lower animals have developed some other faculties as substitutes for color vision and binocular vision is not yet determined. Experimentation, properly controlled, along these lines, is difficult, but if the matter of concealing coloration is ever to be settled, naturalists must begin to pay more attention to the work of the experimental psychologists, testing the results of their experiments, wherever possible, by field observations. Until there is some reason for thinking that coloration is necessary for the concealment of animals from their enemies, or that coloration would be effectual for that purpose, the doctrine, in view of all the apparent exceptions and inconsistencies, stands on rather insecure ground. There is no reason for assuming that animals in their natural habitat appear to other animals as they appear to man.

Finally, the camera does not represent animals in their habitat as they appear to man, both on account of the lack of color and relief, and great reduction of scale in order to show habitat. Stereoscopic views would correct the latter, if it were economically practical to publish them, but color photography has not yet developed far enough for general use in the field. It is fairly safe to say that no photograph has yet been published which exhibited the animal as clearly as it was visible to the human eye. Some authors have frankly acknowledged this in discussing concealing coloration, but others have said the opposite. Especially reprehensible is the indulgence in taking photographs out of focus in order to obscure outlines and patterns, ignoring scale and perpective in paintings and drawings, and placing objects in front of one figure to obscure it in order to show that it is concealingly colored, and omitting the objects from before another figure to show that it is not, all of which have been practiced in advocacy of the concealing coloration doctrine.

SWALLOWS AND BED-BUGS

By EDWARD R. WARREN

IN MY paper in the May-June CONDOR, 1912, entitled "Some North-central Colorado Bird Notes," I referred to the belief that swallows harbor bed-bugs as ridiculous; and now I have to confess that possibly I did not know as much as I thought I did, a not uncommon failing with us all. Some time after the paper was published, W. Leon Dawson in a very courteous letter, called my attention to the fact that he had found Cliff Swallows' nests badly infested with bed-bugs, in one case so much so that the colony had been deserted. He reported this in "The Birds of Washington," page 333. This started me to looking into the matter, something I had not done before, and as it would seem that not very many are posted on the subject, and in fact but little definite has been published that I have been able to find, I have thought it worth while to write up what little I have been able to learn about the matter, together with a few observations of my own, in the hope that it may be the means of bringing out further information. Certainly ornithologists should do their part in ascertaining whether or not swallows are guilty of bringing such disagreeable pests into human habitations.

I found that a bug (*Acanthia hirundinis*), belonging to the same genus as the true bed-bug (*Acanthia lectularia*), is parasitic on swallows, pigeons, chickens, and bats. It should perhaps be stated that the French authority, L. Gedoelst, places it in another genus because of certain structural differences,

calling it *Oeciacus hirundinis*. On writing Dr. L. O. Howard, Chief of the Bureau of Entomology, Department of Agriculture, for information, he gave me a reference to a record by Otto Lugger, State Entomologist of Minnesota, and published in the Sixth Annual Report of the Entomologist of the State Experiment Station of the University of Minnesota, 1900, page 52. This is as follows:

"Bugs, very similar to bed bugs, attack pigeons, chickens, swallows and bats. Those found in the nests of swallows not infrequently reach the inside of houses against which these beneficial birds have built their clay nests. Such bugs very closely resemble the genuine bed-bugs, yet are different when studied in detail; they are much smaller, darker, and cannot exist for any length of time away from their proper home, the nest of the swallow, where they are sometimes exceedingly numerous. * * *

"Since the above account was written [this having been copied from a previous report], another species of true bed-bug was found in a large school building in the western part of the state [Minnesota]. Here these insects became very annoying during winter, and especially near the warm steam-pipes; later they invaded all the rooms. It is a strange fact that an insect, usually dormant at that time, and certainly not active during the day, should so change its habits as to become a veritable trouble in midwinter, annoying students and teachers in broad daylight. This species is much smaller, and resembles the one found in swallow nests so closely that it may be identical with it."

It will be noted that this quotation does not say positively that these insects were the swallow bed-bug, nor is it stated if there had been swallows' nests on school building. However that may be, it is evident that the insects were not the common bed-bug.

Gedoelst, the author previously referred to, says concerning the swallow bug: "Lives in the nests of swallows; may enter houses and attack man."*

As for myself, the only evidence I can offer is of a negative character. In the summer of 1902 there were about thirty Cliff Swallows' nests under the eaves of a one-story log house on the ranch of a friend near Crested Butte, Colorado. I frequently spent the night at the ranch, sleeping in this house, and on the same side as where the nests were, and was never disturbed by any insects. Another man slept there all the time, and never made any complaints. The cabin was built of dry aspen logs, full of cracks and crevices which would have harbored the parasites if they had been about. About this same time I occupied office and sleeping rooms in the town of Crested Butte in a building on which Cliff Swallows had nested, and had no trouble there.

A lady living on another ranch near Crested Butte told me of having a few years previously destroyed the Cliff Swallows' nests on the ranch house because of the dirt they made about the house, and regretted having to do it for the reason that the birds had been very useful in keeping down the mosquitos, which were a pest in the irrigating season. She spoke of the birds having begun to return and build about the barns, and expressed her pleasure at that. I think that if she had thought the swallows guilty of having brought pests into her house she would have spoken of it to me.

Of course it is not impossible that these colonies may not have been troubled with the parasite, and even that it does not occur at that altitude, 9,000 feet, but —its relative does. Not knowing of them at the time I did not look for them.

*Synopsis de Parasitologie de l'Homme et des Animaux Domestiques. Par. L. Gedoelst. Bruxelles. 1911.

but I did take down, after the builders had left, some of the nests from the cabin for examination and photography, and noted no parasites of any sort.

Most animal parasites will not live for any length of time on any host other than the natural one, though some have several hosts, and a few seem quite indifferent in such matters. What the case is with the swallow bed-bug I do not know. I would suggest to my readers that in such cases as may come to their notice they secure specimens of the bugs and submit them to an expert for identification. Certainly the matter will bear further investigation. Incidentally I may remark that it is worth while to collect any parasites one may find on any animal and turn them over to some one interested in these things. I have made it a point lately to always have a few vials containing weak alcohol with me when collecting, and putting into them the parasites which often immediately show on a dead animal, with a label to show from what species they were taken.

I must express my appreciation of Mr. Dawson's courtesy in writing me about the matter instead of correcting me in the CONDOR, which he would have been justified in doing under the circumstances as known to him. As it happens, in a way we were both right and both wrong, so we should both be satisfied.

NOTES ON SOME FRESNO COUNTY BIRDS

By JOHN G. TYLER

Recurvirostra americana. Avocet.

IN PURSUING ornithological studies the bird student is often led to wonder what strange economy of Nature causes certain species to choose an environment that, from a human standpoint, would seem unsuited to a creature of gentle disposition and attractive plumage.

Several miles southwest of Caruthers, Fresno County, California, are a number of shallow ponds of greater or less extent, according to the amount of winter rainfall, and all but two of them possessed of a freakish tendency to become entirely dry at times, only to fill up again without warning. Surrounded by salt-grass knolls, their borders entirely devoid of vegetation of any kind, these ponds are not the most picturesque places in the valley. especially in view of the fact that the water is alkaline and in summer often becomes stagnant. A more foul-smelling, unattractive place could hardly be found, yet these ponds are resorted to each spring by a company of Avocets that remains throughout the summer. It is evidently a matter of choice rather than necessity with these handsome waders, too, for there are numerous overflowed pastures and permanent ponds in other parts of the valley, each of which claims its nesting colony of Stilts every spring; but while a few of the latter may ofttimes be found with their larger cousins, yet I have never found the Avocets elsewhere than in the immediate vicinity of the most sterile sinks.

When the water in these ponds is subjected to the rays of the summer sun, a slimy, jelly-like substance appears around the edges and attracts myriads of flies, which often form an unbroken black band four feet or more in width and completely encircling the ponds. Is it not possible that these flies are one of the staple articles of food with the big waders? Possibly this is the solution of their attachment to these uninviting ponds. A similar assemblage of flies has been previously noted by Walter K. Fisher (CONDOR, IV, 1902, p. 9) as occurring at Mono Lake.