. page 282), and the marginal cross-vein between the end of the anal cell and the tip of the wing is present in all of my examples.

While on a collecting trip in the northern part of this (Los Angeles) county in July last, I captured a singe male specimen of a species closely related to the above, but clearly distinct. As it will be easiest recognized by showing in what respects it differs from episcopus, I give the following comparison between these two species:

Rhaphiomidas Acton N. Sp.	Rhaphiomidas Episcopus, O. S.
Lower edge of third antennal joint much less convex than the upper edge.	Lower edge of third antennal joint as convex as the upper edge.
Apex of third antennal joint destitute of a tubercle.	Apex of third antennal joint provided with a distinct tubercle.
No ocelli present, their places occupied by sunken, not shining spots.	Three convex, shining ocelli present.
Bristles of posterior angles of thorax and of scutellum yellow.	Bristles of posterior angles of thorax and of scutellum black.
Abdomen shorter than the wings.	Abdomen half the length of the hypopygium longer than wings.
Abdomen orange-yellow, base of first two segments and a medio-dorsal spot at the base of the other segments black.	Abdomen black, posterior margin of each segment yellowish.
Segments 5, 6 and 7 together not longer than the third.	Segments 5, 6 and 7 together much longer than the third.
Aypopygium two-fifths as long as the abdomen.	Hypopygium one-fourth as long as the abdomen.

Macrochaeta of legs wholly yellow.	Macrochaeta of legs largely black.
Eyes in death deep green.	Eyes in death dark brown, with a purplish tinge.
Length, excluding the proboscis, 22 mm.	Length, excluding the proboscis, 27 mm.
Expanse, 40 mm.	Expanse, 46 mm.

D. W. Coquillett.

ICE CAVES.

(Written for the Oregon *Naturalist.*)

Caverns in recent lava flows are often observed by travelers. In the neighborhood of Mt. Adams, in Washington, there are some singular caves in basalt which were lately described to the writer by a friend who has visited them and who offers the following explanation of their formation. One of these possessed the unusual features of a fine supply of the purest ice, hanging in great pillars from the roof of the cave, and swelling out in great masses from the sides. These caves are quite numerous in the region drained by the upper waters of the White Salmon river. Years ago sufficient ice was obtained from one of these to supply the city of Portland, Oregon, the ice being packed on mules to the Columbia river, and thence by steamer.

A curious fact was observed, that the ice was formed in the spring and not in the winter season. These caverns are long passages through which lava once flowed in diminished volume after an eruption. In some of these passages the opening through which the lava entered the chamber would become choked up, or the flow otherwise interrupted or diverted into another channel, and the liquid portion remaining would then flow out, leaving an empty chamber. Some of these passages extended from the crater above to the plains below, and such are the ice caves according to the following evidence

First, the unquestionably volcanic character of the cave examined, with its ropy masses of hardened lava, all trailing in the direction of the lava flow.

Second, a cold, freezing wind escaping from the mouth of the cave, cold enough at night in August to freeze.

Third, the observed fact that the ice cut away was replaced in spring and early summer, through April, May and June

The lower opening being in a warmer atmosphere than the upper opening, causes a downward draft through the passage of cold air, which, it is obvious, freezes the water trickling from the sides and roof of the passage as it passes.

THE FOREST TREES OF OREGON.—I.

(From *Resources of Oregon*)

There are two directions in which economical botany may find with the public special interest: One, the need of timber for commerce and in manufacture; the other, the home demand for shade trees and landscape gardening. For both of these lines of demand, that Oregon is well endowed may be seen in even a brief enumeration of the native trees suitable for these objects.

Beginning with the demands of our market, we place first on our list of timber the pines. The principal of these is the Sugar Pine (Pinus lambertiana.) It is at home along the northern slopes of the Siskiyous, is fairly abundant along the line of the Oregon & California railroad near Grant's Pass. It is also very fine and very abundant on the foothills of the Cascades that overlook Klamath Marsh. The timber is not inferior to that of the white pine of the eastern slope of the continent. The tree is large, often growing to the height of 150 to 175 feet. It bears a large cone, often 15 to 17 inches in length, suspended from the extremities of the limbs and therefore scattering. The timber of this sugar pine is highly prized for finishing, scarcely distinguishable from the best eastern white pine.

Another pine, the Pinus ponderosa (Oregon yellow pine), flourishes in many regions, a good marketable timber in and out of Oregon. It is abundant in central Oregon from the Dalles along the eastern slopes and foothills of the Cascade mountains and southward into Lake county. It is met with seldom in the Willamette valley and is there of inferior quality for timber Farther south one meets it more frequently. It is quite abundant on the eastern slopes of the Cascades throughout Oregon and Washington, and in many places is so fine a timber that its boards are often equal to the best of any market. The supply of this timber in Eastern Oregon is very great.

The black pine (Pinus contorta) is abundant along the coast, along the eastern slopes of the Cascades and on the more elevated of the plains beyond. It is a small tree, used for fuel, but is of very little value for timber or for dressed lumber.

The tuberculated pine (Pinus tuberculata) is only found on the mountains and is a small tree of but little economic value. It is remarkable for its habit of retaining all of its old cones attached to the body of the tree. Small groves of this tree may be seen on the upper slopes of the Siskiyous and many places on the Gascades. It rarely reaches the height of 60 feet; its cones, six inches long, never open of their own accord to show their seeds as do other pine cones.

Pinus Muricata and Pinus Sabiniana are rarely found in Oregon.

A good deal of confusion of names has fallen on this group of trees, not only in the popular names they have received but

in the scientific as well. The American R. R. surveys in their reports of our forestry named the trees of this group having pendant cones, *Abies*, and those bearing upright cones, *Picea*. The popular names are spruce and fir. The popular maintenance of this distinction became easy, and inasmuch as a popular description of their place in economic botany is what is here attempted, we will retain this distinction of the R. R. surveys and call those bearing pendant cones, spruce; all bearing upright cones fir;—the former *Abies*, the latter *Picea*.

Abies Douglasii—Pseudotsuga Douglasii. Popularly and especially in the lumber market this ought to be called Douglas' spruce. In Oregon and Washington we have it in two varieties—'red fir' and 'yellow fir.' The yellow is a fine grained wood, and its boards are often as smooth as pine, while the red variety is more stiff and splintery. But red or yellow, this fir is one of the grandest trees of the continent and one of the most important to commerce. For spars, for bridges or for framing for buildings, its strength and great length make it the first in the market. Its great abundance and rapid growth ensure a long continued supply. Douglas' spruce will raise more commercial timber to the acre than any other tree on the continent.

Abies Menziesi—Menzies' or Tideland Spruce. This fine forest tree is seen in its best condition along the coast, where it often reaches the height of 100 feet or more. Its lumber is soft and heavy and coarse, but is so tasteless and odorless that it is found to be the best material for barrels and boxes for packing, and for these purposes is now finding a wide market. It is a handsome ornamental tree and easily transplanted.

Abies Canadensis—Tsuga Canadense—Hemlock Spruce. In any country less favored in commercial timber the hemlock of our mountains or that of our coast would rank well. It reaches its finest growth in Tillamook county. The young trees are graceful ornaments in landscape gardening and are easily transplanted.

Abies Williamsonii—Williamson's Spruce. A handsome tree of elevated mountain habits and so out of reach of present commercial demands. All these spruces have pendant cones

Thomas Condon.

THE DAY LILY OF THE DESERT.

(From *Garden and Forest*, III, 128.)

One of the most beautiful and characteristic plants of the desert region of California is the Day Lily (Hesperocallis undulata). Its flower stems rise from one to two feet above the sand, and bear from a few to thirty or more fragrant flowers, in color, I should judge, of a pearly or greenish white, with greenish stripes. I have seen only one in blossom, and that was too far gone to show the genuine tint.

This interesting species is one of the most promising novelties

of the present season, not only for its promise of furnishing us with another lovely garden flower, but also for its probable economic value in the arid regions of the west. It produces a large edible bulb, varying from one to four inches in diameter, nearly round, with firm flesh. The bulb has a pleasant taste, eaten either raw or cooked like onions. Our party of seven have had them cooked at nearly every meal since we first tested their qualities, and in the lack of other vegetables find them acceptable.

The bulb is found from six to eighteen inches below the surface of the sand or fine gravelly soil, in which the plant thrives best, and is usually found resting on moist gravel or a clay subsoil.

It is not rare on the Colorado and Mohave deserts, and usually blossoms on the Mohave in the month of May. Near the boundary line it bloomed in 1889 as early as February, and was in seed in April. This year (1890) only a few plants are found showing as yet any signs of a flower stem, but a few weeks of warm weather will doubless bring them forward.

The Indians are said to obtain both food and drink from this plant when crossing the plains. For eighty or a hundred miles along our southern border one may travel at certain seasons without finding water. The traveler, is safe, however, if he knows how to search successfully for this important vegetable, and once found he need not fear either hunger or thirst.

Should it prove susceptible of easy cultivation in the arid regions of the west, it will prove a valuable addition to our list of vegetables. It will certainly prove a welcome addition to the garden, if not an acquisition to the farm. *C. R. Orcutt.*

CALIFORNIAN LILIES.

(From the *California Florist and Gardner*, II, 66)

Eight distinct species of lilies are natives of California, besides varieties. They are Lilium Columbianum, L. Humboldtii, L. pardalinum, L. parvum, L. Parryi, L. maritimum, L. Washingtonianum, and L. rubescens. No other country in the world is so rich in these floral beauties, except Japan. Their range is from the sea-coast of Mendocino county to the edge of perpetual snow in the Sierras. Old Shasta's sides are the home of several species. I have found L. Humboldtii in the rich alluvium of the upper Sacramento valley, and L. Parryi, one of the most beautiful, is a native of the high mountains of San Bernardino and San Diego counties.

As a collector I have taken many thousands of the bulbs of six of these species from their native homes, and I have grown all but L. Parryi. In the soil in which they flourish and in the manner of root growth they vary greatly. Briefly, it may be said that L. maritimum, L. pardalinum, L. parvum and L. Par-

ryi are bog lilies with running or rhizomatous roots; that L. Humboldtii and L. Columbianum are native to rich clayey soils. and that L. Washingtonianum and L. rubescens rot easily in cold or wet soils, that they are true bulbs, and that they thrive in well drained soil of leaf mold mixed with disintegrated sandstone or gravel.

Lilium pardalinum, often called tiger lily by the country people, is the most easily grown of all. It has an erect stem with many long, lanceolate, pale green leaves, in whorls. The flower is large and showy; the petals, bright crimson at tips, orange dotted or blotched with black at center, and recurved to the stem. There are few more brilliant sights than a well bloomed plant of this lily. The root is hardy and little subject to rot. It prefers a rich sandy mold, but adapts itself to varying conditions. In a shaded pond I saw fine specimens on the mold of old logs, the fibrous roots running down into the water. They were six to seven feet high with the finest of blossoms. In the rich mold below mountain springs, or in the alluvium on the banks of small streams, they grow to perfection. I have seen them doing well in a sandy soil which in midsummer was as dry as a brick. In cultivation I have seen the best results from planting in a sunken barrel filled with sand well mixed with leaf mold or bog soil. It should be kept moist, not wet, and is better in the shade. The bulbs should be planted about four inches deep. Under such conditions I have seen strong plants grown five to seven feet high, with an abundance of bloom. Once planted, the roots should be undisturbed. They spread rapidly in geometrical ratio. The bulb of this year throws out two glowing roots this fall, each of these throws out two next fall, etc. When the clump gets too thick, the soil can be taken off it and the smaller roots removed without disturbing the ones to be left. I have seen clumps of four or five hundred in the wild state, the product of one bulb. Both leaf and flower of L. pardalinum have wide variations, and three or four varieties are named, but it is hard to lay down a dividing line, as the varieties run into each other.

L. Californicum is a variety with narrow leaves, and a brilliant flower; the tips of the petals a rich crimson and the dots small. Variety puberulum has paler flowers and broad leaves. The English florists have found a clear yellow form which they call L. Wareii, but I have never been able to secure a specimen

Lilium maritimum is one of the rarest in cultivation; this is for a double reason. The bulb is difficult to handle, being particularly liable to decay in handling. Then, too, its range of growth is limited. It grows in and around peat bogs, on the coast of Mendocino county—rarely farther north or south. It is seldom seen farther than two miles from the ocean. The surface of these bogs is dotted with clumps of ferns and azaleas. Around the bogs is a waste of gray, ashy looking sand, densely covered with heath, cypress and pines. On the edges of the bogs the lily is a

dwarf, often blooming at three or four inches. In the bogs it roots itself in the tufts and grows a lovely plant, five feet high with ten or fifteen fine blossoms. The leaves are dark glossy green, and the blossom crimson. At Ukiah, Calif., I have grown it easily in a reclaimed swamp in the shade. The soil is of vegetable matter and sand, and always moist. In the same situation L. parvum, L. pardalinum, L. Columbianum and L. Humboldtii, as well as the Japanese L. auratum, make a vigorous growth, and what is not usual for the latter, strong bulbs. At Ukiah there is little fog, and there are days in the summer when the thermometer will register above 100° F.

Lilium Parryi is similar to L. pardalinum in leaf and bulb, but the bloom is lemon yellow and very fragrant. Of its cultivation I cannot speak, but believe it easy of culture under the same conditions as L. pardalinum.

Lilium Columbianum is L. Humboldtii in miniature. The bulb is small and compact. The stalk is two feet or so high, and the flowers true lily-shaped, the petals recurved. In color it is a light orange-yellow, dotted with dark spots. This lily has for its native home the plains of the Columbia river. It is easy to grow in cultivation, only needing a well-drained loam and ordinary moisture.

The bulb of Lilium Humboldtii is often a pound in weight, and is very compact. The stalk is strong and stiff. The leaves are arranged in circles or whorls and are many in number. Eight or ten blossoms to the stalk are not unusual. These are of a reddish orange with round dark spots. Ordinarily this lily will grow to a height of three or four feet. The finest specimen it has been my fortune to meet grew in the debris by the side of a Sierra stream. It was over eight feet high and had an enormous bulb. This lily increases by seeds only, in its native state, and where the natural conditions happen to be exactly suitable is found in great numbers. I took over eight thousand good bulbs from one place some years ago. It was on a hillside in volcanic soil, where years ago the gold miners had cut the timber. I had spent the previous week in hard traveling to find five hundred.

I once found fine bulbs in an oak grove near Chico. They were doing splendidly in the black adobe of that section. In cultivation I find it will thrive in clay loam or sandy soil. In hot sections it does better planted in the shade. It needs to be planted six inches to a foot deep, and will give the grower value received.

High up in the Sierras above the pine timber on those grand slopes crowned with a mixed growth of wild cherry, manzanita and ceanothus, Lilium Washingtonianum finds its most congenial home. The soil is loose decomposed granite and mold. The snow lies very deep in the winter and is late in melting. It keeps the bulbs moist in their early growth, and when it is gone they make a very rapid growth, often blooming six or eight weeks

after the snow has melted. The stalk grows up from three to five feet, densely leaved in whorls, and with from a few to twenty-five flowers, pure white and with a most delicious fragrance. I have seen places fairly white with this lily and the air heavy with perfume. The bulb is large. I have bloomed it at Ukiah, but find it rather harder to bloom than any of the other native lilies. I believe, however, that it is quite successfully grown in England. It should be given a loose soil and abundant moisture during the growing season.

Lilium rubescens is like L. Washingtonianum in every particular excepting that the flower blooms out pure white, blotched with purple, and gradually gets darker till it is of rich ruby color, hence its name. Similar as the two lilies are in habit, their native homes are very different. L. Washingtonianum is a lily of the high Sierras, L. rubescens of the Coast Range. It is found in the redwoods close to the coast, on shaded hillsides in sandstone gravel, and on high ridges in the chapparal. The finest I have ever seen in numbers were on a chapparal ridge in a soil of gravel mixed with mold, of the ordinary chapparal soil. The bulb grows deep and has abundant moisture in winter and spring, but in the summer such places get very dry. A friend grows and blooms them readily in half barrels filled with sand and mold and placed in the shade. The first essentials with them are perfect drainage and a loose, porous soil. Of all our California lilies it is the most beautiful, and of all lilies the most deliciously fragrant. A flower will perfume the leaves of a book for months, and a well grown plant is the admiration of all beholders.

Carl Purdy.

CALIFORNIA FLOWERS IN ENGLAND.

(Extracts from correspondence.)

Phacelia Parryi, with dark violet purple flowers, is now well-known. It has been in cultivation here several years and seed is cheap. It is lower in price and much less in request than P. campanularia, which I introduced through Messrs. Parish. The latter is more delicate. If the season happens to be wet, the plants die off.

If the Californian seeds like the European climate they soon get cheapened, through the competition which prevails here. But they are not all at home, in England at least. I failed to do any good with Gilia aurea, which Messrs. Parish once sent me. But G. dianthoides, G. dichotoma, and others do very well.

Mimulus glutinosus has long been grown here under its early name of Diplacus (Nuttall's), also a form with red flowers (puniceus); they outlive mild winters, but perish in severe ones. I may make the same remark of Dicentra chrysantha. It is only seen to advantage in a climate like yours—which would suit me well, but I am too old to transplant.

I have also grown Mimulus brevipes. Monardella lanceolata is grown on the continent of Europe by some of the large seed growers.

Dodecatheon Clevelandi has grown well, and much more quickly than the eastern forms usually do. The eastern forms do not usually grow until after a considerable interval, but the seed of D. Clevelandi germinated in a few days. The plants do not get beyond the seed leaf the first season in any of the varieties.

Wm. Thompson.

A fine red lynx (Lynx rufus) was recently caught in a steel trap at Coburg, Oregon. It was eighteen inches in height at the shoulders, two feet and three inches long from the nose to the root of the tail, and the tail was seven inches long.

CALIFORNIA TREES AND FLOWERS.

'In all parts of the civilized world, the refinement, innocence and happiness of the people may be measured by the flowers they cultivate,' says an eloquent author. I would add, that the wild flowers of a country must furnish a truthful index to the adaptability of that land as a home for the human race, for, where they abound, there too man may seek for fruitful toil, pleasure and rest.

Where may lovelier flowers, more brilliant tints, or more delicate coloring be found in greater profusion than on the mountains and mesas, in canyon and meadow, throughout the length and breadth of California! And where may a more perfect abiding place be found for man!

It is to the beautiful annuals which in springtime cover the hills and mesas, that California owes her just fame as a land of flowers. Perhaps in no country in the world do the early spring flowers so change the face of the earth from a desolate waste to a beautiful garden, as on the Pacific coast—hills, mesas, mountains and valleys, and the arid plains of the desert, alike, quickly responding to the vivifying rain. California has probably already furnished to the horticulturist a greater variety of beautiful flowers and stately trees than any other State in the Union. Yet many others are awaiting the appreciation of man, or wasting their sweetness on the desert air.

In this essay it is intended to give brief descriptions of those already introduced into cultivation, with reference to the varieties produced by cultivation, together with notes on many that are well worthy of introduction. A few trees and plants, not natives of California, but now closely identified with our flora, either by cultivation or naturalization, are also noticed.

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*) An asterisk indicates that the colors have been carefully determined by comparison with Ridgway's 'Nomenclature of Colors.'

ABIES.

The firs are magnificent trees, of pyramidal form and rapid growth.

A. BRACTEATA *Nuttall.* A tall, slender, strictly pyramidal tree, 100 to 150 feet high and one to two feet in diameter. Unknown in cultivation.

A. CONCOLOR *Lindl.* The Silver Fir is a very ornamental tree, growing from 80 to 150 feet high, attaining a diameter of three or four feet. Foliage of a pale silvery green, whence its name.

A. GRANDIS *Lindl.* The White Fir attains a height of 200 to 300 feet, with a diameter of three or four feet, and is distinguished by the glossy, green upper surface of the leaves.

A. MAGNIFICA *Murray.* The Red Fir exceeds 200 feet in height, and reaches a diameter of ten feet. Foliage rigid, bark thick of a reddish brown color, from which it receives its vernacular name in common with the following species.

A. NOBILIS *Lindl.* Red Fir, scarcely distinguishable from the preceding species.

ABRONIA.

The Abronias are charming trailing plants, sometimes called wild verbenas from the resemblance between the verbena and their showy umbels of brilliant flowers, which are of great fragrance, and produced abundantly.

A. LATIFOLIA *Eschscholtz.* Waxy lemon yellow flowers, possessing the odor of orange blossoms. A hardy annual in cultivation, perennial in its wild state, like the following species.

A. UMBELLATA *Lam.* The finest species, producing a profusion of large umbels of bright rose-purple flowers.*

A. VILLOSA *Watson.* A slightly smaller plant, but producing equally large umbels of bright rose-purple flowers.*

ABUTILON.

The Abutilons are highly prized green-house plants, of elegant habit. California offers one of the most beautiful species, as yet unknown in cultivation.

A. AURANTIACUM *Watson.* A low compact shrub, a foot high, with large, velvety, light green leaves and showy 'golden flowers.' Found near the southern border of the state, in Lower California.

ACACIA.

Several Australian species of Acacia have been extensively grown in California, either for their beauty or utility. Only one species is a native, and that, A. Greggii, or Cat's Claw, cannot be recommended for trial. These are mostly small trees or shrubs of rapid growth.

A. DECURRENS *Wildenow.* The Black Wattle is one of the most prized, and is largely planted for forest culture, because of its rapid growth, the value of its timber, its beauty and the bark which is rich in tannin.

A. DEALBATA *Link.* Silver Wattle. Very ornamental.

A. FARNESIANA *Wildenow.* Oppopanax is prized for its delicate, delicious and wonderfully persistent perfume, for which it is often grown. It is valued for other reasons, and is of especial historic interest, since it is credited with having furnished the crown of thorns with which the Savior was crowned.

A. MELONOXYLON. Make one of the finest of sidewalk trees, sturdy and symmetrical in form.

A. PYCNANTHA *Bentham.* The Golden Wattle is second only to A. decurrens in importance for its yield of tanner's bark.

ACANTHOMINTHA.

A. ILICIFOLIA *Gray.* A showy mint-like annual, abundant on the mesas near San Diego, and well worth attention. A span high, with white flowers marked with purple.

ACTINOLEPIS.

A. CORONARIA *Gray.* A low annual bearing numerous yellow flowers.

ADENOSTOMA.

Evergreen shrubs, belonging to the rose family, two to ten feet high, which produce an effect upon the landscape similar to that of the heaths of the Old World. By studying the natural blending and contrasts of our wild shrubs and trees in their native haunts, the landscape artist could gather some useful hints, and the species of this genus would prove useful in his work.

A. FASCICULATUM *Hooker & Arn.* This *Chamisal* often covers large areas of country so densely as to be almost inpenetrable. The foliage is very dark green.

A. SPARSIFOLIUM *Torrey.* Foliage light pea green; flowers in large terminal panicles, white and fragrant.

AGAVE.

The so-called Century Plants are among the best known of the succulent ornamental plants that are in cultivation. California furnishes several beautiful species.

A. DESERTI *Engelmann.* A glaucous-leaved species, peculiar to the Colorado Desert. Flower stalk seven to ten feet high, surmounted with a large panicle of flowers of a chrome yellow.* These plants, also known as Mescal or Maguey, from which the alcoholic liquor *mescal* is made, are useful for their strong fibre.

A. PRINGLEI *Engelmann.* A mountain form of A. deserti, rare and beautiful.

A. SHAWII *Engelmann.* One of the most striking and ornamental species of the genus, prized for its compact dark green leaves.

A. PARRYI *Engelmann.* Native of Arizona, as also the following species.

A. PALMERI *Engelmann.*

A. SCHOTTI *Engelmann.*

ALFILARIA.

Erodium cicutarium and E. moschatum are about equally well known by the name Alfilaria, and are valuable forage plants. The foliage is finely divided like a fern leaf, and the rose-purple* flowers are half an inch across. The two generally grow together so that the seed is generally mixed. A considerable demand has sprung up, and Alfilaria is being extensively sown in arid localities for forage

ALLIUM

A large genus, including the onion of the vegetable garden. Some of the wild forms native to California are very pretty, but mostly with small flowers and worthless for cutting. Interesting garden plants.

A. ACUMINATUM *Hook.* Usually a low plant, six inches high, with a good sized umbel of pretty rose-purple flowers.

A. CUSICKI *Watson.* A dwarf vernal form, with white flowers commonly tinged with purple.

A FALCIFOLIUM *Hook & Arn.* Flowers rose colored.

A FIMBRIATUM *Watson.* A pretty plant, abundant in the mountains of Southern and Lower California, bordering the Colorado Desert. It sends up a stout scape a few inches high,—rarely more than three inches—bearing twenty-five or thirty flowers of a deep rose purple*, sometimes of a light shade. Its Mexican name is *Lavina.*

A. HAEMATOCHITON *Watson.* A small species, six or eight inches high, bearing an umbel of six to twelve small white flowers with greenish stripes and a reddish brown centre. It is a tender plant.

A. SERRATUM *Watson.* A showy little plant, about ten inches high, with a naked stem and a many-flowered umbel of dark, bright rose-purple* flowers half an inch wide.

A. UNIFOLIUM *Kell.* A unique little species, with white to rose-purple flowers. Three inches to a foot high.

ANTIRRHINUM.

A. ORCUTTIANUM *Gray.* A tall, slender annual, with long spikes of either white or violet flowers, discovered in 1882. Perhaps the prettiest of the wild Snapdragons of California

AQUILEGIA.

Graceful perennial plants, hardy and very ornamental. Columbine.

A. CAERULEA *James.* Two feet high, with large showy blue or white flowers.

A. CAERULEA FLORE PLENO. Double flowers.

A. CHRYSANTHA. A fine species, with long yellow spurred flowers. The most graceful and beautiful for cultivation.

A. TRUNCATA *F. & M.* The form in cultivation is a hybrid, with large yellow flowers, the sepals and spurs of a deep orange red.

ARBUTUS.

A. MENZIESII *Pursh.* The Madroña is a handsome tree, some times a hundred feet high, with reddish bark and lovely white flowers.

ARCTOSTAPHYLOS.

The Manzanitas are handsome shrubs, with reddish exfoliating bark, evergreen—usually light colored—foliage, and lovely clusters of bell-shaped snow-white or rosy blossoms, which often appear even before the snow is off the ground. If these could be coaxed into the same graceful habits of growing under man's care as obtain with them in their wild state, they would be among the most popular of the ornamental shrubs of the Pacific Coast.

A. BICOLOR *Gray.* A coast species, a few feet high.

A. GLAUCA *Lindl.* A fine but variable mountain form.

A. MANZANITA *Parry.* The *Manzanita*, one of the largest and most beautiful species, peculiar to the Pacific Coast.

A. OPPOSITIFOLIA *Parry.* A willow-leaved species from Lower California.

A. PRINGLEI *Parry.* A peculiar mountain form. Very beautiful.

A. UVA-URSI *Spreng.* Bear berry.

ARGEMONE.

A HISPIDA *Gray.* Thistle Poppy A stout prickly annual three to six feet high, producing numerous large, showy, white flowers, four to five inches in diameter, almost rivaling the Romneya in beauty, and conspicous by night or day. Foliage bright green. A very decorative plant, recommended for large grounds.

A. MEXICANA *L.* Flowers yellow. Otherwise similar.

ASTER.

A beautiful perennial species, a foot high, with large conspicuous flowers, two inches across, and of a delicate mauve or lavender, has lately been discovered on the Colorado Desert. It is likely to prove an acquisition to horticulture.

BAERIA.

The Baerias (named in honor of Prof. Baer of the University of Dorpat) are very pretty annuals, of easy culture in ordinary soil.

B. GRACILIS *Gray.* A span or more high, producing many small heads of small, yellow flowers.

BLOOMERIA.

Bloomeria is a genus of beautiful liliaceous plants related to Brodiæa, and peculiar to California.

B. AUREA *Kellogg.* The broad glossy leaf three or four feet long. The large bulb, an inch in diameter, grows six inches deep in the soil, producing a tall scape bearing a large umbel of showy orange colored flowers.

B. CLEVELANDI *Watson.* A smaller plant, seldom over six inches high, with umbels of bright yellow flowers. Named in honor of Mr. D. Cleveland, of San Diego.

BREVOORTIA.

B COCCINEA *Watson.* Vegetable Firecracker. A showy plant, producing a tall grass-like stem two to three feet high, bearing a pendant umbel of richly colored flowers, blood crimson tipped with white, one to three inches in length.

BRODIÆA.

The Brodiæas have narrow grass-like leaves and slender stems bearing an umbel of bright colored flowers. All are easily grown and forced, doing well in clayey, rather moist soils, but should be dried off at time of blooming.

I.—BRODIÆA.

B. CAPITATA *Benth.* Flower stalks slender, a foot high, bearing a dense head of purple flowers. Sometimes called Wild Hyacinth.

B. CAPITATA ALBA. A pure white form, prized in cultivation.

B CONGESTA *Smith.* Two to four feet high, with deeper, brilliant purple flowers

B. MULTIFLORA *Benth.* Low, six inches high, bulb producing several slender stalks, bearing umbels of purple flowers.

II.—HOOKERA.

The following species are considered by some botanists to form a distinct genus named Hookera.

H. GRANDIFLORA *Smith.* Produces a few very large glossy purple flowers.

H. MINOR *Watson.* Bears a loose, spreading umbel of large royal purple flowers from a short stem. A general favorite.

H. ORCUTTII *Greene.* A foot or two high, with large lavender to royal purple flowers, discovered in 1882. One of the choicest species.

H. STELLARIS *Greene.* Flowers rich purple with white center, in a star-like cluster.

H. TERRESTRIS *Kellogg.* Flowers red-purple.

III.—TRITELEIA

The following species are included by Prof. Greene in the genus Triteleia, but they are best known in cultivation under the old classification.

T. HYACINTHINA *Greene.* Flowers milky white, banded with green.

T. IXIOIDES *Watson.* Low, bearing numerous light yellow flowers banded with green. Very pretty

T. LAXA *Benth.* Tall, with umbel of 15 to 30 large blue flowers.

T. PEDUNCULARIS *Lindl.* Flowers glossy purple on long stems. Rare.

CALANDRINIA.

C. MENZIESII *Hook.* A low, succulent annual, very variable, with pretty red or purple flowers.

C. MENZIESII ALBA. Flowers pure white.

C. ROSEA. A form in cultivation, presumed to have originated in California.

CALOCHORTUS.

I.—MARIPOSA TULIPS.

These Tulips, excepting the true lilies, are the finest of the beautiful liliaceous plants of the Pacific Coast. The Mariposa or Butterfly Tulips are highly recommended for winter flowering and are gaining great popularity in the East and in Europe. Each species varies greatly in color, and the erect, cup-like flowers are of large size, and of the richest and most brilliant coloring. The stout, slender flower stalks vary from eight inches to two or three feet in height, each bearing from a few to fifteen or twenty flowers.

C. AUREUS *Watson.* Three to six inches high, flowers clear yellow, or with a narrow crescent of purple above the well-defined roundish gland, which is densely covered with reflexed hairs.

C. GUNNISONI *Watson.* Petals light lilac, yellowish green below the middle, banded and lined with purple.

C KENNEDYI *Porter.* A rare species only known in the Mojave Desert where it is very difficult of access. The large flowers two inches across, of a deep orange vermilion,* produced on short stout scapes. *A magnificent species*

CALOCHORTUS.

EDITORIAL.

There is a wide field on the Pacific Coast for the SCIENTIST. The botanist, the zoologist and the geologist may each keep his hands well employed, discovering and recording new facts, each in his special division. Inseparably connected with the sciences, pure and applied, are all the industries of the human race. The stockman and farmer may glean many items of interest and practical value to him from the note-book of the zoologist. The miner and the manufacturer will be well repaid in a fund of useful information if he but consults the field notes and general conclusions arrived at by the geologist; in the laboratory of the chemist or mineralogist other useful information will be found.

Still more intimately connected with the science of botany are the many industries embraced in the general terms, agriculture and horticulture. And those dependent upon these, the most important of the industries of the world, must also give attention to many related branches of knowledge if they would reap the greatest returns.

Recent investigations have led to a better realization of the intimate relations between the sciences, and pointed out how, by studying one from a standpoint of investigation, we may better apply our knowlege of another science in industrial enterprises.

We refer especially to the biological survey of the San Francisco mountain region, in Arizona, by Dr. C. Hart Merriam, chief of the division of mammalogy of the United States Department of Agriculture. In North American Fauna, No. 3, Dr. Merriam publishes the results of this exploration and presents important facts bearing on the geograpical distribution of plants and animals. Instead of the usual outline of faunal districts he conclusively shows that distribution of species is more intimately connected with altitude than upon the geographical location. He points out how the horticulturist may materially profit by studying the natural vegetation around him; how the stockman may know what breeds of animals are best adapted to a given region, by noting the existing conditions of soil and climate, the wild animals which abound, and in instituting comparison between different sections of country.

This magazine will devote a considerable number of its pages during the coming year toward arriving at a better acquaintance with the fauna and flora and other natural resources of the Pacific Coast. It will be our aim each month to present something of interest and practical value not only to the naturalist—amateur or professional—to the botanist and horticulturist, but to all who are interested in attaining to a truly liberal education.

There is a recognized field for a journal of the character we have roughly outlined. True literature—instructive and entertaining—on any branch of science is comparatively rare and difficult of production. We hope through industry and perseverance to attain the end in view with the assistance of those whom we are well pleased to call friends.

NOTES AND NEWS.

Aspidiotus rapax, a scale-like insect, has recently been reported for the first time as occurring on the fruits of the orange and the lemon in Southern California.

A fine specimen of a Cycad was discovered in some gravel from the bed of the North Umpqua river, near Roseburg, Oregon, by Mr. Russell, of Yoncalla, Oregon.

The Oregon Alpine Club has for its objects the acquirement of information about the rivers and mountains of the northwest coast, and relating to the geological formation, mineral resources, and the fauna and flora of that region, together with the formation of a museum. Its membership already includes hundreds of the best learned men and women in the State, and other localities may profit by its example. We hope to publish the proceedings of this and other societies as they may be furnished.

The hop crop of Oregon and Washington for 1890 was nearly 60,000 bales, valued at $1,800,000, while the loss sustained by this crop from the hop louse (Phorodon humuli) is estimated as fully one-fifth of that amount. The ability to destroy $360,000 worth of crops in a single season renders this eastern pest, apparently so insignificant in itself, worthy of careful study and investigation as to methods for its destruction.

Coloradia pandora, the large moth which was attracted the past season by the electric lights in southern Oregon in such vast numbers, was originally described from Colorado (whence the name) by Chas. A. Blake, one of the older members of the American entomological society of Philadelphia. The larva (presumed to be of this species) has lately been described as follows, from a specimen found feeding on sage brush in Montana by Mr. Wiley: Mature larva all black, with shiny spines which sting the hand like Hyperchiria io. Pupa somewhat resembles that of H. io, but smaller, and less robust, nearly black.

LIBRARY CATALOGUE.

(Scientific books and periodicals may be ordered through our Book and Subscription Department.)

Recent accessions to the library of the West American Museum of Nature and Art will be catalogued monthly.

4051. Descriptions of two new species of mammals from Mt. Kilima-Njaro, East Africa. By Frederick W. True.

4052. Osteological characteristics of the family Muraenesocidae. By Theodore Gill.

4053. On the family Ranicipitidae. By Theodore Gill.

4054. The osteological characteristics of the family Simenchelydae. By Theodore Gill.

4055. The characteristics of the Dactylopteriodea. By Theodore Gill.

4056. Notes on the birds observed during the cruise of the U.

S. Fish Commissioner schooner Grampus in the summer of 1887. By William Palmer.

4057. Description of new forms of upper Cambrian fossils. By Charles D. Walcott.

(Nos. 4036-4057 inclusive are extracts from the Proc. U. S. Nat. Mus., XIII (1890) and received from the Smithsonian Institution.)

4058. American Journal of Numismatics and bulletin of American Numismatic and Archaeological societies, XXIV, No. 4, April, 1890.

4059. Same, XXV., No. 1, July, 1890. Contributions of alchemy to numismatics. By Henry Carrington Bolton, Ph. D., forms the leading article in this and the preceding number. From the author.

4060. Bibliotheca Polytechnica. Directory of technical literature. A classified catalogue of all books, annuals, and journals published in America, England, France and Germany including their relations to legislation, hygiene and daily life. By Fritz von Szczepanski. First annual issue, 1889. Price 75 cents. The author, St. Petersburg and Leipzig. The International News Co., N. Y.

The catch-words are given in English, French and German; a compact, handy little book, which will be very useful to those having to consult technical literature. 8vo. 80 pp.

4061. Annual report of the State Board of Horticulture of the State of California, for 1890. 8vo. 522 pp.

A most useful volume with invaluable information relating to the olive, orange, lemon, fig and other fruits, handsomely embellished with colored plates and numerous engravings. The Mission olive is thus illustrated, and numerous injurious and beneficial insects are figured.

4062. Le Nov Latin, international scientific lingua supernatural bases. By Dr. Daniel Rosa, Royal Zoologic Museum, Torino, Italy, 1890. From the author.

GOOD LITERATURE.

The publishers of *The Youth's Companion* have sent us a handsome souvenir with the announcements of authors and articles for the next year's volume. It has seven illuminated pages, one for each day in the week, very quaint in style, the whole forming a 'Book of Days,' and each page illustrating a line of the old rhyme:

'Monday for Health,
Tuesday for Wealth,
Wednesday the Best Day of all,
Thursday for Losses,
Friday for Crosses,
Saturday No Luck at all;
Sunday the Day that is Blest
With Heavenly Peace and Rest.'

This novel and unique Calendar is sent free to all new subscribers to *The Companion* who send $1.75 for a year's subscription and request it at the time they subscribe.

The most beautiful frontispiece ever produced in an American magazine, appears in the January number of the *Cosmopolitan.* It is a reproduction in colors of Francoise Flameng's famous picture "The Cake Seller," and can scarcely be distinguished from the imported photogravure which is exhibited in the dealers' windows, at the price of $7 a copy. It is one of the most charming of subjects, and is well worth framing and preservation. The *Cosmopolitan* has become noted of late for its frontispieces and this very much excels its previous efforts.

The first installment of the selections from Talleyrand's long-expected Memoirs is the most striking feature of the January *Century.* A sketch of Talleyrand by Minister Whitelaw Reid prefaces this installment. The opening pages tell of Talleyrand's neglected childhood, and his entry into Parisian society. They also give his views of La Fayette, and the effect of the American on the French Revolution; some account of the beginnings of the latter; a very contemptuous opinion of the Duke of Orleans; a sketch of the author's stay in England and the United States, and a highly interesting conversation between himself and Alexander Hamilton on Free Trade and Protection.

Outing for January is a superb Holiday number, seasonable in matter and elegant in illustration. 'The Mystery of a Christmas Hunt' is a story pervaded by such sportsmanlike spirit and domestic felicity as to lend a charm to the well-drawn pictures that follow in rapid succession from the first page to the last. No better Christmas story has appeared in any magazine for years. 'Lost in the Rockies,' a midwinter adventure, stirringly and powerfully told, follows, and 'Honeymooning Under Difficulties,' a true story of the snow-swept plains of Manitoba, completes a trilogy of fact and fiction hard to beat; and just now, when cross-country running is a pastime supported with all the enthusiasm of its devotees, 'The Last Paper Chase,' by Wm. Earle Baldwin, enriches the incidents of the field with the interest of a most excellent bit of social fiction.

In the January *St. Nicholas*—the second of the Holiday numbers of this magazine—Charles Dudley Warner calls up the thousands of its readers to hear 'A Talk About Reading,' which is delivered with all the earnestness of a true humorist when talking of graver matters. The Pratt Institute, Brooklyn's Great Industrial School,' is fully described by a well-informed writer, and explained by the artistic illustrations of Mr. Wiles, and the young people will marvel at this wonderful school wherein are taught all things teachable, from high art to dusting a room.

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