

# ZOE

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P. O. Box 2114.

SAN FRANCISCO, CAL.

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### AN ORNITHOLOGICAL RETROSPECT.

BY WALTER E. BRYANT.

The irregular periodical abundance or scarcity of certain kinds of birds in localities where they were considered moderately common and the permanent total absence of some species in places where they had formerly been numerous, has frequently been brought to my notice in recent years. Marked changes of a permanent nature have occurred during my observations of more than twenty years in the region of the Bay Counties.

Examples of land birds of periodical temporary abundance may be cited in the cases of Lewis's woodpecker, pine siskin, cedar waxwing, western golden-crowned kinglet, western robin, varied thrush and mountain bluebird. The varying abundance of water birds, particularly the different species of ducks, is annually discussed by sportsmen.

Of species which have decreased or become entirely wanting in localities during the last one or two decades, or have undergone great change in respect to their fear of man, the following are good examples: California vulture, yellow-billed magpie, American raven, American crow, cliff swallow, California partridge and white and gray geese.

The causes for all of the changes are not readily traceable. Periodical increase and diminution of the seven species first noted above are largely due to causes which are known to act in governing the migration of birds—meteorological conditions and food supply, the latter I am convinced being but a small factor. These birds, with the exception of Lewis's woodpecker, being well known migrants, even the woodpecker and sometimes the jay are irregularly migratory. Peculiar seasonal conditions were always found correlative with the increased abundance of any of these birds. Their absence or rarity in a given locality has usually been taken as the

normal standard in annotated lists. It is not intended here to dwell upon the first of the two phases—periodical abundance—many instances, however, have come to knowledge through personal observations and reports and invariably in connection with meteorological phenomena.

Concerning the decrease of certain birds and their very noticeably increased wildness, I have been much impressed by the changes which have occurred within my own recollection, and more particularly with the changes of the last forty years deduced from the accounts of my father, D. S. Bryant, dating from May, 1850.

In June, 1850, he first met with the yellow-billed magpie near San Bruno (San Mateo County), and secured specimens without the slightest difficulty. The birds were also found at San Mateo (San Mateo County), at which place none have been seen since 1870 and they doubtless disappeared even earlier.

Sixteen years ago my father and myself found the magpies common near Gilroy; they were somewhat shy and care was necessary to approach within gun shot. They are now almost or quite absent from that locality. The same remarks are appropriate for the vicinity of Banta and Ellis, on the line of the railroad. Twenty-five to thirty miles from Banta, on the west side of the San Joaquin River, near Grayson, the birds were formerly (1878) common, but now nearly exterminated from eating the carcasses of poisoned animals, and the few that I found there in 1885 were wild beyond all possibility of approaching unconcealed. In March of the present year, Mr. Belding and myself made a collecting trip to Valley Springs (Calaveras County), where we found a few magpies, and had no difficulty in walking openly to within gun shot until after a gun had been fired, when they became exceedingly wild and could only be shot by strategy. The decrease of this species seems to me second only to that of the California vulture, and is plainly attributable to poison, and the few (magpies, not vultures) that are killed for scientific purposes and more that are sacrificed to the insatiable demands of the votaries of fashion. This species inhabits a comparatively limited area and although not in a broad sense an obnoxious bird will, unless some means are taken for its protection, soon be included with the doomed birds of North America.\*

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\*Zoe, i, 8, 284.

Another bird of increasing scarcity and wildness is the American raven. I cannot say that I have ever seen it within this State. Dr. Cooper (1870) evidently considered it a bird of general distribution. Mr. Belding during observations for the past fifteen years has met with so few that he states\* that it is "decidedly rare in Central California." In 1850, my father tells me, they were very common along the roadside from San Francisco to San Mateo, and were exceedingly tame. The vulture he has no recollection of having seen, but crows were common in Visitacion Valley (near San Francisco). The crow is still found in Marin County, but in Alameda County I have not seen one for more than fifteen years.

Eighteen years ago they nested at Berkeley in the old oaks which are now standing by the University campus. It was not unusual to find two or three nests in a single tree. The encroachment of civilization has probably been the chief cause of the crow forsaking its former haunts.

The turkey vulture (common buzzard) and mourning dove, have not decidedly changed their haunts within the past forty years, and although neither are considered wild in regard to their fear of man, still they are wilder than formerly. In those days all birds, including the host of small ones, were tamer than now.

The California partridge has been the most successful (if I except the detested sparrows from Europe) in holding territory after its occupancy by man, but in the more thickly settled communities they have steadily decreased in numbers and proportionately increased in traits tending towards their protection. In the breeding season, however, they are as completely off their guard as in former years, and just as much at the mercy of the despicable camping party who murder all ages, sexes and conditions under the flimsy plea that they "need meat." Can the human palate be so perverted and a mind so shallow as to relish the flesh of a sitting quail!

There has not, so far as I am aware, been a very marked decrease in the number of geese which annually visit California, but the area over which they now feed is considerably less than in 1850. In the fall of that year, my father, while going from San Francisco to San Jose, met with acres of white and gray geese near

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\*Land Birds of the Pacific District, 112.

San Bruno. They were feeding near the roadside, indifferent to the presence of all persons, and in order to see how close he could approach he walked directly towards them. When within five or six yards of the nearest ones they stretched up their necks and walked away like domestic geese; by making demonstration with his arms they were frightened and took wing, flying but a short distance. They seemed to have no idea that they would be harmed, and feared man no more than they did the cattle in the fields. The tameness of the wild geese was more remarkable than of any other birds, but it must be understood that in those days they were but little hunted and probably none had ever heard the report of a gun and few had seen men. This seems the most plausible accounting for the stupid tameness of the geese, forty years ago. What the wild goose is to-day on the open plains of the large interior valleys of California those who have hunted them know. By 1853 the geese had become wilder and usually flew before one could get within shotgun range, if on foot, but in an open buggy or upon horseback there was no difficulty. There was a very marked contrast between the stupidly tame geese after their arrival in the fall and the same more watchful and shy birds before the departure in spring of the years 1852 and 1853. This is an important fact, showing not only the change in the instinct occurring within three years, but the more remarkable change, or it may be called the revival of the instinct of fear, which was effected within a few months; to this point I will refer again.

The island of Guadalupe, off the coast of Lower California, offers an interesting example of the unsuspectingness of the local species in very marked contrast to the extreme shyness of the straggling avifauna. Yet in 1885-6, while making an enforced stay upon the island, I was enabled to very plainly detect the changes which had occurred within the decade since Dr. Palmer first explored it ornithologically.\* In 1875 the Guadalupe junco and house finch could be taken with a butterfly net, but not when I was there ten years later. I found the rock wren the tamest of all the resident birds; they would approach within a few feet of me while keeping motionless, and once one hopped upon my shoe. I was told that formerly the juncos and house finches sometimes alighted upon a

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\*Bull. Cal. Acad. ii, 6, 269.

person's hat or shoulder. Quite contrary to the confiding habits of these insular species was the unusual wildness of the dwarf hermit thrush and the shrike, which had come an hundred miles or more from the mainland.

Upon the Galapagos Islands, Darwin\* found the birds so tame that he could approach near enough to kill them with a switch or his hat and he even pushed a hawk from the branch of a tree with the muzzle of his gun. Upon Chatham Island (one of the group), he says: "The few dull colored birds cared no more for me than they did for the great tortoises." "Cowley (in the year 1684) says that the 'Turtle doves were so tame, that they would often alight upon our hats and arms, so as that we could take them alive, they not fearing man until such time as some of our company did fire at them, whereby they were rendered more shy.'" Darwin further says: "The Falkland Islands offer a second instance of birds of a similar disposition." On those islands the upland geese having learned of the danger from foxes, take precautions against them when nesting, but are not thereby rendered afraid of man whom they have not learned to fear.

From his own observations and those of others, Darwin concludes: "That the wildness of birds without regard to man is a particular instinct directed against *him*, and not dependent on any general degree of caution arising from other sources of danger; secondly, that it is not acquired by individual birds in a short time, even when much persecuted; but that in the course of successive generations it becomes hereditary."

This last clause does not coincide entirely with my own views and with the habits of the wild geese in the early days of California; either the individual birds did in a short time acquire the instinct of fear or the instinct was latent and revived within a short period and became intensified by persecution.

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## ASPLENIUM FILIX-FŒMINA AS A TREE FERN.

BY KATHARINE BRANDEGEE.

The species of ferns having an arborescent trunk are, as is well known, few in number, and nearly all tropical; those of the temperate zones in most cases producing their fronds from a decum-

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\*Voyage of H. M. S. Beagle.

bent or creeping stem called a rootstock. Where this rootstock is very short it is usually erect, but is little more than a crown.

There are, however, in America, north of the Tropics, several species which occasionally produce a somewhat lengthened erect stem called in such cases a caudex. Professor Eaton, in *Ferns of North America*, says of *Aspidium marginale*: "Professor Robinson has remarked of this species: 'This comes nearer being a tree fern than any other of our species; the caudex covered by the bases of fronds of previous seasons sometimes resting on bare rocks for four or five inches without roots or fronds.'"

Prof. L. M. Underwood, in *Our Native Ferns and Their Allies*, writing of *Aspidium conterminum* var. *strigosum*, another of the shield ferns, which is found in Florida, says: "Rootstock stout, erect, often extending a foot above the ground, bearing a crown of fronds."

Mr. J. H. Ten-Eyck Burr, of Cazenovia, N. Y., informs me also that he has collected *Osmunda cinnamomea* in swamps at Burt Lake in Northern Michigan with erect rootstocks about six inches in height and four inches in diameter.

California, somewhat given to boasting of the size of her productions, may now also claim the nearest approach our country can show to the tree ferns. There have appeared in some of the daily papers accounts of a native tree fern received last year from Humboldt County, by Mr. John McLaren, Superintendent of the Golden Gate Park, who takes much interest in the native flora of our coast. The best developed of these plants has an erect caudex two feet in height, five or six inches in diameter, dividing near the apex and crowned with very large fronds, the largest more than five feet in length and over two feet in width.

These ferns belong to a species known to botanists as *Asplenium Filix-fœmina*, commonly called Lady Fern, which is very widely spread over the extra-tropical northern hemisphere, and found also in the southern. The species runs into many varieties, as is usual in plants of wide distribution, and has, of course, many synonyms. This particular form has received the name var. *cyclosorum*. It has deeply incised pinnules, and the sori are rounder than in the usual form.

Remarkable as is the size of these specimens they are shown by examples found in Wildwood Glen near Saucelito to be only a greater development of a not uncommon form. In the upper part

of that ravine there grow in a small space a dozen or more clumps of this species, and in some of them the caudex is quite well developed, six to eight inches in height, and three to four in diameter. These caudices are, however, very deceptive; they are firm and mossy on the outside, but section shows the rootstock to be less than an inch in diameter, the remaining thickness being made up of the bases of former fronds, compacted and covered by a mass of short roots. The structure of the stems of the specimens at the Park has not been examined, but is undoubtedly the same.

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## THE GEOGRAPHICAL DISTRIBUTION OF LAND BIRDS IN CALIFORNIA.

BY CHARLES A. KEELER.

### III. THE SONORAN PROVINCE AND TRANSITION REGION.

By far the greater part of the State is occupied by the Sonoran Province, which includes all the non-mountainous regions. It is divided into two important Areas (as has been already explained), the Californian and Sonoran, while the Great Basin Area also reaches the State along its eastern slope. The Californian Area comprises the great central valley district, being the largest and most distinctive region of the State. For this very reason, however, its limits are less sharply marked and it has fewer species exclusively confined to it than any other Area. Indeed, it seems to penetrate nearly all parts of the State where the oaks grow, although having its center of distribution in the valleys of the Sacramento and San Joaquin rivers. On this account it is impossible to find any one species, the breeding range of which definitely marks the limits of this Area, although the ruddy horned lark (*Otocoris alpestris rubea*) may be taken as illustrating its more restricted boundaries, as may also the pallid wren tit (*Chamæa fasciata henshawi*). These, however, are mere varieties, and when we come to the species distinctive of this region we find that they are nearly all found in the Transition Region as well, while a few (such as the California cuckoo) even cross the Sierra Nevada Mountains to Nevada. Of the forms which are very characteristic of the Californian Area and found also in the Transition Region, the following are conspicuous examples: *Dryobates nuttallii*, *Melanerpes formicivorus bairdi*, *Trochilus alexandri*, *Pica*

*nuttalli*, *Guiraca cærulea eurhyncha*, *Progne subis hesperis*, *Vireo bellii pusillus*, *Harporhynchus, redivivus* and *Polioptila cærulea*. Such widely distributed forms as *Speotyto cunicularia hypogæa* and *Corvus americanus* appear to have their centers of distribution in this Area, but spread out both to the north and south in valley regions. The presence of the roadrunner (*Geococcyx californianus*) indicates most strongly the Sonoran derivation of the fauna, while such southern genera as *Coccyzus*, *Peuceæa*, *Guiraca* and *Polioptila* point in the same direction. Unlike the two Areas of the Boreal Province, we apparently do not in the Californian Area find that its characterizing features grow more pronounced as we go northward, but are distributed over the entire region with tolerable uniformity.

Before considering the Sonoran Area it may be well to take up the Transition Region, which seems to be more intimately connected with the preceding Area than with any other. I have already mentioned a considerable number of forms which are characteristic of the Californian Area which are also found equally common in this southern coast district; but in order to establish it as a Transition Region, we must also find some species which breed there which are characteristic of the Boreal Province and not of the Sonoran. An excellent example of this is afforded by Harris's woodpecker (*Dryobates villosus harrisii*), the distribution of which, as illustrating the boundaries of the Transition Region, may be considered in more detail. This bird is a resident of the Boreal Areas of California and of the Transition Region, but does not breed in the Sonoran Province. Quoting from Baird, Brewer and Ridgway's N. A. Land Birds (II, p. 509): "In California Dr. Cooper found this chiefly a northern bird, frequenting the forests of all kinds up to the summits of the Sierra Nevada, and also resident as far south as Santa Barbara, descending, in winter, to the eastern branches of the Colorado and to Tejon Pass. He found it more common in the higher Coast Range near Santa Cruz, and still more so towards the Columbia River." Mr. Belding, in regard to its distribution in Central California, says\*: "Tolerably common summer resident of the fir forests, apparently driven down from the higher Sierra in winter, though I saw one at Donner Lake, November 16, 1884, and a few at Big Trees, January, 1879, when there was but little snow."

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\*Land Birds of the Pacific District, p. 59.

In the same reference we find it recorded as breeding in the mountains about San Bernardino (F. Stephens), as a resident of the Fort Tejon and Mount Whitney regions (Henshaw), and as a common resident of the Willamette Valley (O. B. Johnson). It is recorded by Evermann from Ventura County\* as "resident throughout the year; common." In private lists it has been recorded from Cahto, Mendocino County, in May and June (R. C. McGregor), and from Eagle Lake, Lassen County, in July and August (W. E. Bryant). The above citations might be multiplied, but these are sufficient to show that while the breeding range of this bird in California is limited to the Sierra Nevada Mountains and the Coast Range it includes the *southern coast district* where the species is a common breeder. The plumed partridge (*Oreortyx pictus plumiferus*) is another example of a bird characteristic of the Boreal Areas and absent in the Californian Area which breeds in the southern coast district. The same is true, I believe, with the russet-backed thrush (*Turdus ustulatus*), which breeds chiefly, at least, in the mountainous districts of the coast and interior; including also the Transition Region, where it is very common.

We have thus far considered certain species characteristic of the Californian Area and of the two Boreal Areas which breed in this southern coast district, but there is still another element represented there, viz., the Lower Californian Area. Of this class of birds are *Trochilus costæ*, *Tyrannus vociferans*, *Icterus cucullatus nelsoni*, *Ammodramus beldingi*, *Ammodramus rostratus*, *Phainopepla nitens* and *Polioptila californica*. Finding, as we do, an overlapping of forms characteristic of each area in the State in this southern coast district, it seems perfectly reasonable to regard it as a Transition Region, and the reason for this seems not hard to find. Consisting, as it does, of a range of moderately low mountains, it sustains a varied vegetation of conifers, oaks and artemisia, thus affording environments suited to birds of all other areas in the State. Moreover, it is so situated as to be in direct contact with every other area: the Pacific Coast, Californian and Sierra Nevada Areas lying to the north have their southern extremities terminating in it; the Sonoran Area bounds it on the west and the Lower Californian on the south.

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\*Auk, iii, p. 93.

Passing now to the Sonoran Area, we find ourselves in the most strongly marked and highly differentiated region of the State. It contains not only a large number of species which are strictly limited to it, but even a few genera, such as *Columbigallina*, *Micropal- las* and *Pyrocephalus*. It is here that the orioles and thrashers attain their maximum abundance, and develop certain species not found elsewhere in the State.

The only region to which the Sonoran Area is closely allied is the Great Basin Area, which it resembles in many important details. It is a desert region with a very slight rain fall, while certain sections are utterly destitute of moisture. Consequently such species as inhabit it have become acclimated to a very unusual environment and are kept within tolerably distinct limits. As would naturally be expected, most of the birds inhabiting this region are pale and dull in color, due partly to the bleaching effect of the sun, but more largely to natural selection, by which protective colors are assumed; but we find also a few conspicuous departures in birds of tropical brilliancy in such species as *Pyrocephalus rubineus mexi- canus* and *Icterus cucullatus nelsoni*. The former is a resident of Central and South America, and serves to illustrate the close relationship existing between the Sonoran and Tropical Regions.

The distribution of Gambel's partridge (*Callipepla gambeli*) may be taken as illustrating the limits of the Sonora Area in California; and in order to show that this Area does not reach the coast in California it may be well to consider the range of this species somewhat in detail. In Cassin's work on the birds of the Western States (p. 47) the following is quoted from Col. McCall: "First, then, with respect to its western limit: This species was discovered by Dr. Gambel 'on the eastern side of the Californian range of mountains in 1841.' He did not meet with it on the western side; nor has it, as far as made known, been found there since that time by others." Mr. Belding, in *Land Birds of the Pacific District* (p. 14), cites several instances of its occurrence in California. Agua Caliente, San Diego Co. (F. Stephens); Mojave River and Fort Yuma (Heermann) Cooper, 1885. "Their range toward the north is not known to be above 36°. At Fort Mojave they are numerous," etc. On the whole, we may say that this species has its center of abundance in California along the Colorado River, whence it diminishes in numbers toward the north and west, reaching its northern limit

at about latitude  $36^{\circ}$  and its western at the confines of the Colorado Desert. This definition of the range of Gambel's partridge applies equally well in describing the boundaries of the Sonoran Area. It is along the Colorado River that we find the maximum in the number and abundance of species characteristic of this area. The following is a list of the forms peculiar to the region:

<i>Callipepla gambeli.</i>	<i>Icterus cucullatus nelsoni.</i>
<i>Polioptila plumbea.</i>	<i>Spizella atrigularis.</i>
<i>Micropallas whitneyi.</i>	<i>Amphispiza bilineata.</i>
<i>Colaptes chrysoides.</i>	<i>Melospiza fasciata fallax.</i>
<i>Melanerpes uropygialis.</i>	<i>Vireo vicinior.</i>
<i>Chordeiles texensis.</i>	<i>Helminthophila luciaë.</i>
<i>Trochilus costæ.</i>	<i>Oroscoptes montanus.</i>
<i>Pyrocephalus rubineus mexicanus.</i>	<i>Harporhynchus lecontei.</i>
<i>Otocoris alpestris adusta.</i>	<i>Harporhynchus crissalis.</i>
<i>Agelaius phœniceus.</i>	<i>Campylorhynchus brunneicapillus</i>
<i>Icterus parisorum.</i>	<i>Auriparus flaviceps.</i>
	<i>Columbigallina passerina pallescens</i>

There is but one other Area represented in California—the Great Basin Area. This is the Nevada fauna, which enters California north of latitude  $36^{\circ}$  and east of the Sierra Nevada Mountains. It is essentially an *Artemisia* country, and has a fauna closely related to that of the Sonoran Area, as shown by a number of forms which are common in both. Among these may be mentioned *Amphispiza bilineata* and *Oroscoptes montanus*. The presence of the sage hen (*Centrocercus urophasianus*) will generally serve to indicate the Great Basin Area. It appears, also, that the thrush occurring on the eastern slope of the Sierra Nevada is *Turdus ustulatus swainsoni*, in which case we would have in this variety another mark of the Area. This Area is, however, merely an incidental feature in California, and the part which it plays in influencing our avifauna is a small one.

## NOTES ON THE NATURALIZED PLANTS OF SOUTHERN CALIFORNIA. VII.

BY S. B. PARISH.

THE PACIFIC LAVATERAS occupy a peculiar position, not only as the sole American representatives of an old world genus, but in their habitat, which is restricted to the very western fringe of the continent. One species is occasionally seen on the continent itself, but always either in cultivation or in places where its presence is evidently due to the hand of man. Otherwise the four species\* which have been described are found only on a few rocky islets. Three of the four occupy each a separate island, while the remaining and most northern one has been found upon four other islands; but in no case do any two species grow together. Thus peculiarly situated the genus has been a prominent factor in the various theories that have been propounded concerning the insular flora.

The resemblance of at least one of the species to older European types has not been unnoticed by botanists, but their validity has been undisputed, and has been accepted by Baker in his recent monograph.† A tradition of the Spanish mission has, however, been brought to light in a late number of this magazine,‡ the acceptance of which deprives those plants of their physiographic importance as endemic species and reduces them to mere escapes from cultivation. It is said, in effect, that the Franciscan friars, about the middle of the last century, imported from Spain a certain "Malva rosa," which is identified with *Lavatera assurgentiflora*.

This easy disposal of a genus anomalous in American botany is not in itself undesirable. Unfortunately the evidence adduced is by no means clear or satisfactory, and is offset by an older tradition that the seed was first brought from Anacapa Island. Moreover, the behavior of the plant on the islands and on the mainland indicates that it is native to the one and introduced on the other. About the old Spanish Missions and Presidios it has entirely failed to become

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\**L. assurgentiflora* Kellogg, Proc. Cal. Acad., i. 10; San Miguel, Santa Rosa, San Clemente and Santa Catalina. *L. occidentalis* Wats., Proc. Am. Acad., xi, 124; Guadalupe. *L. insularis* Wats. l. c., xii, 249; Coronados. *L. venosa* Wats., l. c.; San Benito.

† Baker, E. G., Synop. Genera and Spec. Malvæ.

‡ Zoe, i, 188.

naturalized, surviving but a short time when no longer protected, and never found away from cultivation. On the islands, on the contrary, it is entirely at home, and at least on Santa Catalina, occupied, within the memory of living men, a large part of the island, only yielding to the overstocking of it with sheep and goats.

But the greatest difficulty is found in the fact that we have to account not for one "malva rosa," but for four. The tradition, it is true, relates to but a single species, but it is admitted that the others must receive the same disposal. Yet it can hardly be seriously supposed that the Fathers, with commendable care to guard against hybridizing, should have introduced each different species upon a separate island, or group of islands, and have cultivated only one of them about their own habitations. If to escape this difficulty it is proposed, against the general consensus of botanists, to reduce all to mere forms of a single species, the matter is scarcely bettered, since it then follows that in little more than a hundred years on each island has been differentiated from a common stock a form so distinct as to deceive the best students into defining or accepting them as good species. And this under conditions not very dissimilar, while at the same time the plant common to the northern islands and to continental cultivation, under conditions of greater variance, has remained fixed in type.

But whether the species are one or four no European type or types are suggested to which they are to be referred. Until these are adduced, and the American *Lavateras* identified with them on botanical grounds, it would seem needless further to consider this tradition of the Fathers.

*OLIGOMERIS SUBULATA.* On the ground that this plant is a Spanish migrant Gray and Hooker\* exclude the *Resedaceæ* from the flora of the United States. In this opinion Dr. Watson has not concurred, and classes the plant as indigenous in his Bibliographical Index. Elsewhere he says that it is "seemingly indigenous to the United States,"† and that "it is difficult to account for the wide spread of this plant, if of recent introduction, through a region so desert and sparsely inhabited."‡ It is commonly admitted to be

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\* *Veg. Rocky Mt. Region*, 30.

† *Bot. Cal.*, i, 53.

‡ *Proc. Am. Acad.*, xi, 108.

indigenous in Northern Mexico, of which physiographic province our desert region is an extension, so that there appears to be no good reason for refusing to consider it as native on this side the line. This is also indicated by the places in which it grows on the Colorado desert. Very few exotic plants have established themselves in that arid region, and these are not often met with away from roads, camping places, or habitations. But *Oligomeris* is not found in these places so much as in remote and unfrequented cañons, where the chances of its introduction are at the minimum. It is not an abundant plant in this State, and its Californian range was long ago accurately indicated by Torrey, as "dry places between the Colorado and the sea coast."\* The most northern station on the mainland, known to me, is at Santa Monica, where it has been collected by Dr. Hasse.

On the islands it has been reported usually as abundant, from Magdalena to the Channel Islands off Santa Barbara.† Mr. Brandege also reports it as occurring throughout the whole of that large part of the Peninsula which he has recently explored. Its presence through this arid and desolate region renders it still more difficult to consider it an introduced species.

*Petunia parviflora* has a generally similar geographical range, being found on both sides of the boundary from the Gulf of Mexico to the Gulf of California.‡ In this State it reaches on the sea shore as far north as Monterey.§ It has not been reported from any of the coast islands, nor from the peninsula of Lower California. It has been usually considered a native, but a shade of doubt has been thrown upon it by Dr. Gray, who calls it "a naturalized weed, and perhaps indigenous along the southern borders of the United States."|| In the later enumeration, however,¶ he includes it among the native plants, so that there may be said to be no dissent to this

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\* Pac. R. R. Rep., v, 359.

† Magdalena, Brandege, Pl. Baj. Cal., 129; Cedros, Greene, Pitt., i, 200; Guadalupe, Palmer, Proc. Am. Acad., xi, 113; Santa Catalina and San Clemente, Lyon, Bot. Gaz., xi, 333-4; San Miguel, Greene, l. c., 86; Santa Cruz., Greene, Bull. Cal. Acad., ii, 391.

‡ Torr. Mex. Bound., 155.

§ Bot. Cal., i, 546.

|| Syn. Fl., II, i, 243. ¶ Ib., Supp., 468.

disposition of it, which is indicated by the places and conditions of its growth.

On the contrary, the situations in which *Matricaria discoidea* most abounds in these southern counties are such as to suggest that it may be here a naturalized plant, although it cannot certainly be so pronounced. It is very common in yards and by roadsides, and about all sheep corrals it is almost certain to be plentiful. The same suspicion attaches to *Artemisia biennis*, which I know of only as a weed in cornfields, near Santa Ana.

Perhaps *Astragalus Hornii* ought also to be included among the doubtful plants. So far as I am aware it has been collected in this region only by myself, and my station, two small roadside patches near San Bernardino, is rather one for an introduced than a native plant. They have not materially increased during the ten years that I have observed them, and are now nearly destroyed by the construction of a railroad. Still it is a species to be expected here, as it has a known range from Bakersfield and Owen's Valley to Southern Utah,\* and has been recently collected in the northern part of Lower California.† Occurring thus on both sides of us it will probably yet be found under less questionable circumstances than at its present sole station.

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## THE WOLVERINE (*Gulo luscens*) IN CALIFORNIA.

BY L. BELDING.

I believe there is no record of the occurrence of this animal in this State, though I have been aware of the fact since about the year 1875, when Dr. Eels, the well known clergyman of Oakland, Mr. Merrill of San Francisco, and myself, climbed up to Lake Francis from Soda Springs on the north fork of the American River. Upon reaching the lake three strange animals bounded from near its margin up a steep hill to the base of basaltic cliffs in which they disappeared. We were within about a hundred yards of them, and I fired two loads of buckshot at them without apparent effect.

One of the party suggested that they might be young bears, but neither of us were able to name them satisfactorily. Afterward,

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\*Bot. Cal., i, 150.

†Brandege, Pl. Baja Cal., 149.

however, I became convinced that they were wolverines. I believe I have seen the animal on two other occasions in the high Sierra, and once saw what I thought were tracks of three in fresh snow as low as 5,000 feet altitude. This was at Big Trees in January. Mr. Watson, a hunter of Lake Tahoe, tells me he knows of the killing of wolverines on the Tahoe and Placerville road, and Abe Ritchie, who trapped a long time in Alpine County, told me he caught one there, and I think said he had it mounted at Carson, Nevada.

A few weeks ago I met Mrs. J. B. Scott, who formerly resided in Hope Valley, Alpine County, and enquired if she remembered Mr. Ritchie's strange animal, and she said she had a picture of it.

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### NOTE ON CYBISTER.

BY L. E. RICKSECKER.

Two species of *Cybister*, both abundant in the streams of California, *C. ellipticus* Lec., and *C. explanatus*, Lec., are somewhat difficult to separate. Mr. G. R. Crotch, in his paper on the Dytiscidæ of the United States, published in the Transactions of the American Entomological Society, June, 1873, says of *C. explanatus* that it is "extremely near *ellipticus*, but the females are generally smooth, the elytral margin is narrowed at the apex, and the stridulating plate (of the male) has five well-marked rugæ," instead of 3-4, as in *ellipticus*.



Fig. 1.



Fig. 2.

These rugæ have probably nothing to do with stridulation and they are not confined to the males. I have females of both species that possess them. They are situated in front of the posterior coxæ, on the metasternum, and are too inconstant for much dependence to be placed upon them. In *ellipticus* they are generally three to four in number with sometimes a fifth partly developed. *Ex-*

*planatus* generally has five rugæ. One specimen, collected by myself, in Sonoma County, has five on one side and six on the other. A female, collected in Los Angeles County by Mr. Coquillett, has four ridges on each side.

In addition to the above characteristics, I would draw attention to the inner angle or apex of the hind femora of these two species, which differ very decidedly in this member, a difference that I do not find mentioned elsewhere, although it is quite constant, at least in all the specimens that I have examined (fig. 1). In *ellipticus* the apex of the hind femur forms almost a right angle, without any perceptible point, resembling, in this respect, the eastern *C. fimbriolatus*, Say; but in *explanatus* the apex is formed into a distinctly drawn-out point. The same difference is observable in the apices of the hind trochanters of the two species, but not to so great an extent.

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FIG. 1—Right hind femur of *C. ellipticus*.

FIG. 2—Right hind femur of *C. explanatus*. Both magnified three diameters.

## A NEW NOLINA.

BY T. S. BRANDEGEE.

**NOLINA BELDINGI:** Arborescent, 5-7 m. high, including a panicle, 2 m. in length: trunk about  $\frac{1}{2}$  m. in diameter, dividing near the top into many short branches bearing numerous new and old leaves at their ends: leaves about 1 metre long, 2 cm. wide, narrowed above the broad base, flat, not carinate, strongly serrulate upon the margins, thin and glaucous, narrowing gradually to the point: panicle compound, branchlets 8-10 cm. long: fruit emarginate, on pedicels 5-10 mm. long, jointed near the base: seeds not bursting the cells, round-ovate, 3-4 mm. in diameter.

This *Nolina* seems to be peculiar to the summits of the highest mountains of the Cape Region where it grows amongst the oaks and pines, and forms the most striking part of the vegetation. Its general appearance is similar to that of the *Dracæna*, so common in the gardens and parks of San Francisco. The trunk is crowned at its summit by a mass of leaves sometimes 8 or 10 feet in diameter, and from them grow the panicles 6 feet in length. The living leaves are

thin and weak, bending outward and drooping as much as the mass of persistent leaves below will allow. It probably blooms in July or August. I have seen no fruiting specimens of small size, and it was almost impossible to obtain fruit, until at last one tree was found growing by the side of a large rock, the climbing of which enabled me to get it. This was in the Sierra de la Laguna, where the species is very abundant. The fruit was old at the time of my visit in January of last year. In October I found it on the summits of the San Francisquito Mountains, long past flowering, and failed in getting fruiting specimens from a somewhat unexpected cause. Finding a tree growing on a steep hillside by the side of a cliff in what seemed a favorable situation for obtaining the fruit, I endeavored to reach it, but on touching the tree a crowd of wasps came pouring out of the great mass formed by the dead and adherent leaves of former seasons. Of course I did not wait to verify the truth of the reputation they bear among the Mexicans, which, freely translated, is that they are "very brave little animals." Afterward I found that these wasps, so common in the peninsula and often attaching their nests to cliffs where they hang pendent from one end, make use of the *Nolinas* as well as the palms for a similar purpose, and it is difficult to find one not infested.

In the central part of the peninsula last year I saw a few trees of an aborescent *Nolina* growing near the head of a cañon, and lower down found what was evidently the same species, growing in the usual manner of the genus—that is, with simple caudex, terminated by a crown of leaves. These specimens belonged probably (they were without flower or fruit at the time) to *N. Palmeri*, and prove that even the remarkable size of *Nolina Beldingi* is not a specific distinction, the caudex of any of the taller species being capable of becoming arborescent and branching.

The species is nearest *N. Bigelovii* and *N. Parryi*, but seems to be distinct from these, as I understand them growing in the field. The specific name is given in compliment to Mr. L. Belding, the well-known naturalist, who was the first to notice it in his ornithological expedition to the Sierra de la Laguna, several years ago, and who gave me directions as to the route by which I was enabled to find it.

# NOTICE OF A SUPPOSED NEW VIREO FROM OREGON.

BY A. W. ANTHONY.

A recent comparison of specimens of *Vireo huttoni* from northwestern Oregon with a series from southern California, in my collection, leads me to believe that there are two well-defined races represented.

The series of northern birds is, however, not large enough to enable me to fully establish the standing of that form—the status of which I propose to determine as soon as I can obtain sufficient material.

Specimens from northwestern Oregon (Washington County) and the region of Salem exhibit a uniformly rich suffusion of olive and yellowish tints, much brighter than in any California examples which I have examined, together with darker upper parts, and much more buffy breasts.

Selecting as typical examples of the two forms a specimen from my collection taken at Beaverton, Washington County, Oregon, March 20, and a specimen collected March 19, at Santa Ysabel, San Diego County, California, from the collection of F. Stephens, the differences may be summed up as follows:

## CALIFORNIA (*huttoni*).

Wing bars white. Primaries, secondaries and rectrices edged with pale olive-green, brightest on tail. Above, olive-gray; pale olive on rump.

Under parts olivaceous-white; sides more olivaceous, purest behind; very slight buffy tinge on breast.

Loral region and narrow ring around eye, dull yellowish-white.

## OREGON (*obscurus*).

Wing bars yellowish - white. Primaries, secondaries and rectrices edged with rich olive-green, brighter on tail. Above, darker; olive tints darker and much brighter.

Under parts buffy-white, purest behind; sides and flanks olivaceous-buffy.

Loral region dusky-white, a narrow ring of yellowish - white surrounding the eye, and sharply contrasting with surrounding parts.

The type of *Vireo huttoni* was taken at Monterey, California, and as far as I am able to judge from the description, does not materially differ from the series in my possession, from San Diego and Los Angeles Counties, thus leaving the Oregon form eligible to a new name, for which I propose *Vireo huttoni obscurus*, should the above differences prove as constant as I now suppose them to be.

STUDIES IN COREOPSIDEÆ AND TAGETINEÆ,  
ESPECIALLY OF LOWER CALIFORNIA, WITH DE-  
SCRIPTIONS OF SOME NEW SPECIES.

BY T. S. BRANDEGEE.

LEPTOSYNE HETEROCARPA Gray. This was originally collected by Xantus near Cape St. Lucas. It has been identified with *L. parthenioides* both by Dr. Watson\* and by myself.† In this we were probably in error. There grows in the mountains of the Cape Region a tall annual species, sometimes four feet high, with yellow rays, dissected margins to the akenes and more dissected and conspicuously punctate foliage. It appears not to belong to low elevations, but occurs there in the "washes" of mountain streams. The specimens collected at San Jose del Cabo have no awns to the akenes, but they are present in specimens collected in the mountains back of Todos Santos. The species rests mainly on its size and on its yellow rays. The lobes of the dissected wing, both in this species and in *L. parthenioides*, are setose, especially in early stages.

*L. PARTHENIOIDES* is usually low or small, its rays white or tinged with purple, and with purple veins. Its leaves are also punctate, and it grows at low elevations as far south as the Cape.

LEPTOSYNE DISSECTA (Benth. under *Acoma*) is a suffrutescent perennial, as was stated in the Botany of the Sulphur.‡ The three species must be considered as at last satisfactorily identified.

Heterospermum and Bidens, nearly related genera, especially abundant in Mexico and Baja California, are brought even nearer

\*Proc. Am. Acad., xxiv, 56.

†Proc. Cal. Acad., ser. 2, ii, 176.

‡Ib., 176-7.

by two of the following species. *Heterospermum* differs from *Bidens* chiefly in having wing-margined outer akenes and styliferous rays. Some species of *Bidens* also, however, have styliferous rays.

*HETEROSPERMUM XANTI* Gray, Proc. Am. Acad., v, 162, is one of the new species of the Xantus collection from Cape St. Lucas, and was described from a "single specimen 6 or 7 inches high, hardly sufficient for description." Concerning it Dr. Gray writes: "The disk-achenia and indeed the whole structure, except the fertile achenia, accord with *Bidens*." An abundance of specimens from the Cape Region shows a much nearer relationship than was supposed by Dr. Gray. It is a common plant about San José del Cabo, where it grows to height of a foot and is often much branched. From the Cape to the highest altitudes of the interior Sierras, it is not uncommon but in the mountains it is smaller and often abundant enough to give a yellow tinge to the hillsides. The outer broad akenes are usually smooth on the back with corky margins, and a similar ridge along the ventral face, each of these three lines in most cases continued into a strong awn. The breadth of the wing is variable and some of the inner akenes are not rarely roughened with whitish protuberances.

At San Bartolomé occur forms with somewhat broader and shorter leaf-segments, which are apparently identical with *Bidens Xantiana* Rose.

*BIDENS HETEROSPERMA* Gray—at least Pringle's No. 1637—has strongly three-angled akenes, the outer much shorter, broader, more or less rugose or corky, the awns absent or caducous.

*BIDENS HETEROPHYLLA* Ort., from San Francisquito mountains, has the outer akenes more or less warty.

The following species approaches *Heterospermum* by having fertile rays and sometimes a slight thickening of the margins of their akenes. It is one of the handsome plants of the summits of the high mountains in the interior of the Cape Region. The finely divided leaves crowded near the woody bases of the many stems, contrasted with the conspicuous yellow flowers, make the clumps of this species growing on the cliffs noticeable.

*BIDENS NUDATA*. Suffrutescent, glabrous, 4-5 dm. high, with many stems from a woody base: leaves connate and sheathing at base, dissected into rather remote filiform divisions, 4-5 cm. long,

crowded at the base of the stems, the upper ones few and small: heads few on long, sparingly branched nearly leafless stems: outer bracts of the involucre linear-lanceolate, shorter than the ovate, obtuse, colored scales of the inner: rays 6-8, broadly oval, yellow, 1 cm. long, nearly entire, styliferous and fertile: akenes 2-awned, those of the outer florets caducous, nearly glabrous, thickened on the margin and inner ridge with short protuberances, slightly exceeding the involucre, compressed quadrangular and of equal width their whole length, the outer little shorter than the inner ones.

The following species grows near Miraflores in Baja California, under the shade of trees and bushes.

*BIDENS REFRACTA*. Annual, 4-5 dm. high, somewhat branched, glabrous: leaves divided into three ovate, serrate, acuminate leaflets, 8 cm. long, the terminal one much smaller: heads on stout pedicels 4-6 dm. long, rayless, flowers ochroleucous: akenes quadrangular, glabrous except near the top, slightly attenuate at the apex, arcuate; awns usually 4, 4-5 mm. long, one nearly erect, three refracted downward: inner akenes 20-25 mm. long, outer 8-10 mm. long: bracts of the outer involucre linear-lanceolate 8-10 mm. long, twice the length of the inner linear pointed ones.

At first sight this *Bidens* with large heads and spreading, strongly curved akenes appears to be a monstrosity. The central akene is sometimes nearly straight, but it has always the three refracted awns of the outer curved ones. The bent awns evidently fill the office of the barbs in the ordinary species, for in this plant they are very soft and small. The fruiting head contains 15-20 akenes.

In the *Genera Plantarum* of Bentham and Hooker, only fourteen genera, five of them monotypic, are included in the subtribe Tagetineæ, and the following are reduced either by them or their predecessors to synonyms. *Willdenowia* Cav. *Schlechtendalia* Willd. *Bæbera* Less. *Lebietna* Cass. *Clomenocoma* Cass. *Comaclinium* Scheid. & Planch. *Aciphyllea* Gray. *Gnaphalopsis* DC. *Lowellia* Gray. *Solenotheca* Nutt. *Diglossus* Cass. *Enalcida* Cass. *Pectidopsis* DC. *Chthonia* Cass. *Cryptopetalon* Cass. *Lorentea* Lag. *Cheilodiscus* Triana.; and Dr. Gray has since excluded *Clappia*, reducing one of the species to *Dysodia* and relegating the other as a monotype to the vicinity of Jaumea. He has also reduced *Thymophyllum* to a synonym of *Hymenatherum*. *Adenophyllum*

is invalidated by one of the species of Tagetes, described below, and several species of Porophyllum; *P. scoparium*, *P. crassifolium* and *P. tridentatum*,\* which all agree with Chrysactinia in their long tubular corollas, and their short akenes not contracted at the top, and much exceeded by the pappus, lessen much more than was previously supposed the distance between the two genera; the latter, however, gaining a little strength from the additional species recently described by Dr. Watson.†

Baillon in Histoire des Plantes reduces the genera of the Tagetineæ to six, including in Tagetes, Dysodia, Adenopappus, Nicolleteria, Adenophyllum, Hymenatherum and Thymophyllum; Pectis is unchanged; Syncephalanthus, Schizotrichia and Chrysactinia are kept up; and Lescaillea is reduced to Porophyllum.

The presence or absence of rays can now hardly be considered of generic importance, when it has so often been shown to have little specific value. Nicolleteria is therefore kept out of Porophyllum almost entirely by its double pappus, but a careful examination shows the difference to be more apparent than real. In such species of Porophyllum as *P. tridentatum* and *P. crassifolium*, especially in some specimens of the last from Paso de los Dolores, the pappus consists of an inner series of broader flattened awns or narrow scales, and an outer one of bristles, compacted at the base, however, into a single series, as may be readily seen to be the case in Nicolleteria.

The species of Porophyllum are in many cases so carelessly described, or founded on such trivial distinctions, as to be very uncertain. Of the twenty-four enumerated in De Candolle's Prodrômus, eight, comprising the sections *Cusimbua* and *Kugaia*, were transferred by Bentham and Hooker to Gynura in the Senecionidæ. To the sixteen remaining species *P. macrocephalum*, *P. ellipticum*, *P. ruderale*, *P. viridiflorum*, *P. nummularium*, *P. jorullense*, *P. lanceolatum*, *P. prenanthoides*, *P. Hænkii*, *P. lineare*, *P. linifolium*, *P. linaria*, *P. tagetoides*, *P. decumbens*, *P. coloratum* and *P. obtusifolium*, have been added. *P. gracile* and *P. tridentatum* Benth., Bot. Sulph., 29-30; *P. Seemanni* and *P. Lindeni* Schz. Bip. Bot. Herald, 308; *P. angustissimum* Gardn., Hook. Lond. Jour.

\*All these species, excepting the first, agree with Chrysactinia in having a bulbous base to the style.

†*C. truncata* and *C. pinnata*. Proc. Am. Acad., xxv, 154.

Bot., vii, 410 (Brazil), said by the author to be very near *P. lineare*; *P. latifolium* Benth., Hooker Jour. Bot., ii, 44 (British Guiana); *P. cæsium* Casar., Walp. Rep., vi, 722 (Brazil); *P. amplexicanle* Engelm., Pl. Wright; i, 120; *P. scoparium* and *P. Greggii* Gray, Pl. Wright, i, 119-20, the latter species reduced afterward by the author in Syn. Flora vol. i, pt. 2, 355, to both *P. gracile* and *P. scoparium*; *P. filifolium* and *P. Ervendbergii* Gray, Proc. Am. Acad., xix, 35, where he reduces *P. Lindeni* to *P. viridiflorum*; *P. tagetoides* to *P. coloratum*, and suggests the older specific name *suffruticosum* for *P. linifolium* "mainly" and for *P. decumbens*. The latest species proposed is *P. crassifolium* Watson, collected by Dr. Palmer on the mainland of Lower California and also on Carmen Island in the Gulf. Hemsley in Biologia Centrali-Americana, accepts the conclusions of Dr. Gray as to the Mexican species, evidently without study of the material at his command, a defect which is too apparent nearly throughout the botanical part of the work.

It is plain from the above that the genus is much in need of revision. The few notes given below are contributed in the hope of making some of the species of our southern border better known. The species are separated apparently by such slight and variable characters that any competent revision would probably reduce them one-half at least. One of the organs generally overlooked in Compositæ, the "nectary," may be of some assistance in diagnosis, perhaps also the base of the style.

The color of the involucre, and to a certain extent the proportions of the corolla, appear to be of little importance. They certainly fail in our best known and most widely spread species *P. gracile*. This plant from Magdalena Bay, the original locality, is a woody-based perennial, a foot to eighteen inches high, growing in dense clumps; involucre smooth, greenish or purplish; corolla pale, one segment much more deeply cut than the others; proper tube a little shorter than the remainder of the flower; throat moderately dilated; akenes all alike and free, narrowed at the top, equaling the yellowish pappus and nearly equaling the corolla. The Californian specimens accord well enough with this and show similar variations in the color of the involucre, but in a specimen collected by Pringle in 1888 on "Hills near Tucson," the entire plant is glaucous, the tube of the corolla equals or exceeds the throat and limb; and the appendages of the anthers, the thickened upper part of the filament and the lobes of the corolla are studded with very minute glands.

What has passed under the name of *P. gracile* from the Cape Region may possibly belong to some other species. It usually grows tall and slender, and has a pleasant fragrance which I do not remember ever to have noticed in the specimens about Magdalena Bay. It is called by the natives "Yerba del venado"—deer weed. The heads are pale, slender and few-flowered; corolla greenish-white, deeply cleft; the proper tube very slender, nearly as long as the remainder of the flower; akenes all similar, tapering above, about as long as the corolla, and longer than the yellowish pappus.

*P. filifolium* D.C., as represented by Pringle's "No. 2401, Chihuahua," has shortly cleft corollas, the gradually dilated throat much longer than the tube; pappus a little shorter than the corolla; scales of the involucre broadly concave, obtuse; akenes not narrowed at apex, all alike and free; pappus short, yellowish.

To this species I refer doubtfully a plant growing on rocky sides of cañons near San José del Cabo. It is of slender growth, about three feet high, with few and large dark purple heads, and long filiform leaves, the weak stems waving to and fro in the wind. The tube of the corolla is nearly as long as the remainder; the throat widely dilated and lobes rather deeply cut, style yellow, akenes narrowed at apex nearly twice as long as the soft white pappus, all alike and free.

*P. Seemanni*, Schz. Bip. Palmer's "No. 279, Guaymas, 1887." Flowers greenish, tube about as long as the remainder, throat long, campanulate, lobes very short, styles yellow, branches long and terete, scales of involucre broad, plane, obtuse, akenes hardly narrowed, all alike and free. His "No. 216, southwestern Chihuahua," has the tube somewhat shorter than the rest of the corolla, the throat widely expanded and the lobes rather long, style purple, branches long-acuminate, akenes strongly narrowed towards the top, the five outer smooth, each attached to and embraced by the corresponding involucre bract, which is beaked and somewhat heeled, all the inner akenes pubescent.

"Tagetes is a genus so natural," writes Dr. Gray in Proc. Am. Acad., xix, "that no question of its limitation has ever been raised." Yet some of its species connect very closely with neighboring genera, several like *T. Lemmoni*, have more or less calyculate involucre, while one of the species of *Dysodia*, *D. serratifolia*, as both

DeCandolle and Dr. Gray state, has the naked, united involucre of *Tagetes*. I have nowhere seen it stated that the pappus of *Tagetes* is duplex, and *Adenophyllum* is kept separate from *Dysodia*, and related genera principally on such ground. In the first of the following species the pappus is not only as usual heteromorphous but is plainly in two series; several others, however, show an approach to such a state, notably *T. Parryi*, *T. Lemmoni* and *T. Palmeri*. In these the awns apparently belong to the inner series and are less corneous than those of such species as *T. peduncularis* or *T. micrantha*.

**TAGETES LACERA.** Perennial (?) glabrous, with many stems from the base; stems erect, terete, 1 m. high; leaves opposite or alternate, 10–15 cm. long including the half as long terminal segment; rhachis more or less margined and toothed; segments 7–11, lanceolate, acute; rhachis, teeth, depauperate lower segments, and the small upper leaves setiferous; peduncles elongated ventricose-inflated; heads solitary; involucre campanulate 12–15 mm. long, 8–10-toothed; rays yellow, shorter than the involucre, oblong, retuse, often with two slender lobes from the summit of the tube; style often 3-parted: flowers of the disk not bearded within: pappus of 1–4 usually 2, firm scales, one-half the length of the akene or more, tapering into brownish awns, and an outer series of several short more or less lacerate paleæ.

Summit of Sierra de la Laguna, under the shade of oaks and pines. January, 1890.

**TAGETES SCABRA.** Apparently annual, but the roots far-spreading, 10–16 cm. high, ramose: branches angled, strongly scabrous on the angles; leaves thick, opposite and clasping, dotted, pinnatifid, with 7–13 linear entire, acuminate, not setaceous segments, margins and midrib strongly scabrous: peduncles short, axillary and terminal, sometimes very short, angled and scabrous: involucre smooth, ventricose-clavate, 6–9-flowered, slender, 6–8 mm. long, truncate at apex, the five segments united to the top and each terminated by a recurved short awn: rays 1–3 apparently white, short, obtuse: akenes clavate, hispid on the angles; pappus of 2–5 truncate paleæ with as many stout awns two-thirds the length of the akene:

Antigua, Guatemala, from an unknown collector. In general appearance resembling *Dysodia chrysanthemoides*.

## SOUTHERN STATIONS OF THE ROSE BAY.

On page 83 of this journal a note was made of the occurrence of *Rhododendron Californicum* at Waddell's Mills in Santa Cruz County. Since that time it has been again reported from Santa Cruz County,\* and Mr. McLaren, Superintendent of the Golden Gate Park, states that he has dug up plants of it in the mountains three miles back of Monterey.

T. S. B.

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\* F. L. Clarke. Catalogue of the Plants of Santa Cruz County.

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 RECENT LITERATURE.

*The "Gila" Monster.* By S. GARMAN. This paper is a reprint from vol. xxii, Bull. Essex Institute. The author, the well known curator of the Harvard Museum of Comparative Zoology, comes to the rescue of the much maligned "Monster," and shows by observations and experiments on a specimen kept in confinement at the museum, that many of the reports of its venomous properties are without foundation or greatly exaggerated.

*No. 47 of the Kew Bulletins of Miscellaneous Information* is devoted to a discussion of Liberian Coffee, the product of *Coffea liberica*. It bears a very large fruit (as large as a walnut), which is rather difficult to prepare and its value in the London market is said to be 10 per cent. less than common coffee. On the other hand it is said to be easily cultivated, requiring very little pruning, not easily affected by drought, being a deep rooted tree, and to be comparatively uninjured by the dreaded fungus, *Hemileia vastatrix*, which has worked such havoc in the plantations of *Coffea arabica*. An extended notice of the value of the Cola Nut, *Cola acuminata*, which is said to have properties similar to those ascribed to Coca leaves, *Erythroxylon coca*, terminates the number.

*Annual Report of the State Botanist of the State of New York,* by CHARLES H. PECK. Lists of additions to the State Herbarium and descriptions of many new species of fungi, among which we note, as of much interest, a new genus of Helvellaceæ, called Underwoodia, in compliment to Prof. L. M. Underwood. It is figured on plate 4, and is very peculiar in habit. We regret to see that the unnecessary naming of form-species goes merrily on.

*Botanical Gazette, XV. May.* Hepaticæ Africanæ novæ (with plates xvii–xix) by F. Stephani. Celloidin imbedding in plant histology, by A. C. Eycleshymer. The Collodion method in botany, by M. B. Thomas. A biographical sketch of J. B. Ellis (with portrait), by F. W. Anderson. Notes on the flora of the Lake Superior Region, III, by E. J. Hill.

*A Provisional Host Index of the Fungi of the United States, Part II, Apetalæ.* By W. G. FARLOW and A. B. SEYMOUR. The second of these invaluable papers comes with the promise of the speedy appearance of the third. If anything could check the rabid species maker in his wild career, one would think it might be done by the bracketed synonymy of some of these pages. It is to be feared, however, that this class of mycologists will, instead of amending their ways, use this Host-Index as a convenience in spying out unrecorded hosts and enrolling their guests as new species.

H. W. H.

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#### PROCEEDINGS OF SOCIETIES.

*December 1st, 1890.* President Harkness in the chair.

Lieutenant John P. Finley, U. S. A., read the following paper on Cyclonic Development and Precipitation on the Pacific Coast:

The weather of a place is generally the result of atmospheric conditions which have their initiatory development several hundred miles distant and are brought therefrom under the influence of cyclonic circulation. In mountainous countries weather conditions are strongly localized. General cyclonic movements are broken up under the extraordinary variations in temperature which characterize all regions where the surface circulation of the winds is continually interrupted and diverted. As the general movement of the atmosphere is from west to east, and all storms move in conformity with this influence, we must generally look to the westward in search of the conditions which give rise to our weather, wherever located, north of the 30th parallel. Between the equator and 26° north and 26° south latitude storms move toward the west under the influence of that peculiar circulation of the atmosphere called the "trade winds." These latitudes mark the apices of the parabolic paths of the cyclonic movements, where the direction of progressive movement, for a short distance, is north in the northern hemisphere and south in the southern hemisphere, and thence eastward in both hemispheres.

As to Pacific Coast weather it all comes from the west, and its source of supply is the heat and moisture of the Japan current. All of the storms which enter this country from the Pacific Ocean proceed from the vicinity of the Aleutian Archipelago. This location, and farther to the southwestward near the Japan Islands, is the breeding ground of the storms of the North Pacific. A proper understanding of this matter requires a knowledge of the conditions of storm development. It is

important to know that a disturbance in the atmosphere of the nature of a storm necessitates, at the place of origin, a plentiful supply of heat and moisture. These two elements comprise the food of a storm, and without them cyclonic development is impossible. As any cyclone embraces an area of from 500 to 1,000 miles in diameter the source of food supply must be of proportionate extent and permanency. The breeding-ground must have capacity to incubate and invest with moving power a continued succession of enormous atmospheric eddies. Therefore, in solving the weather problem of any region we must first locate its source of cyclonic development and supply. In the northern hemisphere there are only two such places of origin, viz., the Japan current of the North Pacific and the Gulf and Gulf Stream of the North Atlantic. The distribution of temperature and precipitation over any region is intimately dependent upon the peculiarities of cyclonic movement for that region. This is especially true of precipitation, and therefore the frequency and latitude of the easterly movement of cyclonic areas from the Pacific Ocean, over North America, is the keynote to the conditions which control the occurrence of rainfall in the Pacific Coast States. Some of these storms have been traced directly from the Japan Islands and all from the Japan current. The typhoon of the China and Japan seas may become the violent cyclone which sweeps the coast of Oregon and Washington with great fury. The course of these storms is northeastward from the Asiatic coast to Behring Sea; thence curving southeastward to the coast of British Columbia and Washington. In some instances they cross over the southern portion of Alaska, or at points between Alaska and British Columbia. The period of greatest frequency and intensity of the North Pacific cyclones coincides with the occurrence of the "wet season" in California. This season is more dependent, however, upon the latitude of the easterly movement of the cyclones. The "wet season" includes the month of November to March, inclusive, and occasional heavy rains occur in October and April. There will be striking variations in the amount of rainfall during this season in different years, dependent solely upon the southerly movement of the cyclonic areas. Heavy rains can only occur in California where the cyclonic movement is southeastward through Oregon. When the storm center reaches southward into the northern portion of California and Nevada the heaviest precipitation will occur south of the 42d parallel. To understand the distribution of precipitation attendant upon any cyclone we must know the peculiar characteristics which attach to each of the four quadrants of a cyclonic area, a subject which there is not space to discuss in this paper.

The remarkable rainfall in California during October, 1889, illustrates the effect of the southerly trend of cyclonic areas in augmenting the rainfall south of the 42d parallel. During that month the precipitation exceeded the normal from two to thirteen inches, and was the heaviest for the month in a period of forty years. An examination of the storm-track charts for that month shows that all of the cyclones, except two, passed eastward through *central* Washington and *northern* Oregon, and one extended *southward* into the northern portion of California and Nevada. In previous Octobers the storm centers had passed eastward along the *northern* boundary of Washington, and in most instances considerably north of that State. This was the case during the dry Novembers of 1862, 1876, 1884 and 1890, and explains other dry periods during the "wet season."

An explanation as to why cyclonic areas trend further southward in winter than

in summer is found primarily in the declination of the sun north and south of the equator. Exceptional southerly movements in winter are due to peculiarities in the distribution of atmospheric pressure at the time which can only be revealed by the cartographical study of immense atmospheric areas, embracing an entire continent. All cyclonic movements in the Northern Hemisphere take place at a higher latitude in summer than in winter. On the Pacific Coast, in summer, the cyclones move eastward over British Columbia and to the northward, at which time California and the Middle Plateau are invested with the "dry season." But this season is only relatively dry, for rain does fall in every month of the year at various places within this region. It is really the season of violent local disturbances, such as hail-storms, thunder-storms, and cloud-bursts. The precipitation of the "dry season" results entirely from local conditions, and is not the effect of cyclonic circulation and movement, for we have shown that in summer the cyclones move eastward at a very high latitude. The rainfall of summer then must come from the evaporation of snow on the great mountain ranges of the Sierras. Observation proves this to be a fact. The great masses of snow collected on these ranges during the passage of the winter storms form the only source of moisture for the occasional showers and local storms of summer. No snow in winter means no rain in summer, and *vice versa*. Without these mountains to preserve the snows of winter for the water supply of summer rain would entirely cease, the rivers dry up and the Middle Plateau, with California, would become a veritable desert which the rains of winter would hardly resuscitate.

The cyclones of the North Pacific are first experienced at Alaskan stations in their eastward passage from the Asiatic coast, then at stations on the coast of British Columbia, and finally on the coast of Washington and Oregon. These cyclonic movements illustrate the importance and practical bearing of the meteorology of Alaska on that of the northwest coast of the United States. The establishment of telegraphic stations of observation in Alaska is the key to the solution of the problem of obtaining timely warnings of the approach of storms from the Pacific. Stations of observation on the ocean are impracticable, if not impossible, but their establishment along the coasts of Alaska and British Columbia is already demonstrated. These stations must be connected by telegraph, for without the aid of electricity in overcoming the loss of time over great distances, weather forecasts are impracticable for any part of the country. When the Aleutian Archipelago and Alaska are connected by telegraph with the United States then the approach of the storms of the Japan current can be heralded several days in advance to the seaport cities of the Pacific Coast, and the general weather forecasts for the interior made with greater accuracy. The construction of a transcontinental railway connecting the United States with Russia, through Alaska, would quickly provide the opportunity for the establishment of telegraphic stations of observation in Alaska. Stations on the Aleutian Islands could be connected by means of short land lines and cables to the main land line from Alaska southward. With these outposts on the very verge of the breeding ground of the cyclones of the North Pacific the most important information could be secured concerning their development, frequency, severity and direction of progressive movement, and the data placed upon the daily charts of the forecast official at San Francisco. Reports from these extreme western stations, together with those on the coast of British Columbia, would be of

great value in determining the approach and severity of the Pacific cyclones which enter the United States in Montana and Dakota.

We are to-day trying to perfect a similar scheme which shall join, electrically, the meteorological stations in the West Indies with those of the United States in Florida. By this means the approach and severity of the West India cyclones can be telegraphed to all Atlantic seaports and those of the Gulf, a warning which is of immense value to commercial interests.

I have thus briefly outlined two great schemes for the protection of the maritime interests of the Atlantic and Pacific coasts of this country, and the development of the means for practical study of cyclonic movements from one ocean to the other. It affects the entire meteorological problem of this country on which the Government is expending nearly one million of dollars yearly. North America has no equal in the field of opportunity for meteorological research, and the region which must receive the greatest benefit in such investigation is the United States.

In the discussion which followed, Lieutenant Finley explained and answered many questions which were asked by his audience, and a vote of thanks was given him for his very instructive paper.

*December 15, 1890.* President Harkness in the chair.

Donations to the Museum: From Dr. Joseph Pesca, cranium of polar bear; from Charles N. Comstock, specimen *Bubo virginianus subarcticus*; from Dr. H. H. Behr, one marsupial; from C. H. Townsend, five bird skins; from Walter E. Bryant, one reptile.

The President announced the death of Dr. Henry Ferrer, member of the Society, and made some remarks upon his high standing in the medical profession, and the services which he had rendered to science, especially in the department of Bacteriology.

On motion, Dr. C. Max Richter and Dr. E. S. Clark were appointed a committee to draft resolutions expressing the sentiment of the Academy.

The death was also announced of Dr. J. B. Trembley, well known to his fellow-members in connection with meteorological records upon this coast, and on motion J. R. Scupham and Arthur Brown were appointed a committee to draft appropriate resolutions.

The report of the Nominating Committee, submitting the following names to be voted upon on the day of the annual meeting, was read:

*For President*—H. W. Harkness.

*First Vice-President*—H. H. Behr.

*Second Vice-President*—George Hewston.

*Corresponding Secretary*—Frederick Gutzkow.

*Recording Secretary*—J. R. Scupham.

*Treasurer*—L. H. Foote.

*Librarian*—Carlos Troyer.

*Director of Museum*—J. G. Cooper.

*Trustees*—Charles F. Crocker, D. E. Hayes, W. C. Burnett, George C. Perkins, E. J. Molera, Irving M. Scott, John Taylor.

On motion, Charles Stephens and Walter E. Bryant were appointed judges of election; Charles Burckhalter and Charles E. Keeler, inspectors.\*

Some remarks were made by Walter E. Bryant on the habits of the small skunk of Lower California, which is reported by the inhabitants to be often afflicted with rabies, and to attack men. He also gave an account of a kind of fire-stick (*Baccharis*) used by the natives of Lower California to produce fire when other means such as flint and steel and borrowing a brand from a neighbor, are not at hand. A stick half an inch in diameter and eighteen inches long is held perpendicularly between the palms of the hands and rapidly revolved in a spot slightly hollowed in a piece of dry wood. The exceedingly fine dust which accumulates by the wearing away of the stick soon begins to smoke and in a few minutes ignites. This smoldering little pile is heaped with fine shaving and fanned into a flame. It is a very laborious operation to produce fire in this way, as quick rubbing is necessary for one or two minutes. Almost any one can produce a smoke, but is tired before the spark is made.

The spontaneous origin of forest fires was discussed by some of the members and cases mentioned.

President Harkness announced that the annual meeting and election would be held in the new hall of the Academy on January 5, 1891.

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\*Proposed amendment to the Constitution of the California Academy of Sciences, submitted in writing at a stated meeting of the Academy Sept. 1, 1890, accepted by a majority of the members then present, and referred to the Council who acted upon the matter October 3d and reported it back to the Society. In a full meeting of the Academy October 6th, due notice having been given to each member by postal card of the consideration of the proposed amendment of the constitution, it was read clause by clause, and carefully explained by S. W. Holladay, a member of the Society and of the Board of Trustees, who expressly stated that the amendment made no change in the rights or privileges of any one already a member, but related only to the qualifications of future applicants. It was adopted by a majority of those present and posted conspicuously in the hall of the Academy until its removal to the new building on Market street, and thereafter in a conspicuous place in its library hall as being the place most frequently visited by members:

Art. II, Section 1. After word "honorary" in second line insert the words "and associate." Add to Section 1 "The qualifications for resident or life membership shall be that the applicants are professionally engaged in scientific work or have by their labor contributed to the advancement of some branch of science." [The article so amended reads: Section 1. The Academy shall consist of resident, life, honorary and associate members who shall be elected in the manner hereinafter prescribed. The qualifications for resident or life membership shall be that the applicants are professionally engaged in scientific work or have by their labor contributed to the advancement of some branch of science.]

Section 2. First line to read "Each applicant for life, resident or associate," etc.

Section 4, page 9, 9th line, to read "Each candidate for life, resident, honorary or associate," etc.

Section 5. First line to read "Any resident member," etc.

Section 6. Add "Honorary and associate members shall have all the rights and privileges of the Academy except that of voting."

Art. IV, Section 8, page 21, 9th line, for "Trustees]" read "Council."

Art. VI, Section 1, page 23, read "Resident and associate members," etc.

Section 6, page 24, last line, read "Any resident member," etc.

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