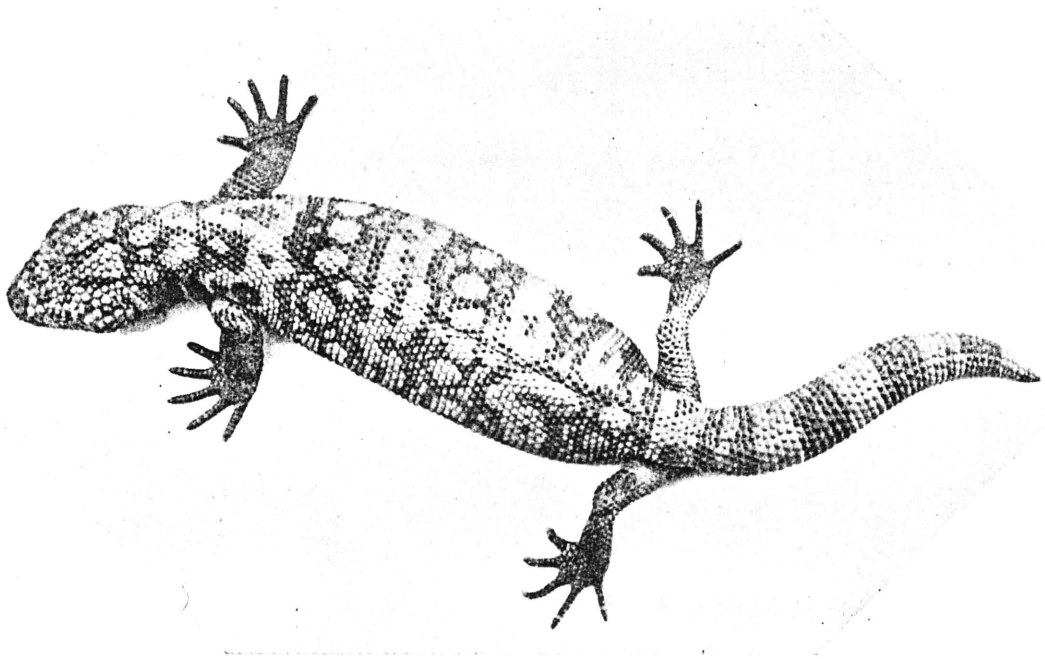


GILA MONSTER (*Heloderma suspectum*).

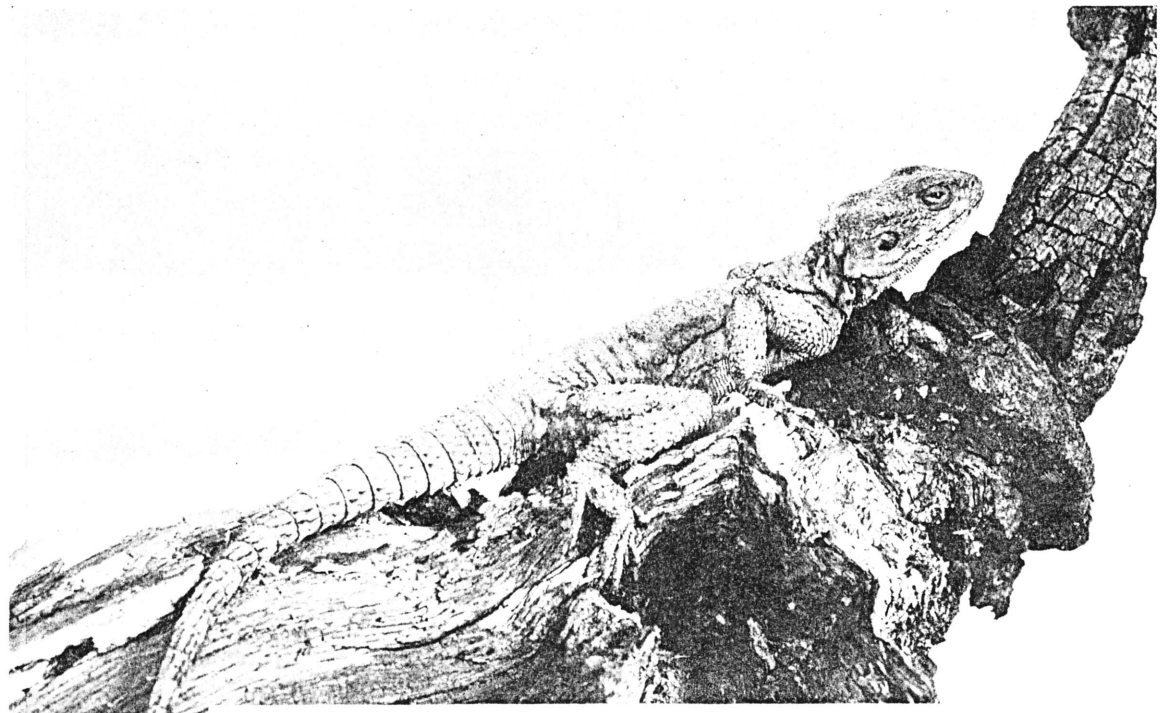
RANDOM NOTES ON LIZARDS.

Specially written for ANIMAL LIFE by Dr. R. W. SHUFELDT (of New York), C.M.Z.S., etc.

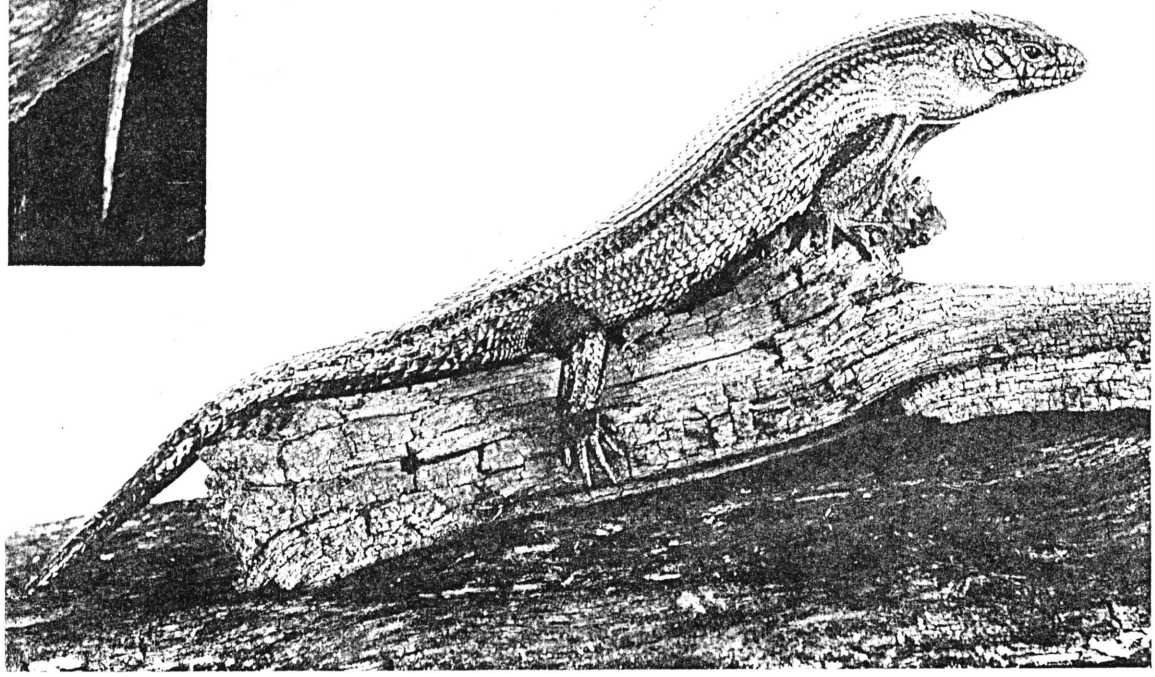
Illustrated with Photographs by the Author.

THE fact that almost every large city contains a number of shops which sell living animals, either to private individuals as pets or to zoological gardens for their collections, shows that the interest in animal life is very general. It is to these shops that naturalists are often indebted for being able to study and photograph living specimens of animals which otherwise they might have no opportunity of observing. Three of the lizards illustrating these notes came to me in this way. The species to which I refer are, first, one of the three forms of lizards occurring on the Canary Islands and known scientifically as *Lacerta callotis*; second, an unusually fine specimen of Cunningham's Skink (*Egernia cunninghami*) from Australia, nearly ten inches in length; and lastly, two large specimens of the common Stellion Lizard (*Agama stellio*) found in Syria, where these were captured. It is very seldom indeed that any of these lizards are seen alive in America, so it was with an unusual interest that I made their photographs and studied them.

My other reproductions of photographs from life herein shown are also some of my own studies, and they represent lizards found in the United States, viz., the Common Alligator Lizard, or as it is sometimes called, the Fence Lizard, or, less frequently, the Swift, and the far-famed Gila Monster or Heloderma, a reptile of which I have had a very considerable experience. The picture I have selected from my collection to represent this lizard here is a direct dorsal view from above of a large specimen (over 20 inches long) that I had alive for nearly a year. It makes an unusual and interesting illustration from the fact that this famous lizard is more commonly photographed from a lateral point of view.



COMMON STELLION (*Agama stellio*).



Photos by R. W. Shufeldt, New York.

CUNNINGHAM'S SKINK (*Egernia cunninghami*).

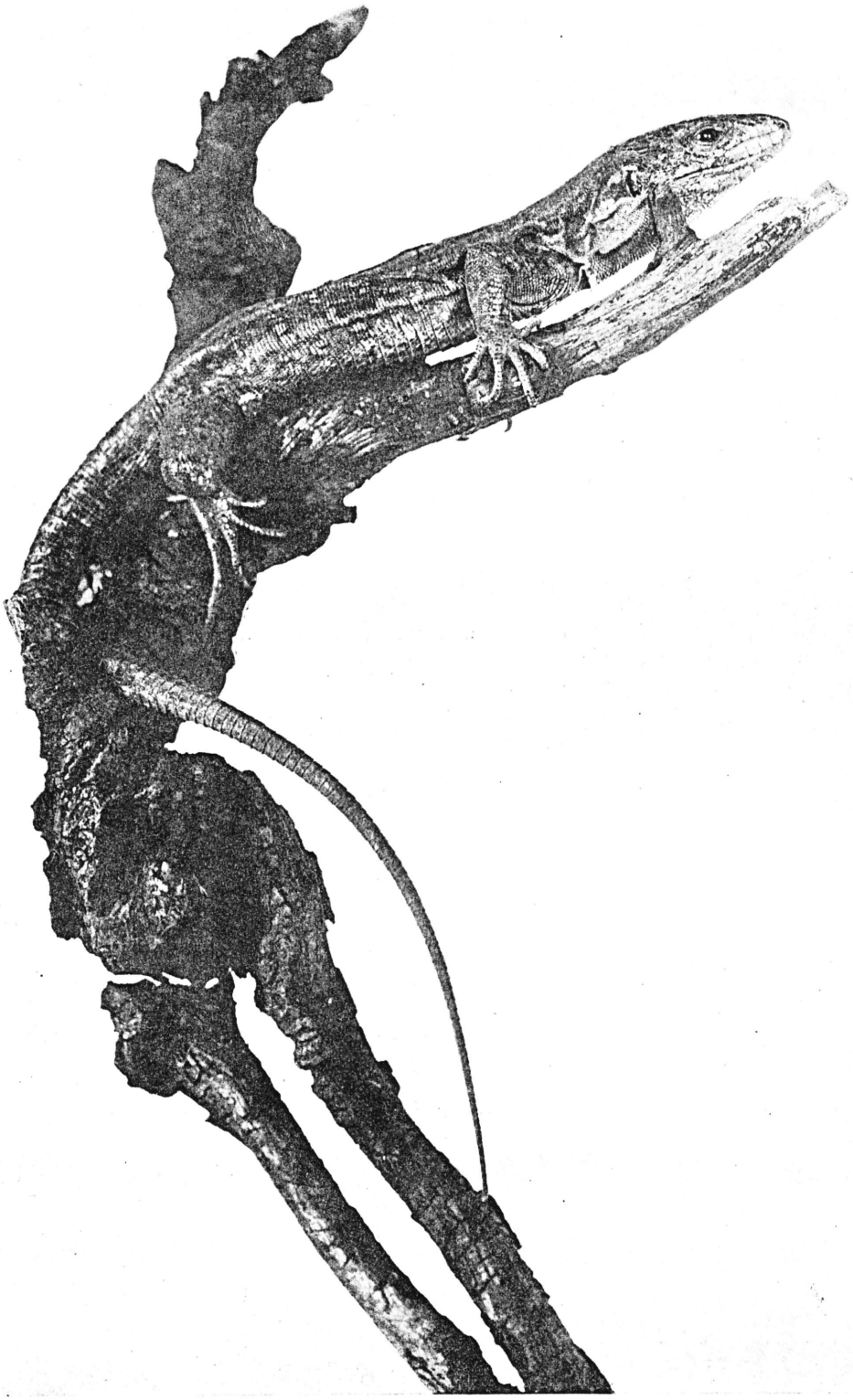


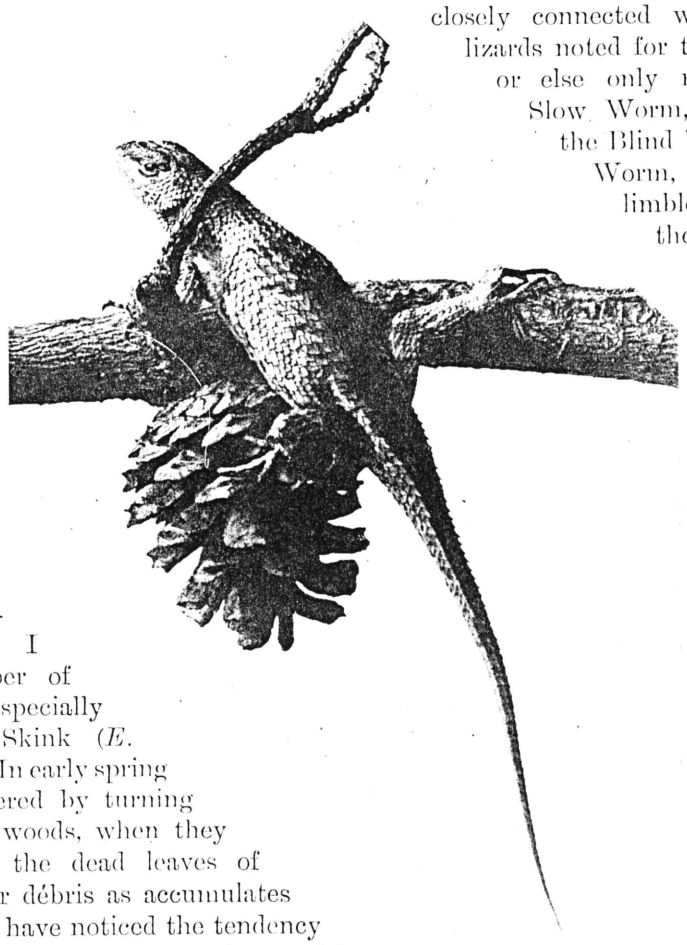
Photo by R. W. Shufeldt, New York.

A CANARIAN LIZARD (*Lacerta callotis*).

Photo by R. W. Shufeldt,] A RACE TO THE TOP—A DEAD HEAT. (A pair of Stellions.) [*New York.*

The lizards foreign to the United States of which I give illustrations here I have not enjoyed the opportunities to study in their natural haunts, but in many respects these have been given us by others who have visited their habitats. Like nearly all the larger skinks, the Cunningham's I found to be a very gentle, quiet, in fact somewhat sluggish reptile that exhibited no fear upon being handled, and no disposition to bite the person who held it fast. I made several photographic negatives of the reptile, the most spirited one being reproduced in the present communication.

The true skinks all belong to a large family of ground lizards that have a wide distribution, being found not only in Europe and Asia, but also throughout Australia, Africa, and America. In their relationships they are more or less closely connected with other groups of ground lizards noted for their having either no limbs at all or else only rudimentary ones. The well-known Slow Worm, or, as they call it in England, the Blind Worm, or in Cornwall the Cripple Worm, is one of these latter. Such a limbless lizard we also meet with in the United States, where it is known as the Glass-Snake (*Ophisaurus ventralis*). It is noted for the great brittleness of its tail or that part of the creature situated posterior to the vent.



FENCE LIZARD.

One of the best-known groups of the typical limbed skinks is, however, the genus *Eumeces*, of which over twenty species have been described, with a few subspecies. I have personally collected a number of the skinks in America, and especially the very beautiful Blue-Tailed Skink (*E. quinquelineatus*), and others. In early spring they may frequently be discovered by turning over old logs or flat stones in the woods, when they will be found concealed among the dead leaves of the previous year, or such other débris as accumulates in such places.

With Cope I have noticed the tendency of the adult scincoid reptiles to lose their colour with advancing age, and of the two Cunningham skinks before me from Australia the smaller one is darker than the larger, though no brighter in the matter of glossiness. I have noted this also to be the case in Heloderma, the big Arizona species of lizard, where the black and the orange in the younger specimens were very much darker than in those far advanced in age.

Many of the limbless relatives of the skinks are subterranean in their habits, making it difficult to study them in nature; and as a matter of fact, in so far as the American forms are concerned, we have a vast deal yet to learn in regard to their geographical distribution, their mating and breeding habits, and the foods upon which they subsist.

The Stellion Lizards are extremely susceptible to the effects of cold. It was very chilly the morning I brought them over to my study packed in a box, a distance of about a mile from their owner's. They appeared to be almost dead when I took them out in my hand, and suspecting that it was the cold I placed them on a table directly in the rays of the warm sun, and the effect on them was almost immediate. They at once revived, exhibited considerable strength, and became very active, so much so that I feared I should have considerable trouble in getting photographs of them.

I did not ascertain the sex of these specimens, and for all that I discovered to the contrary they may both have been males, or both females, or the two sexes may have been represented in them. I photographed the larger one as it stretched itself quietly on an old piece of timber, and upon placing another old dead limb in the vertical position they both ran up it together, and I obtained a fine picture of the pair as they arrived at the summit.

Stellions belong to a family of lizards technically known as the *Agamidæ*, a group containing many different genera, and found distributed throughout the tropical regions of the Old World and Central Asia. Some are arboreal in their habits, while still others are terrestrial. To the latter belong the stellions here shown, representing as they do the genus *Agama*, containing terrestrial forms of Western Asia.

In America the *Agamidæ* are not represented, being replaced throughout the New World by the *Iguanidæ*. If we compare various species in the two families, however, some very striking parallels are to be observed, and these doubtless have been produced through the operation of identical causes affecting the organisms in a similar manner. In terrestrial species the body is depressed, while on the other hand in the arboreal forms, as Mr. Boulenger has pointed out, it is compressed. Again, in the two families we meet with species possessing horny processes on the scales of the body, as well as still more pronounced ones on the head; while in both families still others develop horny spines on the tail. Turning to the arboreal forms of the two families, we meet with representatives in each of them having a median dorsal crest composed of a series of spine-like processes, resembling in some instances the dorsal fin-rays in ordinary fishes. In other species these crests are the result of elongated spines of the dorsal and certain caudal vertebræ, producing similar results.

The stellions of the *Agamidæ* now under consideration have their parallel exactly in *Phymaturus palluma* of the *Iguanidæ* of the New World.

The Canarian Lizard reminds me very much of the common American chamæleon found throughout the southern part of the United States. This lizard of the Canary Islands, however, belongs to the family *Lacertidæ*, an Old World group, while Dr. Günther considers our chamæleon to belong to the New World *Iguanidæ* and to be a representative of the genus *Anolis*, an opinion entertained by all herpetologists so far as I am aware.

All the ordinary four-limbed lizards in Europe belong to the same genus that this Canarian Lizard belongs to—that is, to the genus *Lacerta*. Even in England there are two well-marked species of the *Lacertidæ*, viz., the Common Lizard (*L. vivipara*) and the Sand Lizard (*L. agilis*), while the Green Lizard (*L. viridis*) is found on the island of Guernsey. The latter is the largest of the *Lacertidæ* within this area, though not so large or so well developed as specimens coming from south Alpine regions. The viviparous Common Lizard not only occurs in England and Scotland, but is also to be found in certain restricted districts in Ireland, and wherever found it delights in localities where the heath abounds and banks are common. Rarer than any of these species is the Sand Lizard, now I believe found in England only in the New Forest and in a few localities in the south. Specimens coming from the Continent, where it is abundant, are of larger size and more highly coloured. Continental examples may measure as much as nine or ten inches in length.

The Fence Lizard is also a viviparous species, and its eggs are sub-ellipsoidal in form and perfectly white. During the breeding season, the male of this lizard is a wonderfully handsome reptile, especially in the coloration of its lower parts, which although of a dingy white, are made conspicuous by being set off on either side by an area of deep, iridescent cobalt-blue bordered by a jetty black band. There are many species of this genus (*Sceleporus*) in the United States, differing much in size, colour, and appearance. I am most familiar with some of the south-western forms, and the type of the eastern one here shown. They are extremely interesting little reptiles, perfectly harmless, very gentle, and prettily marked. In the middle districts, as soon as the spring is thoroughly opened and the sun becomes powerful enough to warm up the woods and waysides at midday, then these lizards come forth from the places where they have spent the winter, and are to be observed basking on the old fence-rails or scampering with great agility up the tree-trunks when an attempt at capture is made. I have kept them alive upon many occasions, and found them to be almost wholly insectivorous, and especially fond of flies and ants. Dr. Günther and other herpetologists have classed this genus among the terrestrial lizards, but I have found the members to be quite as much arboreal in their habits as *Anolis*, which by no means confines itself to the trees, as the author I have just quoted seems to believe, placing it as he does, in his classification, among the arboreal genera.

De Kay, an American naturalist, claimed that this Fence Lizard (*S. undulatus*) has the power of changing the brownish olive or grey of its back to a bright azure colour, but I have never seen anything of the kind take place, and I think De Kay was mistaken, or at least misinformed in this matter. It is a well-known fact to naturalists, however, that the little fence lizards lay their white eggs, that I have described above, in the sand in the early part of June, and that they hatch out in about a month; and it is said that when the young appear "they are treated with the utmost gentleness by all the adults." I have collected this lizard as far south as Mount Vernon, Alabama, and have found it abundant in the District of Columbia and in Maryland.

Passing next, for a brief consideration, to the Heloderma, I find that the reptile has been written about and figured in many papers and works upon natural history. Still, no little doubt seems to prevail among people generally that this lizard is a venomous one, and that its bite may prove to be fatal in the case of man. This is one of the most interesting parts of its history, and the more I investigate the matter the less inclined am I to believe the truth of the statement. Indeed, I have yet to meet with a case, either in my reading or through personal observation, where a person has died from the effects of the bite of a heloderma. Certainly, up to a few years ago, when I published a full account of the species, no well-authenticated instance of the kind was on record, and, as I say, no such case has come to my knowledge since. There seems to be, however, some pretty good evidence extant going to prove that with respect to the nature of the wound it inflicts with its teeth, in the case of small animals it has been established that it occasionally turns out to be fatal. Dr. Mitchell's experiments with heloderma venom in Philadelphia appear to corroborate this much. As I have already stated, in my own case the bite was certainly non-venomous, although it was inflicted by a very large and healthy specimen recently captured in Arizona, and the wound, a very severe one, cutting through the ball of my thumb clear to the bone. Beyond sucking the incision, and the internal administration of about an ounce of pure whiskey, with a simple subsequent local dressing, nothing whatever was done in the way of treatment.

While they were formerly very common in the south-western States, these reptiles are becoming very rare. This is due to their having been killed whenever met with.