The Present State of our Knowledge of the Gray Titmouse in California.—Last fall, for the first time in my field experience, I met with the Gray Titmouse (*Baeolophus inornatus griseus*). Upon shooting specimens I was struck with the amount of difference shown between this race and the previously familiar Plain Titmouse. These personal circumstances have led me to look into the history of the Gray Titmouse in California and to try to formulate some conclusions as to its present status in this state, with results as follows.

The Gray Titmouse was first recorded from California on the basis of specimens and information obtained on the Death Valley expedition of 1891, in Inyo and Mono counties. In Dr. A. K. Fisher's "Report on the Ornithology" of that expedition (N. Amer. Fauna no. 7, 1893) the following statements (p. 139) are made in regard to this bird. "In the Panamint Mountains, California, it was seen in Johnson and Surprise cañons among the piñons and junipers in April, and Dr. Merriam found it common north of Telescope Peak, where a female, containing eggs nearly ready to be deposited, was killed, April 17-19. The writer saw a few at the same place June 22. Mr. Nelson noted it sparingly among the piñons on the Panamint, Grapevine, Inyo, and White mountains during the breeding season. Along the eastern slope of the Sierra Nevada a few were seen at the head of Owens River, and at Benton, in July."

Four examples were preserved, according to Dr. Fisher's report, all from the Panamint Mountains. Three of these are still extant, and have, through the kindness of the executive officers of the United States Bureau of Biological Survey, been sent on to me for examination. The data borne by them are as follows: Nos. 136603, ♂, 136600, ♀, Johnson Canyon, 6000 feet, Panamint Mountains, California, March 28, 1891, A. K. Fisher collector (orig. nos. 145 and 146, respectively); no. 136599, ♀, "Panamint Mountains," California, April 18, 1891, F. Stephens collector (orig. no. 47).

The next record is that by Frank Stephens (Condor, v, 1903, p. 105) of occurrence in the Providence Mountains, in eastern San Bernardino County. He simply says that he "saw two." Then Ned Hollister (Auk, xxv, 1908, p. 461) reports that he found the race "fairly common among the junipers on New York Mountain," in the same general range of mountains. "Specimen collected"; and this specimen is now before me, thanks to the authorities of the Biological Survey, and yields data as follows: no. 197059, ♂, New York Mountain, California, June 9, 1905; N. Hollister, collector (orig. no. 859).

The latest printed account of the Gray Titmouse in California is that by G. Willett (Condor, xxi, 1919, p. 206) who found it "rather common in juniper timber around Clear Lake [Modoc County]. By the middle of April [1918] was paired and apparently about to breed."

Now comes some hitherto unpublished information, from specimens and notebooks in the Museum of Vertebrate Zoology. No. 28738 is an adult ♀ taken at Benton, Mono County, September 6, 1917, by H. G. White (orig. no. 1442). This was the only individual seen in the vicinity. No. 40997 is a ♀ taken on the Scott ranch, ten miles southwest of Alturas, Modoc County, May 25, 1920. It was shot from a juniper, and one other titmouse was seen.

On September 27, 1922, Mrs. Grinnell and myself found a pair of Gray Titmouses in some juniper trees near Steele Meadow, Modoc County. They were located by hearing the 'chickadee' call-note, very throaty as compared in our memory with the corresponding call of the Plain Tit. One of the birds pounded so loudly on a branch as to be mistaken for a woodpecker until sighted. The two were taken and proved to be birds-of-the-year. They are now nos. 43375, ♂, and 43376, ♀, Mus. Vert. Zool. (orig. nos. 5554, 5555, J. and H. W. Grinnell).

With respect to relative numbers and continuity of distribution it is useful to call attention to some negative evidence. Three months of field work in the Modoc region in 1910 by W. P. Taylor and assistants did not disclose the presence of any *Baeolophus*. Several weeks of collecting by H. S. Swarth and assistants in Owens Valley and adjacent mountains in the spring and early summer of 1912 produced no titmouses. Several weeks of collecting in Inyo and Mono counties, including the White Mountains, in 1917, by A. C. Shelton, H. G. White, and myself, produced only the one Gray Titmouse noted above, captured by White at Benton. Many weeks of work in

the Death Valley country in 1917, by J. Dixon and me, and again in 1920 by me, failed to disclose to either of us the presence of even one titmouse, though we went over some of the identical ground where the Death Valley expedition had taken specimens some thirty years previously.

As far as I know at the moment of this writing, only the eight specimens of Gray Titmouse above enumerated, taken in California, are contained in any museum.

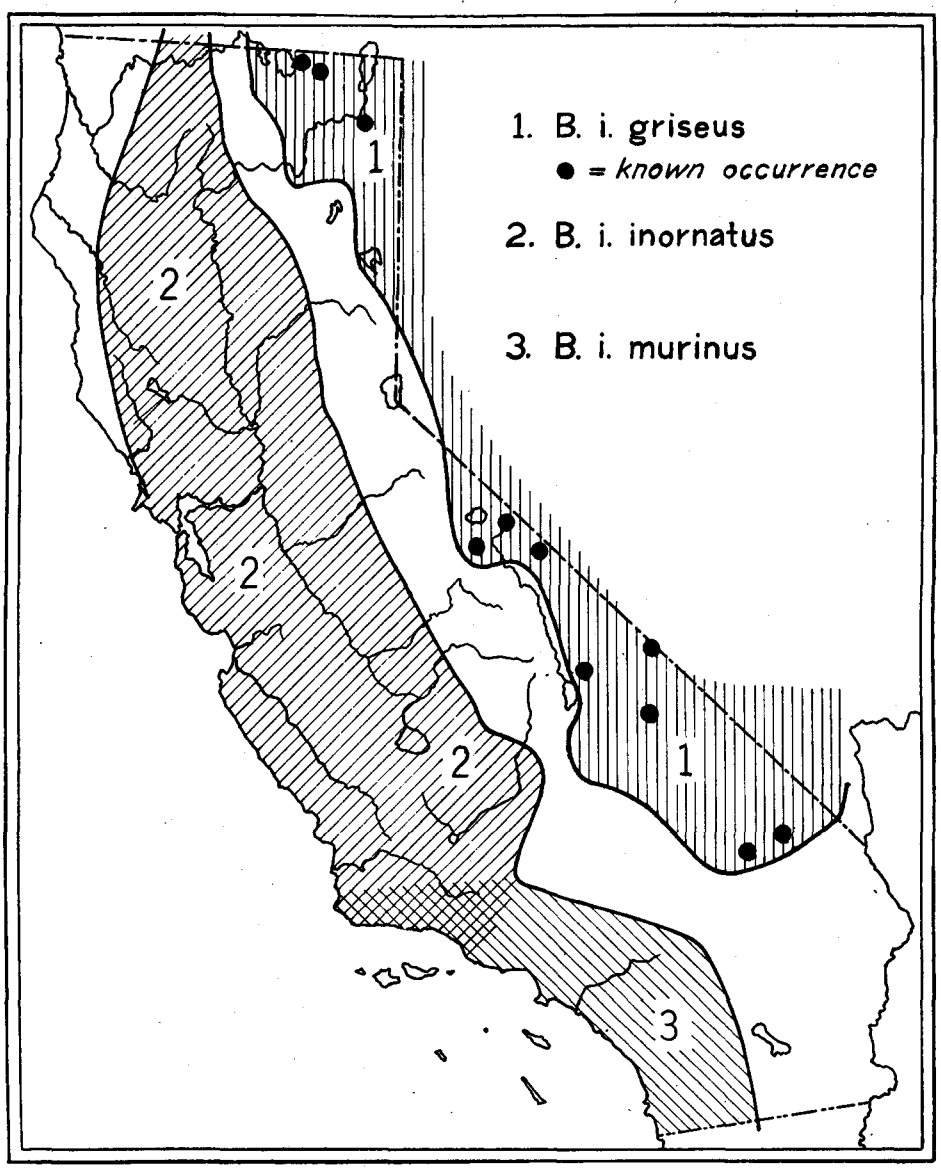

Fig. 45. MAP SHOWING RANGES OF TITMOUSES (*Baeolophus*) IN CALIFORNIA.

I have compared this small series with a very satisfactory series of sixteen examples in this Museum taken in northern Arizona, and find the two lots indistinguishable on any basis whatsoever.

With regard to distinctness, my study of the series of skins available at this writing (24 of *B. i. griseus*, 175 of *B. i. inornatus*, and 57 of *B. i. murinus*) leaves me with

the strong impression that the Gray Titmouse is set off much more sharply from the *inornatus-murinus* titmouses than has hitherto been supposed. In spite of statements and implications to the effect that intergradation between *inornatus* and *griseus* occurs in the region of the southern Sierra Nevada, I have failed to find even one fair intermediate. It is true that specimens of *inornatus* from the southern Sierras and the vicinity of Walker Pass, in Fresno, Tulare, and Kern counties, are decidedly paler in tone of color than typical *inornatus* from west-central California. But this paleness consists merely in lightening of the tone of brown dorsally and a whitening of the lower surface; it does not tend toward the leaden hue both above and below characteristic of *griseus*.

Griseus has other characters, too: relatively longer tail, longer wings, and larger bill, just as pointed out by Ridgway (Birds N. and Mid. Amer., III, 1904, p. 390). These increases in certain dimensions do not, however, accompany a general increase of body size; for ascertained weights (of 19 individuals of *griseus* and of 39 individuals of *inornatus*) show no difference of moment. After all, the leaden color, involving the whole bird including the surfaces of the wings and tail, is the impressive feature; and I will again state that I fail to find any specimen that I would call an intergrade between either *inornatus* or *murinus* and *griseus*.

Furthermore, as shown in the accompanying map (fig. 45), information so far available indicates a geographic hiatus between the range of *griseus* and the range of *inornatus*. I know the territory on the east flank of the Sierra Nevada north from Kern County to Mono County, and I think it very unlikely that there is any well-marked continuity of favorable conditions there, such as would have to be present to permit of free intergradation. It will be recalled that all of these races of *Baeolophus* are rather strictly confined to the Upper Sonoran life-zone. *Griseus* belongs to the piñon-juniper association; *inornatus* to the analogous digger-pine and oak association.

It may be remarked here that the differences characterizing *murinus* are slight and that they are inconstant; also that blending between *inornatus* and *murinus* is complete by way of both geographic and individual variation—which, again, is not the case between either of those forms and *griseus*. *Griseus* parallels *plumbeus* in the bush-tits. I am almost tempted to propose full specific status for the Gray Titmouse. But I do not know enough about the geographic behaviour of the titmouses in the Rocky Mountain region and in Lower California.

To summarize: The Gray Titmouse is a very distinct form, separated sharply from the Plain Titmouse geographically as well as on the basis of phylogenetic characters. No intergradation between these two titmouses is known to take place. The Gray Titmouse in California is a rare bird. It has been found to exist only in small numbers and at a few widely scattered points. The general territory in which it occurs lies east of the Sierran divide, in the arid Great Basin faunal division. The life-zone occupied is the Upper Sonoran, and the association the piñon-juniper.—J. GRINNELL, *Museum of Vertebrate Zooolgy, University of California, Berkeley, March 20, 1923.*

Pine Siskins as 'Foliage-feeders'.—On February 22, 1923, I noticed one of the oak trees (*Quercus agrifolia*) in Washington Park, Alameda, California, swarming with a continually moving flock of birds which, after approaching closer, I found to be Pine Siskins (*Spinus pinus pinus*). Judging that they were enjoying an afternoon meal I decided to watch them. It was not long before I noticed a green substance adhering to the sides of their bills, which they would occasionally wipe off on the branches. Catching some of this as it fell to the ground I discovered that it was green leaf material and concluded (prematurely) that the rascals were nipping the newly formed leaf buds. Further observation proved this to be erroneous, for the birds were procuring their food from the lower surfaces of the leaves. Examining the leaves I found a great many of them afflicted with the gall of a saw-fly (*Callirhytis bicornis*). The galls were attached to the midrib or a lateral vein on the lower surfaces of the leaves. They were composed of leaf material, light green in color (lighter than the leaf), from two to four millimeters long and shaped somewhat like a miniature saddle, being depressed in the middle and rising to an apex at both ends. Each contained a minute milky-white grub and many close views revealed the birds 'shelling' the galls and devouring the contents exactly as a domestic canary shells its seeds.