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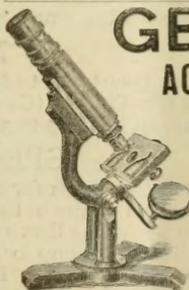
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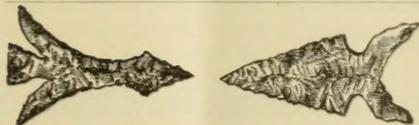
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THE WEST AMERICAN SCIENTIST.

VOL. V.

NOVEMBER, 1888.

No. 41

UNDESCRIBED VARIETIES OF *Calochortus Gunnisoni*.

There are three varieties of *Calochortus Gunnisoni*, Watson, which I describe as follows:

1. Var. *imaculatus*. A dark purple subquadrangular spot of some size on the inside of each petal beneath the gland. Petals, pale violet externally, greenish toward base. A purple band above the gland.
2. Var. *immaculatus*. The dark purple infraglandular spots absent. Petals not so violet externally. A purple band above the gland.
3. Var. *purus*. Like the last, but with *no purple band* above the gland.

This *Calochortus* grows in moist but not wet soil—they are particular about this.

T. D. A. Cockerell.

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THE COLORADO BIOLOGICAL ASSOCIATION.

This association has been formed for the purpose of investigating, in a detailed and systematic way, the Fauna and Flora of Colorado, both recent and fossil, and recording the results in such form as to be a permanent contribution to our knowledge of the Biology of the State. It was commenced early in 1887, as the "Colorado Ornithological Association," and while so known did good work under the leadership of Mr. Chas. F. Morrison, at the Ornithology of Colorado, resulting in a list of about 350 species and sub-species occurring within the State limits, which is now ready for publication. Now that the scope of the Association is widened, still better results are hoped for, as it is accordingly proposed to issue from time to time special bulletins on the fauna and flora of the State, which will be sent free to all members. There will also be an annual report, which will include a complete bibliography of the State for the year. Meetings will be held as often as possible, and it may be possible in the future to

found a library and museum. The annual subscription for members resident in Colorado is \$1.00, and that for corresponding members 0.25. Full particulars may be obtained from the secretary (pro tem), T. D. A. Cockerell, West Cliff, Custer Co., Colorado, who will heartily welcome all co-operation.

AMONG THE MAGAZINES.

"AN ENUMERATION OF THE PUBLISHED SYNOPSIS, CATALOGUES, AND LISTS OF NORTH AMERICAN INSECTS."—Bulletin No. 19, Div. of Entomology, U. S. Dept. Agriculture, 1888.—The title of this admirable bulletin sufficiently explains its nature, and it need hardly be said that it will be of the greatest value to Western Entomologists, who have so few opportunities for consulting the large public libraries. We should have liked the "List of works on Economic Entomology" (p. 70), to have been a little more comprehensive—only 25 titles are quoted—but probably want of space compelled its reduction within what might be considered desirable limits.

"NESTING OF THE RUDDY DUCK" by W. G. Smith. "Ornithologist and Oologist," Sept., 1888, p. 132 (on the nesting of *Erismatura nebida* at Loveland, Colorado.)

T. D. A. C.

"ABSTRACT OF PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY FOR THE YEAR, 1887" (publ. August, 1888, London, Eng., 127 pp. and 2 plates.) This volume is full of interest for the British Entomologist, but has, as one might suppose, but few references to Western North America. Pl. 2, fig. 2, represents the male sex of a remarkable beetle from Mexico, *Golofa hastatus*, showing the enormous thoracic horn. On p. 72 is a note on insects exhibited from Colorado, including some apparently new species of Hymenoptera. On p. 87, it is stated that a "melanic variety of *Vanessa urticae*" taken in Mexico, was exhibited—doubtless this was *V. milbertii*. P. 89 has an enumeration of Mollusca, said to be from Niagara river, but as a matter of fact, all except the first mentioned were from Colorado. There is also a note on a species of *Helicopsyche* from Colorado, and on pp. 92, 93. An account of a case of mimicry between *Vanessa antiopa* and a species of *Lecustidae* in the same State.

"A Provisional Host-Index of the Fungi of the United States" by W. G. Farlow and A. B. Seymour. Part 1. Polypetalæ. (Cambridge, Mass., August, 1888.)

All those who take any interest in Mycology will be sincerely grateful to the authors of this list, which supplies so obvious a want that it seems strange that Mycologists in the United States can have done so long without one. The present part embraces

52 pages of clear type on good paper, giving a list of the Polypetalous plants on which fungi have been recorded as found in extratropical North America; with a list of the fungi under each plant, in which full attention is paid to synonymy. Some species of plants stand as hosts to a very large number of fungi, *Liriodendron tulipifera*, for instance, having no less than 86, while the apple tree has 80. It is hoped that the remainder of the list will be issued during the coming winter, when also will be given any additions to part 1 brought to light in the meanwhile.

T. D. A. C.

I. M. COULTER and J. N. Rose. New Western Umbelliferae—*Eryngium armatum*, California, southward to San Diego Co. (Orcutt), *E. vaseyi*, California and Oregon, *Peucedanum martindalei*, Oregon and Var. *angustatum*, Oregon, Wash. Ter. and Vancouver I., *P. donnellii*, Oregon, *P. californicum*, California, *P. vaseyi*, California, *Selinum grayi* (Gmelin) Port. & Coult., Colorado, *S. dawsoni*, Yukon, *Cœlopleurum maritimum*, Wash. Ter. "Bot. Gazette," 1888. 141-145

C. F. MORRISON. A list of some birds of La Plata County, Col., in *Orn. & Ool.*, 1888, p. 115. This valuable little list continues, the present installment being from *Colaptes* to *Buteo*. The author writes of *Colaptes*, "all our flickers are true mexicanus, and I am glad to be in a country where *hybridus* is not found; in Wyoming I nearly became demented arranging my numerous specimens taken there."

"INSECT LIFE." Devoted to the economy and life habits of Insects, especially in their relations to Agriculture, and edited by the Entomologist and his assistants with the sanction of the Commissioner of Agriculture. Washington (U. S. Department of Agriculture), Vol. 1, 1888. No. 1, July, and No. 2, August.

Perhaps no department of Government work has ever been more thoroughly up to the standard to which it aimed than the division of Entomology of the Department of Agriculture. Agriculturalists and Entomologists alike have constantly been indebted to the careful and fruitful work of Prof. Riley and his assistants and it is therefore with most entire satisfaction that we greet the issue of a new monthly bulletin, "Insect Life," in which the results of that work, too bulky for full publication in the "Annual Report," will be given in detail, accompanied by many and excellent illustrations. The first number commences with a "salutatory" from Prof. Riley, wherein he says "We hope to make the periodical interesting and useful to all in any way concerned in entomology, and, without further comments or promises, we cordially invite such to co-operate with us in our endeavors." After this follows an illustrated biography of the corn-feeding *Syrphus* fly (*Mesograpta polita*), and many other interesting articles, including descriptions of five new species of *Oncœnemis* by I. B. Smith, namely, *O. fasciatus* from Nevada Co., Calif., *O.*

simplex from Utah, and three others from Colorado. There is also an account of the occurrence of the Chinch Bug in considerable numbers in California, where, however, it is not yet known to do damage. No. 2 contains, among other things, an account of the Morelos Orange Fruit-worm, which proves to be the larval of a fly-*trypeta ludens*. The only notes in this number dealing specially with the West are on depredations supposed to be those of the Western Cricket in Colorado, and a notice of the larval habits of *Dicerca* in the same State.

T. D. A. C.

W. G. SMITH. On the nesting of Audubon's Warbler (*D. auduboni*), in Larimer Co., Colorado, in "Orn. & Ool.," 1888, p. 114.

T. D. A. COCKERELL. On the distribution of Aquatic Forms. "Science Gossip," 1888, p. 182. In this paper the freshwater plants and marine shells and algæ of California are compared with those of Europe, and conclusions drawn. There are also various other remarks on Western species.

ON THE MESOZOIC MAMMALIA.

For a number of years past Professor Henry F. Osborn of Princeton College, has been assiduously devoting himself to the study of the taxonomy and morphology of the Mesozoic Mammalia, and in these investigations, this eminent paleontologist has been materially assisted by having been allowed the free use of the invaluable collections formerly utilized by Professor Sir Richard Owen, and now preserved in the British Museum, as well as the collections of Dr. Lemoine, of Rheims, and the American collections of Cope and Williams College. Enjoying such opportunities as these, and worked over by such a hand, we naturally look for more than ordinary results, and science is by no means disappointed in the matter. Professor Osborn's labors now come before us in the form of a magnificent royal quarto monograph of some seventy-five pages, and published by the Academy of Natural Sciences of Philadelphia, (Vol. IX, No. 2, July, 1888.) It is illustrated by thirty wonderfully clear woodcuts in the text, and two very fine lithographic plates, the handiwork of the famous house of Sinclair & Son, which is sufficient guaranty of their excellence. These drawings are all devoted to either the jaws or the dentition of the group under consideration, and amply illustrate the remarks of the author.

Formerly it was generally supposed by paleontologists, that the mammalian fauna of the Mesozoic period were of very limited number, as so late as 1871, Professor Owen, in his well-known monograph, described but twenty genera, while in the

work now before us, these are brought up to no less than thirty-five, five of which come from the Trias. A very convenient table shows the order of occurrence of these forms in time, so far as they are now known to us, the arrangement in the columns presenting the beds of England, North America, Africa, Australia, and the Continent. It is pointed out by our author, that, "In a rapid survey of this ancient fauna, we are at first struck with the very great diversity which prevails in the form and arrangement of the teeth, consisting of six or seven wholly distinct types; and this at a zoological period which we have been accustomed to consider as the dawn of mammalian life. The above types, although primitive, are essentially mammalian. In one genus only, *Dromatherium*, do we find clear evidence of reptilian affinity in the dentition. Then we are surprised to discover a very close zoological relationship between fossil faunæ of the same age, but having a wide geographical distribution. The most striking instance of this is the parallelism between the American and British upper jurassic fauna." These mesozoic mammals were characterized by their diminutive size, and the excessive number of teeth they possessed, which latter, otherwise, are less archaic in their pattern than we would be led to believe from a mere casual observation; the molars being in unusual numbers. As his task developed, Professor Osborn was led to lay especial stress upon (1) the generic characters of the British mesozoic forms; to show (2) their relationships to modern orders, that is all the known mesozoic species to the existing orders of mammals; and (3), a full discussion of the dentition in all its bearings. This is the fundamental plan of the monograph before us, and upon these lines it has been worked out with marked ability and clearness. The literature of the subject has been carefully gone over, and previous laborers in the same fields given in every instance, full credit for their productions. Space will not admit of our entering in detail upon the admirable classification adopted in this monograph, be it enough to say that it is based almost exclusively on the dentition, and that, "We first observe that the Mesozoic Mammalia divide into two large groups. In the first group, A, one of the incisors is greatly developed at the expense of the others, and of the canine, which usually disappears; behind these teeth is a diastema of varying width, while the molars bear numerous tubercles. In the second group, B, the incisors are small and numerous, the canine is always present, and well developed; the teeth usually form a continuous series, and the molars bear cusps instead of tubercles. These two divisions suggest those which obtain among the modern Marsupials, but are in fact much more sharply defined and widely separated from each other."

In conclusion, we find a general discussion upon the development of the teeth of these mammals in time, and masterly sections devoted to the zoological position of these mesozoic types in the two groups just mentioned, to their relations to the Mar-

supialia and the Insectivora, and finally, an appendix containing additional matter of prime importance. But so concisely are these chapters written, there not being a single sentence in any of them that could be subtracted without evident injury to the whole, and so fully is the matter treated, that it becomes obviously impossible to present their conclusions here without running the eminent risk of not only not doing full justice to their author, but failing to impart any adequate idea of their import to the reader of this brief notice,—the work must be read and carefully studied to be appreciated.

Such a classic production as this, with the subject of which it treats so skillfully handled, is indeed a credit to the science of any country, and it is with a sense of extreme satisfaction that we know that the literature of paleontology has been enriched by the addition of a contribution so thoroughly exhaustive in character, with its matter presented in a form so gratifying to the eye.

R. W. Shufeldt.

FORT WINGATE, N. M., August 14, 1888.

BOTANICAL NOTES.

On the Mississippi recently, at Prairie du Chien, I found a single plant of the hoary verbena (*Verbena stricta*), with pure ivory-white flowers, the normal color being blue.

The flowers of this species are larger than those of the other native species, and their color clear and most noticeable. The white-flowered specimen was a conspicuous object, seen against a close, unpainted board fence, about 300 or 400 feet south of Dousman's Hotel, a well known house located directly at the railroad station.

At the same station with *Verbena stricta* is to be found the procumbent *V. bracteosa*, and the ordinary blue vervain (*V. hastata*) of the Atlantic States.

Six miles from Rochester, a blotched *Brunella vulgaris* was found with one or two leaves perfectly white or cream-colored, and most of the others partially so.

SEPT. 25, 1888.

B. F. Leeds.

SOME NOTES ON THE CRAY-FISH.

(*Astacus Fluvialilis.*)

The cray-fish is sometimes called the fresh water lobster on account of its resemblance to that crustacean.

In the spring, about the middle of March, when the female cray-fish comes forth from its winter quarters, it has attached to the un-

der part of its tail numerous eggs fastened to small filaments; these eggs are of about the size and color of hemp seed.

These it carries about until sometime in May or June, when they hatch; but they still continue to cling to the filaments until they have gained sufficient strength to start out alone, they are then about $\frac{1}{4}$ inch long.

While young they grow more rapidly than when they are more advanced in age, they grow a little more than an inch in the first year.

Speaking from personal observations they grow to be about four inches in length when they have obtained their full growth.

The mouth is situated directly in front of where the large claws join the body, and is marked by a pair of jaws running parallel to each other and pointing forwards.

It sheds its shell every few weeks even to the covering of its eyes, after which it is soft for two or three days, it grows only during this state.

While in this condition it conceals itself beneath weeds and stones, because it is now defenceless.

The shell begins to form and is hardened at the end of about four days, when it regains its old confidence.

The cray-fish has the power of reproducing its limbs, when it has lost one through some accident.

Take it all in all they are very interesting, and there is always something new to be found out about them if they are closely watched and studied.

E. Starks.

INDIAN MILLS.

It is a well known fact that the Indians raised corn. They certainly had a way to grind or mash it. It is supposed by some that the mortars sometimes found, were used for this purpose; they may have been used in this way, but it is more probable that they were used for pulverizing roots, etc., by pounding with a pestle, for medicine. I have found several pieces of stone, with rounded edges, about two inches thick, and worn very smooth. The whole piece had been about thirty-two inches in circumference. The other part was made of stone shaped like a very shallow mortar, and made to fit the buhr loosely, the corn being placed between them, and ground by hand, something after the style of ancient Egyptian grinding. The stone of which the buhr was made was hard and granular, and when two pieces were struck together, like flint, they would "strike fire." This kind of a mill was used by the Catfish, and perhaps also by the Mohawk, Indians in Southwestern Pennsylvania.

HUMMING BIRDS.

BY S. ESTLE MILLER.

In all the field of oology, there is no group of birds so interesting to the naturalist as the humming bird. Its size, its gorgeous colors and the abundance of different species, have given this small bird a pre-eminent position among the feathered tribe. The continents and islands of America are its home, and no other country can boast of a single species. It may be found all the way from the Arctic regions, of the chilly north, to Patagonia in the south. They are more numerous in the West Indies and Central America than in any other part of the continent, and it is here that the most beautiful are to be found. The tiny crest of one of these shines like a sparkling crown of colored light, while the colors adorning the breast are equally brilliant.

The species of the humming bird family now number more than three hundred, and through the energy of naturalists, this number is being increased every year. These birds have taken their name from the soft, humming noise made by the rapid motion of their wings. It is claimed by some that this sound differs in different species, and often to such an extent that an observant ear can detect the species by this noise produced in its flight. One of the very common species here in Ohio is the ruby throat, which takes its name from the feathers that encircle its throat, and shine with a ruby lustre.

The humming bird arrives here in Ohio about the 5th of May, each year, and usually comes in pairs. They begin their nest-building about the first week in June. Not long ago, when out walking, we found the nest of one of the smallest of these birds. It was about half the size of a hen's egg, and was swung to a twig about the thickness of a knitting-needle. It was made of cotton fibers and the down of certain plants, and was covered with small bits of leaves and soft bark. The eggs, two in number, were white, elliptical in shape, and of nearly the same size at each end.

The naturalist Audubon discovered a very curious habit belonging to these birds, and one that he concluded was resorted to in order to conceal the whereabouts of their nest. It was this:

While watching the nest of one he saw the female bird suddenly leave its station on a neighboring limb and shoot perpendicularly into the air until it was lost from sight. After a few moments of patient waiting, he had the pleasure of seeing it descend and alight directly upon the spot where she had constructed her nest.

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(*Editorial from the Cosmopolitan, December, 1882.*)

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While the Verraux Freres were gaining a world-wide reputation, an American lad, William H. Winkley by name, was pursuing his studies at the famous technical schools of the French capital, and, when his means were all but exhausted, he left his lodgings in the Latin quarter and apprenticed himself under these famous masters. After serving a long and laborious apprenticeship in the study of animal forms, anatomy, and drawing, he considered himself sufficiently equipped for the practical work of his vocation. Returning to America, and selecting a small interior town where rents and living expenses were light, he set up an establishment of his own, as large as his limited means would allow.

To-day, he supplies the largest museums of the world with stuffed specimens from the elephant down to the smallest rodent, besides large quantities of minerals, rocks, fossils, casts of fossils, skins, and skeletons (unmounted) of animals of all classes, and often the wild animals themselves, alcoholic specimens, insects, crustaceans, shells, echinoderms, corals, sponges, and botanical specimens, from every quarter of the globe and in a great variety of form and price. Also anatomical preparations, chemical, philosophical and optical instruments, with Naturalists' supplies of every description, and, the Verraux Freres being now dead, he has established, as they did, stations upon every continent for the collection of natural history specimens. The attaches of all the stations are over 100 in number, many of whom are specialists.

At his American headquarters at Clearfield, Iowa, there are not far from 100,000 specimens of all classes. Besides mounting the skins sent in by his own collectors, this eminently successful taxidermist takes custom work in his department from those desiring the same, and many hundreds of persons and museums throughout the civilized world are constantly sending him mammal and bird skins and skeletons for restoration. Especially is this true of those scientific persons and wealthy individuals, who, while abroad, have shown prowess in the hunt.

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