VOL. 1. JANUARY, 1888. NO. 1.

THE

ollectors' Illustrated Magazine.

A MONTHLY MAGAZINE

Devoted to the Interests of Collectors in all Branches.

CONTENTS

EDITED AND PUBLISHED BY

E. M. HAIGHT, - - - RIVERSIDE, CAL.

Price, 50 Cts. per Annum. Single Copies, 5 Cts.

Collectors' Illustrated Magazine

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THE ORIGIN OF SALT.

This world was once a haze of fluid light, as the poets and the men of science agree in informing us. As soon as it began to cool down a little, the heavier materials sank toward the center, while the lighter, now represented by the ocean and the atmosphere, floated in a gaseous condition on the outside. But the great envelope of vapor thus produced did not consist merely of the constituents of the air and water; many other gases and vapors mingled with them, as they still do to a far less extent in our existing atmosphere. By and by, as the cooling and condensing process continued, the water settled down from the condition of steam into one of a liquid at a dull red heat. As it condensed it carried down with it a great many other substances, held in solution, whose component elements had previously existed in the primitive gaseous atmosphere. Thus the early ocean which covered the whole earth was in all probability not only very salt, but also very thick with other mineral matters close up to the point of saturation. It was full of lime and raw flints and sulphates and many other miscellaneous bodies. Moreover, it was not only just as salt as at the present day, but even a great deal salter. For from that time to this evaporation has been constantly going on in certain shallow, isolated areas, laying down great beds of gypsum and then of salt which still remain in the solid condition, while the water has happened in a slightly different way with the lime and flint which have been separated from the water chiefly by living animals, and afterwards deposited on the bottom of the ocean in immense layers, as limestone, chalk, sandstone and clay. Thus it turns out that in the end all our sources of salt supply are alike ultimately derived from the briny ocean. Whether we dig it out as solid rock salt from the open quarries of the Punjab, or pumped up from brine wells sunk into the triassic rocks of Cheshire, or evaporate it direct in the salt pans of England and the shallow salines of the Mediterranean shore, it is still at bottom essentially sea salt. However distant the connection may seem, our salt is always in the last resort obtained from the material held in solution in some ancient or modern sea. Even the saline springs of Canada, and the northern states of America, where the wapita love to congregate, and the noble hunter lurks in the thicket to

murder them unperceived, derive their saltness, as an able Canadian geologist has shown, from the thinly scattered salts still retained among the sediment of that very archaic sea whose precipitates form the earliest known life-bearing rocks. To the Homeric Greek, as to Mr Dick Swiveller, the ocean was always the briny; to modern science, on the other hand (which neither of those worthies would probably have appreciated at its own valuation), the briny is always the oceanic. The fossil food which we find to-day on all our dinner tables, dates back its origin primarily to the first seas that ever covered the surface of our planet, and secondarily to the great rock deposits of the dried up triassic inland sea. And yet even our men of science habitually described that ancient mineral as common salt —*Cornhill Magazine.*

HOW THE PLATYPUS BREEDS.

This question is now satisfactorily settled. The platypus lays eggs, and Mr. Caldwell, Natural History Fellow of Caius College, Cambridge, has been credited with the honor of the discovery. Mr. Caldwell, though not responsible to any scientific body in this country, was nevertheless good enough to appear before the members of the Linnean Society of Sidney, and verify his discovery. He exhibited the eggshells, made a statement, and answered all questions put to him. The eggs were round rather than oval, the shells hard and of a calcareous composition. Mr. Caldwell dissected over 600 female specimens before getting one with an egg in it. The female in which the egg was found had layed an egg just shortly before she was caught, and the embryologist, who had suffered so many disappointments from a similar cause, feared that he was to be again doomed to disappointment; but such, however, was not the case, for on dissection another egg was found, and then, and not till then, was this vexed question decided. It is no exaggeration to say that this is one of the most notable scientific discoveries of the nineteenth century. Students to the philosophy of Darwin are quite alive to the importance of this discovery, and it has been hailed with delight by Professor Mosely and many other eminent scientists. The platypus (Ornithorhynchus) has bridged the hiatus that hitherto existed between birds and animals; in other words, the most important of Darwin's "missing links" has been discovered, and the chain of connection between reptiles and man is now very nearly complete. Much credit is due Professor Liversidge, of the Sydney University, for the promptitude with which he cabled the discovery to the Royal Society, then sitting at Montreal; and I am personally much indebted to that gentleman for kindness in furnishing me with Mr. Caldwell's address and forwarding him my letters. I shall be very thankful to your correspondent, "Platypus," if he will forward me those spirit specimens of platypus eggs to the Australian

Museum, Sydney. During my absence from Sydney, Mr. Ramsey has kindly promised to take charge of all specimens that may arrive for me at the museum.—*Australian Exchange.*

[The platypus, commonly known as the duck-bill, is found in Van Dieman's Land and Australia. In its bill-like jaws, its spurs, its monotrematous character, its non-placental development, and its anatomy, it appears to be a connecting link between birds and animals.—*Editor.*]

THE RESURRECTION PLANT.

This singular plant is really one of the wonders of creation Imagine a bunch of withered looking, curled up shoots, brown, stiff, and apparently dead, resembling a bird's nest. Place it in water, in half an hour what a transformation! The withered looking bunch has now opened and is transformed into a lovely patch of moss, entirely covering an ordinary plate. In its native habitat, when the dry season sets in, the plant curls up into a round ball and is wafted away by winds from place to place, sometimes for hundreds of miles, when at last it reaches a moist spot it gradually unfolds itself, makes new roots and thrives in its new found home. This sensitiveness to moisture is so great that even after the plant may seem dead it will open and close as if it were alive. *F. M. Gilham's Catalogue.*

Washington, D. C., was made the capital of the United States July 8th, 1792.

ABORIGINAL FISH-HOOKS.

BY STEPHEN BOWERS, PH. D.

Four years ago the writer contributed an article which was published in *Science* on pre-historic fish hooks, which he believes to have been the first description of the true aboriginal fish-hooks from this section of the country. Many of the specimens figured and described as "fish-hooks" are, doubtless, nothing more nor less than ornaments which were worn in the ears of the natives. This is true of Fig 1, and possibly Fig. 2. The first was manufactured from haliotis shell, and the cut is the size of the original, which is true of all the specimens figured in this paper.

Figure 1.

It will be observed that the point of the specimen first figured comes so near the shank that when the end of the line was looped upon it and cemented with asphaltum, which was universally the case, the space would be filled, and certainly it would be out of the question to hook it into the mouth of a fish.

This may also be argued against Fig. 2. But from the fact that the latter specimen contains a barb, some archæologists claim that it is a fish-hook. Yet it is by no means clear to my mind that it was designed for anything but an ornament for the person.

Figure 2.

The true fish-hook, of what is known as the Santa Barbara stock of Indians, is represented in figures 3 and 4, and was manufactured from bone. Two slightly curved and doubly pointed pieces of bone were tied together at one end, the larger piece being used for the shank on which the line was fastened, and the shorter piece to pierce the mou th of the fish. Its form is similar to that still in use by the South-sea Islanders, and manufactured from the shell of the pearl oyster.

Figure 5 represents a metal fish-hook which the writer found in an Indian grave on the Conejo plateau, in this (Ventura) county. The shank was fastened into an olivella shell which had been notched as represented in the engraving. The shell was, doubtless, designed to attract by its glistening and shiny appearance. The specimen is somewhat restored

Figure 3.

Figure 4.

in the cut, the original having been eaten with rust, but is still sufficiently perfect to show the outline and character of the implement.

On San Miguel Island, and in other places in this section, the writer has found the rude tools by which ornaments like Fig. 1 were made, and the specimens in various stages of development. The study of this kind of aboriginal work is invested with much interest.

Figure 5.

A seventy-five barrel oil well has just been struck in the Adams canon in Ventura County, by the Stuart & Hardison Oil Company. The wells are now producing about 300 barrels daily. The company has about 80 miles of pipe-line carrying oil to Newhall, Ventura and Hueneme.

INDIAN WAR CLUB.

It has been the custom among the American Indians from the remotest times, for the chief of wild tribes to carry some kind of a war club as an insignia of rank, as a recognized leader of his particular tribe. They selected a club suitable for this purpose, and mounted it with flint, stone or hematite celts, according to what could be procured in their respective localities. The above cut is illustrated with henatite celts. They are very scarce and are found in limited quantities in regions where such ore abounds. Probably more plentiful in the vicinity of Cincinnati, O., than elsewhere. A celt is often called an ungrooved axe, and erroneously by others a skin-dresser. There is no doubt but the larger hematite celts occasionally found were used for a single blade in a battle axe, like the larger flint celts. They have been used for cutting hard substances, as the edges are invariably chipped or slightly broken when found. The Indian war club of to-day is quite different. They mount a single egg-shaped stone, more pointed at the ends, with a groove around the middle for the rawhide thong that connects it to the handle of wood which is so skillfully and ingeniously covered with rawhide. To the stone end of the club are attached trophies o the chase, and a tuft of mane of the wild stallion captured, eagle feathers, etc. Sometimes the hair of a noted Indian foe or chieftain slain. In remoter times it was customary to hang the trophies to the handle end of the club. In my next I will speak of the battle axe used by Indian warriors.

R. W. M.

THE CYPRESS VINE AND THE MORNING GLORY.

The Cypress Vine (Quamoclit vulgaris) and the Morning Glory (the genus Ipomæa) are two very beautiful plants which ornament our windows, trellises, etc, throughout the summer, but which die as the frost approaches. They are somewhat alike, but yet they greatly differ. Let us then find out of what their difference and likeness consist. Both of them have very fine and fibrous roots; the stem of each is herbaceous, twining, round, green, and in structure exogenous, consisting of pith in the centre, around which are layers of tissue covered with an outer skin; the branching of the stem is alternate in each, the branches interlacing profusely. The stem of the Morning Glory is larger and much stronger than that of the Cypress Vine, and the Morning Glory is beset off with minute hairs, and the Cypress Vine has none. The leaves of both plants are green and nut veined, and are arranged alternately on the stem. The leaves of the Morning Glory are very large (often four inches in diameter), they are heart shaped and are of a dull green color; and those of the Cypress Vine are about an inch and a half long, feather like, being primately dissected in thread-like divisions, and they are of a light green color, and as delicate as ferns; they grow in great confusion and add much of the plant's beauty. The flowers of the Morning Glory and Cypress Vine are alike in some particulars. The flowers on the Morning Glory are large, slender tubed funnels, growing single and often in clusters of three and five, they are of a deep purple, delicate pink or blue, and sometimes pure white; they are always veined and shaded with a deeper hue. The slender convolute buds are almost as pretty as the expanded flowers. The flowers of the Cypress Vine are small, each being a slender tube suddenly spreading into a flat, five-lobed border; they are of a brilliant scarlet, pure white or yellow, they grow single and are arranged alternately on the stem. The calyx of each is composed of five sepals, those of the Cypress Vine being very small and those of the Morning Glory much larger. The five stamens of each are attached to the base of the corolla, those of the Morning Glory are entirely without the tube, while those of the Cypress Vine protrude beyond the tube.

It is found that these plants bear flowers, therefore, they are called flowering plants. Because of the structure of the stems, and because of the net-veined leaves, they belong to the group of Exogens; they are twining, herbaceous stems and the flower parts in fives, therefore, they belong to the same subordinate group named from the convolute bulbs of some members of the order Convolvulaceæ.

The Morning Glory is one of the most wonderful plants on account of it blooming in the morning when the force of the sun is not very strong and it closes when the sun's rays get stronger.

Now, dear readers, I hope you will take two or more plants and examine them; you don't know how much knowledge you can learn from it, and it is amusing as well as instructive. If you will try it you will not regret it.

Howard Rochester.

NATURAL HISTORY.

BY CHAS. S. MASON.

The whole world is a vast picture gallery filled with the choicest of nature's productions. Yet, we are so used to seeing them, that, like the paintings and statues seen in studios, museums and collections of fine pictures embracing many varieties, from their continual recurrence, they satiate and weary us. Nowhere do we find such rich coloring, such delicate shades. Now and then we find some enthusiast willing to turn aside from the beaten track and devote himself to their study. This would come under the head of science but more particularly under Natural History in the minutiæ. Natural History in its wildest sense includes all natural science and has the whole of creation to deal with. In this sense it was used by the philosophers of antiquity. But now it is limited to those branches of science which relate to the surface of the earth and its productions. Of these, geology and mineralogy have for their subject inorganic portions of creation. Botany and Zoölogy, the various branches of which are often pursued as separate sciences, with physiology, have for their subjects organized creatures. Natural History takes cognizance of the productions of nature and of their relations to each other with all the changes on the face of the earth and all the phenomena of life both animal and vegetable. It derives assistance from other sciences, particularly chemistry and natural philosophy, and some of the branches of chemistry may be regarded as branches of natural history. But when man himself is considered as a subject of scientific study, psychology must be added to the branches of Natural History; but, as the term is commonly employed, this can scarcely be said to be included.

Now, as the globe on which we live is one of the most important or the most important subject to us at present, we will take a look at that branch of Natural History which treats of it. Geology is that science which investigates the history of the earth. Its object is to trace the progress of our planet from the earliest beginning of its separate existence, through various stages of growth, down to the present condition of things. It seeks to determine the manner in which, through the evolution of the earth, great surface changes have been effected. It unravels the complicated processes by which each continent has been built up. It follows even in detail the varied sculpture of mountain, valley and crag. Nor does it confine itself merely to changes in the inorganic world.

Geology shows that the present races of plants and animals are the descendants of other and very different races which have peopled the earth. The geographic distribution of existing faunas and floras is often made clear and intelligible by geological evidence. In the same way light is thrown upon some of the remoter phases in the history of man himself. A subject so comprehensive as this must require a wide and varied basis of evidence. It is one of the characteristics of geology to gather evidence from sources which at first sight seem far removed from its scope, and to seek aid from almost every other leading branch of science. Thus in dealing with the earliest conditions of the planet, the geologist must fully avail himself of the labors of the astronomer. Whatever is ascertained by telescope, spectroscope, or chemical analysis regarding the constitution of other heavenly bodies, has a geological bearing. The experiments of the physicist, undertaken to determine conditions of matter and of energy may sometimes be taken as the starting points of geological investigations. The work of the chemical laboratories forms the vast and increasing mass of geological inquiry. To the botanist, the zoölogist, even to the unscientific if observant traveler by land or sea, the geologist turns for information and assistance. But while thus culling freely from the dominions of other sciences, geology claims as its peculiar territory the rocky frame-work of the globe. In the materials composing that frame-work, their composition, arrangement, the processes of their formation, the changes they have undergone, and in the terrestrial revolutions to which they bear witness lie the main data of geological history.

It is the task of the geologist to group these elements in such a way that they may be made to yield up their evidence as to the march of events in the evolution of the planet. He finds that they have in large measure arranged themselves in chronological sequence, the oldest lying at the bottom and the newest at the top. But it is mainly by the remains of plants and animals imbedded in the rocks that the geologist is guided in unravelling the chronological succession of geological changes. At one moment he has to deal with the bones of some large mammal scattered through a deposit of superficial gravel, at another time with the minute foraminifers and ostracoids of an upraised sea bottom, corals and crinoids crowded and crushed into a massive limestone where they lived and died, ferns and terrestrial plants matted together in the bed of coal where they originally grew, the scattered shells of a sub-marine sand bank, the snails and lizards which lived and died in a hollow tree, the insects which have been imprisoned in the exuding resin of old forests, the footprints of birds and quadrupeds, the trails of worms left upon former shores. These and innumerable other pieces of evidence enable the geologist to realize in some measure what the faunas and floras of successive periods have been and what geographic changes the site of every land has undergone.

THE CLIFF DWELLERS OF SOUTHWESTERN COLORADO.

During the winter of 1883-84, it was my lot to winter among the relics of the Cliff Dwellers, and many pleasant days I spent among those ruins. The Mancon Cañon proper is about thirty miles in length. The formation is sandstone, which breaks off almost perpendicular, leaving a rim-rock from 1,oco to 1,500 feet in height. In the different strata there are immense coal-beds, varying in thickness from five to thirty feet. The coal is of fine quality, the thirty-foot vein being free from slate. In some places as many as seven veins can be seen from the bottom of the cañon. The writer of this has seen almost all the coal deposits of Colorado, and will venture to assert that in no other section will the coal deposit equal that of the Mancon Cañon. The Rio Mancos is an insignificant stream in the summer and winter, but in the spring the snow melting at the head of the stream makes it very dangerous fording. The bottom is of quicksand, and when the stream is high it changes its bed several times a day. The climate is fine during the winter; the snow does not lie where exposed to the sun, even when it is an extraordinarily hard winter, as that of 1883-84. The cañons are filled with deer, mountain-sheep and bear.

There are thousands of cliff houses, every available spot is covered with them. They are more numerous in the cañons running into the main cañon itself. Some houses are so high and built to conform with the outline of the cliff as to be almost invisible. The buildings were built for comfort; the ceilings are high, walls are built of fine sandstone, plastered with gypsum, immense beds of which can be found almost anywhere in Southern Colorado. Some of the rooms will compare favorably with the best work of to-day, though it has been thousands of years since they were built. Many people who have never seen cliff houses, have an idea that the rock has been cut away by human hands, but the hand of Nature cut out the ledges years ago, how many, man cannot conceive. The water cut away the softer strata of sandstone, in some places five feet, in others fifty feet, and even more, and varying in depth, sometimes fifty feet back in under the overhanging cliff. This roof and floor are of solid sandstone. In some places the overhanging cliff protects the buildings, so that there has never been a drop of rain or flake of snow touched them. This accounts for the state of preservation in which they are found.

During my stay in the cañyon, I gathered dozens, yes, hundreds, of relics that would have made the heart of an antiquarian glad, but did not carry any away with me when I left I found many specimens of pottery. Everything from drinking cups to water pots holding fifteen or twenty gallons. The pottery is decorated in many curious designs. In different ruins I found

moccasins made from the leaves of the soapweed, or Spanish bayonet, varying in size from No. 6 to No. 8. In many places the imprint of a hand covered with gypsum can be found. The hands are all small, though from the moccasins their feet must have been those of average-sized people. I found a great many coils of twine and pieces of rope made of fiber resembling hemp. The twine was not larger than a large size fishing line, and time has not hurt it in the least, as it is so strong that a man cannot break it easily with bare hands. The finest specimen I found was a dress-skirt made from feathers or rather from the down; the outside of the feathers had been carefully plucked, the down separated from the quill and carefully wound around twine strings, and the whole worked into a skirt about two feet in length. Being a man, I am at a loss for words to describe this article of female apparel, but should think that it required not less than six month's time to make it.

[TO BE CONTINUED.]

CALIFORNIA DIAMONDS.

For a period of more than thirty years the placer miners o California have occasionally picked up small diamonds. The hydraulic washings at Cherokee, Butte County, have been the most prolific. The diamonds are usually found by the miners when cleaning up their sluices or while washing off the bed rock, though in some few instances they have been picked up on the surface. As a general thing, the gravel in which they occur is mixed with lava, ashes, or other volcanic matter; zircon, platinum, iridium, magnetite, etc., being associated with the diamonds. While many of these stones have been of good color, brilliant and perfect, none weighing over 3½ carats have been found in the State. In size they have ranged usually from about half a carat down to stones of microscopic dimensions, the latter being numerous in a few localities. So far as known, $500 is the highest price for which any California diamond in the rough has been sold, though large numbers have found purchasers at prices ranging from $10 to $50, and not a few at as much as $100. The stones have been all colors, white, yellow, straw and rose, and many of good water. A few small diamonds have been found also in the placer diggings of Idaho, being of about the same quality and occurring under the same conditions as in California. In neither region have diamonds been made the object of special search, those found having been picked up by miners while washing gravel for gold. Fragments of diamonds have been noticed in the tailings from the quartz mills, being the remains of stones which have been broken under the stamps.—*C. G. Yale, in "Precious Stones."*

A COLLECTING TRIP.

On June third, of last year, the writer arrived at Donner, Placer County, Cal., for a short collecting trip among the birds which breed on the high Sierra. The altitude at the Summit is about seven thousand feet, and when I arrived, there was still in places considerable snow. The Mountain Chickadee (Parus Montanis) is a common bird both but at Summit and at Blue Canyon. At half the elevation, where I stopped over one day, I found two of their nests at Blue Canyon, both of which contained youug. The first one was in a natural hole in a dead and fallen tree, only two feet above ground. The nest was discovered by seeing the hole, and then I found it well nigh impossible to get her out again, for she resisted my efforts to frighten her from the nest with all the pertinacity of the species.

The other nest was in a decayed stump and only about three inches above the ground. Both nests were of wool and other soft materials. During my stay in the mountains I found three nests of the rare white-headed Woodpecker (Xenopicus albolarvatus).

H. R. Taylor.

EDITORIAL.

It is with pleasure that we present the initial number of THE COLLECTORS' ILLUSTRATED MAGAZINE to our friends and reader. We shall strive to improve with every issue, and will endeavor to keep our pages well filled with choice original matter of interest to collectors in all branches, and request all our friends and readers to send us original items of interest, descriptions of collecting trips, etc., which we will gladly publish. Our exchange columns are open free to all our subscribers and we wish to make this one of the leading features of our magazine. All questions of general interest to our readers will be cheerfully answered through our columns. Having a large stock of specimens of all kinds on hand, we are enabled to give a valuable premium to every subscriber, and in addition to our regular premium we offer a series of prizes, which we hope every one will try for by sending us their subscriptions at once.

Do not fail to read our Grand Prize Offers which appears elsewhere.

Parties writing to us for information should always enclose a 2 cent stamp to insure a prompt reply.

Every cash yearly subscriber is entitled to 20 cents worth of specimens, of their own choice, from any of our price-lists, as a premium.

We believe all of our advertisers to be perfectly reliable, and when writing to them you will confer a great favor on us by stating that you saw their advertisement in THE COLLECTORS' MAGAZINE.

Advertisers, send us a list of collectors you want your advertisements read by. and we will send a paper to each, containing a marked copy of your advertisement, free of charge.

Advertisements and articles for publication should reach us by the 20th of the month to insure insertion in the next number, and all copy should be plainly written on only one side of a sheet.

Advertisers will find THE COLLECTORS' ILLUSTRATED MAGAZINE a valuable medium for reaching collectors in all branches, through out the United States and Canada, as we guarantee a large lation among bona-fide collectors every issue.

Publishers of Natural History, Coin, Stamp and Curiosity papers, intending discontinuing their publications, can have their unexpired subscriptions filled by us on exceedingly favorable terms. Write us and get our prices before making arrangements elsewhere.

We have received from Mr. C. S. Mason, whose "ad" appears on another page, some very fine, clear Gypsum Crystals, from the famous Crystal bank near Ellsworth, Ohio. Every collecter should have some of these Crystals in his collection.

Exchanges.

These columns are free to subscribers only. All exchanges must be in by the 20th of the month to insure insertion in next number.

One of James' $10.00 "mad stones" for foreign or U. S Stamps or Indian relics. Send list. C. HADDAWAY, Easton, Md.

California curiosities of all kinds to exchange for others. Send lists and prices, and I will send mine in return.
C. M. HAIGHT, Riverside, Cal.

One of James' famous "Mad Stones" ($10.00 size) for a pair of tree climbers.
C. HADDAWAY, Easton, Md.

Any one of Chinese cash coin, chopstick, slow match, game stone, game card, nut, Japanese paper napkin, alligator tooth and cactus wood for every perfect Indian arrow head sent me. Any three for every Indian net sinker, knives, pottery and any five for every hammer stones, scrapers and celt.
C. M. HAIGHT, Riverside, Cal.

Gypsum crystals, fine sandstone from Garfield monument, stylographic pen, drawing paper (Whatman's cold pressed), botanical labels, stamps, etc., for a type writer, coins, arrow and spear head, Indian and mound builders' relics and minerals, shells and curiosities. All letters answered.
CHAS. S. MASON,
120 Whitman St., Cleveland, Ohio.

OUR MONTHLY BARGAIN LIST

TERMS—Cash, with order, and if in any amount less than fifty cents add four cents extra for postage. Postage Stamps in denomination or less, taken for amounts less than one dollars.

Birds' Eggs.

Eggs are all strictly first-class and such as I have in sets with data are indicated by a *. The numbers correspond to the new A. O. U. check list.

No.	NAME.	PRICE EACH.
29	Pigeon Guillemot	$ 10
*30a	California "	15
49	Western Gull	15
120c	Farallone Cormorant	50
122	Brandt's "	25
123b	Baird's "	25
*183	Roseate Spoonbill	40
*197	Snowy Heron	08
*199	Louisiana Heron	08
*200	Little Blue "	08
*201	Green "	05
202	Black-crowned Night Heron	08
*203	Yellow " " "	18
*218	Purple Gallinole	15
273	Killdeer	10
*289b	Texan Bob White	05
*294	California Partridge	06
294a	" Valley Partridge	05
*316	Morning Dove	02
*360	Sparrow Hawk	15
365	Barn Owl	15
*378	Burrowing Owl	15
*385	Road Runner	15
*387	Yellow-billed Cuckoo	08
409	Red-bellied Woodpecker	15
413	Red-shaped Flicker	05
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505a	Arizona Heoded Oriole	25
506	Orchard Oriole	04
508	Bullock's "	08
510	Brewer's Blackbird	04
511	Purple Grackle	04
511b	Bronzed "	04
513	Boat-tailed Grackle	04
519	House Finch	05
519a	Crimson House Finch	04
529	American Goldfinch	05
530	Green-backed Goldfinch	10
531	Lawrence's Goldfinch	13
540	Vesper Sparrow	03
*552	Lark Sparrow	05
*542a	Western Lark Sparrow	08
*560	Chipping Sparrow	02
574	Bell's "	75
*581	Song "	02
*581c	Heerman's Song Sparrow	08
581d	Samuel's " "	05
591b	California Brown Towhee	05
*593	Cardinal Grosbeak	04
604	Black-throated Banting	14
611	Purple Martin	10
*612	Cliff Swallow	03
*613	Barn "	03
*616	Bank "	04
*620	Phanopepla	35
*622a	White-rumped Shrike	04
*624	Red-eyed Virei	05
*648	Blue Yellow-backed Warbler	13
*652	Yellow Warbler	03
*703	Mocking Bird	04
*704	Cat Bird	02
705	Brown Thrasher	03
710	California "	13
713	Cactus Wren	08
715	Rock "	37
721a	Parkman's Wren	04
722	Winter "	37
725	Long-billed Marsh Wren	04
*731	Tufted Titmouse	37
*733	Plain "	25
*736	Carolina Chickadee	13
*755	Wood Thrush	04
*758	Russet-backed Thrush	06
*761	Robin	03
†766	Blue Bird	03
767	Western Blue Bird	08

Foreign Copper Coins.

Great Britain, ½ penny, Geo. II	$ 10
" " " " Victoria	05
" " 1 farthing, "	05
" " 1 " " laureated	05
Great Britain, ½ penny, Victoria, laureated	05
Great Britain, 1 farthing, Geo. IV	10
" " 1 penny, " III	10
" " ½ " " "	10
" " 1 " Victoria	03
" " 1 farthing, Geo. II	20
Honduras, provisional money, rude, 8 reals	15
Mexico, 1 centavo, nickel	05
" 2 " "	08
" 5 " "	10
Hanover, 1 pfennig	10
" 2 "	10
" 2 " Horse	10
Russia, 2 kopecs, Nicholas II	05

Rome, 4th bronze coins, found in digging Suez canal, 1500 years old	12
India, old dumps	10
Denmark, Frederick VII, 1 skilling	05
Sweden, 2½ skilling, Frederick VI	10
Japan, old sen, scarce	50
Peru, provisional money, scarce, 5 centavos	20
Peru, provisional money, scarce, 10 centavos	20
Holland, 1 cent	10
France, 5 centimes, Nap. III	05
" 10 " " "	05
" 1 " laureated head, Nap. III	10
Japan, tempo	15
Portugal, large coin of	20
Egypt, 20 para, (silvered)	10
Russia, 1 kopec, (bright)	10
Russia, Elizabeth, old	15
Germany, 4 varieties	20

U. S. Cents.

1803, head to right	$ 25
1817, head to left, 13 stars	10
1818, head to left	08
1819, head to left	10
1820, uncirculated	40
1821, head to left	30
1822, " "	30
1825, " "	20
1827, " "	15
1828, " "	20
1831, " "	10
1832, " "	10
1833, " "	10
1834, " "	05
1835, head 1834	10
1837, plain, hair-string	10
1838	08
1840	08
1852, head to left	05
1868, bronze, Indian head	08
1880, " " "	05

California Gold.

Half-Dollar, round, different dates	$ 55
" " octagonal, " "	55
Quarter-Dollar, " " "	30
" " round, " "	30

Confederate Money.

Interest note, train of cars	$ 10
$500, Feb. 17, 1864	50
100, " "	12
100, " " small note, very rare	1 50
50, Feb. 17, 1864	08
20, " "	08
10, " "	05
5, " "	05
2, " "	10
1, " "	10
50 cts., " "	10

Curiosities

Agates, (polished)	$ 25
Cal. Sea Urchins	05 to 10
Liver Beans	05 to 10
Alligator Teeth	05
Sharks Eggs	15
Pampas Grass Plumes	25
Humming Bird's Nests	25
Cactus Wood, (curious)	05 to 25
Earthquake Sand, thrown up by the Charleston Earthquakes, several colors in a vial	15
Chinese Nuts	2 for 05
" Game Stones	2 for 05
" Slow Matches	2 for 05
" Game Cards	2 for 05
" Chopsticks	per pair 06
" Chinese Coins (very old)	each 05
Japanese Paper Napkins	05
" Tempo Coin (large oval)	10
" Cat's Eyes (polished)	15

California Sea Shells.

Acmar Personar	02
" Scabra	02
" Spectrum	03
" Pelta	03
" Testudinalus	03
Cerethidea Sacrata	02
Crepidula Adurea	03
Chlorostana Funebrale	02
Donax Californiens	05
Fissurella Volcano	02
Guadrana radiata	03
Haliotis Cracherodii	05 to 1 00
Hipponyx Cranoides	02
Littornia planoxis	03
Lottia gigantea	03
Nacella incesia	03
Olivella biblicata	05
Pecten æquisuleatus	05
Pachydesma (Trigore) crassalellaroides	02

Fifty cents worth of specimens free from this list to every new subscriber to THE WEST AMERICAN SCIENTIST, who sends $1.00 to E. M. Haight, Riverside, Cal.

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E. M. HAIGHT,

RIVERSIDE,

San Bernardino Co., CALIFORNIA

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Third.—To the person sending us the next largest list of subscribers before the 1st of April, we will give Ten dollars worth of specimens.

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Sixth.—To the first subscriber from Canada and each and every State and Territory of the United States, will give 50 cents worth of specimens.

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VOL. 1. FEBRUARY, 1888. NO. 2.

THE

Collectors' Illustrated Magazine.

A MONTHLY MAGAZINE

Devoted to the Interests of Collectors in all Branches.

CONTENTS:

EDITED AND PUBLISHED BY

E. M. HAIGHT, - - - RIVERSIDE, CAL.

Price, 50 Cts. per Annum. Single Copies, 5 Cts.

OUR MONTHLY BARGAIN

TERMS—Cash, with order, and if in any amount less than fi add four cents extra for postage. Postage Stamps in denominati cts. or less, taken for amounts less than one dollar.

Birds' Eggs.

Eggs are all strictly first-class and such as I have in sets with data are indicated by a *. The numbers correspond to the new A. O. U. check list.

No.	NAME.	PRICE EACH.
1	Western Grebe	$ 25
6	Pied-billed "	10
*12	Tufted Puffin	75
*51	Herring Gull	15
*58	Laughing Gull	10
*63	Gull-billed Fern	10
64	Caspian "	25
*69	Forster's "	10
*80	Black Skimmer	08
120	Double-crested Cormorant	15
*192	Great White Heron	60
211	Clapper Rail	05
258	Willet	20
263	Spotted Sandpiper	08
*277	Piping Plover	30
*280	Wilson's "	15
*286	American Oystercatcher	35
305	Prairie Hen	10
*325	Turkey Vulture	40
342	Swainson's Hawk	50
366	American Long-Eared Owl	30
373e	California Mottled Owl	35
*406	Red-headed Woodpecker	05
*412	Flicker	04
430	Costa's Humming Bird	60
431	Anna's " "	40
457	Say's Phoebe	10
464	Baird's Flycatcher	15
483	Green Jay	65
*495a	Dwarf Cowbird	18
*497	Yellow Headed Blackbird	04
536	Lapland Longspur	40
588a	Spurred Towhee	15
*594	Texan Cardinal	40
*601	Painted Bunting	10
*608	Scarlet Tanager	15
627	Warbling Vireo	10
*631	White-eyed Vireo	08
*633	Bell's Vireo	08
*661	Black Poll Warbler	40
674	Oven Bird	08
681	Maryland Yellow-throat	06
742	Bush Tit	10
753	Black-tailed Gnatcatcher	35

Foreign Copper Coins.

Great Britain, ½ penny, Geo. II	10
" " " Victoria	05
" " 1 farthing, "	05
" " 1 " " laureated	05
Great Britain, ½ penny, Victoria, laureated	05
Russia, 2 kopecs, Nicholas II	10
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Hanover, 1 pfennig	
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L. I. FEBRUARY, 1888. No. 2.

NATURAL HISTORY.

t is evident that to deal successfully with these varied mate-s, a considerable acquaintance with different branches of ence is needful. Especially necessary is a tolerably wide owledge of the processes now at work in changing the surface the earth, and at least those forms of plant and animal life ose remains are apt to be preserved in geological deposits, which in their structure and habitat enable us to realize what ir forerunners were. It has often been insisted on that the sent is a key to the past, and in a wide sense this assertion is inently true. In the systematic treatment of the subject, the lowing heads are given:

1st. *The Cosmical Aspects of Geology.*—Under this head we y consider the evidence supplied by astronomy and physics re-rding the form and motions of the earth, the composition of the n and planets and the probable history of the solar system.

2nd. *Geognosy; an inquiry into the materials of the Earth's bstance.*—In this division we deal with the parts of the earth — envelopes of air and water, its solid crust and the more proba-condition of its interior. Especially do we have to study the ore important minerals of the crust and the chief rocks of which t crust is built up. In this way we lay a foundation of knowl-ge regarding the nature of the materials constituting the mass the globe, and may next proceed to investigate the process by ich these materials are altered and produced.

3rd. *Dynamical Geology* embraces an investigation of the vari-s agencies whereby the rocks are formed and metamorphosed, d by which changes are effected upon the distribution of sea d land, and upon the forms of terrestial surfaces. Such an in-iry necessitates a careful study of the existing geological onomy of nature, and forms a fitting introduction to the investi-tion of the geological changes of former periods. This and the evious section include most of what is embraced under Physical eography.

4th. *Structural Geology, or the Architecture of the Earth.*—We w advance to consider how the various materials composing the ust of the earth have been arranged. We learn that some have rmed in beds or strata on the floor of the sea, that others have

been built up by the slow aggregation of organic forms; that others have been poured out in a molten condition or in showers of loose dust from subterranean sources. We further find that though originally laid down in almost horizontal beds, the rocks have subsequently been crumpled, contorted and dislocated, that they have been incessantly worn down and have often been depressed and buried beneath later accumulations.

5th. *Palaeontological Geology.* — This branch of the subject deals with the organic forms which are found preserved in the crust of the earth. It includes such questions as the relations between extinct and living types, the laws which appear to have governed the distribution of life in time and in space; the relative importance of different genera of animals in geological inquiry; the nature and use of the evidence from organic remains regarding former conditions of Physical Geography.

6th *Stratigraphical Geology.* — This section might be called geological history. It works out the chronological succession of the great formation of the earth's crust, and endeavors to trace the sequence of events of which they contain the record. More particularly it determines the order of succession of the various plants and animals which in past time have peopled the earth, and thus ascertains what has been the grand march of life upon the planet.

7th. *Physiographical Geology.*—Starting from the basis of fact laid down by stratigraphical geology regarding former geographical changes, embraces an inquiry into the origin and history of the features of the earth's surface, continental ridges and ocean basins, plains, valleys and mountains. It explains the causes on which local differences of scenery depend, and shows under what very different circumstances and at what widely separate intervals the hills and mountains even of a single country have been produced. We now come to another branch of Natural History in the inorganic world, namely, mineralogy. Natural objects which are homogeneous in their mass and in which no parts formed for special purposes can be distinguished, are termed minerals, and the branch of science is termed mineralogy. Minerals differ in structure from those objects treated of in botany and zoölogy in the three following particulars:

1st. They differ in the mode of their formation. This has been accomplished, not by assimilation of matter producing growth from within, but by the augmentation of bulk through accretion of particles from without. 2nd. Minerals are not heterogeneous, while the objects treated of in the other departments of Natural History consist of being possessed of life and having parts which, being mutually dependent, cannot be separated from one another without a more or less destruction of the individual. The objects treated of under the department of mineralogy have so uniformly consisted of an individuality, that they are not destroyed by any

separation of parts, each portion or fragment possessing the same properties and the same composition as the whole. 3d. While those beings which are possessed of life have their component element grouped into complexes, for the most part capable of change, minerals have a constitution resulting from chemical attraction alone, and an arrangement of their parts under physical influences, which has resulted in rigidity and an absence of all tendency to change. The most precise definition of a mineral would be, an inorganic body possessed of a definite chemical composition and usually of a regular geometric form. Of these the second is in one respect the direct outcome of the first, while many of the most important physical properties possessed by minerals, an outcome of the second. Both the geometric forms and composition of minerals are produced and modified under the influence of general laws. Mineral bodies occur in the three physical conditions of solid, liquid and gas. Those now found in the last two states are few in number and are altogether of inferior interest to those which occur as solids, but there is reason to believe that the minerals we know as solids, once existed in the liquid or gaseous state, and that their present structure was determined in the process of solidification. All bodies thus formed may be divided into two great classes: 1st. *Amorphous bodies*, or such as do not possess a definite and characteristic geometrical form. These, when transparent, refract light singly in every direction except when under stress. They are equally difficult to break in all directions. When broken they exhibit a conchoidal or earthy fracture. They are equally hard throughout all their parts, they are equally elastic in all directions, and they conduct heat with equal rapidity and in equal amount in all directions. 2d. *Chrystalline boaies*, such as occur in definite geometrical forms, bounded by flat surfaces. These present greater facility of separation of particles or cleavage in certain directions, lying in determinate planes, than they do in others. Most of them are neither equally hard nor equally elastic in all directions, conduct heat more equally in certain directions than they do in others, and when transparent refract light doubly, except in certain directions. Mineral bodies are found in both the above classes, and the same mineral body may occur in both the amorphous and crystalline condition.—*Charles S. Mason.*

[TO BE CONTINUED.]

A BURIED CITY.

It is reported that Professor Cashman, who has charge of a government exploring expedition in Southern Arizona, has unearthed a whole city there, and exhumed a large number of skeletons. The location is about eighty miles northwest of Tucson, near the junction of Salt river with the Gila.

A RARE COIN.

Carl Scheben of Kansas City has a coin said to be very valuable. It is one of seventeen gold pieces coined in the mint at San Francisco in 1879. For some unexplained reason the dies were destroyed after these coins were made. It is a curious piece of United States mohey, of the face value of $4. One side bears the head of the Goddess of Liberty, the date 1879, and around the rim are thirteen stars with the following figures and letters between them: "6, G, 3, S, 7, C, 7, G, R, A, M, S." On the reverse side is a five-point star in the center, underneath which is the word "Met." In a circle outside the stars are the inscriptions, "E Pluribus Unum" and "Deo Est Gloria." There is still another circle outside the inscription, bearing the words, "United States of America. Four Dol."

AN OLD-TIME ADVERTISEMENT.

The following appeared in the *Evening Post* of Boston in 1742: "To be sold by the Printer of this Paper, the very best Negro Woman in this Town, who has had the Smallpox and the Measles, is as hearty as a Horse, as brisk as a Bird, and will work like a Beaver. August 28, 1742."

WONDERFUL MICA.

Mica, although one of the most common of minerals, is also one of the most interesting. Some of its varieties are the first specimens collected by the beginner, while others are often the last to find their way into the cabinet of the mineralogist. Take from the cabinet the mica group and the collection is robbed of some of its choicest minerals. What other mineral has the perfect cleavage, and the brilliant polish of mica; and what other mineral will separate into those delicate flexible plates? Mica has truly wonderful qualities. What collection would be complete without the beautiful rose and lilac lepidolites a mineral found in so few localities, principally Maine, Connecticut and Massachusetts. Lepidolite contains from two to five per cent. of the rare earth lithia, that imparts to the blow-pipe flame a deep crimson color. Specimens from Rumford, Maine, are often penetrated with slender crystals of pink tourmaline, while from other localities in the State plates of muscovite surrounded by lepidolite are often completely changed to the latter mineral. Associated with lepidolite (in all three states) are those wonderful colored tourmalines that have made the Mt. Mica locality at Paris, Me., so famous. Clevelandite is also found in connection with both, generally the gangue. From Branchville, Conn., comes another curious curved mica, and some of the specimens would resemble a mass of silvery soap bubbles, while in others may be

seen the gradual change from the foliated through the curved to the semi-globular. The gangue is often pure while albite, which gives the mica a pleasing background. Spherical mica from Bennington, Vt., is another old form, brilliant balls from one-fourth to one and one-fourth inches in diameter protrude from the granite matrix. The plumosed variety with the scales arranged in plume-like form is a very desirable specimen. At Mineral Hill, Delaware Co., Pa., has been found the interesting mineral vermiclite, a mineral belonging to the chlorite group but related to the micas. When heated this mineral will expand forty times its original size. Its color is green, but after heating becomes white. Perhaps the most useful and the only mica that has an economical value is the variety 'muscovite,' from mines in Alstead, N. H., have been taken sheets four feet across. In 1883 a single mass weighing 512 lbs. was also discovered. The best quality is used principally in stove manufactories, while the poor quality, clippings, etc., are ground up to be used as a lubricant for machinery and for fire proof packing. There are numerous mineral substances that owe many of their interesting qualities to some form of mica. Take for instance the gem stone aventurine quartz, which is simply transparent quartz spangled with scales of mica. That interesting flexible sandstone (itacolumite), the very gangue of the diamond itself owes much of its flexibility to hydrous mica. In the formation of many rock masses mica holds important positions. Granite, the oldest and most durable of rocks, a rock that is the very foundation of the earth itself, has been securely locked together by the well selected and "Wonderful Mica."—*J. J. Alton.*

THE CLIFF DWELLERS OF SOUTHWESTERN COLORADO.

The largest cliff house is worthy of a better description than I can give. It is situate in Bear Cañon (so named by prospectors), about three miles from the Mancos Cañon, on the west side. From the bottom of the cañon it requires about one and one-half miles' walk from a point immediately below it to reach it. In climbing the cliffs on the route I took, I found footsteps cut in the rock, and think the people who lived here must have gone up in the same way I did. When I arrived I found a perpendicular cliff about forty feet high, which I climbed, by the aid of a rope which I threw on a small cedar, at the risk of breaking my neck, but I was well repaid for my trouble by finding a building at least two hundred and fifty feet in length, six stories in height in the front, and from four to six rooms deep into the cliff. This seems to have been a chief's house, or perhaps a Pan-Electric director, or perhaps a boodle man. The rooms were finely plastered with gypsum, which had a beautiful pink cast. In one room were

stone lasts, rudely shaped, but after the fashion of the shoemaker's last of to-day. Another room had arrow heads, stone axes and hatchets. There are also two weaving-rooms. In one there is a rude kind of loom, in the other shuttles and other implements for weaving. I found specimens of cloth resembling coarse linen. At one end I found a chicken-house with roosts for chickens. I also found jugs of pottery made to resemble our White Mountain quail, and think perhaps that the mountain quail was at one time the domestic fowl of these people.

There is also a room in which venison has been smoked. Every building has a round water-tank, from ten to fifteen feet across, and the larger buildings as many as three. The tanks vary in depth from five to ten feet. The kitchens of these buildings seem to have been built weaker than any other part, as they have nearly all tumbled down, while the other parts of the buildings are strong. There are bushels of broken pottery in the parts fallen down, so I naturally supposed them to be kitchens. I never found a building in which the kitchen was standing, but I do not doubt but there are some of them left standing. If one could be found that had not fallen, I think there would be a great deal of pottery found. In every ruin can be found corn-cobs and husks, squash-rinds, bone-knives and curious articles that I could not make out for what use they were intended. There are one or more granaries connected with every building. They have doors and windows in which slabs of slate are fitted to such a nicety that a mouse could never get into them. There are also cellars in which I found large jars covered with smooth, flat stones. What they contained I can only surmise.

The buildings were heated with a rude kind of furnace, a passageway built of stone and cement inside running the full length of the lower floor, as I supposed, for carrying heat to different apartments. The walls in some places are covered with paintings in which red colors predominate — pictures of men, women, animals and birds.

There is one cliff about thirty feet square, on which are the pictures of various birds. That of the stork is the most numerous and is a faithful copy of that bird. I have been in this section for several years and have never seen a stork, and it has been probably many years since that bird inhabited this country. I think this shows that this section, which is now so dry, must have been wet at the time it was inhabited by the cliff dwellers.

In the Colorado desert, near Idaho, there is a bed of rock salt, and the Southern Pacific Railroad, in laying the track to the salt bed, has been obliged to grade the road for 1,200 feet with blocks of these crystals. This is the only instance where the roadbed is laid and ballasted on salt. The sea, which once rolled over this place, dried up and left a vast bed of salt nearly fifty miles long.

CANADIAN WILD BIRDS.

FAMILY VIREONIDAE.—This interesting family of small birds, remarkable for the peculiarly ingenious manner in which their nests are formed, has some sixteen representatives in North America, of which some five or six are summer residents or spring and autumn visitors of Ontario and other parts of the Dominion of Canada. Of these the yellow-throated species is the largest, the warbling vireo the most sociable, and the red-eyed species the most common and widely diffused, as well as the most remarkable for its long continued and varied song notes. The Philadelphia vireo is but rarely met with in Ontario, though apparently more common in the northwest, while the blue-headed species, though more common in the spring and autumn, evidently prefers to make its summer home in the more evergreen and untrodden regions north of Ontario. With these remarks no further reference will be made to these two latter species in these sketches.

THE YELLOW-THROATED VIREO.

(Vireo Flavifrones.)

This species is generally a summer resident of the high rolling, hard-wood timbered lands, where there is an intermingling of those various kinds of wood for which the original Canadian forest was noted. But it seems to shun low, swampy places as well as those woods where the different species of evergreens predominate; and it also appears more especially to confine its range to the spreading branches of the tallest trees, where, among the green foliage, it gleans its insect food and sends out on the summer air its peculiar flute-like notes. The exact period of its advent in this locality is uncertain, as it is generally towards the latter end of May, when the wild flowers are in bloom, the buds bursting into leaves, and the lower woods vocal with the many noted songs of other species of the feathered race, that the wanderer in the wild woods is first apprised of the presence of this active Highland piper. Then it is also remarkable for its agility in securing its insect prey from the leaves and branches of the trees, or capturing them on the wing, after the manner of the fly-catchers. As soon as the leaves are sufficiently developed to afford concealment, the duty of nidification begins; and in the performance of this work the male assists the female in the collection of materials, which it takes several days to accomplish. The nest, made in the form of a small basket, is suspended from the fork of a small horizontal branch, generally pretty high off the ground, over which there is a canopy of leaves, and from which the bird has an extensive view of the lower woods and all that passes there, and on this she sits when her full complement of eggs are deposited, fearless and faithful to her charge, though it often swings violently to and fro in the winds of a summer storm. The nest is a neat and elegant work of bird architecture, composed of a

variety of soft materials, such as strips of different kinds of woody bark and vines, insect webs and cocoons, bits of dry leaves and mosses, and lined with the fine dry stems of leaves and seeds and some horse hair. These birds appear to be very affectionately disposed towards each other, and while the female is incubating, her partner supplies her with the choicest food, and also adds some trimming to the outside of the nest. The eggs, three or four to the set, are of a clear white hue, dotted towards the large end, with spots of blackish or brownish color, much resembling those of the more common red-eyed vireo. In length this species is between five and six inches, the plumage on the upper parts being generally of a rich olive green hue; the throat and upper parts of the breast bright yellow; the lower parts, wing and tail feathers edged with white.

THE RED-EYED VIREO.

(Vireo Olivacens.)

The original home of this species was the wild backwoods. There from the early part of summer to the days of autumn, from the earliest settlement of the Canadian wilderness, it has been observed by the pioneer, the sportsman, the traveler and the ornithologist, to form its little basket shaped nest, while through the livelong sultry summer's day its loud, clear notes greets the ear of all who approach the woodland side or penetrate the forest's shade. Now, since much of the original wildwoods has disappeared by the onward progress of the agriculturist, and orchards and plantations of other trees have sprung up around the human residences, this bird is often seen or heard in these places, and its unending song is often poured forth as it gleans its insect food among the tops or in the thick foliage of the trees, where it has made choice of a summer residence. This vireo makes its advent here with the first warm weather in May, or at the same time as the Scarlet Tanager; and in the same woodland their song-notes may, at that period, be often heard in close proximity to each other, but the continuity of its song is somewhat erratic until the trees are in full leaf and it can best conceal itself among the dense foliage; then perched high in the deepest shade and concealment, it rattles away for hours at a time its varied notes, as though such a performance was the chief aim of its existence, and it was desirous to astonish all the rest of the woodland tribes with the powers and periods of its oratory. Sometimes two males of this species will take a position in adjacent trees and then run over their well learned and often practiced notes, as if vieing with each other as to who will repeat the greatest number in the shortest space of time; then on a sudden the performance ceases, and you hear from the more deep recesses of the wood one of the musicians, as if exulting over the discomforture of his opponent, or, both start anew, and as if to beat each other down, run again rapidly over

the same notes, in the same clear and distinct tone of voice. These performances continue generally through the whole of the months of June and July and the early part of August, but cease altogether before the advent of September. The formation of the nest of this species is very remarkable. This is generally suspended from the forks of a small horizontal branch, and about three inches in diameter. The twigs are united by some fibrous materials which form the rim of the nest, and this, when completed, resembles a small basket, and is composed of bits of dry leaves, wool, fibers of bark, moss and spiders' webs, the inside being lined with the stalks of maple seeds. The eggs, generally four, rarely five, but sometimes three to the set, are clear white with a few dark spots on the large end. Its nest is often occupied by one or more of the eggs of the cowbird, whose young are raised with the same affectionate care as its own progeny. In length this species is between five and six inches. The plumage on the upper parts is of an ashy-olive color, below it is whitish; there is also a dark and white band on each side of the head.—*Wm. L. Kells.*

[TO BE CONTINUED.]

JUMPING SEEDS.

Considerable wonderment has often been created in certain localities by the appearance of what appeared to be small, minute seeds, which keep up a continual jumping, as if possessed of life and animation.

The seeds are very minute, presenting the appearance of a mustard seed, and are of a brown color. On placing them in the open hand the "seeds" jump about from one place to another in a very lively manner. Even when in a vial or small bottle the same characteristic is manifest, and as they were somewhat peculiar the "flea-seeds" have attracted considerable attention.

The gall or cocoon is found lightly attached to the leaf of the oak, and in time falls to the ground, when the noise occasioned by the thousands leaping about, without any apparent cause or organs of motion, sounds very much like the falling of fine rain on the leaves. An examination shows that the extraordinary activity displayed is caused by the spasmodic contraction and concussion of the ab-

dominal parts of the occupant against the side of the shell, which movement does not cease even after the covering is nearly split in halves, if the tender structure of the chrysalis be not injured. That it is the chrysalis and not the larvæ has been shown by the microscope, and its change to the perfect insect has been noted at weekly stages.

The average length of the insect is five-hundredths of an inch, and in each has been found from sixty to eighty pear-shaped ova. The engraving gives its general appearance, with wings raised somewhat unnaturally, for the purpose of showing their size and shape. It was drawn on the wood from the microscope, and is enlarged twenty diameters. Its ovipositor is a tiny, though perfect, piece of nature's mechanism, and lies encased in a shell at the lower part of the abdomen. The following is the technical description of the insect:

Genus Cynips—L. Cynips saltatorius (Nov. 8p.). Black, shining, head broad between the eyes, which are very prominent. Antennæ 14-jointed, the first and second joints being much smaller, and the third joint larger than the other two; the remaining joints are long, simple, and nearly equal. Thorax densely but finely punctured, very globose in front, projecting so far as to almost hide the head. Abdomen globose, shining. Ovipositor cases, short, spatulate received into margined groove in the body. Ovipositor itself flesh color, curved inwardly towards its middle. The abdomen is six-jointed. Terminal joint of palpi, hatchet-shaped. Tarsi very hairy throughout, the anterior pair with six and the remainder with seven joints. Coxæ very globose. Tibæ long, with large and powerful spires at the base.

A RICH DISCOVERY.

A pleasant morning in September, 1884, found the writer accompanied by his wife and daughter, in the vicinity of Cheyenne City, Wyoming Territory. We were seated in a drawing-room car of one of the fast trains of the Union Pacific railroad. Our meals were served in the dining-room cars that were attached to our train, and they were well cooked and given us in as good condition as at any first-class hotel of New York or Chicago. Everyone had had their breakfast, and felt the consequent satisfaction that results from partaking of a good meal. Sociability and joviality were the prominent features of the hour. The passengers were as happy and agreeable a lot as it has been my pleasure to meet. Everyone wished to know his neighbors, and to make the time pass pleasantly, and generally with success. A scarf-pin worn by one of the party was noticed by another, and the remark made that it was a decided novelty. The gentleman took the pin and passed it around for inspection, requesting each one to state what they thought it was. Opinions were various, but the general

decision was that it was an ancient gold coin, and was rather pretty, certainly. I coincided with these opinions, but went farther, stating the country, name, age of the coin, and gave a little history of its time. This led to a further discussion in regard to the coinage of various countries, and some of the gentlemen spoke so correctly and intelligently of the historical connections of the world's coinage that all were entertained and interested. From history, the conversation drifted to telling stories, and I requested that there should be a continuation of the theme of old coins, and that each tell some personal recollection that had occurred in their past history. The first was related by Dr. B——, of St. Louis, a man well known in the numismatic world; and the following is a digest of the main points of the story in his own words: "Shortly after the close of the war of 1860 to 1865, I held a position in a prominent bank of a large southern city that shall be nameless. The business of the bank was passably good. More borrowers than depositors were among our callers, for the people had only begun to rise from their ruined plantations, and lacked the means to restock and replenish them again. Help must be hired and no money to hire with. Everything was demoralized, and of necessity nothing but money could straighten out the perplexity of affairs. The banks were ready to furnish means, providing the security was good and ample. I remember distinctly of a lady calling one morning to negotiate a loan. She was plainly but neatly dressed, and as she desired a private interview, I invited her into the inner office and inquired what we could do for her. She told her story briefly and to the point, and with that air of refinement and grace that denotes the true lady. Previous to the war, her husband owned a fine plantation four miles east of the city limits, with nearly 200 slaves, and all necessary apparatus to carry on the plantation successfully. They had three children, one a boy of seven, and two girls still younger. Like his associate planters, her husband espoused the Confederate cause, joined the army, and in one of the great battles before Richmond, gave up his life to the 'lost cause.'

The close of the war found his family destitute and nearly penniless. All the slaves were freed; the Confederate Government had driven off all their stock, paying for the same in Confederate scrip. Now the Confederate scrip was worthless, fire had devestated their plantation, and nothing but their home buildings remained. They were in great need. Could she not effect a loan of a few hundred dollars on her land property? I laid the matter before the other officers of the bank, and they instructed me to drive over the lady's place the following day, and make a report of the condition of the plantation. This I accordingly did, and was pleasantly received by the lady and intelligent children. The son, now fourteen years of age, directed me in my drive over the premises. He was one of the brightest boys I had ever met, and showed training

by a master hand. To my inquiry who had been his tutor, he answered 'no one but mother.' About half a mile from the house, we passed a peculiar formation of ground, and I asked what it was. Harry answered it was the remains of an old French fort of by-gone time. He said he had found a few old coins, French apparently, while digging in it one day; and, on my return to the house, he showed them to me. All were copper but one, and this was covered with clay so not to be decipherable. I took my knife and cut through the incrustation, discovering it to be gold. Before leaving, I stated to Harry that it was possible that he might find more gold coins if he searched the old fortification carefully and thoroughly; and, if he did so, I would give him $3 each for all he found. Returning to the bank, I presented my report and it was decided not to loan the lady any money, as the security was not desirable.

[TO BE CONTINUED.]

NATURAL HISTORY OF THE BEE.

We give upon another page an illustration showing the different stages in the growth of the bee; the three classes into which the occupants of the hive are divided; the structure of different parts of the bee as shown by the microscope, and the distinct kinds of cells which appear in the brood comb. Each figure in the engraving will be introduced in the proper place as we proceed with the description.

THE WORKING BEES.

Of the three kinds of bees inhabiting a hive the workers form almost the entire swarm. They are called "neuters," because they do not serve for the propagation of the species. To explain this singular fact in the order of nature, it is thought that all the workers would have been females, like the queen, had not the eggs from which they were produced been deposited in cells too narrow to allow a proper development of their sexual parts. They are much less in size than the queens or drones, being about half an inch in length.

The working bee (figure 8) is no less admirable in the structure and form of its body than wonderful in its instinct or sagacity. It is perfect in proportion, and harmonious in the combination of its parts, all concurring to the design of its creation. On each side of its head is a large, round eye, sufficiently hard on the surface to be proof against injury from contact with the substances it ordinarily meets.

When these eyes require cleaning it is performed by the brush of the legs. The head is also furnished with two 'antennæ' or horns of delicate touch, by means of which they reciprocally obtain by feeling a knowledge of each other, their queens as well as their young. It is by these simple organs that bees are guided

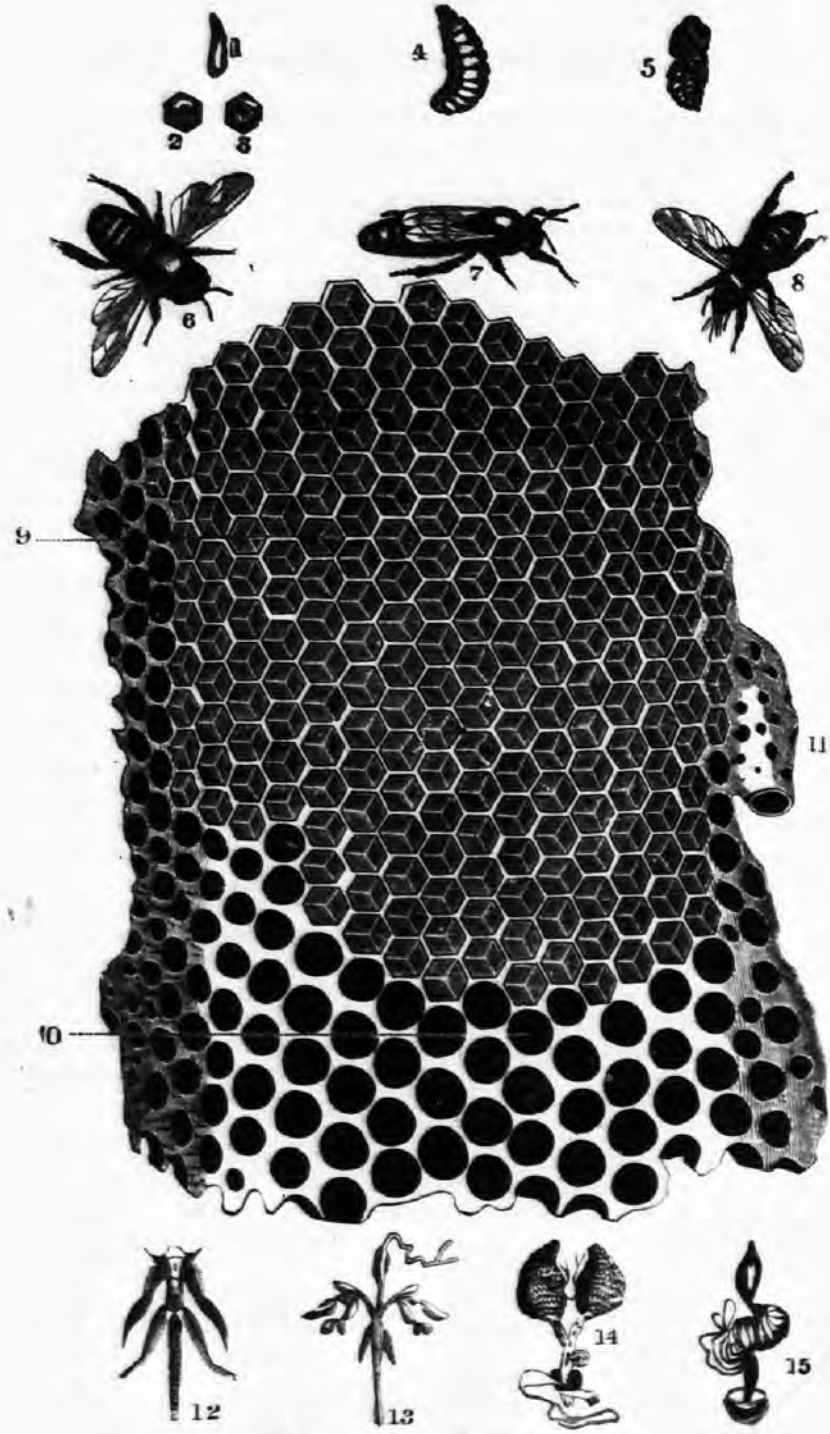
in the dark, and are enabled to construct their comb and cells and feed the young brood. It has a long tongue, proboscis or trunk (shown in magnified form in Fig. 12) for licking and sucking the honey, and two strong mandibles or teeth which enables it to construct the cells and combs as well as to carry all obnoxious substances from the hive. It has four wings and six legs. The third pair of the latter is much longer than the others, each containing a triangular cavity lined with strong curved hairs, used for the purpose of holding and carrying to the hives the pellets or little balls of pollen which it gathers from the anthers of flowers.

Thus, when a bee enters a flower the pollen adheres to its body, whence it is collected by the hairy legs into the form of a pellet and deposited into the cavity for transportation to its hive. At the extremity of each of the six feet are little fangs, with which they occasionally attach themselves in clusters to each other and to the sides of the hive. The abdomen is provided with two stomachs (magnified in Fig. 15), the first being only a simple bag, which is transparent, and when filled is of the size of a pea, containing nothing but honey, as it is collected from the fields, a portion of which is disgorged into the combs to serve as a store for the future; whilst another portion passes for nourishment into the second stomach. At the extremity of the abdomen there is a sting (magnified in Fig. 13), its weapon of defense, not consisting of a simple sharp pointed instrument, but of two lancets concealed in a director, and operated upon by muscles of uncommon strength, which, to a casual observer, would seem to be the sting itself. The external side of each of these lancets is provided with numerous arrow-shaped barbs, which prevent their extraction when pierced into the flesh without great pain.

When the retreat of the bee is hurried, or when the part stung is too firm, as the skin of man, the sting remains in the wound, and the bee thus injured only to die in a few hours. Notwithstanding the sting has become detached from the insect, it still retains its power of penetrating further into the wound. Again, the embarbed part of the sting is so finely polished that even with the best microscope no inequalities of surface can be discovered.

THE QUEEN

Is distinguished from the others by her form and size (Fig. 7), being usually about twice as long as a worker, with a color tending to a deeper yellow, although queens vary in size, according to the cells in which they are bred, some being scarcely larger than the working bee. Her abdomen is longer in proportion and its thickness is augmented when filled with eggs. Her legs are neither provided with bristles nor cavities, and her wings are much shorter than her body, in consequence of which it is somewhat difficult for her to fly. Her sting, which she seldom uses, except when in combat with a rival, is strong. and bent at the end.



THE HONEY-BEE, ILLUSTRATED.

The queen lays all the eggs in a colony. Figure 14 shows the ovigerous tubes and appendages in a magnified form. The eggs are quite small (magnified in Fig. 1), elongated, slightly curved, of a brown color, and are deposited into cells adapted in size and shape to the kind of bee that is destined to occupy them. The queen, before she deposits an egg, examines whether the cell is clean and suitable to its future occupancy, being aware which kind of bee will be produced from the egg she deposits. She lays profusely in the spring, less in the summer, but little in autumn, and in winter not at all. She first deposits eggs for workers, one, or rarely two, at the bottom of a cell; and as the combs are placed perpendicularly, the eggs of course rest in a horizontal position (Fig. 2) and not on one side of the cell like those of wasps.

She next lays eggs in the male cells, intended for drones; and last of all, in royal cells for queens. She always lays in the same order in respect to the kind of eggs, though they are less in number at every successive brood. Each sort is hatched in three or four days by the warmth of the hive, according to the season or climate, into 'larvæ,' or white worms, which lie in a curved position on the bottom of the cells (Fig. 3) surrounded by a thin, transparent fluid, or bee bread, believed to be prepared with pollen, mixed with honey and water, which appears to be adapted to their age. As they advance in growth, they lie horizontally with their heads toward the entrance, and repeatedly moult or shed their coats.

After the larvæ are sufficiently large, nearly to fill their cells (Fig. 4), say in about eight days, they prepare for another state called 'pupa,' 'chrysalis' or 'nymph' (Fig. 5), during which they require no food. The workers being aware of this change, cover the mouths of the cells with a light brown wax. When they are thus entombed, they are at first milky and soft, in which state they continue even after they assume the insect form until they gradually harden and change color, and in eight days more, at a trying moment, resulting in the death of many, break through their covering and, without assistance, come forth perfect bees, the whole period of metamorphoses occupying about twenty days from the time of depositing the eggs. As soon as the young bees emerge from their cells, they are wiped clean and presented with food by the workers, and in twenty-four hours after birth are capable of sallying forth into the fields, changing from a grayish or silvery hue to a yellowish-brown. The larvæ of drones are hatched in the same way as those of the workers; yet the time of their growth is somewhat less than that of the queens, which is usually about sixteen days.

THE DRONES

(Fig. 6) are larger and thicker than the workers, though similar in color, and are shorter than the queens. As they never visit

flowers for collecting sweets, their probosces are shorter than those of the workers, and they require no strong hairs to brush off, nor cavities in their hinder legs to hold pollen, and accordingly have not been provided with them. They are known to be males and are only useful in propagating their species, taking no part in the construction of the cells, in collecting the food, nor any interest in the economical duties of the hive, which they seldom leave except in the middle of warm days.

THE COMB.

Those who have seen a honey comb must have observed that it is a flattish cake composed of a vast number of cells, for the most part hexagonal, regularly applied to the side of each other, and arranged in two strata or layers placed end to end. Those intended for workers (Fig. 9) are hexagonal and horizontal, about an eighth of an inch in diameter, and six times as deep as they are wide. Those for drones (Fig. 10) are also horizontal, somewhat irregular and larger; but the royal cells (Fig. 11), or the departments for queens, are circular, still larger, and arranged perpendicularly in the comb.

Attention is called to the great variety in the table of contents of *The Century* for January. Its subjects embrace an authoritative account of the formation of Lincoln's Cabinet in the history by the President's private secretaries, with many unpublished letters; Mr. Kennan's startling record of personal investigations of 'Russian Provincial Prisons;' Professor Atwater's valuable and practical paper on the 'Pecuniary Economy of Food;' an illustrated article on 'The Catacombs of Rome,' by the Rev. Dr. Philip Schaff; in art and literature a critique and personal sketch of John Ruskin by Mr. Stillman, with an excellent portrait for the frontispiece of the number; in sport 'An Elk-Hunt on the Plains,' by Schwatka, with drawings by the younger Inness; in travel 'The Upper Missouri and the Great Falls' by E. V. Smalley, (illustrated); and many other interesting articles.

NOTES AND NEWS.

The 'Santa Clara Valley' Agassiz Association chapter has recently been organized at the office of that journal. Louise E. Francis, assistant editor *Santa Clara Valley*, San Jose, Cal., is the chapters' address.

J. G. Lemmon and wife, of Oakland, recently paid a long-deferred visit to San Diego, and propose to return again.

Abundant rains give promise of an excellent season for the farmer and botanist.

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These columns are free to subscribers only. All exchanges must be in by the 20th of the month to insure insertion in next number.

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