Since there are no population counts compiled at any time in the past, there can be no satisfactory method of comparing conditions of ten or twenty years ago with the present; therefore, there can be no solution to this phase of the problem. Theoretically, however, any decrease in the number of parasites and predators would result in an increase in the density of population, irrespective of increase in available areas. If there has been no decrease in parasite effectiveness, but if there has been a reduction in the number of effective predators, we would expect that there might be an actual temporary increase in the density of the spider population, which would continue until the additional food supply made available to the parasite would act on the population of these organisms, accelerating their rate of increase to meet the newly created opportunity for multiplication. That we may be in a stage where there are more spiders available and where the parasites have not yet increased to their maximum numbers seems entirely possible.

So far as one may judge, all gardeners, amateur and professional, are 99.9 per cent. antagonistic to all reptiles, and the unfortunately snake-like *Gerrhonotus* is apparently particularly obnoxious to these active outdoor people. Although the above percentage may not be exact, at least one seldom hears of any evidence indicating a friendly attitude on the part of the non-herpetologist to this lizard. Unfortunately, even though the gardeners might be amenable to a herpetological conversion, the clean, cultural methods involved in gardening and cultivation of the ground are both inimical to an increase in the number of lizards. Another factor which may have a bearing on numbers of these useful animals is the predatory skill of our domestic cat. Although our spiders are so much feared and although the lizards may be an important control device, it is not believed that even though this information is disseminated there will be any marked shift in the choice of pets, at least not on the part of those who, at least since Darwin's time, have enjoyed the company of cats. In the writer's own experience, cats are serious enemies of this as well as other species of lizards. Again, in the writer's experience, it appears to be probable that the protection and introduction of *Gerrhonotus* will result in a decreasing population of the black widow spider. Too many uncontrolled factors enter into the present discussion, but it might be mentioned here that five years ago the writer's house was thoroughly popular with black widow spiders. An effort to reduce their numbers made little impression on the population. At the same time, however, an effort was being made to increase the numbers of the San Diegan alligator lizard. Individuals of this species were introduced onto the place; cats were carefully driven away; and clean cultural methods were not employed. As a result, the population of the alligator lizard increased considerably. Five years later, when spiders were needed for the present experiment, it was found that the black widow was extremely scarce; hardly any specimens could be found on the writer's property. That this may have been due to an increase in the number of parasites is recognized; but it may also have been due to the presence of an unusually large number of *Gerrhonotus*. Particularly significant is the fact that in the garage, where spiders were particularly abundant, *Gerrhonotus* was repeatedly found climbing about within the building, even as high as the top of the garage door, approximately eight feet from the ground. Here the lizard would lie in the narrow space between the top of the door and the lintel, where occasionally they were crushed by the closing of the doors. Although the evidence in this case is circumstantial, it appears probable that the friendly protection and encouragement of the San Diegan alligator lizard and, incidentally, the elimination of cats, might be of considerable benefit to the population of southern California.

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NOTES ON THE DISTRIBUTION OF THE BLACK WIDOW SPIDER

IN Donald C. Lowrie's note in SCIENCE for November 13, 1936, "New Localities for the Black Widow Spider," Minnesota, Iowa, Virginia, Delaware, New Jersey, Connecticut, Rhode Island and Vermont are listed as the only states from which this spider has not been officially recorded.

However, it may be noted that this spider must be fairly prevalent all over the state of Virginia, as stated by G. W. Jeffers in SCIENCE for December 11, 1936, and has been recorded by Anderson and Walker,[1] C. R. Willey[2] and W. J. Schoene,[3] as well as noted in the article by C. E. Burt in the *Journal* of the Kansas Entomological Society (8: 4, 117, 1935).

In addition this spider has been recorded from New Jersey by C. H. Headlee[4] in 1935, from Connecticut by W. E. Britton[5] in 1935 and from Rhode Island by A. E. Stene[6] in 1936.

H. L. Bailey informs me that this spider has been collected in Springfield, Vermont, in the fall of 1936 (identification verified by C. R. Crosby, of Cornell

[1] L. D. Anderson and H. G. Walker, *Bulletin*, U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Insect Pest Survey, 12: 404, 1932.
[2] C. R. Willey, *ibid.*, 14: 9, 296, 1934.
[3] W. J. Schoene, *ibid.*, 15: 7, 359, 1935.
[4] C. H. Headlee, *ibid.*, 15: 8, 389, 1935.
[5] W. E. Britton, *ibid.*, 15: 6, 318, 1935.
[6] A. E. Stene, *ibid.*, 16: 6, 306, 1936.

University). Also Paul L. Rice, of the Delaware Agricultural Experiment Station, states that he and Donald MacCreary have frequently observed this spider near Camden and Wilmington in the fall of 1936.

Letters from Clarence E. Mickel, of Minnesota, and C. J. Drake and H. E. Jaques, of Iowa, report that they have no records of this spider having been found in their states, but that it probably occurs there. Thus Minnesota and Iowa are the only states from which this spider had not been recorded.

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WESTERN HIGHWAY HAZARD FOR JACK RABBITS

WHILE passing over the highways of Idaho one is usually impressed by the great number of jack rabbits which have been killed by automobiles. On November 17, 1936, the writers passed through the Hagerman Valley, where dead jack rabbits were especially numerous along the highway, and a count of dead rabbits the following day showed that 154 had been killed by automobiles in three tenths of a mile. It was evident that they had been killed within a few days, as otherwise they would have been devoured by the scavenger crows and magpies.

At the point where the count was made, there was a stack of alfalfa hay in a small alfalfa field on one side of the road, while on the other side sagebrush extended back for miles. The fall weather had been unusually dry, so there was no green vegetation amongst the sagebrush. It therefore appears that at this place the jack rabbits had been attracted to the alfalfa and had subsequently met their death.

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PROTECT DIONAEA MUSCIPULA

Dionaea muscipula Ellis or Venus fly-trap is not only one of the most interesting biological objects but is also a plant species that is strongly endemic. It has been reported from the environment of Wilmington, N. C., and from a few localities in South Carolina.

I was frequently able to visit this region, especially around Wilmington. In many places here this plant has become extinct. In fact, during the last three years I was able to witness the disappearance of plants over several fields. An important reason for its disappearance is that a considerable part of its natural habitation is being artificially drained to aid agriculture, the result being that we find on the remaining land another type of vegetation which threatens the existence of *Dionaea* very distinctly, whereas, in other places, we observe a modification of plant associations, although *Dionaea* still remains.

It would be very desirable that some typical parts of that interesting country should be protected before it is too late. The land of that neighborhood is cheap. Its purchase by state or government would offer no objections.

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CUSCUTA NOT A COMPLETE PARASITE

Too often, when a false statement creeps into a book, it is copied and passed along. Thus it is, again and again, when a new text on botany appears, once more appears the statement that Cuscuta is a complete parasite devoid of chlorophyll. Though I make no claim to having read every American text-book on botany, I believe I have seen the majority of them, and with no exception, these state that cuscuta is devoid of chlorophyll.

Dodder is a phanerogam, Convolvulaceae. Its seed germinates somewhat differently from others of that family, for it sends forth a green (protonema-like) filament, which runs over the surface of the ground, drying at the seed end as it grows, until it reaches a succulent host, whereon it twines and forms haustoria. Then its stems become somewhat brownish, but the areas where haustoria are functional are still quite green. In midsummer it blooms. Its buds also are quite green, its fruits very green.

Alcoholic and ether extracts would show that the fruits have as much chlorophyll as any other convolvulaceous plant, its buds nearly as much, its haustellate areas about half as much and other parts of the stem a little. Inasmuch as plants with little chlorophyll produce more carbohydrate per unit than those with much chlorophyll, it is quite likely that Cuscuta may be able to sustain itself on its own organic foods, as does mistletoe. Let some physiologist solve that problem.

Dr. Louis Knudson in a personal conversation stated he had grown dodder on nutrient agar unsuccessfully unless a green host plant was supplied. He admitted, however, other factors might be involved.

Cassytha (Lauraceae), often mistaken for Cuscuta, has about the same relative distribution of chlorophyll. Cuscuta and Cassytha are green plants, even though they are parasites. They do contain chlorophyll, both alpha and beta. Strasburger states they have chlorophyll.

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