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BY

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WITH NUMEROUS COLOURED ILLUSTRATIONS

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REPTILIA.

THE orders of Reptilia represented in Persia are the *Chelonia*, *Lacertilia*, and *Ophidia*. No crocodiles are known to occur in the country; so far as I can learn, there are none in the Tigris or Euphrates, and I have been unable to obtain any information of their existence in Persian Balúchistán. In the neighbourhood of Sind *Crocodilus palustris* is common, I found it abundant in deep pools on the Hab river west of Karáchí, and heard of crocodiles (doubtless the same species) somewhat farther west; but there are few spots in Balúchistán where the supply of water throughout the year furnishes a suitable habitat for crocodiles, and the only locality where their existence is at all probable is in some of the great marshes on the shores of the Persian Gulf, especially that lying along the coast north of Kishm Island and west of Bandar Abbás. The absence of crocodiles in the Shat-el-Arab renders their existence in other rivers running into the Persian Gulf very improbable. It is rather surprising, however, that none are found there, since they are said to occur, though rarely, in Palestine, and they certainly extend much farther to the northward in India than the latitude of Basrah.

The most abundant reptiles in Persia by far are the lizards, several kinds of which swarm throughout the country. On the semi-desert plains *Eremias*, *Phrynocephalus*, and *Agama* are the prevailing forms, *Acanthodactylus* being only met with in the South, whilst a huge Uromasticid (*Centrotrachelus*) lives in burrows at the edge of the Sístán and Karmán desert, a second is found on the shores of the Persian Gulf, and a true *Uromastix* inhabits Mesopotamia. In hilly parts of the country *Stellio* and *Ophiops* prevail, the former keeping much to rocks, but

one species being also found on old walls. The Geckos and Scincids are less numerously represented than the Agamoids and Lacertians, but still are not rare. Of snakes the prevailing forms are species of *Psammophis* and *Zamenis*, and, in Northern Persia especially, *Tropidonotus hydrus*. Poisonous snakes are less abundant, the only common one being *Echis carinatus*. All which were obtained belong to the *Viperidæ*, but poisonous *Colubridæ* undoubtedly exist. Land tortoises are common, and a species of *Clemmys* abounds in suitable localities.

The present list adds considerably to the number of reptiles known to exist in Persia. The forms inhabiting the neighbourhood of the Caspian have mostly been collected and described by various Russian naturalists, Pallas, S. G. Gmelin, Ménétries, Eichwald, and Strauch, but the only collections previously made in the central and southern parts of the country appear to have been those of Olivier, Aucher-Eloy, Kotschy, Keyserling, De Filippi, and Doria¹.

CHELONIA.

FAMILY TESTUDINIDÆ.

1. *Testudo Ibera*, Pall.—De. F.

T. Ibera, Pall. Zoog. Ros. As. iii, p. 18, Pl. II, fig. 2, 3 (1831).—Eichwald, Faun.

Casp. Cauc. p. 47, Pl. V, VI.—De F. Viag. in Persia, p. 352.

T. ecaudata, Pall. Zoog. Ros. As. iii, p. 19, Pl. III, figs. 1, 2.

T. Mauritanica, Dum. et Bibr. Exp. Gén. ii, p. 44 (1835).

*T. pusilla*², Shaw apud Strauch, Mem. Acad. Sci. St. Pet. 1865, viii, No. 13, p. 14, nec Linn.

T. Græca, partim, Gray, Cat. Shield Rept. p. 10.

1-6. Karmán 5000

Dr. Gray unites this species with *S. Græca*. It appears to me to differ in colour, in the shape of the plates, and in being less convex and more oblong. It is kept separate by the authors of the *Erpétologie Générale*, and by Strauch in his work on tortoises.

¹ See Introduction, pp. 3-6.

² The *T. pusilla* of Linnæus was from the Cape of Good Hope, and amongst other characters the fore and hind legs were said to be naked and without scales, whilst the colouration differs widely from that of *T. Ibera*.

T. ecaudata, Pall., was described from a drawing made by S. G. Gmelin of a specimen obtained on the south shore of the Caspian. It was said to have five toes on all its feet, but the additional toe on each hind foot may very possibly be attributed to an error of the draughtsman.

The name *Ibera* applied to this species by Pallas is derived not from Spain, but from another country anciently also called Iberia, viz. Georgia.

I was at first disposed to consider the South Persian *Testudo* a distinct species from *T. Ibera*, from ordinary specimens of which it differs in the form of the sternal plates, the pectorals and præanals being very short along the median suture. In young specimens the median suture between the pectoral shields is about half the length of that between the gulars and postgulars, which are equal to each other; in adults the proportion is still less, about one quarter. The median abdominal suture is always about one-third the length of the sternum. The suture between the præanals is about one-third as long as that between the anals. The transverse suture between the postgulars and pectorals is much curved, that between the abdominals and præanals is also curved.

Another circumstance which induced me to suspect that the tortoise of Southern Persia differed from that of the North was pointed out to me by Major St. John. In the first-named region the common land tortoise inhabits barren hill-sides and semi-desert plains far from cultivation. In Northern Persia it is chiefly found in woods and gardens.

On comparing my specimens, however, at the Zoological Gardens with a large series of living *T. Ibera* (*v. Mauritanica*) from various parts of Southern Europe and Northern Africa, I found that there was no constant difference, some of the African specimens having the same form of sternal plates as those from Persia.

Tortoises are common throughout Persia. All my specimens are from Karmán, but I frequently saw and examined others near Shiráz and on the road from Shiráz to Isfahán, which appeared to differ in no respect from those collected. I saw none east of Karmán, and I did not meet with any in Northern Persia, though they are far from rare.

2. * *T. (Homopus*¹) *Horsfieldi*, Gray.

Testudo Horsfieldii, Gray, Cat. Tort. Croc. etc. Brit. Mus. 1844, p. 7.—Cat.

Shield Rept. p. 7, Pl. I.—Gunther, Rept. Brit. Ind. p. 7.

Homopus Burnesii, Blyth, J. A. S. B. 1853, xxii, p. 642.

Testudinella Horsfieldii, Gray, P. Z. S. 1870, p. 658.—Supp. Cat. Shield Rept. Brit. Mus. p. 12.—Ann. and Mag. Nat. Hist. Ser. 4, ii, p. 143, Feb. 1873.

Dr. Gray has referred to this species two carapaces obtained by General Goldsmid's party near Duruh, north of Sístán, and presented to the British Museum, where I have examined them. Although the animal has not been preserved, and consequently the number of the claws on the fore-feet, the peculiar character of this type, cannot be determined, the form of the carapace agrees well with that of *T. Horsfieldi*, and Dr. Gray is probably right in referring these specimens to that species, the range of which is thus shown to extend into North-eastern Persia.

The Sind tortoise, *T. Leithi*, Günther, P. Z. S. 1869, p. 502 (subsequently considered by Dr. Günther to be probably identical with *T. marginata*), may perhaps be found in Balúchistán, but I did not meet with it.

FAMILY EMYDIDÆ.

3. *Emys orbicularis*, (L.)—De F.

Testudo orbicularis, L. Syst. Nat. 1766, i, p. 351, No. 5. — Gm. Syst. Nat. i, pt. 3, p. 1039.—Pall. Zoog. Ros. As. iii, p. 17.

T. Europæa, Schneider, Schildk. p. 323, (1783).

Cistudo Europæa, Dum. et Bibr. Erp. Gén. ii, p. 220.—Gray, Syn. Rept. p. 19.—De F. Viag. in Pers. pp. 80, 352, etc.

Lutremys Europæa, Gray, Cat. Shield Rept. p. 40.—Supp. Cat. Shield Rept. p. 22.

Emys lutaria, Strauch, Mem. Acad. Sci. St. Pet. 1865, viii, No. 13, p. 49, nec *Testudo lutaria*, L.

1-5. Enzeli, on the Caspian Sea.

¹ I doubt whether the division of the genus *Testudo*, on account of the number of claws on the fore-feet, first proposed by Duméril and Bibron, is quite natural. The character appears to me scarcely of generic importance. But if the African species having four toes on the fore-feet be made into a distinct genus *Homopus*, I fail to perceive any object to be gained by creating an additional genus for the Afghan tortoise as proposed by Dr. Gray.

This species is not known to be found, in Persia, anywhere except on the shores of the Caspian. It abounds at Enzeli in the great sheet of shallow water called the Murdáb and the various streams and creeks running into it. According to De Filippi, it is usually to be met with in brackish waters, *Clemmys Caspia* inhabiting running streams of fresh water.

The Caspian variety of the common European *Emys* is a very beautiful tortoise: the carapace above is dark olive, finely and closely dotted over with yellow spots, which tend to form radiating lines on the vertebral and costal plates; the sternum is uniformly coloured yellow. The head and limbs are also dark olive, finely spotted and streaked with yellow. It grows to a considerable size; I saw specimens nearly a foot long.

I cannot understand why this species, which appears to be unmistakably the *Testudo orbicularis* of Linnæus, should be known to all European naturalists by Schneider's later name, which is in no way preferable. Dr. Gray, in his Catalogue of Shield Reptiles, quotes the Linnæan title as a synonym of that given seventeen years later by Schneider. The name *Emys lutaria* employed by Strauch is by him ascribed to Marsili, Danubius perlustr. iv, p. 91, tab. 32 and 33, a work which I have not succeeded in finding. The *Testudo lutaria* of Linnæus is evidently a distinct form; it is said to be from India, and to be carinate on the three hinder plates.

4. *Clemmys Caspia*, (S. G. Gmel.)—De F.

Testudo Caspica, S. G. Gmel. Reise d. Russland, iii, p. 59, Pl. X, XI.

T. Græca, Pall. Zoog. Ros. As. iii, p. 17.

Emys Caspia, Eichwald, Zool. Spec. Ross. Pol. iii. p. 196.—Dum. et Bibr. Erp. Gén. ii, p. 255, partim.—Gray, Cat. Shield Rept. p. 22, partim.—De F. Viag. in Persia, pp. 88, 108, 352, etc.

Clemmys Caspica, Eichw. Faun. Casp. Cauc. p. 45, Pl. III, IV.—Strauch, Mem. Acad. Sci. St. Pet. viii, No. 13, p. 73.

*E. Grayi*¹, Gunther, P. Z. S. 1869, p. 504, Pl. XXXVIII.

Emmenia Grayi, Gray, Supp. Cat. Shield Rept. Brit. Mus. p. 38.

¹ The locality of the type presented by Dr. Leith to the British Museum was Bussora, evidently the port of that name (more correctly written Basrah) on the Shat-el-Arab, the stream formed by the union of the Tigris and Euphrates. It is well to note this, because all the other specimens presented by Dr. Leith at the same time were from Western India.

- 1-11. Near Shiráz, partly from Tang-i-Kerim, seventy miles east of Shiráz, partly from the Bandámír valley, near Persepolis.
 12. Safed Rúd, south of Resht, North Persia.
 13. Murdáb, near Enzeli, on the Caspian Sea.

The various authors who have referred the common *Clemmys*¹ of Southern Europe to this species have evidently been unacquainted with the young of the Caspian and Mesopotamian form, which is well distinguished by its peculiar colouration, and a specimen of which, received in the British Museum from the neighbourhood of Basrah, was recognised as distinct by Dr. Günther, and named by him *E. Grayi*. This was subsequently made the type of Dr. Gray's genus *Emmenia*; but although the specific difference is unquestionable, I cannot think the Eastern form deserving of generic separation, for the two species are very closely allied. Indeed, in the adults, the only characters by which the forms can be certainly recognised are the colours of the under part of the shell, and especially of the marginal shields just below the lateral edge of the carapace. In every specimen of *C. Caspia* which I have examined, young or old, the portions of the fourth, fifth, sixth, and seventh marginal shields (counting from the front) which are bent over between the axillary and inguinal incisions to meet the shields of the sternum, are yellow, marked with two black spots on each shield. In the European and Levant form, the oldest name for which appears to be *E. leprosa*², Schweigger, this is never the case, the inferior portion of the shields in question being of a uniformly dusky brown, or else brown with irregular patches of yellow. The sternal shields themselves, too, in *C. Caspia*, are dusky brown in the young, with narrow yellow margins, and in older specimens the yellow covers a larger portion of the surface, there being usually a black patch in the middle of each plate, whilst in the young of *C. leprosa* the sternum

¹ As Strauch has pointed out, the type of the genus *Emys* of Wagler was *E. Europæa* (= *E. orbicularis*); and the forms referred by Duméril and Bibron, Gray and others, to *Emys* are those constituting Wagler's genus *Clemmys*. The genus *Emys* was first proposed by Duméril, who, however, included all the fresh-water tortoises (*Emydidæ* and *Trioncidæ*), and named no typical species. Wagler divided the genus into several, which have been adopted more or less by subsequent writers, and he first defined the genus as now admitted.

² Duméril and Bibron appear to have united with *C. Caspia* the form inhabiting South-eastern Europe and Asia Minor, and they distinguished this from the species found in Spain and Northern Africa, their *E. sigriz*. If this distinction holds good, the latter is probably the true *C. leprosa*, whilst the Levant form must take Gray's name *C. vulgaris*, published in 1831, Syn. Rept. p. 24, Pl. IV.

appears to be as a rule uniformly coloured, and in older shells the distribution of the pale and dark colours is less regular than in *C. Caspia*, the transverse sutures being frequently the portions which remain darkest. So far too as I can judge from the very fair series of specimens in the British Museum, the nuchal plate in adults of *C. leprosa* is always longer than broad, in *C. Caspia* it is as broad as long, or the breadth slightly exceeds the length. The markings on the neck and limbs consist in both forms of longitudinal yellow lines; these seem to be rather coarser in *C. leprosa* than in *C. Caspia*.

But it is in the young shell that the distinctions between the two forms are most marked. Duméril and Bibron describe the young (of the European tortoise evidently) as tricarinate, but this character appears not to be constant, at least specimens from the Levant in the British Museum do not show it, whilst a specimen in which the lateral keels are well developed may perhaps be somewhat distorted. It is possible that two forms are still confounded under *C. leprosa*, in one of which the young is tricarinate, in the other destitute of lateral keels, but this I have no means of determining. The central keel, however, does appear always to be more developed in *C. leprosa* than in *C. Caspia*. But the principal distinction of the Eastern species can only be seen when the epidermal shields are worn thin, or when they have been removed, and then upon the blackish surface of the bone-plates beneath there is seen a double whitish ring, somewhat like a distorted figure of 8, on each of the vertebral and costal shields, and a single ring on each of the marginals. Lines run out from some of the angles of the rings to the margins of the shield, so that on some there is almost a double figure of 8. On the lateral marginals below the angle of the carapace the two characteristic black spots are also found, on removing the epidermal shield, to be due to the colouration of the bone-plates below.

That this is really Gmelin's species is shown by the following facts. Gmelin's type, described in the 'Reise durch Rüssland,' was procured in a stream called the Pusahat, close to the town of Shamaki, west of Bákú, on the Caspian, and the same form was found, as stated by Gmelin himself, in Ghílán. The plates in Gmelin's work are coarsely executed, and Pl. X, representing the upper part of the shell, might have been taken as well from *Emys orbicularis* (*E. Europea*) as from *C. Caspia*, but Pl. XI, in which the sternum is figured, is evidently, from the colouration, taken from the Caspian *Clemmys*, the peculiar black spots on the marginal plates being clearly shown. Plates III and

IV of Eichwald's Fauna Caspio-Caucasica also evidently represent the present form, although the colouration of the soft parts is incorrect, and the sternum is represented as uniformly dark, which is not the case in such specimens as I have examined; but the nuchal plate is nearly square, and the characteristic dark spots are shown on the lower portions of the marginal shields.

The two specimens obtained by me in Ghílán, near Resht and Enzeli, both quite young, agree exactly with those obtained in Southern Persia, and with the types of *E. Grayi* from the Euphrates. This *Clemmys* abounds in the streams running into the Caspian in Ghílán, in the creeks around Resht, and, according to De Filippi, in running waters throughout Georgia. It is equally common in the streams of Southern Persia, and probably in Mesopotamia, for it evidently abounds in the Shat-el-Arab at Basrah, whence a fine series has quite recently been procured for the Zoological Gardens in London. In the Bandámír valley I saw hundreds on the banks of the streams which traverse the plain of Persepolis. I did not meet with this species more than 100 miles east of Shiráz.

Major St. John informs me that he has seen a fresh-water tortoise, probably a *Clemmys*, in great numbers, on the banks of a small brackish stream near Kázrún, on the road between Bushire and Shiráz. They were larger than *C. Caspia* usually is near Shiráz, and they wanted the bright green and yellow colouring of the soft parts. This last difference may have been due to age, the colours being less distinct in older specimens, but it is possible that the Kázrún form may be distinct. Major St. John tells me that, on a subsequent occasion, a search for this tortoise at the salt lake near Kázrún was unsuccessful.

FAMILY TRIONYCIDÆ.

5. *Trionyx Euphraticus*, (Daudin).

Testudo Euphratica, Daud. Hist. Nat. Rept. ii, p. 305, (1802).

T. rafeht, Olivier, Voy. Emp. Othm. Eg. et Pers. iii, p. 454, Pl. XLI, (1807).

Trionyx Euphraticus, Gray, Synops. Rept. p. 48.

Gymnopus Euphraticus, Dum. et Bibr. Erp. Gén. ii, p. 498.

Trionyx rafeht, Gray, Cat. Shield Rept. p. 65, Pl. XXX.

Rafetus Euphraticus, Gray, Supp. Cat. Shield Rept. p. 104.

Trionyx rafeht, Strauch, Mem. Acad. Sci. St. Pet. 1865, viii, No. 13, p. 130.

This species, which inhabits the Tigris and Euphrates, must be found in the large streams running into those rivers from the eastward, the Karún for instance, and there cannot I think be much doubt of the propriety of including it in the Persian fauna. I do not know if it inhabits the Shat-el-Arab, the estuary formed by the united rivers, the left bank of which for some distance from the mouth belongs to Persia.

LACERTILIA.

FAMILY AGAMIDÆ.

6. *Calotes versicolor*, (Daudin).

Dum. et Bibr. Erp. Gén. iv, p. 405.—Gunther, Rept. Brit. Ind. p. 140.

1. Khor Askán, north of Bampusht, Balúchistán	..	3000
2-6. Kalagán, Balúchistán	.. .. .	3500

I was somewhat surprised at finding this Indian tree-lizard in Balúchistán, for it extends far to the east of India, and even to China, and as a rule the animals (forms of world-wide distribution excepted) which range from the Malay countries into India are not found even in Western India. *Pratincola caprata*, however, affords one instance of a species ranging both east and west of India, and *Calotes versicolor* is another. The latter had previously been brought from Afghánistán.

I only met with this species twice, and on both occasions it was found on date-palms. As the plantations of these palms are few in number and many miles intervene between them, it is very difficult to account for the appearance of these lizards, unless we suppose them to have inhabited the country at a time when it was more covered with wood than is the case at present. It is quite true, as stated by Dr. Stoliczka, J. A. S. B. 1872, p. 110, that *Calotes* is often not much more arboreal than terrestrial in its habits. I have repeatedly seen and captured specimens on the ground, but always, I think, in the neighbourhood of trees. I do not remember meeting with it in open plains away from trees or large bushes, as I have often seen *Sitana Pondiceriana*, and I cannot conceive a *Calotes* crossing the desert plains and barren rocky hills of Sind and Balúchistán to reach patches of date cultivation. In the geological portion of this work, however,

details are given to show the probability of a more moist climate having formerly existed in Persia and Balúchistán, and it is reasonable to suppose that this lizard migrated into the country whilst this was the case. Many of the date-groves are probably of very high antiquity, and the *Calotes* may have inhabited them for ages.

I cannot say how far this species extends to the westward in Balúchistán; it should be looked for in the country near Bushire and the date-groves of Mesopotamia.

7. *Agama agilis*, Olivier.—De F.

Olivier, Voy. Emp. Othm. Eg. et Pers. ii, p. 428, Pl. XXIX, fig. 1.—Dum. et Bibr. Erp. Gén. iv, p. 496. — De F. Viag. in Pers. p. 353. — Anderson, P. Z. S. 1872, p. 384.

1-8. Samán, Dasht, west of Gwádar, Balúchistán	—
9-11. Báhu Kalát, Balúchistán	—
12-16. Mand, Balúchistán	700
17. Ispidán, near Mand, Balúchistán	1000
18, 19. Zamrán, Balúchistán	2000
20, 21. Ghistigán, Bampusht, Balúchistán	3000
22-24. Isfandak, Balúchistán	3000
25. Dizak, Balúchistán	4000
26-29. Sib, west of Dizak, Balúchistán	4000
30, 31. Magas	4500
32. Between Magas and Bampúr, Balúchistán	3000
33, 34. Near Rígán, Narmashír, south-eastern Persia	2500
35. Karmán	5000
36-42. Southern Persia (labels illegible).	
43. Ghílán, northern Persia	—

This is the most common and widely spread of the Agamoid lizards of Persia; indeed amongst all the Persian lizards I know of there is but one, *Eremias pardalis*, which has an equally extensive range throughout the country. *Agama agilis* is to be found equally on rocky hills and open plains, lurking in the clefts of the rocks or under roots of bushes. It is active in its movements, running with considerable speed. So far as I have seen, it never ascends trees or bushes, but is always to be found on the ground; its original discoverer however, Olivier, says that he observed it on shrubs near Baghdad. I cannot help suggesting that he may have confounded the habits of this species with those of the nearly allied *Trapelus ruderatus*.

I do not remember noticing *A. agilis* at any considerable elevation above the sea, even in Southern Persia, as a rule, I think, not above

6000 feet, and it was met with throughout Balúchistán as low as the sea level. It has been obtained in the Punjab in India by Theobald, and I myself collected specimens in Sind, near Karácbí.

The following notes of the colouration are taken from living specimens. Upper parts dark sandy, with a bluish tinge on the scales of the back; the limbs above with faintly-marked pale narrow cross bands; tail with transverse dark bands about a quarter of an inch apart, becoming more distinct and black about the tip. Sides of body dull cobalt blue speckled with sandy. Abdomen whitish, often with darker longitudinal bands more or less distinctly marked. Chin mottled bluish and sandy or dusky; throat pale blue; a black fold before each shoulder.

In spring the blue colouration becomes richer and darker, the chin, throat, and sides of the belly becoming dark ultramarine, more or less mottled with white. Some specimens have claret-coloured spots on the back, forming imperfect cross-bands. Young specimens are sometimes transversely banded with dark brown on the back, the cross-bands being more or less broken up by lighter patches.

8. *Trapelus ruderatus*, (Olivier).—De F.

Agama ruderata, Olivier, Voy. Emp. Othm. Eg. et Pers. ii, p. 429, Pl. XXIX, fig. 3.

A. mutabilis, Dum. et Bibr. Erp. Gén. iv, p. 505 partim, nec Merr. Syst. Amph. p. 50.

Trapelus ruderata, Gray, Cat. Liz. Brit. Mus. p. 258.

Agama Lessonæ, De F. Viag. in Persia, p. 353.

Trapelus ruderatus, Anderson, P. Z. S. 1872, p. 384.

1-8. Near Shiráz	..	..	..	4000
9. Near Isfahán	..	..	..	5000

I have examined the type of *Agama Lessonæ*, De F., in the Turin Museum. The whole of the dorsal scales, whether enlarged or not, are distinctly keeled, but I cannot consider this as a specific character, because I find that there is great variation amongst the specimens of *T. ruderatus* from one locality, some having all the scales or nearly all distinctly keeled, whilst in others only a few are carinate. Usually the keeled scales have a fresher appearance, whilst those which are not keeled have a worn rounded look, as if all the scales were normally keeled but the keels wear off.

It should be borne in mind that the Persian lizard is the type of *Agama ruderata* of Olivier, and therefore even if the Egyptian form be separated, Olivier's name must be retained for the Persian animal. Judging from the specimens from North-eastern Africa in the British Museum, I am disposed to consider that they are distinguished from the Persian lizards by the back being mostly covered with equal-sized scales in transverse rows with only a few distinctly keeled larger scales scattered singly here and there, whilst in the true *T. ruderatus* larger and smaller scales are most irregularly mixed, and the smaller scales are neither uniform in size, nor arranged in distinct rows. The Egyptian species, if it be, as I think it is, distinct, will retain the name of *T. mutabilis*, Merr.

On the whole, my specimens agree fairly with Dr. Anderson's description of those obtained by him from Shiráz, except that the tail is about $1\frac{1}{4}$ times the length of the head and body, instead of a little less than twice the length, and that I think the number of oblique rows of ventral scales between the fore-legs, 14, must be a misprint for 24. It is, however, very difficult to specify any exact number, no two people in all probability would count the same in any given specimen. The largest specimen I possess measures 7.5 inches, of which the tail from the anus measures 4.1, fore-limb 1.7, hind-limb 2.25.

The colour when fresh was sandy, with transverse bands formed of large subquadrate spots on the back; these are usually red, but sometimes dusky, the animal having probably the power of changing the colour. Tail with irregular cross-bands often indistinct. There are five transverse bands between the head and the thighs, the anterior one being on the neck.

I only met with *Trapelus ruderatus* near Shiráz and Isfahán; Anderson received it from Tehrán. The type of *Agama Lessonæ* was from near Isfahán. I did not notice this species far east of Shiráz. It is very often found on bushes, indeed I saw it more commonly in this position than on the ground. The greater portion of the specimens captured were females, and they appear to have been engaged in laying eggs, which may possibly have been connected with their being found on bushes. In the oviducts of one I find as many as thirteen eggs about half-an-inch long.

9. *Stellio nuptus*, De F. Pl. XIX, fig. 1.

Agama nupta, De F. Giornale dell' I. R. Ist. Lomb. vi, 1843.

Stellio carinatus, A. Dum. Cat. Méth. Rept. Mus. Par. p. 107, 1851; Arch. Mus. Hist. Nat. viii, p. 580.

S. nuptus, De F. Viag. in Persia, p. 352.

1. Near Sib, west of Dizak	..	..	..	..	4000
2-5. South-east of Rígán, Narmashír, south-eastern Persia					3000
6-10. Karmán	..	..	..	..	5000
11. Tehrúd, near Karmán	..	..	..	..	5000
12. South-east of Karmán	..	..	..	..	5500
13. North of Shiráz	..	..	..	..	(?)
14. Kushkizard, between Shiráz and Isfahán	..	..	..	..	8000
15. Isfahán	..	..	..	..	5000

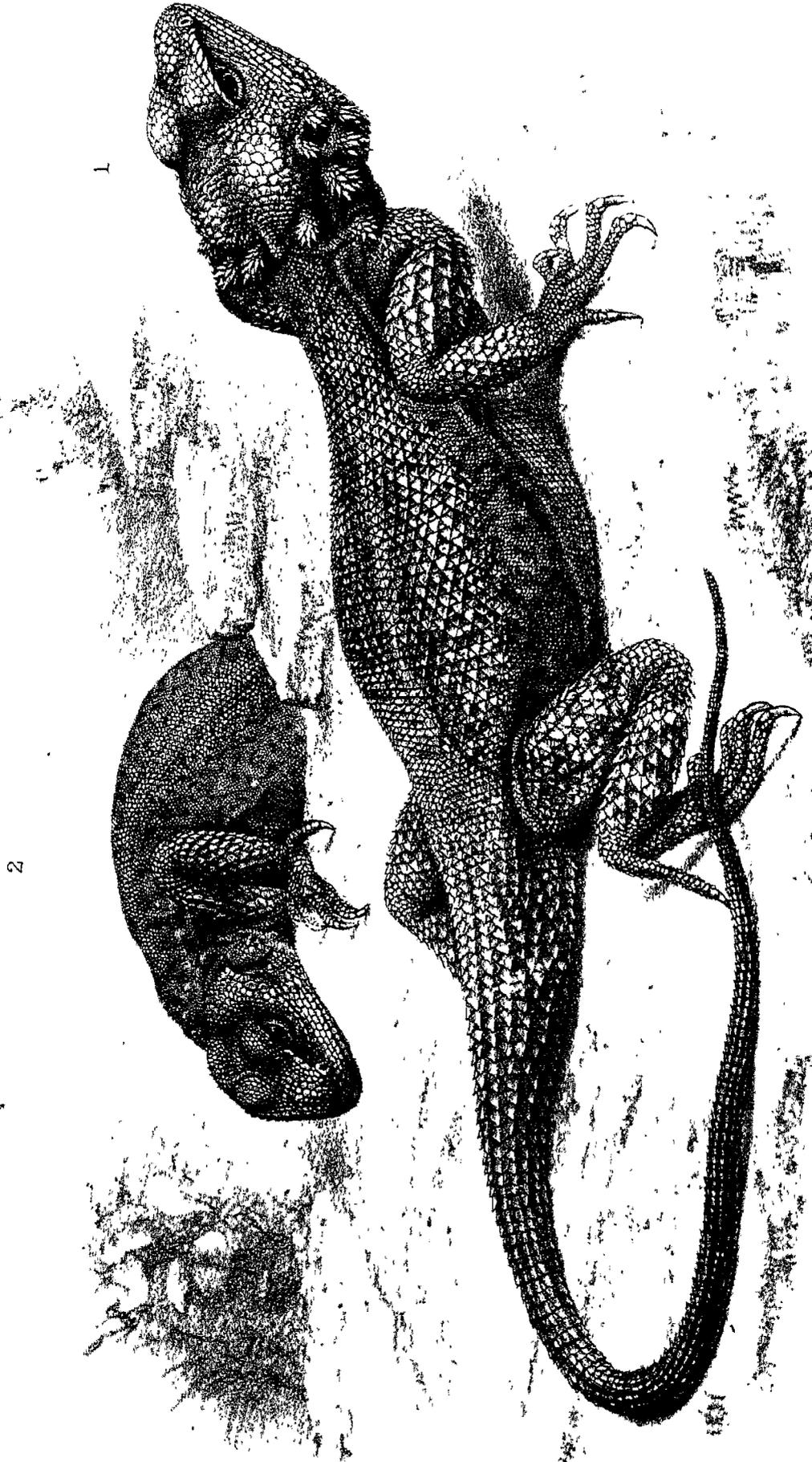
Description:—General form rather stout, head and body depressed, tail long, from $1\frac{1}{2}$ times to nearly twice the length of the head and body. The head is rather flat, triangular, broader in males than in females, the breadth at the ear orifices in the former being equal to the length. The fore-leg when laid back extends to the thigh in some specimens, in others it falls somewhat short of it; the hind-limb nearly reaches the ear when laid forwards. The third and fourth toes on the fore-foot differ but little in length, the fourth being just perceptibly the longest; on the hind-foot the fourth toe exceeds the third by less than half the length of the claw. All the claws are strong and curved. Adult specimens measure when perfect 16 to 17 in. in length; head and body, from nose to anus, 6 in.; tail, 10 to 11 in. In such a specimen the head alone measures 1.6 in.; fore-limb 3; third fore-toe, without claw, 0.6; hind-limb 4.75; third hind-toe, without claw, 0.75.

The scales on the upper surface of the head are mostly smooth, especially those of the supraorbital and occipital regions; on the snout the scales are often bluntly keeled. The nostril is of moderate size, directed a little backwards, and situated on the *canthus rostralis*, which is sharp just in front of the superciliary ridge, and then appears interrupted by the nostril. There are two or three scales between the nasal shield and the rostral, and the same number between the former and the upper labials. Rostral nearly twice as broad as it is high, and twice as broad as the supralabials; mental (or lower rostral) the same breadth as the rostral, but longer and pointed behind. Labials very little larger than the adjoining scales; about fifteen, or rather more, may

be counted on each side of each jaw. Scales at the side of the head keeled, those near the upper labials longitudinally elongate. The margins of the tympanum and sides and back of the neck are ornamented with groups of well-developed flattened spines, less developed in the females : of these tubercular groups of spines, there are two on each side of the back of the neck, the posterior pair being more widely separated than the anterior ones : round the tympanum are five almost equidistant groups, the largest, bearing the longest spines, being just behind the ear-opening, and there are three or four much smaller groups in an horizontal line under the ear, the hindmost of them being at the extremity of the anterior throat-fold, some of the scales on which have distinct spines in old specimens.

The scales of the occiput are keeled and pass gradually into the small scales of the back of the neck. In the centre these are raised into a small longitudinal ridge or rudimentary crest. The scales of the back are imbricate, equal in size, all keeled, and terminated by small points ; there are usually about 15 or 16 (in extreme numbers 13 to 19) enlarged scales across the centre of the back, arranged in slightly oblique lines converging behind ; they are abruptly separated at the sides from the small rhomboidal scales of the flanks ; the ventral scales are also rhomboidal, larger than those of the sides, though smaller than those of the back, and arranged in transverse and oblique series ; they are quite smooth, and pass gradually into the scales of the sides, which are for the most part not keeled, though they are pointed behind. There are no enlarged spiny or tubercular scales scattered over the sides. The scales above the limbs and tail are sharply keeled and terminate in points, and the scales above the shoulder are almost spines in some specimens. Scales on the lower part of the tail not keeled near the base. The tail scales are in more or less distinct rings.

Besides the double fold beneath the chin there is a very distinct fold across the back of the neck, single in the middle, more or less distinctly double at the sides ; and from the side of the neck another fold begins, which runs at first upwards and backwards above the shoulders and then descends gradually along the sides to the anterior lower portion of the thigh. In many specimens there is a well-marked but small fold below, inside the thigh, and three or four slight folds at the back of the thigh. There are, in the males only, three or four rows of thickened scales in front of the anus, and a small oval patch, five



Muntern Bros. imp

1. STELLIO NUPTUS
2. S. MICROLEPIS.

G. H. Ford. lith.

to seven scales long and five or six broad, of similar thickened scales in the centre of the abdomen. Both of these are wanting in females.

The general colour above is pale yellowish brown, sometimes more or less dusky, the upper part of the limbs, the fore limbs especially, and the end of the tail being often dusky or black, but the distribution of dark and light colouration varies much. The chin is cobalt blue, more or less mottled and veined with yellow; the abdomen the same in front, but paler.

Stellio nuptus is found on rocks, walls, and buildings. It is often very common about towns and villages on the old walls, tombs, etc. built of earth hardened by exposure or of unburnt bricks, but it is equally abundant in places on rocky hills far from dwelling-places. It is insectivorous. I captured one in the act of devouring a small scorpion, and I have found remains of insects in the stomachs of such as I have examined, mixed, however, with remains of vegetables. I found ten eggs, each three quarters of an inch long, in the oviducts of a female captured at Karmán in May.

I met with this species first in the highlands of Balúchistán at 3000–4000 feet above the sea, and found it abundant thence in many places throughout Southern Persia, as far north as Isfahán, where it is common on the old walls near the suburbs of Julfa. I never saw it in Northern Persia. Major St. John informs me that either this species or a closely allied one is very abundant in the rocky pass called Míyán Kotal, between Shiráz and Bushire. If the species be the same, it is probable that this lizard is also found in the Zagros mountains west of Shiráz.

De Filippi (Viag. in Persia, p. 353) states that the dorsal and caudal scales are finely pectinate. I do not find this character constant; in some specimens the edges of the scales show distinct comb-like serration, especially on the upper basal portion of the tail, but in others I can see no trace of this character. It is by no means confined to the upper parts, but may be traced distinctly on the throat and abdomen in some specimens. It is entirely confined to the lower or cuticular layer of each scale, and is best seen when the epidermal or horny portion is removed.

♂ a. *S. nuptus*, var. *fuscus*.

1. Kalagán, Balúchistán	..	..	..	3500
2. Near Jálk, Balúchistán	..	..	..	3000

S. differt a S. nupto typico plicâ nuchali eurrente, squamis supra-collaribus paullo majoribus, colore subnigro.

These two specimens differ from all others in their very dark colour, in the absence of the fold on the back of the neck, and in the scales of the same part being not quite so minute as in the typical form; but I feel a little doubt about distinguishing them specifically, because in one there appears a tendency to a rudimentary fold above the neck, and because the specimen of the typical form from Sib, near Dizak, in Balúchistán, shows a smaller fold than those from Karmán and Shiráz. The colouration too may be partly due to the season, and it is variable in Persian specimens.

The following is the colouration of the Kalagán lizard noted when fresh:—General colour black, the under parts from the throat and nearly the whole of the limbs and tail being entirely of that colour, but the upper parts of the head and body and the sides are speckled with brownish white, and the chin and throat are mottled whitish and dusky. Usually on the upper parts there is a brown spot in the middle of each scale, the edges being black.

10. *S. liratus*, W. Blanf. Pl. XX, fig. 2.

Ann. and Mag. Nat. Hist. June 1874, xiii, p. 453.

1. Samán, Dasht, Balúchistán, near sea level.

S. supra fuscus, nigrescente transversim fasciatus; a valde affini S. melanurâ Blyth, squamis supracaudalibus caudæ basin versus haud carinatis, plicâ nuchali præsentate, et forsan squamis carinatis ad medium dorsum majoribus distinguendus. A Stellio nupto differt squamarum carinis ad medium dorsum in lineis parallelis dispositis, ad latera postice divergentibus, ipsis squamis dorsalibus utrinque gradatim diminuentibus, et colli lateribus vix spinosis.

Hab. in Gedrosiâ (Balúchistán) haud procul a Gwádar.

Description:—General form moderately stout, depressed, tail much longer than the body, head rather flat, the breadth behind about two-thirds of the length. The fore-limb, laid back, extends to the thigh, or rather beyond; the hind-limb, laid forward, reaches in front of the ear. The fourth toe on the fore-foot very slightly longer than the third; on the hind-foot the fourth toe exceeds the third by the length of the claw. Claws rather small, well curved. The only specimen obtained, a female, measures 4 in. from the snout to the anus; the

tail is imperfect; the head barely 1 in.; the fore-leg, to the end of the toes, measures 2 in.; its third toe, without the claw, 0.35; the hind-leg 2.95; its third toe 0.55.

The scales of the upper part of the head are transversely keeled on the occiput, smooth in the convex superciliary regions, convex or bluntly keeled longitudinally on the snout. Nostril in the hinder part of a small nasal shield in the middle of the *canthus rostralis*, separated by two scales from the rostral, and with two or three between it and the upper labials. Rostral twice as broad as it is high, and more than twice the breadth of the adjacent supralabials. Mental the same breadth as the rostral, acuminate behind. About fourteen upper and fifteen lower labials on each side. The sides of the head are covered with keeled scales, very small near the tympanum and immediately round the eye. A group of spinose scales in front of the large tympanum, and a very few scattered spines below and behind it. (In males these spines may be more developed, and the head is perhaps broader.)

The scales of the back of the neck are very small; in the middle, a little behind the occiput, commences a row of larger keeled scales, forming a rudimentary crest. These are continued backwards and join the enlarged dorsal scales. In the middle of the back are six or seven rows of large keeled scales, the keels forming continuous parallel lines; towards the sides the scales gradually diminish in size, and the keels, still forming continuous lines, diverge backwards. The lateral scales are small, all being keeled; the ventral scales are flat and rhomboidal, much larger than the lateral ones, but not half as large as the median dorsal scales; they pass gradually into the smaller lateral scales. I count 120 to 130 scales round the middle of the body; those on the sides and abdomen are all in transverse series. No enlarged scales on the sides. The scales above the limbs are sharply keeled and pointed, those above the base of the tail are pointed but not keeled, those below the tail towards the base are smooth and rounded, the remainder of the tail scales are keeled and pointed. None are in distinct rings.

A fold across the back of the neck, single in the centre, dividing into two immediately at each side. Two or three folds across the throat; a fold from the side of the neck over the shoulder, running back towards the groin. The only specimen being a female, there are no thickened præanal or abdominal scales.

Colour, when fresh, dusky above, with imperfect blackish transverse markings; a small blackish pit before each shoulder.

The only specimen procured was found on rocks in some barren hills near the halting-place called Samán, in the Dasht province of Balúchistán, four marches west of Gwádar.

This species is evidently close to *S. melanura*, Blyth, of which I have no specimen for comparison, but judging by the fact that Dr. Anderson was at one time disposed to consider *S. melanura* the young of *S. Dayanus*, Stol., I can only suppose that the dorsal scales in *S. melanura* must be considerably smaller than in the present form; and this is rendered more probable by the number of scales round the body being greater in the former, 149 according to Anderson. Anderson gives 53 as the number of smooth ventral scales in *S. melanura*; in the present species they are less numerous, but they pass so gradually into the small lateral scales that it is impossible to assign any exact number. The present form is also distinguished apparently by having a fold at the back of the neck as in *S. nuptus*, and by the scales above the tail near the base not being distinctly keeled. *S. melanura*, too, is said to have the tail scales in distinct verticils, but in some allied forms of *Stellio* this character is somewhat liable to variation. I have not seen any species in which the annulation is so indistinct as in the present.

From *Stellio nuptus* the present form may be immediately distinguished by the keels of the dorsal scales forming parallel lines in the middle of the back, instead of converging behind, and by the enlarged scales of the back passing gradually into the smaller scales on the sides. Judging too from the present specimen, *S. viratus* is a much smaller form, with very few and small spines at the sides of the neck and around the tympanum.

11. *S. caucasicus*, Eichwald, Pl. XX, fig. 1.—De F.

Eichwald, Zool. Spec. iii, p. 187.—Fauna Casp.-Cauc. p. 80, Pl. XIII (Osteology).—Gray, Cat. Liz. Brit. Mus. p. 255.—A. Dum. Cath. Méth. p. 105; Arch. Mus. Hist. Nat. viii, p. 578.—De F. Viag. in Persia, p. 352; Bull. Sc. pp. 198–200.—Ann. and Mag. Nat. Hist. Ser. 3, xix, p. 145.

Lacerta muricata et *L. Stellio*, Pall. Zoog. Ros. As. iii, pp. 20, 24.

Stellio vulgaris, Mén. Cat. Rais. No. 219, p. 64.

S. Persicus, Anderson, P. Z. S. 1872, p. 382, fig. 4 (*fig. mala*).

1-10.	Kohrúd, north of Isfahán	.. ..	7000-8000
11-16	Elburz mountains, north of Tehrán	.. ..	5000-7000
17-21.	Elburz mountains, north of Kazvín	.. ..	4000-5000

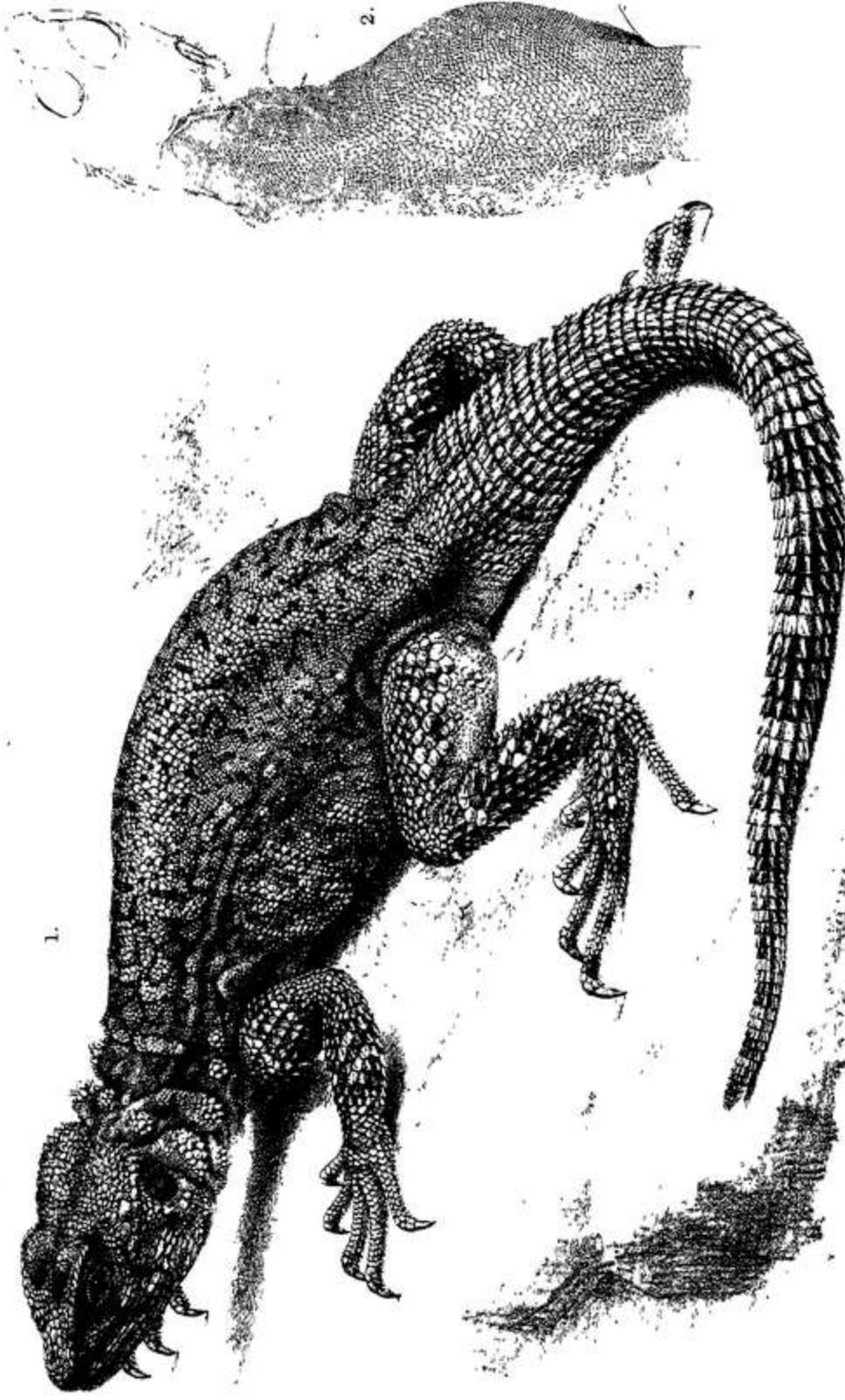
Although I have not, for want of specimens, ventured to keep the species from the Caucasus distinct from that inhabiting the Elburz and other ranges in Northern Persia, I am not quite convinced that they are identical. A single specimen in the British Museum from Elizabethpol, Transcaucasia, differs from Elburz examples in colour, in having all the scales of the centre of the back sharply keeled, and in having fewer scales, about 135, round the body. The original types of Eichwald came from the Caucasus, near Tiflis, Bákú, etc., but he identified with them specimens from the Tális mountains which are almost certainly of the same species as those from the Elburz; in describing the species in the 'Fauna Caspio-Caucasica,' he calls the central back scales subcarinate, and his description generally agrees with the Elburz form, so that it is by no means improbable that the Elizabethpol specimen may belong to a species inhabiting Armenia, not the Caucasus. Anderson's typical specimen of *S. Persicus* differs in no respect that I can see from young specimens of the Elburz species, identified by Eichwald with *S. Caucasicus*. At the same time, should the Caucasus form prove distinct, Anderson's name will stand for that of Northern Persia. In young specimens of the latter the enlarged scales in the centre of the back are distinctly keeled, but with age the keels disappear more or less. There is no distinct line of smaller scales along the vertebral line, and in adults there are decidedly spinose scales scattered over the sides. As no complete description taken from adult specimens appears to have been given, I append the following, for the purpose of facilitating comparison with the form next to be described.

Descriptions:—General form stout, much depressed; tail, depressed near the base, $1\frac{1}{4}$ to $1\frac{1}{3}$ times the length of the body; the fore-limb does not reach the thigh, the hind-limb about reaches the ear or falls a little short of it. Head flat, triangular, its length exceeding its breadth. The fourth toe on the hind-foot exceeds the third by about half the length of the claw. In a large specimen, the head and body, from the nose to the anus, measures nearly 6 in. Judging from other specimens, this would, if the tail were perfect, be about 14 in. long. The head measures 1.55, fore-limb to end of toes 1.75, hind-limb 4 in.; third toe of hind-foot, without the claw, 0.75.

The scales on the supraorbital bosses are smooth as usual, and

rather smaller, especially near the superciliary ridges, than on other parts of the head. Those on the occipital region are smooth in front, but towards the hinder portion they bear compressed spines. Scales of the snout convex; *canthus rostralis* well marked; loreal region concave; the nasal shield is just below the *canthus*, usually separated by two shields from the rostral, and by three longitudinal rows from the upper labials; nostril in the hinder portion of the scale, and directed backwards. The scales of the snout and sides of the head and some of the occipital scales have brown dots on their outer or lower margins. Rostral broader than high, about twice as broad as the adjoining labials; mental the same breadth as the rostral, bluntly pointed behind. There are about twelve upper and thirteen lower labials; two or three rows of elongate scales along the edge of both upper and lower labials, those on the upper jaw being keeled. A line of sharply-keeled enlarged scales (sometimes two rows) runs back from under the eye to over the tympanum, which is large. Enlarged spinose conical scales, more or less arranged in groups before, below, and behind the tympanum; the largest patch is usually behind: there is another group a little further back on the side of the neck, and several smaller groups of similar enlarged conical scales scattered over the lateral portions of the neck above, but none in the middle, and there is no trace of a crest.

The back of the neck is covered with minute granules, amongst which the spiny groups of scales are scattered. Just before the shoulders these pass gradually, in the middle of the back, into larger scales, which form a not very broad line down the centre of the back. They are rather irregular in shape and size, not arranged in rows, subimbricate, and keeled in young specimens, but smooth in adults. Sometimes they are smaller in the middle, but not always, and usually from seven to ten may be counted across. The sides of the back and the flanks are covered with very small keeled scales, arranged in transverse series, scattered amongst which are larger conical scales, often in small groups. Towards the middle of the body, separated by an area of smaller scales from the enlarged vertebral series and joining the ventral scales, there is a somewhat conspicuous patch of larger scales, keeled and submucronate, unequal in size. The ventral scales are smooth, rhomboidal, in transverse series, containing, in the middle of the abdomen, about fifty-five to sixty scales. I count 150 to 160 scales altogether round the middle of the body, but owing to the irregular



Montana Bros imp

1 STELLIO CAUCASICUS. 2 S LIRATUS

G.H.Kord.

size of the scales the number is variable. The chin scales resemble those of the abdomen, but are smaller; those beneath the neck smaller still. Scales above the limbs strongly keeled and spinose, those on the thigh as large as the caudal scales; behind the thigh are some scattered spinose scales amongst smaller ones. Scales below the limbs smooth. Tail scales strongly keeled and spinose, except below near the base; all are in distinct verticils.

No distinct nuchal fold: there are two distinct folds on the sides and lower portions of the neck. The fold running back from the neck over the shoulder is not so distinct as in *S. nuptus*, nor is it continued in the same way down the sides to the inguinal region. In front of the anus are several rows of thickened scales, as many as six to eight in adults, those in front being smaller; and a large oval patch of similar scales occupies the centre of the abdomen, rather nearer to the vent than to the throat. This also increases with age; in old males I find it occupies in the centre forty-five to forty-eight transverse rows of scales, and where broadest comprises about twenty-six scales, and it is 2 inches long by $1\frac{1}{4}$ broad. There are the same thickened præanal and abdominal scales in adult females, but they are much fewer in number.

Colour:—Head pale olive above, paler than the body: the enlarged scales in the middle of the back are also pale, often whitish, but generally with black scales scattered amongst them. The rest of the upper part of the body varies from greyish to dusky olivaceous, with more or less distinct transverse bands of white or pink, black-edged ocelli; these are usually well marked near the shoulders, but not on the loins. Occasionally the sides, which are usually darker than the middle of the back, are sooty, the enlarged scales being always pale coloured. Limbs olivaceous to dusky above, the fore-limbs with irregular pale cross-bands. The tail pale olive to whitish, usually with irregular transverse dusky marks. Lower parts usually pale, often with a pinkish or salmon tinge; the breast and abdomen in old specimens are often dusky, and the skin is frequently veined or marbled with dusky marks.

Stellio Caucasicus abounds on the Elburz mountains, especially on the northern slope in the upper portion of the Mazandarán and Ghílán forest region. I met with it up to 7000 feet, or perhaps rather higher. I never saw it in the plain of Tehrán, and I think it probable that Dr. Anderson's specimen of *S. Persicus* was from the Elburz north of the

city. I also met with this lizard in the greatest abundance at 7000 to 9000 feet above the sea on the range of high hills crossed by the road from Isfahán to Tehrán, near Soh and Kohrúd, three to four marches north of Isfahán. There is nothing peculiar in their habits; they are, like all *Stellios*, so far as I have seen, strictly diurnal lizards, coming out as soon as the sun's rays acquire sufficient elevation to warm the earth in the morning, and hiding at night and in cold weather beneath stones or in the fissures between rocks. In winter, I am informed by Major St. John, none are to be seen. I believe that, like most reptiles, they keep to one spot; I have certainly seen one and apparently the same lizard occupy the same stone day after day. Professor De Filippi has noticed that they are chiefly herbivorous; I have found remains of insects in the stomachs of all which I have examined, mixed with fragments of herbaceous plants, chiefly small stems. I did not find seeds.

A full account of the osteology of this species is given by Eichwald in the *Fauna Caspio-Caucasica*. He gives fifteen as the number of teeth in each ramus of each jaw, besides the two elongate incisors on each side in front. I find only fourteen maxillary teeth in my specimens on each side. In old specimens they are much worn.

12. *S. microlepis*, W. Blanf. Pl. XIX, fig. 2.

Ann. and Mag. Nat. Hist. June 1874, xiii, p. 453.

1-4. Khán-i-súrkh pass, north of Sarján, between Karmán and Shiráz, South Persia	..	9000
5-14. Kushkizard, between Shiráz and Isfahán	..	8000

S. Caucasico affinis, sed squamis præsertim in medio dorso, inter humeros, minoribus et coloribus magis fuscis distinguendus. Squamæ circum medium corpus plus quam 200, cum in S. Caucasico 150-160 duntaxat numerantur.

Hab. in montibus Persiæ meridionalis.

It is quite unnecessary to give a detailed description of this species, which is so closely allied to *S. Caucasicus* that the characters of that species apply equally to *S. microlepis*, with the following exceptions. The scales in the present form are all smaller. I count always considerably more than 200, usually 210 to 220, round the middle of the body. The enlarged scales down the middle of the back are decidedly smaller, and they diminish in size on the sides and pass more gradually

into the lateral scales. They also decrease rapidly in size in front; between the shoulders they are always much smaller than in *S. Caucasicus*, and there appears always a longer space on the back of the neck between them and the occiput.

The scales of the supraorbital bosses are very little smaller than those of the occiput, except close to the superciliary ridges. The brown dots on the scales of the snout and loreal region are faint or wanting. The labials are rather more numerous, usually thirteen to fifteen in the upper and about fourteen to sixteen on each side of the lower jaw, but the number varies. The spinose scales around the tympanum and on the sides of the neck are a little smaller. As a general rule the head and limbs are rather smaller and the tail rather shorter, but this is only well seen on comparing adult males. There are the same large patches of thickened scales on the abdomen and before the anus, but the scales themselves are a little smaller.

The general colour is dusky olivaceous, the scales in the middle of the back never being conspicuously paler as in *S. Caucasicus*, and being frequently darker than the sides. The whole colour is more uniform than in the Northern form; the cross-bands of pale spots are very much less marked and smaller.

I met with this species in two localities, both at a considerable elevation, in Southern Persia; first on a high pass, about 9000 feet above the sea, near Khán-i-súrkh, on the road from Karmán to Shiráz, about 100 miles south-west of the first-named city; secondly, at about 8000 feet above the sea, near Kushkizard, on the high plateau traversed about half-way from Shiráz on the road to Isfahán. Both of these passes traverse portions of the same range of hills, and this lizard may probably be found throughout the higher parts of the chain. I nowhere saw *Stellio microlepis* at an elevation much below 8000 feet above the sea. Its habits, so far as observed, are precisely similar to those of *S. Caucasicus*.

13. *Phrynocephalus Olivieri*, Dum. et Bibr.—De F.

- Olivier, Voy. Emp. Othm. Eg. et Pers. Atlas, Pl. XLII, fig. 1.—Dum. et Bibr. Erp. Gén. iv, p. 517.—De F. Viag. in Persia, p. 354.—Anderson, P. Z. S. 1872, p. 386.
P. Tickellii, Gray, Cat. Liz. Brit. Mus. p. 260.—Günther, Rept. Brit. Ind. p. 160.

1-23.	Ghistigán, Bampusht, Balúchistán	..	..	3000
24-28.	Dizak, Balúchistán	..	..	4000
29-31.	Magas, Balúchistán	..	..	4500
32, 33.	Near Bampúi, Balúchistán	..	..	1500
34-38.	Near Rígán, Narmashír, south-eastern Persia			2500
39, 40.	Near Bam, south-eastern Persia	..	..	4000
41-44.	Rayín, south-east of Karmán	..	..	7000
45-50.	South Persia	..	..	—
51.	Near Isfahán?	..	..	—

I have examined the single type specimen of *P. Tickellii*, said to be from Afghánistán, in the British Museum. It is much dried and shrunk, and the scales on the limbs have contracted so much as to appear keeled in places, but I have no doubt of its being identical with *P. Olivieri*, as was suggested by Dr. Günther in the 'Reptiles of British India.'

The colouration varies a good deal in fresh specimens, and changes greatly in those preserved in spirits. The following note of the colour was taken from living animals. Above olive grey, drab, or dusky. Along the middle of the back in many specimens is a well-defined oval patch, extending nearly from the shoulder to the loin, and one-third the width, of a decidedly pink or pale purplish colour. A dark band crosses the back behind the shoulders, and another in front of the thighs, and these are often united by longitudinal bands, one along each side, but these markings vary greatly, and are often wanting. There is, in many cases, a fine whitish speckling on the back. On each side of the neck above are two short dark longitudinal marks, occupying slight depressions; between them and below the lowest are raised folds covered with tubercular scales. There are in some specimens dusky spots on the labials. The limbs are marked above with transverse bands. Tail greyish above, white below, with five to seven perfect black rings, which are jetty black beneath. Remainder of lower parts pure white. The length varies from 3.5 to 4.5 inches, the tail from the anus being $\frac{1}{4}$ to $\frac{2}{5}$ longer than the head and body.

P. Olivieri inhabits gravelly or stony plains. I have occasionally seen one take refuge on a small bush when I have been endeavouring to capture it, but I never at other times noticed it on bushes. Neither this nor any other of the Persian species inhabits holes, nor have I noticed any in pairs as was observed by Theobald in the case of *P. caudivolvulus* (J. A. S. B. xxxi, 1862, p. 518, and xxxvii, pt. 2, extra number, Cat. of Rept. p. 40). The tail is not prehensile; nor

have I ever seen it coiled, but it is extremely flexible; it never appears to be reproduced, and very rarely lost or defective. I do not think *P. Olivieri* is viviparous (cf. Theobald on *P. caudivolvulus*, l. c.). I find in each case four eggs of rather large size, about half-an-inch long, in pregnant females captured about the end of February and in March. The food of this lizard consists chiefly of ants. I have not in any case detected vegetable substances in the stomach¹.

I found *P. Olivieri* abundant in most parts of Southern Persia and Balúchistán, at elevations from 2000 to about 7000 feet above the sea, keeping chiefly to open semi-desert stony or gravelly plains, but not on sand. I met with it commonly near Isfahán, but farther north it became very scarce, and I am not sure that it occurred near Tehrán, where it appeared to be completely replaced by *P. Persicus*. De Filippi also received it from Southern Persia only. Around Shiráz and Karmán it is common.

14. *P. Persicus*, De F.

De Filippi, Archiv. p. la Zool. Gen. ii, p. 387; Viag. in Persia, p. 353.—
Anderson, P. Z. S. 1872, p. 388, fig. 5.

1-27. Kushkizard, between Shiráz and Isfahán	..	8000
28, 29. Between Tehrán and Kazvín	.. ..	4000

I have compared my specimens with De Filippi's types in Turin, and they are undoubtedly the same lizard. I believe the species to be distinct from *P. helioscopus*, Pall., of which there are specimens from Siberia in the British Museum, but not on the same grounds as Prof. De Filippi; and I may mention that I feel much doubt whether the *P. helioscopus* of that writer from Armenia is really identical with Pallas's species. *P. Persicus* appears to me to differ from *P. helioscopus* in having the back scales neither keeled nor as a rule distinctly imbricate, in the scales below the head not being imbricate, the scales above the limbs being as a rule smooth, or sometimes very faintly keeled, on the fore-arm and tarsus especially, and by the enlarged spinose scales of the upper parts being much larger. In *P. helioscopus* all the scales of the upper parts are bluntly keeled, those of the back

¹ I may remark that I greatly doubt if there is any close affinity between *Uromastix* and *Phrynocephalus*, as suggested by Theobald. *Phrynocephalus* I consider as most nearly allied to *Agama* and *Trapelus*, *Uromastix* I agree with Theobald in looking upon as the type of a distinct sub-family at least (see foot-note to p. 334).

and also those of the chin and throat over-lapping the next scales at their posterior margins, and the dorsal tubercles are much smaller. The colours also differ somewhat. I give the fresh colouration of *P. Persicus* below.

With reference to both De Filippi's and Anderson's descriptions (P. Z. S. l. c.), I note the following characters from the series before me. The scales between the nasals vary from two to five, the commonest number in my specimens being three (five is the number given by both De Filippi and Anderson); they are irregular and not in distinct rows, except occasionally in the middle, where in some specimens there is a vertical row of enlarged keeled scales. The ordinary scales of the back are subimbricate in general rather than imbricate; often in the middle of the back they have no tendency to overlap. The scales on the lower portion of the posterior half of the tail are bluntly keeled and arranged in longitudinal rows. The number of enlarged scales on the edge of the eyelids varies somewhat, but is usually about the number given by Dr. Anderson; twelve on the upper, ten on the lower. The number of labials varies greatly; I count in various specimens twenty-nine to thirty-five round the upper lip. The dental formula in fully adult animals is $m \frac{10-10}{10-10} ; \frac{3-3}{2-2}$, but except in rather old specimens some of the teeth are often deficient, and in the young it is impossible by an inspection of the mouth to distinguish the anterior molars from the incisors. When full grown the outer pair of incisors (? canines) are longer than the other teeth. The crest on the nape is very variable, and more often wanting, in Southern Persian specimens at least, than present. The edges of the toes on the hind-feet are slightly fringed, especially the outer edge of the fourth toe, but not those of the fingers; the animal is not a digger. The figure in the 'Proceedings of the Zoological Society' is not good, the head being much too large.

To the above I may add that the scales above the head are tubercular, bluntly keeled or submucronate. The tail varies in length from a little less than that of the head and body to a little more. A large specimen measured 4.75 in. in length, of which the tail from the anus was 2.3, fore-leg 1.05, hind-leg 1.55. In another specimen, 4.25 in. long, the tail measured 2.3.

The prevailing colour above is sandy, below white. There are no distinct cross-bands on the body or tail, but there are large dusky spots on each side of the latter. There are often a pair of large spots

on the sides of the back, one behind the shoulders, the other before the thighs, and small spots on the upper parts of the limbs and sides of the head. In many specimens there is a large greyish-blue or pale indigo patch of considerable size on each side of the neck, with the upper margin bright scarlet. In a few specimens the under parts were dingy red, and in one the lower portion of the tail was pale green, becoming red near the anus. These bright colours on the lower parts are probably seasonal. In most specimens the under surface of the head is mottled with dusky grey.

The habits of this species appear to me identical with those of *P. Olivieri*. It inhabits similar plains, does not live in holes, and when pursued takes refuge, not under stones or in the ground, but amongst the roots of bushes or on the bushes themselves. Its food, too, consists largely of ants.

I first met with *P. Persicus* near Kushkizard¹, on the plateau, 8000 feet above the sea, traversed by the road from Shiráz to Isfahán. It abounded on the same open plain with scattered bushes, on which I found *Ablepharus bivittatus*, another North Persian species not met with elsewhere in Southern Persia. I again found this *Phrynocephalus* abundant near Tehrán at a much lower elevation, 4000–5000 feet above the sea.

15. *P. maculatus*, And.

Anderson, P. Z. S. 1872, p. 289, fig. 6.

1-3. Near Bam, south-eastern Persia	..	..	3000
4-7. Karmán	..	..	5000
8. Salt marsh, Sar-i-júm	..	..	5000
9-12. Between Karmán and Shiráz	..	..	(?)

Although my specimens differ from Dr. Anderson's description in colouration, in the number of teeth, and a few minor points, I have ascertained by comparison with the type that the species is the same. The colour varies, and some of the teeth in Anderson's specimen were deficient, owing to its being immature. I give a fresh description from adults.

Description:—General form rather depressed, similar to that of *P. caudivolvulus*; head not quite so short, body not so broad, as in

¹ The locality whence Anderson's specimens were obtained was near this, but on another road from Shiráz to Isfahán. 'Awada,' seven days north of Shiráz, is a misprint or misreading for Abádeh.

P. Olivieri; limbs and tail longer. In adults, the fore-limb laid back reaches the thigh, the hind-limb laid forward extends about to the eye, in younger specimens to the end of the snout; the tail exceeds the body in length by from one-third to one-half. The base of the tail is depressed and very slightly dilated, the tail tapers gradually, is much thicker in proportion than in *P. Olivieri*, and can be coiled upwards near the end. Toes strong and moderately long, very little serrated at the edge; the fourth toe on the hind-foot exceeds the third by twice the length of its claw. Claws strong, very little curved, of a yellow colour; the claw of the fifth toe on the hind-foot is double the length of the others. Maxillary teeth (molars) $\frac{10-10}{10-10}$, incisors $\frac{3-3}{2-2}$, the outer pair of the latter in each-jaw being elongate. A large specimen measures 7.25 inches, of which the tail from the anus is 4.2; the fore-limb is 1.5, hind-leg 2.45 long, measured as usual to the ends of the toes.

Scales of the head rather tubercular, slightly unequal in size, those of the frontal region and centre of the occiput being usually rather larger; each nostril is usually in the upper part of a rather large oval shield, with a smaller crescentic shield above it, or it is between two shields, an upper and a lower; one scale (more rarely two) in the middle between the nasals. There is a fringe of moderate-sized, rather rounded scales to the upper eyelid, and of much longer pointed ones to the lower, in each case about ten in number, varying slightly. The scales on the sides of the head above the labials and some of the scales of the occiput have often pores on their lower or outer surface, but I do not find this character constant. Upper labials about 30-31; usually the last on each side is larger, and there is no distinct rostral. But there is much variation in these points; in one specimen I count 36 upper labials. The mental plate or lower rostral is larger than the other lower labials; there are two rows of enlarged scales, the lower of them the larger, but not extending far back, along the lower labials. Ears covered by small granular scales similar to those of the throat.

Scales of the back rhomboidal, smooth, in transverse rows, in the centre of the back a little larger, and gradually diminishing slightly towards the sides, granular in front of the thigh and behind the shoulder; ventral shields nearly square, about the same size as those in the middle of the back, and as a rule smooth, but in some cases I find slight keels and distinctly mucronate terminations behind on

some of the scales about the middle and posterior portions. I count about 106-112 scales round the middle of the body. Scales on the limbs as a rule smooth; on the tarsus and fore-arm however they are usually, but not always, more or less keeled above and below; scales beneath the soles of the feet strongly keeled, cross-plates beneath the toes ribbed (only seen under a strong lens). The tail is covered near the base and for about a quarter of its length with smooth rhomboidal scales the same size as those of the back; the remainder is covered with keeled scales, the keels forming longitudinal lines below, but not above; all the tail scales are in rings.

Colour of the upper parts, when fresh, pale slaty grey to dusky brown, speckled more or less finely and closely with whitish, and occasionally, but by no means generally, crossed with transverse dusky bands, usually of a pinkish or coppery colour in living specimens, or marked with dark spots. The tip of the tail is always black below, and usually above also, but the distance to which the black extends from the tip varies; in front of the black portion and separated from it there are frequently one or more black rings, and the basal portion is often marked with dusky spots at the sides or banded with dusky above. Lower parts, except the end of the tail, usually white; in some cases the lower part of the tail except the tip is of salmon colour (probably during the breeding season only), and the hinder part of the thighs is bright yellow.

This *Phrynocephalus* was found in open plains, very locally distributed, and apparently keeping to more barren and sandy parts of the country than the other species. The only place where I found it common was in the great sandy plain east of Karmán. I first met with it in Narmashír, near Rígan and Bam, at about 2500 feet above the sea; the other places where it was seen were 2000 to 3000 feet higher, but it was not observed at any greater elevation. One specimen was captured on the utterly barren salt-swamp of Sar-i-júm, between Karmán and Shiráz. Anderson's examples come from Awada, evidently Abádeh, which is higher than any place where I observed this species. I also remember seeing it near Isfahán, but I have not preserved specimens, and I did not notice it further north.

P. maculatus has a habit of coiling the end of its tail upwards, or in the reverse direction to that in which a chamæleon coils it. I cannot form any idea of the use to which this animal puts its tail as a prehensile organ. The places it inhabits are as a rule destitute even of

bushes, so that the tail can scarcely be employed for climbing. Although it is closely allied to *P. caudivolvulus*, I do not think it is either herbivorous or viviparous; I find only remains of insects (chiefly ants, as in the other species) in the stomach; and in two pregnant females captured near Bam on the 21st of April I find two eggs in each. Neither have I ever observed that this species burrows or takes refuge in holes or under stones¹.

Undoubtedly *P. maculatus* is closely allied to *P. caudivolvulus*. On comparing it with specimens of that species from Tibet, in the British Museum, I find the latter differ in having a shorter tail, no keels on the tail scales except close to the tips, and strong keels to the scales of the abdomen. The size is much smaller and the colouration different. Dr. Günther states, in his 'Reptiles of British India,' p. 161, that these Tibetan specimens have been compared by Prof. Peters with the type of *P. caudivolvulus* and found identical. But it is worthy of notice that Eichwald, in his 'Fauna Caspio-Caucasica,' describes the ventral scales of *P. caudivolvulus* as not keeled, and the present species, as we have seen, has them sometimes slightly keeled, so it is possible the difference in this respect is not constant.

16. *Uromastix*² *microlepis*, W. Blanf.

P. Z. S. 1874.

U. affinis *U. spinipedi*, *tuberculis majoribus ad latera corporis sparsis carentibus, plicis ad latera colli tuberculos parvos ferentibus, squamisque supra et infra pedes minoribus, distinguendus. Ab U. acanthinurâ squamis omnibus multo minoribus facile recognoscitur.*

Hab. in Mesopotamiâ juxta urbem Basrah (Bussora).

¹ I mention these facts because Mr. Theobald found a *Phrynocephalus* on the banks of Lake Tsomoriri in Thibet, called at first *P. Olivieri* by the finder, J. A. S. B. 1862, xxxi, p. 518, and then *P. Theobaldi* by Mr. Blyth, id. 1863, xxxii, p. 90, but subsequently identified by Mr. Theobald himself with *P. caudivolvulus*, Cat. Rept. Mus. As. Soc. p. 40, which he described as living in pairs, inhabiting burrows, and producing living young,—two and occasionally three foeti being found in females. The same species was described apparently as *P. Stoliczkae* by Steindachner, Rept. Novara, p. 22, but identified by Günther with *P. caudivolvulus*, Zool. Record, 1867, p. 137.

² Mr. Theobald (Journ. Linn. Soc. x, p. 34, and J. A. S. B. 1868, Cat. Rept. p. 39) proposed to separate *Uromastix*, *Leiolepis*, and *Phrynocephalus* as a distinct family, because they are herbivorous and live in burrows. This view has been adopted by Anderson, P. Z. S. 1871, p. 167, and Stoliczka, P. A. S. B. 1872, p. 81. If maintained, however, it must be so on other grounds than those assigned by Theobald, and I do

Description:—General form massive; trunk broad, depressed; head triangular, upper portion flat behind, descending in a curve towards the muzzle. Limbs rather stout; the fore-foot laid forward extends beyond the snout by the length of the fingers, laid backward it reaches two-thirds of the distance to the thigh; when the hind-foot is brought forward, the ends of the toes nearly touch the axil. Toes strong, a fringe of pointed scales on the outer edge of the fourth toe of the hind foot, and less marked fringes on the second and third toes. Claws rather long, pale coloured. Tail thick, gradually attenuate, formed of rings of pointed conical tubercles, its length about equal to that of the body without the head and neck.

About eighteen subconical teeth on each side of the upper jaw, those in front smaller and much worn down; fifteen similar teeth much blunted on each side of the lower jaw. In front of the upper jaw is a cutting edge formed of a broad central portion, which appears to be a process of the maxillary bone, and two smaller lateral teeth, one on each side, apparently united to the central process at the base. Similarly in front of the lower jaw are two cutting edges, one at the end of each ramus of the mandible, each composed of an osseous and a dental portion, the osseous portion the broadest, and nearest to the extremity of the jaw. In young specimens the dental portion of these pseudo-incisors is more developed and the osseous portion less than in adults. Tongue deeply cleft at the end.

The largest specimen obtained measures 21 inches, of which the tail from the anus measures 8.5, head 2, fore-limb to end of claws 4.75, third toe and claw measured from the division between the third and fourth toes 1.12, hind-limb 6.25, third toe 1.22.

Scales:—Head covered above with convex scales, largest on the snout and occiput, and on the forehead between the eyes. *Canthus rostralis* rounded; nostrils lateral, oval, rather large, each in the middle of a single plate below the *canthus*. Rostral enlarged; mental smaller than the rostral. Labials scarcely larger than the neighbouring

not think *Phrynocephalus*, none of the Persian species of which live in holes or are herbivorous, and the dentition of which resembles *Agama* and not *Uromastix*, can be included. *Stellio*, on the other hand, is herbivorous, though not exclusively so. That *Uromastix*, *Centrotrachelus*, and I believe *Leiolepis*, form a well-marked section, is obvious, and they appear to me just as deserving of separation from the *Agamidae* as are the *Sepsidae* from the *Scincidae*, but I prefer myself retaining the larger groups as families.

scales; posterior upper labials triangular, all others square Chin, except near the lower labials, covered with very small convex scales; scales of the neck equally small, subconical or mucronate, those of the lower surface in transverse rows. Sides of the neck with irregular longitudinal folds, bearing larger tubercular pointed scales; there are also transverse folds below the neck, but they do not bear larger tubercles. Scales of the back and sides all small, submucronate, with the points compressed and directed backward, in well-marked transverse rows except near the middle line of the back; no enlarged scales on the sides. Abdominal scales rhomboidal, a little larger than those of the back, arranged in transverse series. Scales of anterior portion of the fore-limb like those of the abdomen, those on the posterior surface the size of the back scales, a few slightly enlarged scales on the outer surface of the fore-arm. On the hind-limb the scales are larger on the inner, smaller on the outer surface; a row of large conical tubercles passes down the front of the tarsus, and large spinose tubercles are scattered over its outer surface; a few, less in size, occurring on the posterior portion of the thigh. Feet and toes covered beneath with keeled scales, the keels longitudinal on the soles of the fore-feet, transverse on those of the hind-feet. In the largest specimen, a male, there are eighteen femoral pores on one side, twenty on the other, in a younger specimen fourteen beneath each thigh, the two series coming close together in the præanal region. Tail when perfect consisting of about twenty-three or twenty-four rings, the upper and lateral portion of each ring consisting of large spines, the points directed backward; the lower portion, except towards the tip, is covered by rings of smaller nearly flat scales, diminishing in size towards the base of the tail.

Colour olive grey, with small rather indistinct darker spots on the back; lower parts and tail rather paler.

Intestinal canal elongate, but apparently less so than in *Centrotrachelus*. In a specimen measuring altogether 17 in. in length, of which the tail is 7, the whole length of the intestinal tract from the cardiac end of the stomach to the anus is 28 in., the large intestines measuring 8 in.

This species was found inhabiting the neighbourhood of Basrah, whence three specimens were brought by Captain Phillips and presented alive to the Zoological Society. It is in all probability

this lizard which was first noticed in Mesopotamia by Olivier (Voyage dans l'Empire Othman, l'Egypte, et la Perse, ii, p. 428), and said to be larger and longer than a man's arm, and dwelling in holes like those made by foxes.

U. microlepis is closely allied to the African *U. spinipes* and *U. acanthinurus*; it is distinguished from the former by the absence of enlarged scales on the sides and by the lateral folds on the neck bearing tubercles, and from the latter by its much smaller scales.

17. *Centrotrachelus Asmussi*, Strauch, Pl. XXI.

Bull. Acad. Imp. Sci. St. Pet. 1863, vi, p. 479.

Boz-mich or *Boz-mijeh*, Persian (Goat-milker).

- | | |
|---|------|
| 1. About ninety miles north-west of Bampur, Balú- | |
| chistán | 1800 |
| 2-4. Near Rígan, Narmashír, south-eastern Persia .. | 2500 |

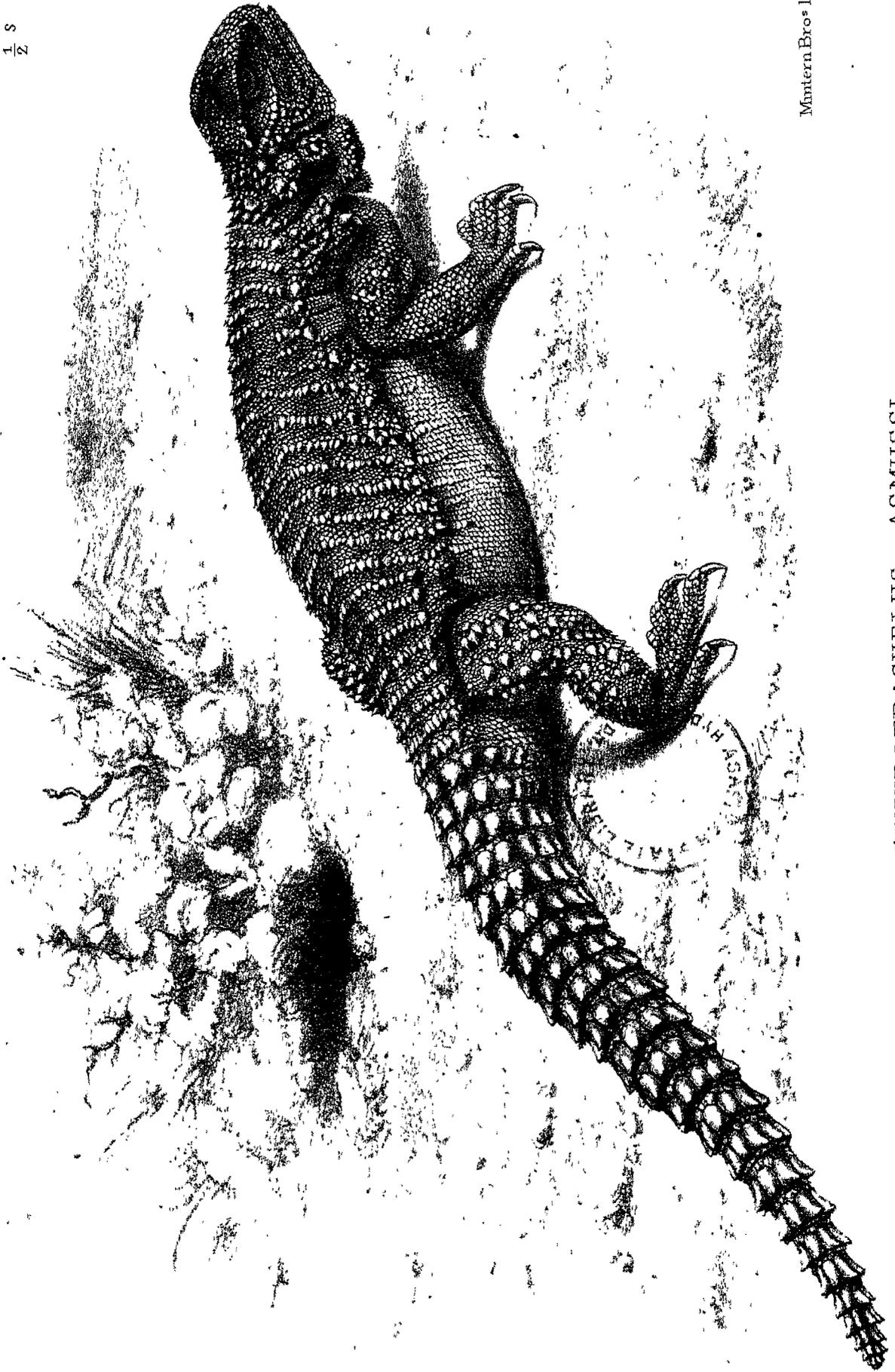
This is the second of the two remarkable lizards procured at Sar-i-cháh, north-west of Sístán and north-north-east of Karmán, by Count Keyserling, when attached to Mons. de Khanikoff's expedition into Eastern Persia, and described by Strauch. The example from which the description was taken was brought alive to St. Petersburg. Strauch's description in Latin is excellent: it is reproduced in the Zoological Record for 1864, p. 115. I append a somewhat fuller account in English.

Description:—General form very massive; trunk remarkably broad and depressed; head short, subtriangular, depressed, but not very flat, about as broad as long, the frontal region descending in a curve to the blunt muzzle. Limbs stout, of moderate length; the fore-foot laid forward extends beyond the snout by the length of the fingers, laid back it reaches more than half-way to the thigh; the hind-leg laid forwards extends about three-quarters of the distance to the axil. Toes short and strong, not fringed, those of the hind-foot about the same length as those of the fore-foot, gradually increasing in length from the first to the fourth; in the fore-foot the fourth toe is very little longer than the third, in the hind-foot it exceeds it by the length of its claw. Tail very thick, rather shorter than the body and head, depressed near the base, regularly attenuate, surrounded by rings of conical tubercles. Dentition peculiar, being similar to that of

Uromastix, and differing widely from that of the insectivorous Agamoids. There are in a large specimen twenty-two subconical teeth on each side of the upper jaw; twenty, of which nineteen are subconical and one in front to be presently described, on each side of the lower. These teeth are laterally compressed and very close together, forming a continuous series, and those in front are worn down, so as to form almost a continuous cutting edge. In front of the upper jaw, separated by a small interspace from the maxillary teeth, is a broad cutting edge, like that of a human incisor, formed apparently of a process of the intermaxillary bone, and not an implanted tooth; opposed to this in the lower jaw are two cutting edges, one at each end of the row of lower molars, not separated from the lower molars by any space, but a little apart from each other. These pseudo-incisors appear entirely composed of bone, the dental portion seen in *Uromastix* being apparently deficient in the present species, or perhaps becoming so worn down in old specimens that it cannot be seen. The tongue is moderate, deeply cleft at the end. The largest specimen collected measures 20 in., of which the tail from the anus is 9.5, head 2: the body is 5 in. broad. In another smaller specimen measuring 15 in., the tail is 6.25 long, head about 1.75, fore-limb 3, third toe and claw measured from the division between the third and fourth toes 0.7, hind-limb 4.25, third toe and claw 0.7.

Frontal and occipital regions of the head and the central line joining them covered with convex tubercular scales of unequal size, but much larger than those on the supraorbital region. This is indented by a longitudinal groove just inside the superciliary ridge, which is not prominent. *Canthus rostralis* rounded, indistinct, the nostril lateral, crescentic, rather large, occupying the hinder portion of a nasal plate below the position of the *canthus*, and with the hinder margin formed of small scales. No enlarged rostral or mental; labials all small, scarcely if at all larger than the adjoining scales. Several rows of rather elongate scales parallel with the lower labials. Scales of the sides of the head mostly small; a row of rather larger tubercular or bluntly-keeled scales commences below the eye and continues upwards and backwards to above the tympanum. Scales in front of the ear slightly enlarged and conical. Tympanum rather large, its height greater than its breadth, partly concealed by the spinous folds of the neck; the membrane rather deeply seated. Chin and throat below granular.

Pl. XXI.
Zoology of Persia
 $\frac{1}{2}$ S



Mintern Ero's lch

CENTROTRACHELUS ASMUSSI

On the back of the occiput are some large mucronate scales, and groups of still larger spinose tubercles are scattered over the back and sides of the neck; the intervening scales small and submucronate. The back and sides are covered with small rhomboidal, subimbricate scales, obtusely keeled, and terminating posteriorly in rather blunt points; across these extend numerous transverse, equidistant rows of much larger mucronate tubercles, their points directed backwards; some on the anterior portions of the sides are spinose. Abdomen clothed with rhomboidal imbricate scales in transverse series, mostly smooth, but sometimes bluntly keeled near the sides, especially in front, nearly equal in size to the larger dorsal scales. Limbs covered with imbricate scales, more or less distinctly keeled or submucronate, much larger above than below; some very large conical scales scattered over the upper and hinder parts of the thigh and tarsus. Scales of the soles keeled, the cross-plates below the toes with several keels each. Tail in very distinct rings, about twenty-five in number, each surrounded above and at the sides by very large spinose tubercles, eight to ten in each ring, the lower portion without tubercles, but covered with keeled scales. From nine to eleven pores, showing as soft blunted tubercles, on the underside of each thigh, each pore surrounded by small scales, the row of pores extending to the præanal region but not across it. Neck with fold below and at the sides; no distinct fold across the nape.

The intestinal canal is elongate, measuring 40 in. in a specimen about 18 in. long. In a specimen of *Agama agilis*, 10 in. in length, the intestinal tract, similarly measured from the cardiac end of the stomach to the anus, is only 7 in. long: both specimens being preserved in spirit, the tissues have doubtless contracted. The stomach of *Centrotrachelus* is small in circumference but about 6 in. long. About 10 in. from the anus the intestine swells into a large sac-like cæcum, much exceeding the stomach in circumference. The rectum is thick, and longitudinally grooved externally throughout the greater part of its length, but this may be due to contraction just before death.

All the specimens collected are males. In these, when fresh, the head, limbs, and tail were blackish above; the back and sides were buff, the larger tubercles and many of the smaller ones upon the head, neck, and shoulders scarlet, the red colour gradually disappearing on the enlarged scales of the back. Probably this colour is seasonal, and may in

the height of the breeding season colour all the back. Some specimens, probably females, appeared to be of a uniform yellowish olivaceous colour on the upper parts. The lower parts of the head, limbs, and tail black, more or less mottled with greyish white; abdomen pale.

This superb Uromasticid was first seen at Khusrín, five marches north-west of Bampúr, in Balúchistán, where a specimen was shot by Major St. John on a small stony rise at the edge of the Bampúr plain. We met with it more commonly along the margin of the Narmashír desert, near Rígán, a few marches farther to the north-west. This plain extends far to the northward, towards Sístán and Khorassán, and the same lizard may inhabit a considerable portion of Eastern Persia. Where seen it lived in a semi-desert, rather gravelly plain, with scattered patches of low thin bush, chiefly barilla and tamarisk. It is heavy in its movements, but can run tolerably quick. It lives in large holes resembling rabbit-holes, evidently dug by itself; I dug out one individual, which I had seen take refuge in a hole, from a depth of about 2 ft. under ground. The burrow, about 18 in. from the surface, turned at right angles to its original direction, and was altogether about 4 ft. long.

Centrotrachelus Asmussi, like *Uromastix Hardwicki*¹, is purely herbivorous, living on leaves and stems of herbaceous plants, seeds, etc. It also resembles *Uromastix* in not leaving its burrow until the sun is well up, in the cold season at all events, and in its gentle disposition. It does not attempt to bite when captured.

In the accompanying plate this lizard is represented two-fifths the natural size.

18. **C. loricatus*, W. Blanf.

P. Z. S. 1874.

C. peraffinis C. Asmussi, a quo colore pallidior, isabellino nec olivaceo, fusco-maculato, squamarum majorum dorsalium seriebus magis distantibus, unguibus fortioribus, squamis supradigitalibus minoribus et carinis squamarum infra pedes posteriores in lineas transversas haud obliquas dispositis, tantum differt.

Hab. haud procul a Bushire.

¹ Conf. Theobald, Jour. Lin. Soc. x, p. 34.—Cat. Rept. Mus. As. Soc. p. 39, in J. A. S. B. xxxvii, Pt. 2.—Stoliczka, Proc. A. S. B. 1872, p. 81.

In all essential characters this species resembles the type of the genus very closely. I have only examined a single specimen of *C. loricatus*, and that is said to be a very small one; it is 16 in. long, and, as preserved in spirit, of a pale pinkish or cream colour, very different from the olive of *C. Asmussi*. The back is marked with small dusky spots, owing to some of the larger scales here and there being of that colour. The larger scales are arranged in rather more distant lines, and in the lines themselves they are more scattered, but the most striking difference is that there are very few spinose scales on the neck, and the enlarged scales of the back and sides are nearly flat, instead of being sharply mucronate. This, however, may be partly a sexual distinction, as all my specimens of *C. Asmussi* are males. The only example of *C. loricatus* is eviscerated, and I cannot determine the sex. The femoral pores are ill-developed and obscure, but they appear closer together and more numerous than in *C. Asmussi*. The best character, however, for separating these two forms is to be found in the toes, which in *C. loricatus* are shorter and have much stouter claws, the scales above the toes, except close to the claws, being much smaller, and the keeled scales beneath the feet having their longer diameter and the direction of their keels transverse, whilst in *C. Asmussi* they are oblique. In the specimen of the former, the third toe with claw in the fore-foot measures 0.67 in., in the hind-foot 0.6. The feet too are broader in the Bushire species, and there is a much more distinct fringe along the outer edge of the fourth hind-toe.

From the various accounts given of this *Centrotrachelus*, I believe it to be probably larger than *C. Asmussi*. The specimen I have examined is said by the gentleman who sent it to be very small. I am indebted to Major St. John for the following interesting note of its occurrence near Bushire. Major St. John also told me that he believed this lizard was a larger animal than that which we found in Narmashír.

For an opportunity of examining a specimen I am indebted to Dr. Sclater, who has been indefatigable in endeavouring to obtain from the different correspondents of the Zoological Society some of the Persian animals of which I had heard, but which I had been unable to procure. The present lizard was obtained and sent to Dr. Sclater by Mr. Ellis, who after much trouble succeeded in obtaining a specimen from the Arabs. His chief difficulty was that in the winter these

lizards were never seen; doubtless they hybernate at that season, as suggested by Major St. John.

A young *Uromastix* was obtained from the south coast of Arabia by Dr. Carter, P. Z. S. 1863, p. 237. Dr. Gray, who examined the specimen, which was dried, found that it was impossible to determine the species.

[The *Centrotrachelus* I have only seen once, when riding across the desert from Shif, a small port opposite Bushire, to Borasjún, the surface being sandy clay, with small bushes of wormwood and barilla. The lizards were sitting outside their holes in the evening in May, and my bull-terrier killed two. They evinced no terror of the dog; indeed, one attacked her, and the dog's mouth was severely cut by the sharp scales of the lizard's flanks; from memory, I should say the lizard was 20 in. long. The above was the only occasion on which I have been off the regular road in summer, though I have been all over the country in winter without remarking the *Centrotrachelus*, which must therefore, I should think, be a hybernating animal.—O. ST. J.]

FAMILY GECKOTIDÆ.

19. **Hemidactylus maculatus*, Dum. et Bibr.

I saw this species in houses at Gwádar, on the coast of Balúchistán. It may perhaps have been introduced from India.

20. *H. Persicus*, Anderson.

P. Z. S. 1872, p. 378, fig. 2 (mediocris).

No exact locality is given; I believe the species, however, to have been obtained in Southern Persia, and probably at Bushire. The woodcut is not very correct, the dorsal tubercles being represented as hemispherical and the pupil as circular.

The tubercles on the centre of the back are not distinctly trihedral, though they are keeled; they become more elongate on the loins, and are conoidal towards the sides. The tubercles on the tail are rather smaller than those on the back; they are a little irregular, but the proper number in each row is six, three on each side. Limbs moderate,

the hind-foot laid forward does not extend to the shoulder, the fore-foot reaches the eye. The rostral is cleft for some distance above; nostril with three enlarged scales behind it.

21. *H. sp.* Pl. XXII, fig. 1.

1. Dizák, Balúchistán 4000

I cannot satisfactorily identify the only example of a *Hemidactylus* which I procured. It is near *H. maculatus* and *H. Persicus*. The back is covered with granular scales, thickly interspersed with rather small trihedral tubercles, none of which equal the ear-opening in size. There are about fourteen rather irregular rows of these tubercles across the middle of the back; they are rather smaller in front, and on the sides of the back and fore-part of the limbs they are smaller and indistinctly trihedral. There are about forty scales across the abdomen. Tail verticillate, towards the base the rings are marked by three or four tubercles on each side, smaller than those on the back; no enlarged subcaudal plates, and in the only specimen obtained (a female apparently) no femoral or præanal pores.

Occipital portion of the head with small round tubercles scattered over it. Eyelid circular, without enlarged scales; pupil vertical. The granular scales between the nostril and eye rather larger than those on other parts of the head. Nostrils between the rostral, first labial and three slightly enlarged scales behind. Ear-opening moderate. About ten upper and eight or nine lower labials; a row of slightly enlarged scales along the superior edge of the upper labials; only one pair of chin shields, which form a broad suture behind the mental, and only meet the first lower labial; a few enlarged scales along the edges of the lower labials.

Limbs rather longer than in *H. maculatus*. The fore-foot extends beyond the eye if laid forward, the hind-limb just reaches the shoulder. Plates beneath the toes numerous (twelve to fourteen), divided nearly to the base, the two halves meeting at a very obtuse angle.

Colour grey, with imperfect cross-bands on the back and tail; a dark line from the nostril, through the eye, and above the ear. Length 3.65 in., of which the tail from the anus measures 2 in.

This species is distinguished from *H. maculatus*, D. and B. (as restricted by Günther), by the much smaller tubercles on the tail (which has no appearance of having been reproduced in the specimen

before me), by its rather more elongate form, by much smaller scales on the abdomen, only one pair of chin shields, and more numerous plates beneath the toes.

From *H. Persicus*, And., it appears to differ in being more slender, in having longer and slighter limbs, fewer scales across the abdomen and less marked tubercles on the tail. It is possible that the greater slenderness may be due to immaturity.

But a single specimen was obtained of this form, and although it appears to me distinct from *H. Persicus*, I do not name it, as it may prove only a variety.

22. *Gymnodactylus brevipes*, W. Blanf. Pl. XXII, fig. 2.

Ann. and Mag. Nat. Hist. June 1874, xiii, p. 453.

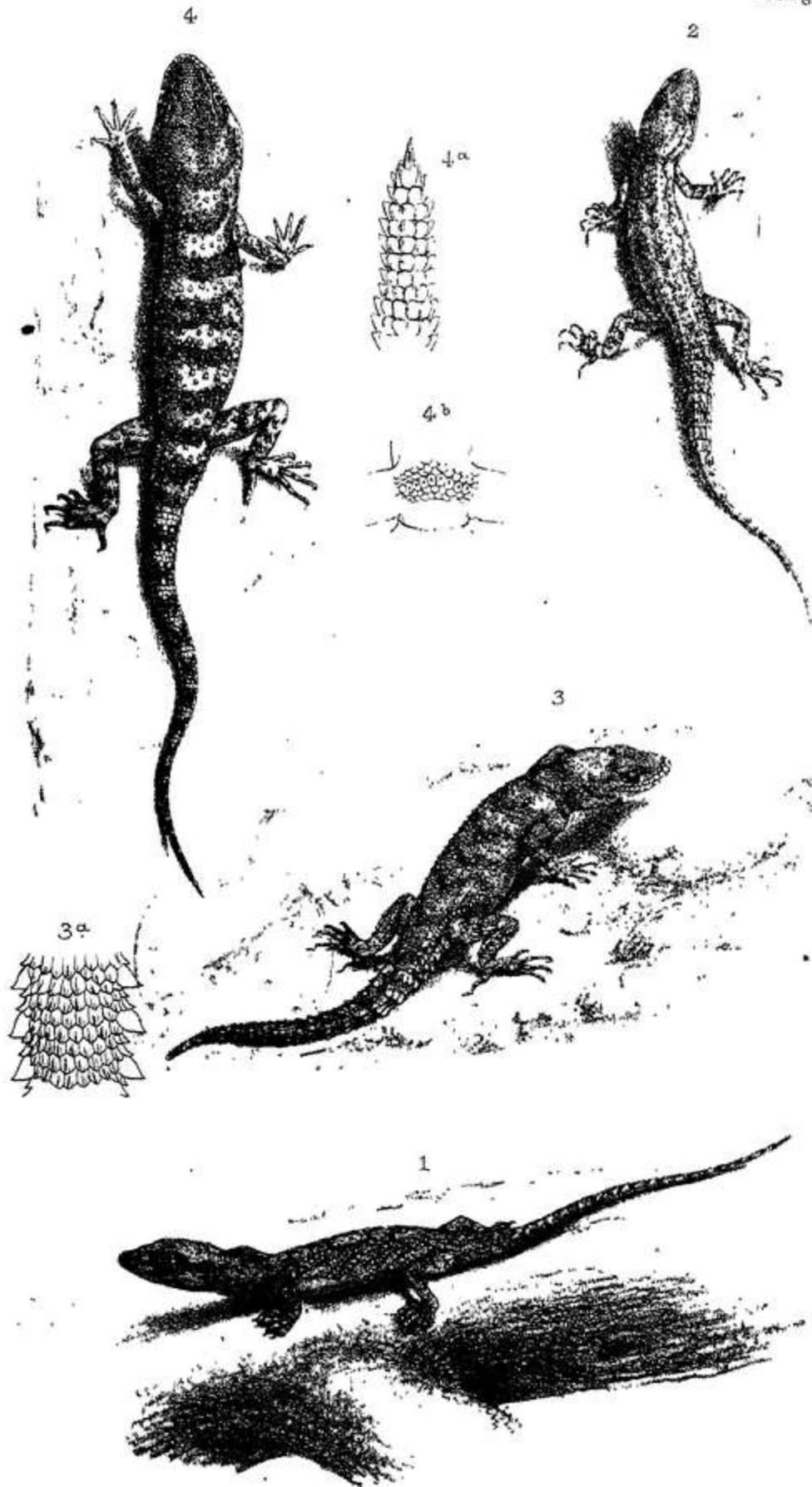
1. Aptar, near Bampur, Balúchistán 3000

G. affinis *Gymnodactylis geckoidi*, Caspio Kachhensique, *dorso tuberculis parvis triquetris in 10 series longitudinales dispositis ornato, caudá verticillatá, annulo singulo tuberculis tribus carinatis longiusculis utrinque armato, subtus scutis majoribus (nonnullis divisis) indatá: squamis ventralibus in serie transversá circum 22; poris inguinalibus 4, femoralibus nullis, membris digitisque brevibus, pede anteriore via ante oculum, posteriore humerum attingente.*

Hab. in Gedrosiá (Balúchistán).

Head and body moderately depressed, limbs rather short. Scales of the back granular, with numerous sharply-keeled trihedral tubercles, each nearly equal to the small ear-opening in size, and all arranged in regular longitudinal lines, of which ten may be counted in the middle of the back, diminishing to six between the thighs. All these tubercles are rather longer than broad. Tail longer than body, distinctly ringed, each ring with three sharply-keeled, rather elongate trihedral tubercles (larger than those on the back) on each side, the space between the two uppermost in the centre of the tail being very little broader than the interspaces on the sides; lower portion of the tail, except at the base, covered with larger plates, many of them divided into two; when undivided they are about equally long and broad, and there are two to each ring.

Hinder part of head covered with unequally sized granular scales; scales of the anterior portion larger, equal in size, convex, not carinate. Pupil vertical, upper eyelid very short, lower wanting. Nostrils between



G. H. Ford lith

Mintern Bro* imp

1. HEMIDACTYLUS

3. G. HETEROCERCUS.

2. GYMNOACTYLUS BREVIPES.

4. BUNOPUS TUBERCULATUS.

the hinder edges of rostral and first labial without any enlarged plates behind. Rostral rather broader than high, deeply cleft above. Upper labials nine, lower seven on each side. Two pairs of larger chin shields, the first only in contact, the second pair smaller and widely separated; a few larger scales along the edge of the lower labials. Scales below head round, flat, those beneath the neck rather smaller, those on the belly considerably larger in the centre than towards the sides, in about twenty-two rows in the middle of the abdomen, but the passage into the granular scales of the sides is so gradual that it is difficult to say where either ends. I count about eight granules on each side between the flatter ventral scales and the lowest trihedral tubercles. Femoral pores four, in a curved row between the thighs.

The hind-limb laid forward just reaches the shoulder, the fore-limb laid back extends about two-thirds of the distance between the shoulder and thigh; laid forward the toe reaches to between the eye and snout. The longest toe of the hind-foot is about equal to the distance between the eye and nostril. Limbs covered with imbricate scales above, some larger tubercles on the anterior portion of the hind-limb only. The two last joints of each toe much smaller than the basal portion.

Colour grey, with three rather imperfect longitudinal dusky bands on the back, formed of arrow-head shaped marks. A dusky line not very strongly marked from the eye to the shoulder.

The only specimen obtained was found in an open sandy plain, with scattered vegetation, not far from Bampur, in Balúchistán. The length is 2.95 in., of which the tail from the anus measures 1.7, fore-limb 0.4, hind-limb 0.57, middle toe of hind-foot 0.13.

This species is distinguished from all its allies, *G. Caspius*, *G. geckooides*, *G. Kotschyi*, and *G. Kachhensis*, by its much shorter limbs and feet, and especially by its short toes. It is further distinguished from *G. Caspius* by its smaller number of præanal pores, from the same species, *G. Kotschyi* and *G. geckooides*, by its more slender form, narrower and more depressed head, and narrower subcaudal shields. It differs from *G. Kachhensis* in not having subcarinate shields on the snout, in having fewer rows of tubercles on the back, and of scales across the belly.

23. **Gymnodactylus heterocercus*, W. Blanf. Pl. XXII, fig. 3, 3 a.

Ann. and Mag. Nat. Hist. June 1874, xiii, p. 453.

G. Caspius, De F. Viag. in Pers. p. 352, partim, nec Eichwald.

and first labial, without any enlarged scales behind. Rostral broader than it is high, deeply cleft above. Upper labials eight to ten, lower seven to eight. Mental shield triangular, rather large, with two or three pairs of enlarged chin shields behind it, only the first pair meeting behind the mental. Upper eyelid well developed, pupil vertical. Ear-opening small.

The *colour* in spirits is grey throughout, without markings. A specimen measures 3.2 in.; the tail, partly replaced but apparently full grown, being exactly one-half this length, or 1.6, head 0.45; fore-leg 0.55, hind-leg 0.78.

The only two specimens of this species which I have seen belong to the Turin Museum, and were brought by the Marquis Giacomo Doria from Hamadán. The keeled imbricate scales beneath the tail and legs serve to distinguish it from all allied forms.

24. **G. Caspius*, Eichwald.—De F.

Spic. Zool. pars posterior, p. 181.—Faun. Casp.-Cauc. p. 91, Pl. XV, Fig. 1, 2.

—C. Duméril, Cat. Méth. Col. Rept. Mus. Paris, p. 45.—Steindachner, Sitzb. K. K. Acad. Wiss. lxii, p. 329.

Uromastix fasciatus, Mén. Cat. Rais, p. 64.

Gymnodactylus geckoides, Gray, Cat. Liz. Brit. Mus. p. 175, partim.—Blyth, J. A. S. B. 1853, xxii, p. 410.—Theobald, J. A. S. B. 1868; Cat. Rept. Mus. As. Soc. Bengal, p. 31.

Duméril and Steindachner have shown that *Gymnodactylus Caspius* is distinguished from *G. geckoides*, Spix, amongst other characters, by the number of femoral and præanal pores; about thirty in the former species, extending in a line along both thighs; only four to eight in the latter, confined to the inguinal region. Steindachner (Sitz. Acad. Wien, lxii, 1870, p. 329) has farther separated from the African *G. geckoides* (*G. scaber*, Rüpp.), under the name of *G. Kotschyi*, the race with much smaller dorsal tubercles inhabiting Syria and the neighbouring countries, and agreeing with the African species, not with *G. Caspius*, in the number of præanal pores. A fourth form is *G. Kachhensis*, Stoliczka, from the province of Kachh, in Western India, 'Proc. As. Soc. Bengal,' 1872, p. 81.

I did not meet with *G. Caspius* in Persia; but it is probable that it is not rare in some of the northern provinces. It may very possibly be found in Khorassán and Afghánistán, as specimens were collected by Theobald in the Panjáb. The specimens obtained by the Marquis

Doria at Hamadán, and referred to this species by De Filippi, are clearly distinct, and belong to the last species.

25. **G. geckoides*, Spix.

Gray, Cat. Liz. Brit. Mus. p. 175.

G. scaber, Rüpp. Atlas, p. 15, Pl. IV, fig. 2.

A specimen obtained by Kotschy at Shiráz exists in the British Museum, which received it from the Museum at Vienna. I am indebted to Mr. O'Shaughnessy for calling my attention to it.

Specimens of the same species are said also to have been brought from Persia by Aucher-Eloy.

Bunopus¹, gen. nov.

W. Blanf. Ann. and Mag. Nat. Hist. June 1874, xiii, p. 454.

Genus inter Gymnodactylum et Stenodactylum fere medium, cum illo digitis ad latera haud denticulato-fimbriatis, cum hoc scutellis infra-digitalibus verrucosis concordat.

Toes slender, not fringed at the sides, covered below by cross plates, which are furnished with projecting tubercles (Pl. XXII, fig. 4 a). General form as in *Gymnodactylus*.

This form only differs from *Stenodactylus* in the absence of fringes to the toes; but this distinction is important, since the presence of fringes is characteristic of lizards which dig holes and usually live in them².

26. *Bunopus tuberculatus*, W. Blanf. Pl. XXII, fig. 4, 4 a, 4 b.

Ann. and Mag. Nat. Hist. l. c.

1. Samán, Dasht, Balúchistán	—
2-7. Báhu Kalát, Balúchistán	—
8-23. Píshín, Balúchistán	500
24-27. Mand, Balúchistán	700
28. Isfandak, Balúchistán	3200
29. Near Bampúr, Balúchistán	1500
30. Rígán, Narmashír, south-eastern Persia	2500
31. Tumb Island, Persian Gulf	—

¹ Etym., *βουνός*, a mound, and *πούς*, a foot.

² Conf. C. Duméril, Rev. Zool. 1851, p. 479.

B. griseus, fusco-maculatus atque transfasciatus; tuberculis dorsalibus confertis triquetris, meatum auditorium magnitudine fere æquantibus, ornatus; porisque inguinalibus circa 7 præditus; scutellis post et inter nares vix majoribus, supralabialibus 10-12; caudâ annulatâ, annulis tuberculatis.

Hab. in Gedrosiâ (Balúchistân) Persiâque meridionali frequens.

General form moderately depressed; the head higher and broader in proportion to its length in adult specimens than in young ones. Back granular, with numerous enlarged tubercles in about fourteen longitudinal rows (not very regular), larger and as a rule trihedral on the centre of the back and base of the tail, where they are often nearly as large as the ear-opening, smaller and convex on the back of the neck and on the sides. The larger trihedral tubercles are nearly as broad as long.

Pupil vertical. Nostrils between the rostral, first labial and three small shields behind, the latter being scarcely larger than the granular scales covering the muzzle. Rostral about as broad as it is high, grooved above; mental rather broad. Upper labials about ten to twelve; lower labials eight to ten. No enlarged chin shields behind the labials; ear-opening small. Chin and throat covered with small granular scales. Abdomen covered with flat hexagonal subimbricate scales in about twenty-five to thirty rows across the middle. A row of præanal pores between the thighs nearly in a straight line, usually seven in number, sometimes six or eight (Pl. XXII, fig. 4 b). Tail, when perfect, longer than the head and body, verticillate, each ring being terminated by a row of large closely-set carinate scales, wanting below and in the centre above; no enlarged subcaudals.

Limbs moderate, granular above with scattered enlarged tubercles, the granular scales larger and flatter below, on the thighs especially. Toes and fingers rounded, rather short, covered with small imbricate scales above.

Colour sandy, with dark spots taking more or less the form of cross-bands on the back and tail. Dark marks from the nostrils on each side through the eyes, sometimes meeting each other on the occiput. Some specimens are much darker than others, and marked with brown transverse bands throughout.

A variety of which I have specimens from Mand, Báhu Kalát, and Samán, in Balúchistân, differs so much in colour from the common form of the species that I was at first inclined to consider it distinct.

The ground colour is pale sandy, with the dark markings on the back almost confined to the enlarged tubercles, some of which, in patches, are brown, the patches having a tendency to form longitudinal rows. There is a dark mark from the nostril through the eye to above the shoulder; farther back it becomes broken up. The dorsal tubercles too in this form are small, and sometimes less distinctly trihedral. There appears, however, to be no constant distinction between the two varieties, which occur together.

B. tuberculatus abounds in parts of Balúchistán, being found in houses and under stones on hill-sides, etc. I never obtained it at more than about 3000 feet of elevation above the sea. In Pl. XXII, fig. 4 a, the terminal portion of a toe, much magnified, is shown from beneath; fig. 4 b represents the pores of the inguinal region.

27. *Pristurus rupestris*, W. Blanf. Pl. XXIII, fig. 1, 1 a.

Ann. and Mag. Nat. Hist. June 1874, xiii, p. 454.

1-3. Near Maskat, Arabia.

4-6. Khárg or Karrack Island, Persian Gulf.

P. parvus, dorso squamis æqualibus induto, sine cristá; caudá compressá, supra, haud infra, cristatá; pupillá rotundá. A *P. flavipunctato*, Rüpp., differt dorso non cristato, cruribus longioribus, scutis infralabialibus plerumque 3, nec 5.

Hab. in rupibus ad Maskat Arabiæ et in insulá Kharg vel Karrack dictá, in Sinu Persico.

Scales of the back and sides and of the upper part of head and limbs equal, not imbricate, round, convex. *Back not crested.* Tail compressed laterally, indistinctly verticillate, with a low crest of flat spines, their points directed a little backward, along the top; none below. Scales of the sides of the tail equal, granular; those below rather larger and flatter. Scales of abdomen round, flat, but little larger than those on the back, and passing so gradually into the convex scales of the sides that it is difficult to estimate the number. No femoral or præanal pores.

Pupil round. Upper eyelid but slightly developed; no lower eyelid. Nostril directed laterally upwards between the rostral and about three scales, two of which, one on each side of the nostril, are enlarged, the outer of these separating the nostril from the first labial; the other enlarged scale does not meet the corresponding one on the opposite

side of the rostral. Rostral large, cleft above. Mental larger and broader than the rostral. Six upper and three lower labials; no enlarged chin shields behind the labials.

Limbs rather elongate, the fore-limb laid forward reaches the end of the nose, and laid back extends to the thigh; the hind-limb laid forward comes nearly or quite to the ear; toes 5-5, slender, rounded, with minute claws. The scales above the limbs similar to those on the back, those on the inner anterior side of the thigh and below the tarsus larger and flat, those above the toes imbricate; beneath the toes are cross-plates, as in *Gymnodactylus*, scarcely so broad as the toes, the plates beneath the joints of the toes being longer, but not broader than the others.

Colour (noted when fresh) olive grey, a pale band down the centre of the back, the back and sides with rufous spots forming broken longitudinal lines, those on the back larger than those on the sides and with a white hinder margin; these spots disappear in spirits. A rather narrow dark mark from the nostril to the eye, continued a short distance behind the latter. Specimens from Khárg are spotted black on the sides of the head and neck, chin, and throat, but Maskat examples are unspotted.

The length of the only perfect specimen I have is 1.9 in., of which the tail from the anus measures 1.05, and the head and body 0.85; the hind-limb 0.55, and the fore-limb 0.35. Other specimens are a little larger, the length from the nose to the anus in the largest specimen being a little over an inch, but the species would appear never much to exceed two and a half inches in length.

This is evidently a second species of Rüppell's genus *Pristurus*, and very closely allied to *P. flavipunctatus*, Rüpp. (Neue Wirbelth. Rept. p. 17, Pl. VI, fig. 3), but that species is distinguished by having the posterior portion of the back crested as well as the tail, by its stouter habit and shorter limbs. In specimens of *P. flavipunctatus* in the British Museum the hind-legs just reach the shoulder, whereas in *P. rupestris* they come in front of it when laid forward, and, in the former, the fore-legs do not extend to the thigh when laid backward, which they do in the latter. Other differences are that in *P. flavipunctatus* the tail is more compressed, and that there are seven upper and five lower labials on each side, the usual corresponding number in *P. rupestris* being six and three. According to its discoverer also, the habitat of *P. flavipunctatus* differs essentially from that of *P. rupestris*,

for Rüppell found the former on trees. It was discovered near Mas-sowa, on the coastland of Abyssinia.

Messrs. Duméril and Bibron unite *Pristurus* to *Gymnodactylus*, but Dr. Gray, in his 'Catalogue of the Specimens of Lizards in the British Museum,' classes it as distinct, and I quite agree with this view. The genus is distinguished not only by its compressed tail and caudal crest, but by its being diurnal and having a circular pupil.

I obtained specimens first near Maskat, in Arabia, on limestone rocks and in houses at a place called, I think, Fálej, four or five miles inland. The majority of these had dried and become useless before I could put them in spirits, and in none was the tail preserved, but I had noted down their characters when fresh. I subsequently obtained some more specimens, which only differ in colouration, on the island of Khárg or Karrack, north-west of Bushire, in the Persian Gulf, again upon limestone rocks. These geckoes appeared to be quite diurnal; I found them out on the surface of the rocks at 10 or 11 o'clock in the morning, and they only took refuge in the crevices when approached. Owing to the numerous cracks and fissures in the limestone, it was difficult to capture specimens, for these little geckoes were very active.

*Ceramodactylus*¹, gen. nov.

W. Blanf. Ann. and Mag. Nat. Hist. June 1874, xiii, p. 454.

Digiti ad latera fimbriati, subtus squamis parvis imbricatis in seriebus obliquis ordinatis obtecti; caput corpusque squamis parvulis undique induta; crura longiuscula; palpebra inferior nulla.

The toes fringed at the sides and covered beneath with minute pointed scales, distinctly imbricate. In the only species known the edges of these scales are denticulate (Pl. XXIII, fig. 2 a). General form rather agamoid; head large, not depressed; both the head and body covered with very small subequal scales above and below; legs rather long.

This genus is near *Stenodactylus*, but differs from it in having imbricate scales in oblique series instead of cross-plates beneath the toes. A similar arrangement is represented by Duméril in the figure which he gives of the toe of the remarkable West African form named by

¹ Etym. κέραμος, a tile, and δάκτυλος, a finger.



Mantern.Bros. imp

1 PRISTURUS RUPESTRIS. 2. CERAMODACTYLUS DORIÆ.
 3. AGAMURA CRURALIS. 4 A. PERSICA

C.H. Ford lith

him *Stenodactylus caudicinctus* (Arch. du Mus. viii, Pl. XVIII, fig. 15), but the scales are much fewer in number. This species Dr. Gray (P. Z. S. 1864, p. 60) proposed to make the type of a new genus under the name of *Psilodactylus*, which he considered (rightly, I believe) allied to *Eublepharus*. It differs widely, in my opinion, from *Ceramodactylus Doriæ*, being distinguished by its heavy body, massive ringed tail, and very marked and peculiar dorsal tuberculation, and I think that Dr. Gray was quite justified in placing it in a genus by itself.

The toes of *Stenodactylus garrulus* (Smith), (*Ptenopus maculatus*, Gray) are broader than those of *S. guttatus*, and besides the cross-plates with projecting points, which occupy the central portion of their lower surface, there are granules towards the margin. Still there is no such important difference from *S. guttatus* in the scales covering the lower surface of the toes as there is in the present genus.

28. * *Ceramodactylus Doriæ*, W. Blanf. Pl. XXIII, fig. 2, 2 a.—De F.

Ann. and Mag. Nat. Hist. June 1874, 1 c.

Stenodactylus guttatus, De F. Viag. in Pers. p. 352, nec Cuv.

C. squamis capitis, corporis atque caudæ omnibus, supra subtusque, parvis, fere æqualibus; caudâ quam corpore brevior; capite magno, parum depresso; oculis magnis, pupillâ verticali, meatu auditorio parvo; pede anteriore femur fere attingente, posteriore axillam; poris inguinalibus duobus distantibus; superne fulvus, albo confertim maculatus.

Hab. haud procul a Bandar Abbas juxta litus Sinus Persici.

The surface of the head, body, and tail, both above and below, is covered with small subequal, slightly convex scales, those of the throat being scarcely smaller than those of the belly, and the latter about equal to those of the back. The back scales are in oblique rows. There are no enlarged præanal or subcaudal scales, but there are two scales, one on each side, in the inguinal region just between the thighs, rather larger than the others, and each perforated by a pore. These two scales are separated from each other by about six ordinary scales. The tail is not verticillate, it is very slightly depressed at the base only, regularly attenuate and shorter than the head and body.

The body is rounded, not depressed; the head large, much broader than the neck¹; the limbs long; the fore-foot laid forward extends

¹ The specimen appears to have slightly shrunk in spirits, and the head in a fresh specimen may differ less in size from the neck and body.

beyond the snout by the whole foot, laid back it nearly touches the thigh; the hind-foot laid forward reaches the shoulder. The length of the only specimen examined is 4.5 in., of which the tail from the anus measures 2, head 0.8, fore-leg to end of toes 1.15, longest toe (third) 0.18, hind-leg 1.35, longest toe 0.25.

The toes are of moderate length, fringed at the sides like those of an *Acanthodactylus*, rather broad, and covered beneath with peculiar imbricate scales, so small that a microscope is required to make them out. These scales are in cross rows close to the ends of the toes, but only in oblique series elsewhere; they are sharply pointed at the end, and their free margins bear one or two smaller points on each side. The claws are well developed (Pl. XXIII, fig 2 a, showing the extremity of a toe seen from beneath and greatly magnified).

The eyes are large, with a well-developed upper eyelid covered with small granular scales; no trace of a lower eyelid; the pupil appears to be vertical. Ear-opening small. Nostrils surrounded by the rostral, first labial, and three postnasal shields, which appear a little swollen in the specimen, but this appearance may be due to the shrinking of the head. The rostral is divided vertically into two. Supralabials about twelve to fourteen, those behind very small; lower labials about fourteen. Mental shield quadrangular, rather larger than broad; no enlarged plates behind it.

Colour, in spirits, pale brown, thickly spotted with white, much as in *Stenodactylus guttatus*.

The only known specimen of this species was obtained by the Marquis Giacomo Doria, who has informed me that he found it on the sand of a torrent bed, one march from Bandar Abbás on the road to Karmán. It is the specimen to which De Filippi refers under the name of *Stenodactylus guttatus*. It belongs to the museum of Turin, and I am indebted to the courtesy of Count Salvadori for the loan of this and of specimens of *Gymnodactylus heterocercus* and *Lacerta Brandti*.

29. **Teratoscincus Keyserlingi*, Strauch.

Strauch, Bull. Acad. Sci. St. Pet. 1863, vi, p. 480.—Zool. Record, 1864, p. 111.
—Mel. Biol. vi, p. 554.

This was one of two species brought by Count Keyserling from Khorassán, and described by Strauch, who at first referred the form to the scinques, on account of the granular surface of the tongue, but subse-

quently ascertained that it was a gecko near *Stenodactylus*. It is in all probability still more closely allied to the remarkable form from Western India, *Teratolepis fasciata* (Blyth), (Günther, P. Z. S. 1869, p. 504), from which it differs in having an external ear, the toes not dilated, but fringed at the sides, the tail longer, and the scales of the back not carinate. It is perhaps a question whether the two genera might not be united, but a comparison of specimens would be necessary.

Teratoscincus is a rather large gecko, about six inches long, covered with smooth imbricate scales. The head is gecko-like, the pupil of the eye circular. The feet are like those of *Stenodactylus*, the margins being fringed as in *S. garrulus*. It was obtained at a place called Seri-Tschah (probably Sar-i-cháh, head of a spring, or spring-head), and most likely from a spot so named marked on Khanikoff's map about 150 miles W. by N. of Lásh Jowain, and a similar distance N.N.E. of Karmán.

Agamura, gen. nov.

W. Blanf. Ann. and Mag. Nat. Hist. June 1874, xii, p 455.

Genus Geckotidarum propter squamas digitosque ad Gymnodactylum accedens, dorso tuberculato, palpebris inferioribus nullis, pupillá verticali, dentibus numerosis æqualibusque, linguá antice brevissime fissa; sed membris elongatis, caudá subcylindricá, valde flexibili, nunquam regenitá, Agamæ simile.

This new genus is proposed for the very singular gecko described by C. Duméril as *Gymnodactylus Persicus*, and for another closely allied species which I obtained in Balúchistán. These two appear to form, with *Spatalura Carteri*, Gray, and perhaps *Pristurus longipes*, Peters, a group which may almost be considered as a sub-family of the *Geckotidæ* with Agamoid affinities, which are, however, perhaps more superficial than real. The characters of the skin, tongue, teeth, and eyes are those of ordinary geckoes, but the elongate limbs and the very peculiar flexible tail differ widely from the corresponding parts in other genera of the family; not a single specimen of *Agamura* which I have examined shows signs of the tail having been reproduced, whilst in ordinary geckoes nearly one-half have lost their tails and formed new ones. The caudal vertebræ, however, are biconcave as in the other geckoes, not concavo-convex as in the Agamoids, and they

differ principally from those in the more typical forms, such as *Hemidactylus*, in their very short apophyses, the transverse processes in especial being very little developed, as might be expected from the tail being round instead of depressed.

The nearest ally of *Agamura*, so far as I know, is a form obtained by Dr. Carter on the island of Massira, off the south coast of Arabia. This was described by Dr. Gray (P. Z. S. 1863, p. 236), under the name of *Spatalura Carteri*. It is distinguished from *Agamura* by having a compressed tail, fringed above and below, and it also differs from both the known forms of the new genus by its non-tuberculate back, much fewer labials, and much larger ear orifice.

30. *Agamura cruralis*, W. Blanf. Pl. XXIII, fig. 3, 3 a.

Ann. and Mag. Nat. Hist. l. c.

1. Rás Malán, about 120 miles west of Karáchí, Balúchistán.
- 2-4. Báhu Kalát, Balúchistán.
- 5, 6. Mand, Balúchistán.
- 7, 8. Zamrán, Nihing River, Balúchistán.
- 9, 10. Askán, near Bampusht, Balúchistán.

A. grisea, fusco transversim fasciata; dorso granulato, granulís vix convexis tuberculisque majoribus frequentibus instructo; membrís elongatis, pede posteriore oculum attingente, haud tuberculatis, nisi interdum supra femur; capite brevi, alto; supralabialibus utrinque 12-14; meatu auditorio mediocri, caudá verticillatá, inermi, subtus serie unicá scutorum polygonalium majorum instructá. Poris inguinalibus in maribus duobus.

Hab. inter lapides in Balúchistán.

Scales of the back rather flat, more or less round and somewhat unequal in size, with rather numerous and larger scattered convex tubercles, not in distinct rows, but nearly equidistant from each other. Scales of sides granular, subequal, smaller than those of the back; those of the belly rounded, subimbricate, about the same size as those on the back, passing gradually at the sides into the smaller scales. Head covered with rounded scales above, those on the occiput smaller than those on the snout, and having sometimes a few scattered larger tubercles; eye large, pupil vertical¹; upper eyelid well developed, with a row of larger scales along the margin; lower eyelid wanting. Nostrils directed rather upward, between the rostral, first upper labial and

¹ In many specimens preserved in spirits the pupil is fully expanded and appears circular.

three scales, a little larger than the ordinary scales on the snout, behind. Rostral nearly twice as broad as high, grooved in the centre above; upper labials 12-14, lower 9-11 on each side, both becoming much smaller behind and often varying in number on the two sides of the same animal. Mental shield elongate; no enlarged chin shields behind the labials; chin and throat covered with rounded granular scales, very little smaller than the ventrals, and some of which along the edges of the lower labials are larger than the others. Ear-opening moderate, about as large as one of the anterior upper labials.

Limbs covered above and below with nearly equal subimbricate scales, about the same size as those of the back; occasionally there are a few convex enlarged tubercles on the upper part of the thigh, but not on the tarsus; the scales behind the thigh smaller and granular. The soles of all the feet are covered with convex tubercles of unequal size, some being much larger than others. The toes are rounded, not fringed at the sides, and covered with small imbricate scales above, and with cross-plates below. All the toes are furnished with minute claws. The hind-foot laid forward reaches the eye, the fore-limb laid backward extends beyond the thigh, often reaching the vent.

There are two inguinal pores in enlarged adjacent scales between the thighs some distance in front of the vent, in the males (Pl. XXIII, fig. 3 a); the females have the enlarged scales, but not the pores.

Tail thick at the extreme base, but becoming suddenly small just behind, and continuing of nearly the same thickness to the end. Its length is rather less than that of the body and head together. It is covered above and at the sides with smooth subimbricate scales, rather longer than broad, arranged in rings, every fourth ring consisting of rather larger scales in some specimens, though not in others, and the verticils thus formed are never so well marked as in the next species. Beneath the tail is a single row of larger polygonal plates, equally long and broad, each corresponding to two rings of scales; these are often broken up into smaller scales near the base of the tail.

Total length of a large specimen measured when fresh 5.75 in., of which the tail from the vent measured 2.4, head 0.8, fore-limb 1.43, third toe of fore-foot 0.27, hind-limb 1.9, its middle toe 0.32.

The teeth are obtuse, subcylindrical, numerous, and closely set in both jaws throughout; no larger teeth in front of either jaw; the tongue broad and fleshy, very briefly cleft at the end.

Colour grey, with broad transverse dusky bands on the upper parts of the body, tail, and limbs, and with more or less dusky irregular spots on the upper parts, chin, and throat. There is usually a dark cross-band on the back of the neck, and four others, sometimes five, across the back.

The first of these peculiar geckoes which I met with I found in the middle of the day on the open, barren, stony plain which forms the flat top, 2000 feet above the sea, of the promontory known as Rás Malán. I at first took it for an Agamoid lizard, and it was only on carefully examining it subsequently that I saw it was a gecko. I afterwards found several specimens in barren stony plains and on hill-sides, usually in the evening, and from the vertical pupil I should judge this species to be usually nocturnal. I met with it here and there up to an elevation of about 3000 feet above the sea, but not higher: it was never common, and I found no specimens about houses.

Its mode of progression is by no means fast, and somewhat resembles that of a chamæleon, although it is not so slow. It is usually easily captured, although on level ground it can run quickly for a short distance, but its motions have but little of the usual activity of geckoes. I never saw it climb up a perpendicular surface, and from the formation of its feet I doubt if it can do so, except by clinging with its claws as the Agamoid lizards do.

31. *A. Persica* (C. Dum.), Pl. XXIII, fig. 4 a, 4 b.

Gymnodactylus Persicus, C. Duméril, Archives du musée d'Hist. Nat. viii, p. 481.

1-2. Ráyín, south-east of Karmán	..	..	..	8000
3. ? near Isfahán ¹	..	..	..	(?)

I find on comparison with the types in the Paris Museum of Natural History that my specimens correspond with those described by Duméril. It is unnecessary to give a detailed description of this form, which closely corresponds in all its principal characters with *A. cruralis*, but is distinguished by having rather shorter limbs, the hind-foot when laid forward only reaching the ear, the fore-foot only just extending to the thigh; by having the ear orifice rather smaller,

¹ The label of this specimen was illegible. It was obtained from some place on the road from Karmán to Isfahán *viâ* Shiráz, and I think I remember finding it not far from Isfahán.

and the tubercles on the back, and especially on the occiput, larger and more numerous. There are no inguinal pores in any of the specimens examined, but all have the scales between the thighs slightly enlarged. The most characteristic differences, however, are, that in the present species the upper parts of the thigh and tarsus are ornamented with enlarged convex tubercles (Pl. XXIII, fig. 4 b) that the tubercles on the posterior portion of the back are conoidal with points directed backward, and the rostral shield is vertically divided into two (fig. 4 a) instead of being merely cleft above. In general form, colouration, and habits, *A. Persica* resembles *A. cruralis*, but it is found at a much greater height above the sea. The specimens procured near Ráyín were taken on the stony lower slopes of the Kúh-i-hazár, at an elevation of at least 8000 feet.

This species was originally described by C. Duméril, from specimens collected by M. Aucher-Eloy. As has been already pointed out, these specimens, although all labelled Persia, appear in part to have been procured in countries lying to the westward, and the exact localities not having been recorded, it is impossible now to identify them.

FAMILY CHAMÆLEONTIDÆ.

A specimen of *Chamæleon vulgaris*, brought by Aucher-Eloy from his Persian journey, exists in the Paris Museum. It belongs to the western or African form, and not to the Indian (*C. Ceylonicus*, Laur.)

As with most of Aucher-Eloy's collections, the exact locality of the specimen remains doubtful, but it is highly probable that the chamæleon inhabits the forests on the flanks of the Zagros mountains and those of Mazandarán. Without more certain information, however, I cannot say positively if it is found in Persia or not.

FAMILY VARANIDÆ.

32. **Psammosaurus Caspius*, Eichwald (? = *P. scincus* [Merr.]).—De. F.

Eichwald, Zool. Spec. iii, p. 190. — Fauna Casp.-Cauc. p. 48, Pl. VII, VIII, IX. (The Plates represent the osteology only.)

Varanus arenarius, Geof. De F. Viag. in Persia, p. 352.

I did not obtain this species, and I have not access to specimens sufficient to determine whether it is really distinct from *P. scincus* (Merrem). There is a very fine stuffed specimen of *P. Caspius* in the British Museum which appears to agree well with African examples of *P. scincus*, and as the species found in North-western India (*Varanus ornatus*, Carlleyle) has been identified with *P. scincus* by several naturalists, I think it very possible that *P. Caspius* may be the same lizard.

The distinctions pointed out by Eichwald are chiefly the shape of the tail, which he says is round throughout in *P. scincus* (*P. griseus* is the name under which he refers to it), whilst, except at the base, it is somewhat compressed in *P. Caspius*, and the teeth are said to be minutely serrated at the edge in the former, but not in the latter. But in specimens of *P. scincus* preserved in spirit in the British Museum the tail is slightly compressed behind, and the serration on the sides of the teeth does not appear to be a very well marked character. Eichwald also notices some differences in the form of some of the bones.

Eichwald states that this reptile extends to Persia, and De Filippi obtained a specimen from the neighbourhood of Tehrán, which is now in the Turin Museum.

33. *Varanus dracæna* (L.)

Günther, Rept. Brit. Ind. p. 65.

1. Píshín, Balúchistán

Only a single specimen was obtained in Balúchistán, and no monitors were seen on the Persian plateau. The specimen procured was olive-grey when alive, with imperfect whitish transverse bands on the posterior portion of the body and the tail. The lower parts are much paler, with dusky spots on the throat. The length when fresh was 36 in.¹, of which the tail from the vent measured 21 in. There are 107 rows of ventral shields from the gular fold to the groin, the first 25 being irregular, the remainder in regular transverse rows; the whole number is considerably more than that given by Günther, but specimens from the west have perhaps more numerous ventral shields than those from other parts of India. Stoliczka gives the number in specimens from Kachh as 90 to 100.

Varanus dracæna, so far as my observations extend, is a thoroughly terrestrial lizard, living in dry places far from water. The same has

¹ It has scarcely altered by preservation in spirits.

been noted by Carlleyle (J. A. S. B. xxxviii, 1869, p. 195) and Stoliczka (P. A. S. B. 1872, p. 73), and is also said by Carlleyle to be the case with *V. lunatus*, which indeed appears to be little more than a variety of *V. dracæna*. I found the Abyssinian *V. ocellatus* living similarly far from water. The specimen of *V. dracæna* from Balú-chistán was obtained in a very dry region, where the only water occurs in small streams, which are dry, except in a few pools, for the greater part of the year.

FAMILY LACERTIDÆ.

34. *Lacerta muralis*, Merr.—De F.

L. agilis, Men. Cat. Rais. p. 60, teste Eichwald.

1-55. Elburz mountains, north of Tehrán .. 5000-10000

Some of the specimens collected want the usual large mid-temporal shield. Duméril and Bibron speak of this character as variable, but in some specimens I find it entirely wanting, the whole temporal region being occupied by subequal scales. The fore-legs, too, when laid forward do not reach the nostril, as they are said to do in European specimens; usually the ends of the toes just touch the eye. The præfrontal is occasionally divided, and sometimes there is a small shield between the postfrontals.

The colouration (noted from fresh specimens) agrees best with that of variety *d.* of Duméril and Bibron. It is olive-grey on the back, finely spotted with black, rather darker on the sides, the under parts pale throughout in some individuals, in others (probably males) all the abdomen, breast, throat, and sometimes part of the lower labials, are brick-red, and when this colour is most intense there is a line of pale blue spots on the exterior edges of the outermost ventral scales. This colour is very possibly only assumed in the breeding season (my specimens were collected in August). Behind the eye is a broad dark band.

L. muralis inhabits the higher parts of the Elburz mountains. I only saw it on the south side of the hills, close to their summit, but it abounded on the north side, in the forest region, as low as 5000 feet above the sea, and perhaps lower, and was met with, rather less

abundantly, up to an elevation of at least 10000 feet. De Filippi met with this lizard in the same neighbourhood, in the valley of the Lár, north-west of Tehrán, at a considerable elevation. I did not observe it elsewhere in Persia.

L. Taurica was found by De Filippi common in Armenia and the Caucasus, but not further to the East. It does not appear as yet to have been found in Persia. Dr. Gray (Cat. Liz. Brit. Mus. p. 28) identifies the *L. agilis* of Ménétries with *L. Taurica*, but Ménétries himself calls his species *Le lézard des murailles* of Daudin, and *L. muralis*, common throughout the Elburz, is probably equally abundant on the Tálísh mountains, Ménétries's locality.

35. **Lacerta Brandti*, De F. Pl. XXV, fig. 1.

De F. Archiv. p. la Zool. ii, p. 387, Viag. in Persia, p. 354.

This species, according to De Filippi, may be distinguished from its allies by the number of the series of abdominal shields. The specimens obtained were captured at Basminsk, the first halting-place from Tabriz on the road to Tehrán.

I have examined the types, two in number, in the Turin Museum, and by the kindness of Count Salvadori, the Curator of the Museum, I have been allowed to bring one of them to England for comparison. From it I take the following detailed description of the species.

Description:—Palatal teeth present. Lower eyelid opaque, granular. Two postnasals. Temples covered with small polygonal scales, irregular in size, with one or two larger scales in the centre. Ear-opening moderate, not toothed in front, with one larger plate in front above. Dorsal scales small, round, convex, equal, arranged in transverse and oblique series; I count fifty-two to fifty-three scales round the body, not including the ventral plates. Scales of the throat about equal in size to those on the back; those of the collar variable in number (seven in one specimen, ten in the other), decidedly larger than those immediately in front; the collar is straight, free, the edge even, not denticulated. Ventral scales in twenty-nine to thirty-one transverse rows and eight longitudinal rows, all nearly equal in size: in one of the specimens there is an additional row of much smaller scales on each side, but it is broken up in the other specimen. A large præ-anal plate. Femoral pores sixteen to nineteen; the thighs protected below by large transverse plates; scales beneath the feet convex;

toes a little compressed. Tail scales oblong, very narrow, obliquely carinate above, smooth below, arranged in rather short verticils.

Habit moderately slender, rather stouter than in *L. muralis*. The fore-limb laid forward reaches to the nostril; the hind-limb nearly or quite to the axil. The tail is wanting or renewed in both specimens; in that before me the length from the nose to the anus measures 2.65 in., the head to the posterior margin of the occipital plates 0.55, fore-limb 0.9, hind-limb 1.35.

Colour:—Centre of back olive grey; a rather irregular whitish line down each side, breaking up behind into white spots, with irregular mottling and spots of black forming an indistinct band inside and outside the white one; another ill-marked pale line down the lower portion of each side, the ground colour of which, and of the breast and abdomen, is pale greenish blue (glaucous green), the anterior and inner margins of most of the ventral plates near the sides being black. According to De Filippi, there are some blue spots near the axillary region, and the anal region and lower part of the tail are tinged with fiery red; but these colours have faded in spirits. The limbs are bluish-grey above, with pale spots, and there are a few black marks on the tail and the sides of the head. This, it should be remembered, is the colouration of a specimen which has been for some years in spirits; living animals are probably more brightly coloured.

Head shields:—Rostral moderate, broader than high; the anterior nasals meeting in a short suture behind it. Posterior nasals two, equal in size, one above the other. Anterior loreal about as high as broad and half the length of the posterior loreal or præocular. *Canthus rostralis* rounded. Præfrontal rather broader than long, more angulate in front than behind; postfrontals each nearly equal in size to the præfrontal, as long as broad, irregularly pentagonal, meeting in a very long suture in front of the vertical. The vertical is nearly as broad behind as in front; anterior margin convex, posterior with a projecting point in the middle; lateral margins very little concave. Superciliaries four in number, a very small one in front, followed by two large shields, the anterior the larger, and both separated by a row of granules from the superciliary ridge; another small superciliary, larger than the foremost one, behind. Anterior occipitals irregularly pentagonal, together scarcely equal to a post-occipital in size. The latter are much longer than broad, and narrower in front than behind. They are separated from each other

by a small elongate central occipital, and a still smaller interoccipital behind it, and are bounded on the outer margins by some rather long shields. Supralabials nine on each side, the sixth being the large infraorbital shield; lower labials six or seven; chin shields in five pairs all touching the lower labials; the first three pairs in contact with each other, and the fourth pair a little the largest.

This form does not appear to have been refound by any one since its first discovery by De Filippi; neither Major St. John nor I met with it during our travels in Persia.

36. **L. viridis*, L.

According to Eichwald, a variety of this lizard is found on the shore of the Caspian, near Astrabád. (Fauna Casp.-Cauc. p. 66.) It is also met with in the Caucasus. Pallas states that his *Lacerta Europæa*, β . *viridis*, which I believe is the same, is common in Persia (the Caspian provinces?) in grassy fields. (Zoog. Ros. As. iii, p. 29.)

37. *Lacerta strigata*, Eichwald.—De F.

Eichwald, Zool. Spec. iii, p. 189.—Fauna Casp.-Cauc. p. 70, Pl. X, fig. 4, 5, 6.

—Gray, Cat. Liz. Brit. Mus. p. 32.—Anderson, P. Z. S. 1872, p. 372.

L. viridis, var. Dum et. Bibr. Exp. Gén. v, p. 212.

L. viridis, var. *strigata*, De F. Viag. in Persia, p. 354.

Two specimens of this lizard, obtained by Major St. John at Shiráz, have been described by Dr. Anderson (l. c.), who has, however, omitted to state by whom the specimens were obtained. De Filippi met with the same species at Lankorán, and the specimens collected by him are in the Turin Museum.

This may perhaps be only a small form of *L. viridis*; but although it appears closely to resemble that species in all important characters, it looks so different from the common green lizard of Southern Europe that I should hesitate to unite them. De Filippi says of *L. viridis*, var. *strigata*: 'A constant race, very nearly ranking as a true species.'

38. *L. princeps*, W. Blanf. Pl. XXIV.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 31.

1. Hills near Niríz, east of Shiráz, South Persia .. 7000

L. magna, fere sesquipedalis, dentibus palatalibus prædita; scutis postnasalibus utrinque binis; præfrontali unico; verticalis marginibus laterulibus parallelis, anteriore posterioreque in medio prominentibus; squamis temporalibus polygonalibus, anticè majoribus; collare libero, denticulato; squamis dorsalibus rhomboideis, carinatis, in series transversas ordinatis; ventralibus in decem series longitudinales, extremas valde angustiores; poris femoralibus utrinque 14; supra griseo-olivacea, subtus albida, maculis 4-5 cæruleis, nigro marginatis, longitudinaliter ordinatis, post axillam utrinque ornata.

Hab. in Persiâ meridionali.

Description:—Palatal teeth present. Nostrils in the lower posterior angle of the nasal shield followed by two postnasals. Lower eyelid opaque, scaly. Temples covered with polygonal shields, large in front, small behind. Scales of the neck above and at the sides granular, passing gradually on the shoulders into the subimbricate, equal, rhomboidal, diagonally carinate scales of the back. Scales of the sides rather smaller than those of the back, and not keeled. Scales of the sides and back in transverse rows of about thirty-four each. Scales of the throat imbricate behind, about the same size as those of the back; collar well marked, with a denticulated edge, formed by the projecting points of seven enlarged imbricate plates. Ventral scales in thirty-one transverse, and, in the middle of the belly, ten longitudinal rows, the outer longitudinal row much smaller than the others, and the two central rows rather narrower than the rest. Præanal plate slightly larger than the others; fourteen femoral pores on each thigh. Limbs covered with smooth scales; those on the lower portion of the fore-arm and tarsus very little larger than on the humerus and thigh. Scales on the under part of the feet smooth, convex; toes with transverse plates below; those beneath the proximal portions of all the toes, except the first on the fore-feet and the fifth on the hind-feet, divided in the centre¹; plates near the claws undivided. Tail with all the scales keeled and in distinct rings.

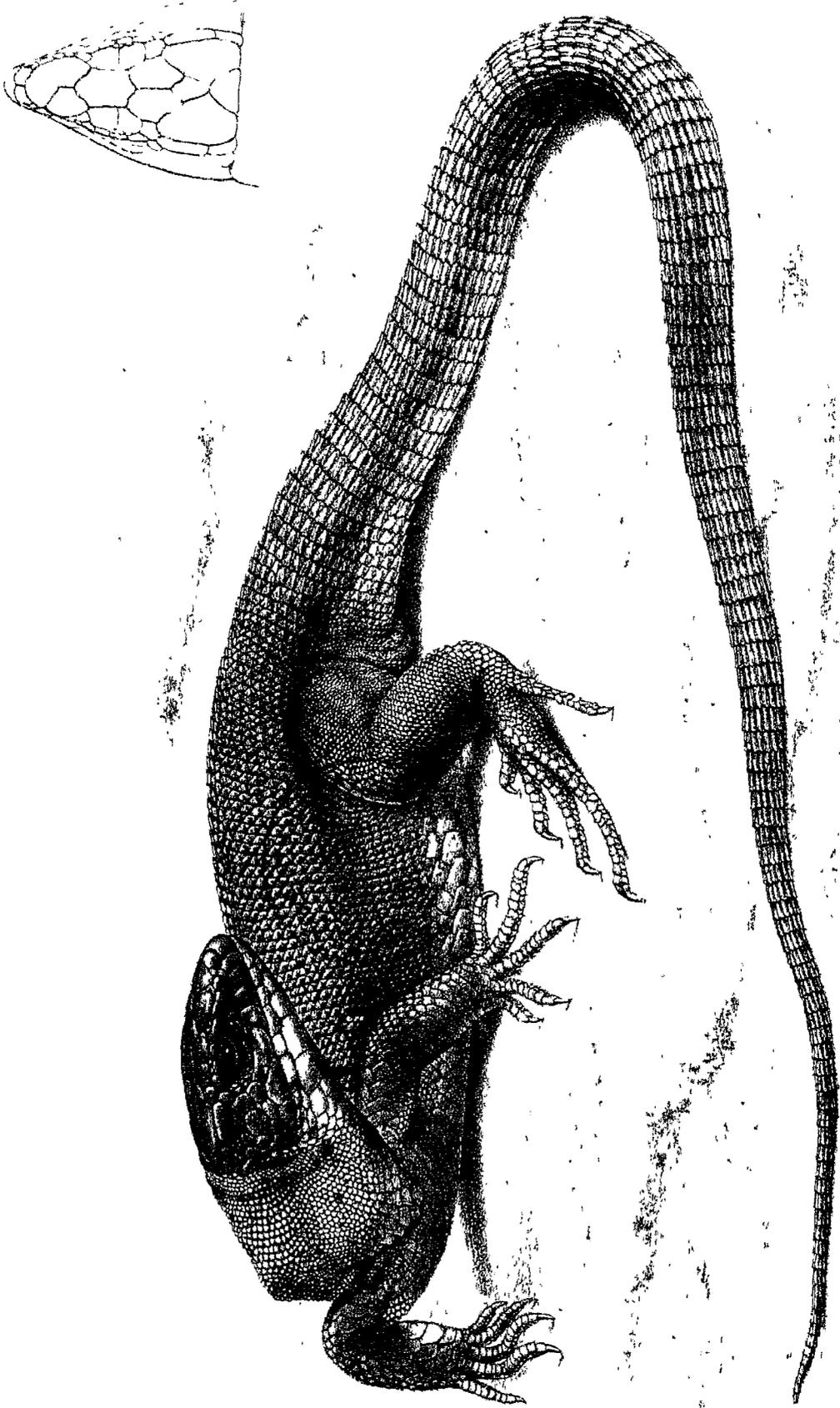
Habit of body moderately stout, rather depressed: tail more than twice the length of the body; head conical; limbs moderate; when the fore-leg is laid forward the longest toe reaches to the nostril, the hind-limb extends about four-fifths of the distance to the axil. Length 17 in., of which the tail from the anus measures 13.5;

¹ This may of course be an individual peculiarity.

the head, from the snout to the hinder margin of the occipital shields, 1.15; fore-limb, to the end of the toes, 1.75; longest toe (third or fourth) 0.5; hind-limb 2.7; longest toe (fourth) 0.95.

Colour:—Olivaceous grey above, whitish below; there are a few small black spots on the back and sides of the neck, and a row of three or four blue ocelli (those in front double), with black margins, behind each shoulder, extending in a line for a short distance down each side. The sides of the head are bluish, a tint especially marked on the labials; throat yellow.

Head shields:—Rostral moderate, broader than high; nasals forming a suture behind the rostral, and articulating also with the rostral and upper postnasal. Nostrils in the lower posterior angle of the nasal shield, surrounded by the nasal, rostral, first labial, and two small subequal postnasals. Præfrontal single, broader than long; post-frontals each about equal in size to the frontal, meeting behind it in a broad suture: their length exceeds their breadth, and the posterior margin of each is very convex exteriorly where it fits into the hollow between the vertical and superciliary disk, and concave towards the middle to receive the convex anterior edge of the vertical. Vertical with a very slight groove in the middle; sides parallel, anterior and posterior margins convex in the middle. Superciliary shields four on each side; the anterior small, the two central ones nearly equal; posterior about one-third the size of a central one; only a very few granules along the exterior edge of the central superciliaries between them and the supraorbital ridge. Two anterior occipitals of rather irregular form, convex in front and behind, and with a salient angle exteriorly, each a little smaller than the vertical. Two postoccipitals (parietals), each about treble the size of an anterior occipital; two central occipitals; the anterior the smaller, with an oval depression in the centre; the posterior nearly triangular, its posterior margin forming a right line with the same margins of the postoccipitals. Two loreals, the posterior about double the size of the anterior; eight upper labials, the last small; the sixth enlarged above and forming the lower portion of the orbit. Temples covered with polygonal shields all much larger than the neck scales, those in front larger than those behind, and two elongate shields above touching the postoccipitals. Ear-opening not toothed; a rather large shield on the upper anterior edge. Lower labials six; five pairs of chin shields, the three first in contact in the middle of the chin, the fourth the largest.



Of this very fine lizard but a single specimen was obtained. This was shot by my collector in brushwood on a pass near Niríz, about 100 miles east of Shiráz, and at an elevation of about 7000 feet above the sea.

The nearest allies of this form appear to be *Notopholis Fitzingeri*, Weigman, and its allies, which have similar scales on the back. All are small and differ widely from the present species. They are placed by Gray (Cat. Liz. Brit. Mus. p. 34) in the genus *Notopholis*. But the type of *Notopholis* of Wagler, as Duméril and Bibron pointed out, had previously been separated as *Psammotromus* by Fitzinger, and the type species *P. Hispanicus* differs in important generic characters from the *Incertæ* with rhomboidal scales of the type of *L. Fitzingeri*.

39. *Ophiops elegans*, Mén.—De F.

Mén. Cat. Rais. p. 64.—Eichwald, Fauna Casp.-Cauc. p. 78, Pl. XII, fig. 1-5.

—Anderson, P. Z. S. 1872, p. 374.

Amystes Ehrnbergi, Wiegman, Archiv. f. Naturgesch. 1835, p. 1.

Ophiseps elegans, Dum. et Bibron, Exp. Gén. v, p. 259, Pl. 53, fig. 1.

1, 2, 3.	Küh-i-lazár, south-east of Karmán	..	8000-10000
4.	Karmán	.. .. .	5000
5-10.	Sarjún, south-west of Karmán	.. ..	5000
11.	Niríz, east of Shiráz	.. ..	—
12-22.	Between Karmán and Shiráz (labels illegible)		—
23-26.	Between Shiráz and Tehrán (labels illegible)		—
27.	North of Isfahán	.. ..	—
28.	Kohrud, north of Isfahán	.. ..	7000
29.	Near Tehrán	.. ..	4000

The above series shows less variation in the characters of the head shields than I should have anticipated from that shown by its Indian ally *O. Jerdoni*, (conf. Stoliczka, J. A. S. B. 1872, xli, pt. ii, p. 89.) In no case do I find more than two post-nasals, and I have not a single example in which these shields or the two nasals are united, but in two specimens from Southern Persia the lower nasal is joined to the lower postnasal, so that the nasal shields resemble those in *Chondrophiops* or *Eremias*. In one instance the anterior loreal is divided longitudinally on the *canthus rostralis*, and I cannot help thinking that this shield is included when the species is stated, as it is by some writers, to have three small shields behind the nostril. In only one specimen is the anterior frontal divided, as it is represented in Duméril and Bibron's figure. In specimens described by Dr. Anderson from Shiráz the

postfrontals were not in contact in every case, but they are so in all collected by me, and divided by a suture of some length. The number of labials varies slightly of course; usually there are four upper labials before the suborbital shield and three behind, but not unfrequently one of the shields is divided or else two are united. Duméril and Bibron's figure agrees with most Persian specimens, except that in the latter the præfrontal is not divided.

The ventral shields appear more variable than usual. The number of transverse rows, counted from the corner of the fold before the shoulder to the groin, ranges from twenty-four to thirty-one, the latter number being, however, clearly exceptional. Duméril and Bibron and Anderson give the number of rows across the belly as eight, but in most of the specimens before me there are but six rows of broad scales, with a much narrower series along each edge. In a few specimens, however, this outer row is half as broad as the next. The femoral pores are usually nine or ten in each thigh. There are about twenty-six scales round the body, not including the ventral plates. This is rather more than the usual number in the closely allied *O. Jerdoni* of India, which is distinguished by its rugose head shields, and, to judge by the only specimen which I possess, its much larger scales in the centre of the back and large shields between the occipitals. The scales on the back of the neck in *O. elegans* are granular, as in *O. microlepis*.

The largest specimen collected measures a little over 6 in., of which the head and body from the nose to the anus measure 2. Usually, however, the tail is not quite twice the length of the head and body.

The following is the colouration of fresh specimens noted from those taken on the Kúh-i-hazár, near Karmán. General tint above brownish olive or dull olive, with two more or less well-marked white bands down each side; the upper, which runs from the superciliary ridge, being the best marked. A well-defined dark band between the two white streaks. In many specimens there are black spots on the labials and along the sides of the back, less frequently in the centre. Some specimens have a black line in the middle of the hind neck and anterior portion of the back. In specimens from Northern Persia there is sometimes no trace of the white bands on the sides, and the dark band running back from the eye is replaced by a dull reddish brown one.

In a female captured in July I found four eggs, each about $\frac{1}{10}$ of an in. in length.

O. elegans is a common lizard on the Persian plateau. I did not meet with it in Balúchistán, and it appeared in Southern Persia not to occur below about 4000 to 5000 feet above the sea, but in the North it was common at a lower elevation. On the Kúh-i-hazár, near Karmán, I saw it at an elevation of at least 10000 feet, but I did not notice it upon the Elburz mountains near Tehrán, although it abounded in the plain between Tehrán and Kazvín. As a rule, it was found on rather stony plains and slopes of hills. I did not observe it in the sandy semi-deserts, where forms of *Eremias* are more common. It is very active and not easily captured.

I somewhat doubt whether *Ophiops macrodactylus*, Berth. 'Gottingen Abhandlungen,' i. p. 58, is more than a variety of *O. elegans*. The colouration described is certainly similar to that of some specimens of the latter, the length of the tail is not excessive, and the remaining characters scarcely appear to me of specific importance.

40. *O. meizolepis* (Stol.), Pl. XXV, fig. 2, 2 a.

Gymnops meizolepis, Stol Proc. As. Soc. Bengal, 1872, p. 124.

1-6. Banks of the Shat-el-Arab, Basrah, Mesopotamia.

I am unable to note any character by which this little lizard can be distinguished from the species described by Stoliczka from the Panjáb. The legs are a little shorter, the fore-foot not quite reaching the end of the snout instead of extending beyond it, whilst the hind-foot laid forward reaches the ear instead of the eye, but in all other respects the specimens agree with Dr. Stoliczka's description. I presume that in giving the number of 'lateral transverse rows of scales between the fore and hind limbs' as forty-five, Dr. Stoliczka refers to the small scales on the sides. I count about the same number, but of the enlarged ventral shields between the rudimentary collar and the groin there are twenty-four to twenty-nine transverse rows.

There is nothing in the character of the scales which distinguishes this species from *O. elegans*, and as in writing of the latter I have shown that the lower nasal and lower postnasal are sometimes, though rarely, united, I can no longer consider that the subgenus *Chon-*

*drophiops*¹ (which I proposed for *O. microlepis*) is worthy of distinction.

O. meizolepis was found abundantly on the bank of the Shat-el-Arab, the river formed by the union of the Tigris and Euphrates, opposite Basrah (Bussora of many maps). Though the locality is not in Persian territory, the frontier is at no great distance, and there can be but little doubt that this and other forms met with near Basrah occur within Persian limits also.

41. *Eremias Persica*, W. Blauf. Pl. XXVI, fig. 1, 1 a.—De F.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 31.

E. variabilis, De F. Viag. in Persia, p. 354, nec Pallas.

1. Magas Balúchistán	4500
2-5. Ráyín, south-east of Karmán	7000-8000
6. Kuh-i hazár, near Ráyín	10000
7-9 Karmán	5000
10-18. Between Karmán and Shiráz (labels illegible) ..	—
19-25. Near Isfahán	—

E. major, caudá elongatá, corporis longitudinem dimidio vel plus quam dimidio excelente, membris longioribus quam in *E. argutâ*, Pall., pede anteriore ad rostrum attingente, posteriore ultra humerum; scuto infraoculari ad labrum pertinente, supralabialibus ceteris 5-7 antice, 3-4 postice; squamis caudalibus basin versus haud carinatis; adulta supra grisescenti castanea nigro sparsim maculata, fuscíá latá nigrá vel nigrescente, interdum albo maculatá vel interruptá utrinque ad latus ornata; dorso in ætate juniore albo nigroque longitudinaliter fasciato, lateribus membrisque superne nigris, albo-maculatis; ceterum *E. argutæ*, Pall., *E. velocique similis*.

Habitat frequens fere in omnibus planitiebus Persicis quæ altitudinem circa 3000 pedum supra mare superant.

Description:—Palatal teeth present. No interoccipital behind. Lower eyelid opaque, granular. The infraorbital shield extends to the upper lip; there are from five to seven supralabials in front of it, and about four behind. Temples covered with small granular scales. Collar distinct, free. Dorsal scales circular, convex, in transverse rows, with a few minute granules between. Ventral shields, fourteen to sixteen across the middle of the abdomen, in about thirty-one transverse rows, arranged in oblique, not in longitudinal series. No enlarged

¹ Jour. As. Soc. Bengal, 1873, xlii, pt. 2, p. 144, olim *Gymnops*, J. A. S. B. 1870, xxxix, pt. 2, p. 357.

præanal shields. Tail in rings, all the scales perfectly smooth except near the tip, where some show convexity in the middle. Femoral pores eighteen to twenty-four (usually about twenty) in each thigh, the two series closely approaching each other and being only separated by two scales in the groin. The fore-leg laid forward reaches to the end of the snout, laid back it extends about three-fourths of the distance to the thigh; when the hind-limb is laid forward, the toes come in front of the shoulder, always reaching the collar and in some specimens to the ear. The body is stout for the genus; and the tail, when perfect, from about half as long again as the body to nearly twice its length.

Colour:—The adult when alive is chestnut brown on the back and the upper parts of the limbs, with a more or less strongly marked grey tinge, and dotted over with rather small black spots (never with ocelli, as in *E. arguta*) rather irregularly dispersed, or arranged in lines. There is usually a broad black or brownish black stripe, spotted with white down the upper part of each side, but this is occasionally broken up into patches or spots; in many specimens there is a narrower dark stripe or more commonly a line of black spots along the side, below the upper black band, from the axil to the thigh. Lower parts white. Young specimens show a totally different colouration, so distinct indeed that they might easily be taken for a different species. The back is marked with about four longitudinal black bands alternating with white or pale brown stripes, the sides and the upper part of the limbs are black or blackish, spotted with white. As the lizards grow older the black bands on the back appear to break up into spots. Some specimens are dark brown with white spots at this stage.

Head shields:—Rostral rather broader than high. Nasal shields much swollen, the upper nasals meeting in a suture behind the rostral; lower nasals about equal in size to the upper, just touching the rostral in front, and extending along the upper surface of the two anterior upper labials. Loreal small, nearly square, followed by a large præocular, which extends to the upper surface of the head. Præfrontal hexagonal, about as long as broad; postfrontals convex, each very little smaller than the præfrontal, meeting in a broad suture in front of the vertical, which is longitudinally grooved in front, where it is about twice as broad as behind; the anterior margin is strongly convex, the lateral edges concave. The superciliaries consist of two larger subequal semi-elliptical shields, meeting in a straight line, with a row of

granules along their outer edge separating them from the elongate or granular shields forming the supraorbital ridge; in front of and behind the superciliaries is a small triangular space chiefly occupied by small granular scales with one rather larger shield behind. Anterior occipitals small, each about the same size as one of the frontals, rather irregularly triangular; posterior occipitals as broad as long, each about three times as large as a præoccipital; a very small central occipital, no azygos interoccipital shield (*plaque occipital*, D. and B.). Upper labials five to seven in front of the large infraorbital shield, which extends to the lip; three or four smaller supralabials, gradually diminishing in size backwards, behind the infraorbital; five or six pairs of chin shields, the first three generally meeting in the middle, the third and fourth pairs largest, sixth when present very small, the anterior four pairs in contact with the lower labials.

Scales of the back rather larger and less convex than those on the neck; there are a few granules interspersed between them, which are more numerous on the sides. I count sixty-five scales across the middle of the back from the ventral plates on one side to those on the other. Scales of the throat about the same size as those of the back. Collar slightly curved backward, consisting beneath of about nine enlarged scales, those in the middle the largest, and those at the sides becoming gradually smaller, until they are no larger than the neighbouring scales. The ventral shields are not in longitudinal rows; they are in very distinct transverse lines as usual, and in less marked oblique series; there are fourteen to sixteen across the middle of the belly, and thirty-one or thirty-two transverse series from the collar to the groin. The scales in front of the anus are very irregular, usually they are all nearly the same size, sometimes some of those behind or in the centre are rather larger than the others. The scales beneath the tarsus are very broad, those in the middle extending completely across; scales beneath the feet lozenge-shaped, sharply keeled, the direction of the keels being transverse to the foot on the hind-feet, longitudinal on the fore-feet. Caudal scales perfectly smooth near the base, and, in adults, for at least the anterior half of the tail; near the tip they are bluntly keeled, and in young specimens the keeled scales are found to extend rather farther forwards.

This fine lizard grows to a length of between 9 and 10 in. A specimen obtained near Karmán, with a perfect tail, is 9.5 in. long, of which the tail from the anus measures 6 in., but in this the tail is

longer than usual. A perfect specimen, from near Isfahán, measures 9 in., of which the tail from the anus measures 5.5, head 0.75, fore-limb to the end of the toes 1.4, hind-limb 2.15.

Eremias Persica is common in almost all parts of the Persian plateau where there are open plains, not absolutely desert. It is usually found amongst bushes, on sandy or gravelly soil, at an elevation of not less than 4000 feet above the sea. I first saw it on a plain covered with bushes, near Magas, in Balúchistán, and thence met with it in most suitable places till beyond Tehrán. It is very active in its movements. So far as I have observed, I do not think it lives in holes, although it will of course take refuge in a hole made by another animal. I met with these lizards in pairs in May, and once captured a male which had actually seized the female. The former had his claspers fully exerted, and upon capturing him, he discharged the seminal fluid through them.

I frequently met with young lizards of this species throughout the summer, some of them (not very small) as early as the end of April, and at Ráyín, at least 7000 feet above the sea.

E. Persica was collected in Northern Persia by De Filippi, who, however, mistook it for its near ally *E. variabilis* (*E. arguta*), and specimens obtained by the Marquis G. Doria, I believe near Tehrán, are preserved in the British, Turin, and Genoa Museums. De Filippi also states that he found *E. variabilis* abundant in Armenia, but as I did not see any specimens at Turin, I cannot help thinking it possible that he may have mistaken *E. velox* for it. Still, it is equally probable that the present species may be met with as far west. To the eastward it has been brought from Nasirabád, in Sístán, by Major Euan Smith.

This species may be distinguished from *Eremias arguta* (v. *variabilis*) by its much longer tail and limbs, by the infraorbital shield descending to the lip, which it does not do in *E. arguta*, by the larger number of upper labials, and femoral pores; of the latter there are about ten in *E. arguta*, twenty in *E. Persica*. From *E. velox* it is distinguished by its larger size, by its upper caudal scales near the base never being keeled, and by the scales beneath the palms of the feet being keeled, which they are not in *E. velox*.

On Plate XXVI, fig. 1 represents the adult lizard, 1 a the young.

42. *E. velox* ? (Pall.)

Lacerta velox, Pall. Reise, i, p. 718, No. 40.

L. argulus, Eichwald, Zool. Spec. Ros. Pol. iii, p. 188.

Podarcis velox, Eichwald, Fauna Casp.-Cauc. p. 76.

Aspidorhinus gracilis, Eichwald, Fauna Casp.-Cauc. p. 74.—Gray, Cat. Liz. Brit. Mus. p. 42.

?*Eremias cæruleo-ocellata*, Dum. et Bibr. Erp. Gén. v, p. 295, partim.

Eremias velox, Gray, Cat. Liz. Brit. Mus. p. 40.

1-3. Ghilán, south of Resht.

The three specimens which, with a little hesitation, I refer to this species, are in some respects intermediate in character between it and *E. Persica*, for they have the tail scales either smooth or very bluntly keeled. In the true *E. velox*, of which I obtained a specimen at Bákú, on the Caspian, all are distinctly keeled. In size however, in colouration (which differs from that of *E. Persica* in the absence of black spots on the back, and the occurrence of black-edged white markings), and in the want of keels on the scales beneath the palms of the feet, the specimens agree with *E. velox*.

I think it almost certain that *Aspidorhinus gracilis*, Eichwald, is founded on the young of this species, which differs so much in appearance from the adult that, but for the parallel case of *E. Persica*, I should not have recognised it. A specimen procured by me in Ghilán agrees very well with Eichwald's figure and description.

I doubt if the *E. cæruleo-ocellata* of Duméril and Bibron from the Crimea be not another species, for it is said to have no palatal teeth, whilst they are clearly present in the specimens of *E. velox* collected by me. The number of femoral pores also appears larger in *E. velox*, and the colouration different. Dr. Anderson refers to *E. cæruleo-ocellata* specimens from Yarkand, which agree with Messrs. Duméril and Bibron's description, but he does not mention the palatal teeth nor the presence of keels on the caudal scales in his description, P. Z. S. 1872, p. 373. If, however, his identification be correct, it shows that the different forms of *Eremias* belonging to the typical group have a peculiarly complicated geographical distribution.

43. *Eremias fasciata*, W. Blanf. Pl. XXV, fig. 3.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 32.

1. Magas, Balúchistán	4500
2, 3. West of Rígán, Narmashír	2500
4-12. Near Saidabád, Sarján, south-west of Karmán	5500

E. serpyllaris, gracilis, elongata; caudá corporis longitudinem duplam æquante vel superante; collare libero, recto; squamis dorsalibus parvis, rotundatis, convexis; caudalibus superioribus carinatis; ventralibus in series transversas circa 32-35, singulis in medio abdomine e 14-16 scutis, oblique nec longitudinaliter ordinatis, compositas; præanali uná saepe, haud semper majore, poris femoralibus utrinque 16-19; scuto præfrontali unico a rostrali supranasalibus et a verticali postfrontalibus longè discreto, supraciliaribus duobus æqualibus granulis fere vel omnino circumdatis; interoccipitali posteriore nullo; infraorbitali ad labrum pertinente; dentibus palatalibus nullis; supra albida vel fulvescenti-grisea, fusco longitudinaliter fasciata; membris superne fuscis, albo-maculatis.

Hab. in Persiá meridionali haud procul ab urbe Karmán, et in Gedrosiá (Balúchistán) haud frequens.

Description:—No palatal teeth. No interoccipital behind. Lower eyelid opaque, granular. The infraorbital shield extends to the lip; there are six or seven (more rarely five) supralabials in front of it, and three or sometimes four behind. Temples covered with small scales. Ear-opening moderate, about the same size as the eye; margin not toothed, with one large scale above in front. Collar distinct, free, nearly straight, consisting of a variable number, usually about eight to ten enlarged scales, the largest being in the middle, whence they diminish gradually in size on each side; sometimes only the central scales are larger than those in front. Dorsal scales circular, convex, in transverse rows, those on the back of the neck a little smaller, whilst on the flanks they become larger and flatter; I count from forty-five to fifty scales in each transverse row across the back, from the ventral plates on one side to those on the other. Tail scales in distinct rings, all sharply keeled except those beneath near the base. Ventral shields in thirty-two to thirty-five transverse rows, each in the middle of the belly consisting of fourteen to sixteen rhomboidal plates, not arranged in longitudinal rows, but in oblique series. There is usually a larger scale in front of the anus, but it is by no means constant; in some specimens all the scales near the anus are rather larger than in front, whilst in others all are of about the same size. There are from sixteen to nineteen femoral pores on each thigh, the two series being separated by about four scales in the groin.

Both body and tail are elongate, the latter especially so, being when perfect twice, or more than twice, the length of the head and body. The fore-limb laid forward reaches the end of the snout, the hind-limb to between the shoulder and ear, occasionally extending to the latter.

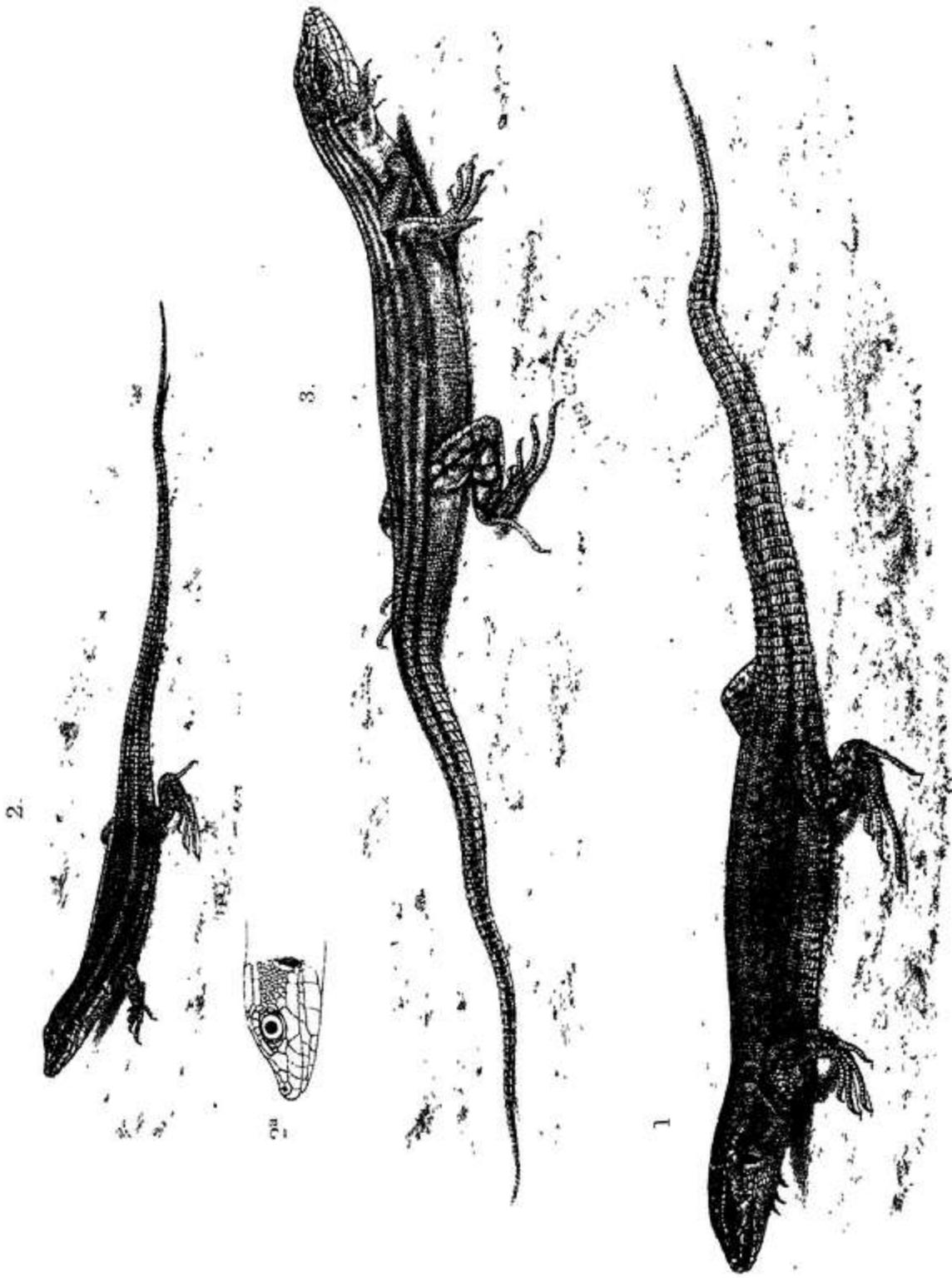
Colour:—Head uniform pale brown above; back light brown to white (paler in specimens from Narmashír and Balúchistán), with from six to eight longitudinal dark brown bands, equal to the interspaces in breadth, extending the whole length of the body, and each pair uniting and terminating on the anterior portion of the tail, or occasionally in the middle of the back. Limbs above dark brown spotted with white or pale brown. Lower parts white.

Head-shields:—Rostral rather broader above than below, and about as high as broad. Nasal shields moderately swollen; the upper nasal meeting the rostral and just touching the first labial on each side in front, and the pair forming a broad suture and separating the rostral from the præfrontal; lower nasal touching the three first labials. Loreal about as broad as high. Præfrontal single, hexagonal, broader than long, broadly separated from both the rostral and vertical. Postfrontals each very little smaller than the præfrontal, meeting in a broad suture before the vertical. Vertical about twice as long as broad, nearly twice as broad in front as behind, with a rather shallow broad groove on its anterior surface; front margin very convex, lateral edges concave. Superciliaries two, equal in size and semi-elliptical, in most specimens entirely surrounded by granular scales, but in some cases these are wanting along the middle of the inner edge. Præoccipitals each about the size of a frontal. Postoccipitals each about four times the size of a præoccipital, equally broad and long, the posterior margin of the two being a straight line. A very small central occipital with a tubercle in the centre, no shield behind it. Five pairs of chin shields, the first three meeting in the middle, third and fourth the largest; all are usually in contact with the lower labials.

Scales of the throat rather larger than those on the back. Shields beneath the tarsi very broad, extending quite across. Scales beneath the feet not keeled.

The length is usually from six to seven inches. A fine specimen from Sarján measures 6.8 in., of which the tail is 4.5, head 0.55, fore-limb 0.8, hind-limb 1.5.

This species closely resembles young individuals of *E. Persica*, but it is much more elongate, and may be distinguished at once from



1 LACERTA BRANDTII.
2 OPHIOPS MEIZOLEPIS
3. EREMIAS FASCIATA.

that species and all its allies by the absence of palatal teeth, and usually by the superciliary shields being surrounded with granules on their inner edge. From *E. Persica* it may further be known by the caudal scales being keeled and those beneath the feet flat, by the inferior nasal articulating with three supralabials instead of two, by the rostral being narrower in front, the præfrontal shorter compared to its breadth, the less numerous scales round the body, and by the longitudinal dark bands on the sides not being spotted with white.

I found one specimen of *E. fasciata* near Magas, in Balúchistán, on the same day and in the same spot as I procured my first specimen of *E. Persica*, on an elevated plain covered with bushes. I again met with this species on the fertile plain of Narmashír, south-east of Bam, and once more in the much higher plateau of Sarján, on the road between Karmán and Shiráz. In the two last-named places it was common, but I saw it nowhere in the intermediate country. Its habits present nothing remarkable; it lives on bushy plains, and is very active and difficult to catch.

44. *Mesalina pardalis* (Licht.).—De F.

Gray, Cat. Liz. Brit. Mus. p. 43.

Eremias pardalis, Dum. et Bibr. Erp. Gén. v, p. 312.—De F. Viag. in Persia, p. 354.

? *E. Watsonana*, Stol. Proc. As. Soc. Bengal, 1872, p. 86.

1. Rás Malán, Balúchistán	..	..	..	..	2000
2-7. Gwádar, Balúchistán	..	..	..	..	—
8-17. Dasht river, Balúchistán	..	..	..	..	—
18-20. Mand	..	..	..	..	700
21-23. Zamrán, Balúchistán	..	..	..	..	2000
24-26. Bampusht, Balúchistán	..	..	..	..	3000
27. Magas, Balúchistán	..	..	..	..	4500
28, 29. Ráyín, south-east of Karmán, South Persia	..	..	..	..	8000
30, 31. Karmán	..	..	..	..	5000
32-34. Sarján, south-west of Karmán	..	..	..	..	5500
35. Near Isfahán? label illegible.					
36. North of Isfahán	..	..	..	..	(?)
37. Near Tehrán	..	..	..	..	4000

The best distinction of the genus *Mesalina* from *Eremias* appears to be the character of the ventral shields, which are in longitudinal rows in the former and in oblique rows in the latter. The principal character assigned by Gray, viz. the large præanal shield of *Mesalina*, varies in individuals.

The above series of this lizard comprises specimens agreeing well with typical North African examples in the British Museum, and with Duméril and Bibron's description; but considerable variation is exhibited. Thus, the large præanal plate, just mentioned above, is very unequally developed; usually it is large, and occupies a considerable proportion of the area between the anus and the groin, but in some cases it is very little larger than the scales around it. The ventral plates are in ten longitudinal rows, the two outer of which are very much narrower than the others; but I do not think they are ever wanting, although they are often broken up into smaller scales in the anterior and posterior portions of the abdomen, and in one specimen (and only one) of the large series before me they are thus broken up almost throughout. The number of transverse rows is usually 28 to 31, sometimes as few as 27, and occasionally as many as 34. Femoral pores 11 to 15, the commonest number being 12. There are about 45 to 50 granular scales round the middle of the back from the ventral plates on one side to those on the other, those on the sides near the ventral plates being larger than those on the back. The hind-foot laid forward sometimes reaches the ear, in other cases it barely extends beyond the shoulder; the fore-limb sometimes extends to the end of the muzzle, but usually falls short of it. But few of the specimens collected by me exceed five inches in length; one, however, measures 5.75 in.

The transparent disk on the lower eyelid is single or double, or occasionally divided into three or four. The interoccipital plate between the hinder portion of the postoccipitals is usually well developed, and forms a suture with the central occipital, separating the postoccipitals from each other, but occasionally the interoccipital is quite minute, and not sufficiently produced in front to meet the central occipital, or there may be another small plate interposed between the two.

The *colour* is dark slaty grey above, with small black spots, often edged on one or both sides by white, or sometimes forming small ocelli with a white centre, and usually with a tendency to form longitudinal lines, especially towards the sides. The markings are sometimes very faint or altogether wanting. Lower parts white, sometimes with a yellow tinge on the chin and throat. In some specimens the markings on the upper parts are very distinct, in others scarcely perceptible. At the

beginning of July I found specimens near Isfahán with the chin, throat, and breast yellow. They were probably breeding at that time.

Mesalina pardalis chiefly inhabits stony plains or gentle slopes, where there is not much herbage or bush. I did not usually notice it in the more sandy portions of the country. It appears to occur throughout Persia from the neighbourhood of Tehrán to far east in Balúchistán. I met with it first on my way from India, at Rás Malán, only 200 miles west of Karáchí; and if I am correct in believing Dr. Stoliczka's *E. Watsonana*¹ to be the same, it extends into North-western India. It was common on the rocky promontory near Gwádar, and throughout Balúchistán and South-western Persia; rather less so in Central and Northern Persia, but I occasionally met with it as far as Tehrán.

45. *M. brevirostris*, W. Blauf.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 32.

E. Watsonana, Stoliczka, Proc. As. Soc. Bengal, 1872, p. 125, ex Kálábágh (? nec typus ejusd. speciei).

1-5. Tumb Island (Great Tombs), Persian Gulf.

M. ab M. pardali scutis ventralibus in 12 series longitudinales (nec 10) ordinatis, capite brevior, minusque depresso, distinguenda.

Hab. ad Kálábágh in regione Panjáb dictá Indiæ, et ad insulam Tumb in Sinu Persico.

This species is distinguished from *M. pardalis* by its having two additional rows of ventral plates, there being twelve in all, of which the two outer, one on each side, are, as in *M. pardalis*, not more than half the size of the other shields. It has moreover a shorter head, much less depressed in proportion to its height, and consequently the head shields are as a rule shorter in proportion to their breadth. The small azygos inter-occipital ('occipitale' of Duméril and Bibron) is moreover very minute or wanting, and the postoccipitals meet behind the central occipital, which is very little, if at all, longer than broad. The scales beneath the tarsus also are not quite so broad as in *M. pardalis*. The following is a brief description of *M. brevirostris*.

Palatal teeth none. Lower eyelid with a transparent disk (sometimes divided) in the centre. Nasal shields much swollen, the upper

¹ See under the next species.

pair meeting in front of the single præfrontal, which is also separated by the postfrontals from the vertical. Head shorter and higher than in most allied species; from the suture between the superciliary shields to the point of the nose is about equal to the breadth of the head behind the eyes. A central occipital is present, nearly equal in size to each of the præoccipitals; posterior interoccipital rudimentary or wanting. Four or five supralabials between the rostral and the large infraorbital, which is usually divided below, a narrow supralabial being formed from the lower portion intervening between it and the lip, but this character is not constant; in some specimens the infraorbital extends to the tip. Ear-opening rather large, not denticulate in front, with an elongate plate above and in front of it. Dorsal scales convex, in transverse and oblique rows, those at the sides larger and flatter. There are about forty-three to forty-five scales round the body, not counting the ventral plates, of which there are twelve longitudinal rows, the two outermost smaller than the others, and from thirty to thirty-three transverse rows. Femoral pores thirteen to sixteen in each thigh. A large præanal plate. Tail scales in verticils, all keeled except those beneath. The fore-limb laid forward extends nearly or quite to the muzzle; the hind-limb comes in front of the shoulder. Colour dark grey, with indistinct dusky spots, pale in the centre, on the back forming more or less distinct longitudinal bands.

I only obtained specimens of this form on a small island known as Túmb, and marked on the chart as Great Tombs, lying in the Persian Gulf, about seventy miles west of the Straits of Hormuz, and nearly south of the port of Bassadore in Kishm Island. The lizard was abundant among some low shrubs close to the shore.

My friend, the late Dr. Stoliczka, kindly sent me a specimen of this form from Kálábágh, in the Panjáb, as his *Eremias Watsonana*. But the type of that species from Sakkar, on the Indus, is described as having 'the belly with eight rows of enlarged trapezoid shields, one row on either side being situated at the edge,' which agrees with *M. pardalis*. I think Dr. Stoliczka must have overlooked the distinctions between these two closely-allied forms, but his description clearly does not apply to the present species, for besides the difference in the ventral shields, he states that the postoccipitals are separated by a small shield, and he does not mention the division of the infraorbital, which appears to be the rule in the form now described. I am therefore compelled to propose a new name for the latter.

46. *M. pardaloides*, W. Blanf.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 32.

1. Henjám (Angám, Angaum, or Angar) Island, Persian Gulf.

M. peraffinis *M. pardali*, sed scutis ventralibus in series longitudinales duntaxat 8 (nec 10) ordinatis serie extremá utrinque e scutis multo angustioribus compositá.

Hab. in insulá Henjám seu Angám dictá in Sinu Persico.

This species agrees in every respect with *M. pardalis*, except that it has only eight longitudinal rows of ventral shields instead of ten; of these eight longitudinal rows, the outer row on each side consists, as in *M. pardalis* and *M. brevirostris*, of shields not half the breadth of those forming the remaining six rows, so that there can be no difficulty in distinguishing from it such exceptional specimens of *M. pardalis* as may have the outer row ill developed, since they have still eight rows of plates nearly equal in size. The type of *M. pardaloides* has fourteen femoral pores in each thigh, twenty-eight transverse rows of ventral plates, and about fifty scales round the body, excluding the ventral shields. The hind-legs and feet are rather long, the ends of the toes reaching the ear when laid forward.

I obtained but a single specimen of this lizard. It was not rare, but as I was busily occupied, during the few hours I spent on the island, in looking after fossils, I did not collect more, as I did not then notice the difference from *M. pardalis*. The specimen captured was found on barren stony ground, the usual habitat of *M. pardalis*. Henjám, or Angám, is a small island lying south of the large island of Kishm in the Persian Gulf, not far from the entrance.

47. *Acanthodactylus Cantoris*, Günther, Pl. XXVI, fig. 3, 3 a, 3 b.

Günther, Rept. Brit. Ind. p. 73.—Jerdon, Proc. A. S. B. 1870, p. 71.—Stoliczka, J. A. S. B. 1872, xli, Pt. 2, p. 91, and Proc. A. S. B. 1872, pp. 85, 124.

1, 2.	Jáshk, coast of Persia, outside entrance to Persian Gulf	—
3-10.	Dasht river, west of Gwádar, Balúchistán	.. —
11.	Báhú Kalát, Balúchistán —
12, 13.	Mand, Balúchistán	.. .. 700
14-18.	Bampúr, Balúchistán	.. .. 2000
19, 20.	Near Rígán, Narmashír, South-eastern Persia	.. .. 2500
21-24.	Near Bam	.. .. 3000

This species has been identified by comparison with the types in the British Museum. I have but little to add to Dr. Günther's original description of this species as supplemented by Dr. Stoliczka's remarks. All the series collected in Balúchistán and the neighbouring parts of Persia are adult or nearly so, and the longitudinal stripes on the back are faint or wanting, but in November, in Sind, I found young banded specimens in abundance, precisely agreeing in colour with Dr. Stoliczka's description. In every one of my specimens also the head shields are as described by Dr. Günther; there is a single præfrontal, and the postfrontals form a broad suture behind it; but in one young example from Sind the præfrontal is divided, and there is a small central plate between it and the postfrontals. I have not a single specimen in which the large infraorbital shield reaches the lip, but the breadth of the supralabials, which separate the infraorbital from the labial margin, varies greatly. The anterior edge of the ear appears almost always more or less toothed, but the number and size of the projecting scales, and the extent to which they project, are variable. The number of rows of enlarged scales in the middle of the back is eighteen to twenty in most specimens, and in some cases these terminate abruptly on the sides, and are succeeded by small scales, but in other specimens the scales in the centre of the back pass gradually into the smaller scales of the sides, there appearing to be much variation in this respect. The scales on the sides are always larger in the middle than near the shoulder and thigh, but there is much variation in the size of the lateral scales where they are largest; in some specimens only five or six scales intervene just in the middle of the body between the ventral plates and the enlarged dorsal scales, whilst in other examples there are double that number. In the same way the ventral shields are very variable in number. Günther gives twelve as the number of longitudinal rows, Stoliczka fourteen to sixteen, and I have examples in which as few as ten occur, but the most common number amongst my specimens is about twelve; there are however, very often, one or two smaller rows about the middle of the body on each side, forming a passage into the smaller lateral scales. The number of transverse rows of ventral plates is usually thirty, varying from twenty-eight to thirty-three. The number of femoral pores in each thigh is from seventeen to twenty-one, twenty being the commonest number.

The hind-limb usually extends to the ear, and in small specimens

(probably immature) sometimes even as far as the eye. I have no example exceeding 9 in. in length.

Acanthodactylus Cantoris is usually found only on sand. It is peculiarly abundant in sandy places near the coast, and where hillocks of blown sand have accumulated upon plains and have remained sufficiently unchanged to permit tamarisk and other plants to grow. In such places the surface of the sand will be found marked in all directions by the tracks of these lizards, which live in holes, usually made in the raised and somewhat consolidated mounds around the roots of bushes. In these holes the animals appear to pass the night, and in them they take refuge when alarmed. In the cold season, on the Balúchistán coast and in Sind, the *Acanthodactyli* usually issue from their holes about nine or ten o'clock in the morning, when the air has become thoroughly warmed by the sun, and they retreat to them again before sunset. They are very swift, and easily alarmed, but they may be captured by approaching them very slowly and cautiously, especially if two persons approach them at once, one from each side, in which case the lizards frequently remain quiet, apparently trusting to their resemblance in colour to the soil around them for concealment. From the circumstance that I found large numbers of young in November, whilst in January and February all appeared to be nearly full grown, I think it probable that the eggs are hatched in the autumn, having probably been laid in the summer.

Acanthodactylus Cantoris abounds throughout the lower portions of Balúchistán and South-eastern Persia, but I never met with it at a greater elevation than about 3000 feet above the sea. It appears to be equally common throughout the desert portions of Sind and the Panjáb, extending eastward as far as the neighbourhood of Delhi and Agra. The points furthest west at which I found it were near Bam and at Cape Jáshk, close to the entrance of the Persian Gulf. I cannot say if it occurs on the shores of the Gulf.

48. *A. micropholis*, W. Blanf. Pl. XXXI, fig. 2.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 33.

1. Rás Malán, coast west of Karáchi, Balúchistán ..	—
2. Dasht river, west of Gwádar, Balúchistán ..	—
3, 4. Zamrán, Balúchistán	2000
5. Kalagán, Balúchistán	3500

6. Dizak, Balúchistán	4000
7-9. Magas, Balúchistán .. .	4500
10, 11. Bampúr, Balúchistán	2000
12-14. Near Rígán, Narmashír, south-eastern Persia ..	2500

A. squamis dorsalibus carinatis, parvis, antice et ad latera minimis; scutis ventralibus in series longitudinales 10, extremas angustiores, ordinatis; poris femoralibus utrinque circiter 25; digitis breviter fimbriatis; scuto infraorbitali plerumque ad labrum pertinente; supra griseus vel fuscus, longitudinaliter albo-striatus, membris albo-maculatis; ceterum A. Cantoris similis.

Hab. in Gedrosiá (Balúchistán).

Description:—No palatal teeth. The infraorbital shield as a rule extends to the lip behind the fourth supralabial, but this character is not quite constant, for I have two specimens from Magas in which the infraorbital is separated from the lip by the fourth and fifth supralabials. Temporal region covered with small scales, minute, granular, and convex above, rather larger below, and either flat or convex, but never so distinctly keeled as they usually are in *A. Cantoris*. Ear-opening usually with from two to four scales projecting so as to form a serrated edge. Scales of the back small, subimbricate, semi-oval, rounded behind and sharply keeled, arranged in transverse and oblique series, and passing imperceptibly into minute, convex, granular scales like those of an *Eremias* on the back of the neck, and into equally small, rhomboidal, bluntly keeled or convex scales on the flanks, the latter becoming smooth and increasing in size below near the ventral plates. The number of scales round the middle of the body, not including the ventral plates, is about 50 (49-53), whilst in *A. Cantoris*, although very variable, I never find it to exceed 40, and in some specimens it is only 30. Ventral plates in 28 or 29 transverse rows and in 10 longitudinal series, the outer of which on each side consists of much narrower scales than the others, and is frequently only well marked in the middle of the body. Femoral pores usually 23 to 27; in one specimen there are only 21 on one side and 22 on the other, but this is exceptional. Scales beneath the tarsi of moderate size, none of them extending more than about half the breadth of the limb. Scales beneath the feet rhomboidal, subequal, transversely keeled on the hind-feet, longitudinally on the fore-feet. Fore-toes only slightly serrated along the edge, and the fringes formed by the projections of the scales along the edges of the hind-toes are shorter than in *A. Cantoris*. Scales

of the throat about the same size as those of the middle of the back, smooth and becoming larger and more imbricate near the collar, which is quite free and consists of eight to ten scales with their points slightly projecting, and of about the same size as the anterior ventral scales. Tail scales about three times the length of those on the back, rhomboidal, in distinct verticils, all keeled except some of those underneath, the keels forming continuous longitudinal lines. The scales in the middle of the præanal region are generally larger than those on the sides, but, as in most Lacertians, they are variable.

Body and tail elongate, snout moderate, head rather shorter than in *A. Cantoris*, tail about twice the length of the head and body. The fore-limb laid forward usually reaches the end of the snout, but sometimes falls a little short of it. The hind-limb extends usually to the eye, more rarely only to the ear. The largest specimen obtained measures 8.25 in., an average example 7.25. In the latter, the head from the snout to the hinder edge of the postoccipitals measures 0.56, snout to anus 2.4, tail from anus 5.85, fore-limb to end of toes 0.95, hind-limb 1.85.

Colour:—Head greyish-brown above. Body dark grey, with five white lines down the back, and another more or less distinct down each side. Just behind the head there are six white lines, two of which meet a little way back and form a single line, which disappears on the root of the tail, where the two adjoining ones coalesce, and farther back on the tail all the bands become indistinct. The dark stripes between the white lines are sometimes blackish, with white spots, at other times grey, with small black spots or with alternating black and white dots, being more spotted towards the sides than in the middle of the back. All the lower parts white.

Head shields:—Rostral moderate, terminating in an obtuse angle above between the anterior nasals. Nasal shields slightly swollen, the anterior pair meeting in a short suture behind the vertical. Two loreals, the anterior about half the length of the posterior, their upper margin forming a distinct *canthus rostralis*. Præfrontal single, rather broader than long, with a slight hollow running longitudinally down the centre. Postfrontals each a little smaller than the præfrontal, bluntly keeled longitudinally, meeting in a broad suture in front of the vertical, which is elongate, grooved in front, where it is about twice as broad as it is behind, the anterior margin convex, the lateral margins concave and converging. Superciliary disk consisting

of two large semi-oval subequal plates in the centre, a smaller shield in front, sometimes occupying all the anterior portion of the disk, but more frequently separated from the large shields by a row of granules and small granular scales, and occasionally one rather larger plate behind, a row of granules separating the principal shields from the superciliary ridge. Præoccipitals about the same size as the postfrontals, nearly triangular, with the inner angles truncated; postoccipitals more than twice the size of the præoccipitals, subquadrate, their joint posterior margins generally slightly concave in adults, straight in younger specimens; there is a very small central occipital with a small circular depression in the centre, but no ayzgos shield behind. Supralabials four in front of the large infraorbital shield, which usually reaches the lip behind the fourth labial, but in some specimens is separated from the margin by the fourth and fifth supralabial shields. The anterior portion of the infraorbital region is separate, and the infraorbital shield only touches two supralabials, differing in this from *A. Cantoris*, in which it rests upon three or four. There are usually three or four more supralabials behind the infraorbital, but they rapidly diminish in size. There are generally six lower labials on each side and five pairs of chin shields (more rarely six), the first three pairs in contact with each other, and all touching the lower labials; the third pair is the largest, but does not much exceed the second or fourth.

Acanthodactylus micropholis was found locally throughout Balúchistán, being much less abundant in the lower elevations near the coast than *A. Cantoris*, but apparently replacing that species completely at elevations above 3000 feet. It was not, however, found on the highlands of Persia, where, hitherto, no species of *Acanthodactylus* has been observed. Its habits are precisely similar to those of *A. Cantoris*, with which it is found consorting.

From its ally *A. Cantoris* it may easily be distinguished by its much smaller scales on the back, by the granular scales, like those of an *Eremias*, on the back of the neck, by the infraorbital shield resting on two supralabials instead of three or four, and usually reaching the lip, by its more numerous femoral pores, its shorter fringes to the feet, and by its colour, being always striped, even in adult specimens. The only other *Acanthodactylus* which approaches the present in its characters, viz. *A. Boskianus*, has even larger scales on the back than *A. Cantoris*.

FAMILY ZONURIDÆ.

Pseudopus apoda (Pall.) (*P. Pallasii*, Cuv., *P. serpentinus*, Merr. etc.) has not as yet been found within the territory of Persia, but it was obtained by Ménétries on the river Kúr, just north of the Persian frontier (Cat. Rais. p. 65), so that it may very possibly occur within our limits. De Filippi only observed it in the Caucasus.

FAMILY SCINCIDÆ.

49. *Eumeces pavimentatus*, Geoff.—De F.

Sc. pavimentatus, Geoff. St. Hil. Desc. de l'Égypte, p. 135, Pl. III, fig. 3, and Pl. IV, fig. 4, 4 a.—Peters, Monatsber. Akad. Berlin, 1864, pp. 48, 51.—Anderson, Proc. As. Soc. Bengal, 1871, p. 180.—Stoliczka, J. A. S. B. 1872, p. 121.

Plestiodon Aldrovandi, Dum. et Bibr. Erp. Gén. v, p. 701.—De F. Viag. in Persia, p. 354.

*P. auratus*¹, Gray, Cat. Rept. Brit. Mus. p. 91.

Mabouia aurata, Gunther, Rept. Brit. Ind. p. 82.

Euprepis princeps, Eichwald, Bull. Soc. Nat. Mosc. 1839, p. 303; Fauna Casp.-Cauc. p. 93, Pl. XVI.

1. Píshín, Balúchistán	700
2, 3. Sarján, south-west of Karmán, Southern Persia ..	5500
4-9. Near Niriz, east of Shiráz	4000-6000

I find twenty-six scales round the middle of the body in all specimens except one, which is from Píshín, in Balúchistán, and has twenty-eight, thus showing a tendency to a passage into the very closely allied *Mabouya Blythiana*, Anderson². The fore-leg when laid forward in some specimens only reaches the eye, in others it extends to the end of the snout. The nasal shield is divided in all my specimens, and two central rows of dorsal scales are broader than the others, so there

¹ The specific name *auratus* has been applied to this species by several naturalists, in the belief that it is the *Scincus auratus* of Schneider (Hist. Amph. fasc. ii, p. 176). But Wiegmann (Archiv, 1837, Pt. i, p. 134), Gravenhorst (Act. Acad. C. Leop. Carol. xxiii, pt. i, p. 321, Pl. XXXII), and Peters (Monatsber. Akad. Wiss. Berlin, 1864, p. 51) have all shown that Schneider's type is *S. tristatus*, Daud., an American species. Moreover Schneider's specific name was taken from Linnæus, and can only be employed for the *Lacerta aurata* of the 'Systema naturæ,' a species which has never been clearly identified.

² Proc. As. Soc. Bengal, 1871, p. 186.

can be no question of Blyth's genus *Eurylepis* being identical with *Eumeces*, as has been pointed out by Anderson.

The colour is olive grey or sandy grey, with at times golden yellow longitudinal stripes, varying in breadth and distribution, down the sides. In two specimens from Sarján there are dusky longitudinal bands down the back and sides.

I met with this fine scinque but seldom in Southern Persia and Balúchistán. Most of the specimens obtained were brought to me by villagers. The few I myself saw occurred on plains covered with bushes, and on one occasion I saw two together, apparently a male and female, which took refuge in a hole beneath a stone and had to be dug out. The hole appeared to have been made by some animal, for it possessed the peculiarity of turning at right angles a short distance from the surface: I doubt if the scinques had dug it. De Filippi found this lizard common in Armenia; Eichwald, who described it again under the name of *Euprepis princeps*, and gave a very fair figure of it, obtained it from the Tálísh mountains, south-west of the Caspian, and I heard of a species, which from the description was probably the same, near Tehrán, so that it inhabits the whole of Persia.

50. *Euprepes septemtaeniatus*, Reuss.—De F. Pl. XXVII, fig. 3.

Mus. Senck. i, p. 47, Pl. III, fig. 1.—De Filippi, Atti Soc. Ital. Sc. Nat. vii, p. 185.

E. affinis, De F. Viag. in Persia, p. 354.

- | | |
|---|------|
| 1. Kushkizard, between Shiráz and Isfahán | 8000 |
| 2. Between Isfahán and Tehrán, near Kúm | (?) |

I have examined the typical specimens of *E. affinis* in the museums at Genoa and Turin, and compared with them the specimen obtained by myself between Isfahán and Tehrán, which agrees in every respect, except that in the former there are in each thirty-four scales round the body and about thirty-eight between the axils, whereas in the specimen I collected there are thirty-six scales round the body and thirty-five between the axils. In the other specimen, from Kushkizard, the scales round the body number thirty-four, as in De Filippi's types, and thirty-six between the axils. Of three specimens presented to the British Museum by the Marquis Doria, two have thirty-eight and the third thirty-five scales round the body.

I have also compared my specimens with the two typical examples of *Euprepes septemtaeniatus* in the Paris Museum, and I have arrived at

the same conclusion as De Filippi did, viz. that *E. affinis* cannot be considered a distinct species. The only differences I can see are that the postfrontals are contiguous in the specimens of *E. septemtaeniatus* from Nubia, whilst they are separated in the Persian form, and that the lobules in front of the ear are larger in the latter; but these differences are insufficient for specific distinction. I find in the Paris Museum specimens of the same form from Maskat and from some other part of Arabia, which, if the localities be correct, show that this species has a wide range throughout South-western Asia. From *E. quinquetæniatus*, Wagler (*E. Savignii* Dum. et Bibr.), which I myself obtained in Abyssinia, and of which I have seen specimens labelled *E. septemtaeniatus*, the last named is distinguished by the absence of keels on the scales of the anterior portion of the back and of the upper part of the limbs, and by the smaller ear-opening, which is round, not oval. I cannot help feeling some doubt, however, as to these distinctions being constant.

The following is a brief description of the Persian specimens. General form much as in *E. carinatus*, Schn. (*E. rufescens*, Shaw), and *E. quinquetæniatus*, Wagler, except that the tail is much shorter. A pair of supranasal shields, which meet in a suture behind the rostral. Postfrontals separate, each about half the size of the single præfrontal. An elongate central occipital, completely separating the postoccipitals from each other. The fifth upper labial is the largest, and forms the lower part of the orbit; it has two other labials behind it. Lower eyelid with a large transparent disk. Ear-opening rather small, circular, with two or three subequal lobules in front. Scales of the back with three very faint keels; scales of the anterior portion of the back, of the sides, and the limbs, smooth. Thirty-four to thirty-eight series of scales round the body, thirty-five to thirty-eight between the axils. Neither the præanal shields nor subcaudals are enlarged. Limbs moderate; the fore-limb laid forward extends in front of the eye.

The general colouration of Persian is very different from that of African specimens, but that of the latter is so variable, that I doubt if any conclusions can be drawn from this character. The colour of Persian specimens of *E. septemtaeniatus*, to judge from those I have seen, does not appear to vary greatly; it is pale olive brown, with more or less numerous black spots on the head, back, and sides; these tend to form four longitudinal bands on the anterior portion of the back, and a broad band, produced in front through the eye, down each side.

Below this is a narrow pale line from the upper labials to above the shoulder, with a more or less marked dark band beneath it. The specimen from Kushkizard is more strongly marked than those from Northern Persia, and in this the head shields, the posterior portion of the back, and the tail are all spotted, the spots on the hinder portion of the body having rather a tendency to form transverse bands.

This species is viviparous. The large female which I captured at Kushkizard on being placed in spirit gave birth to three perfectly-formed young, each about 3 in. in length, and with an umbilical cord attached to a placenta-like mass. Two others remained inside the body. The length of this specimen was 7.8 in., of which the tail from the anus measured 3.9, fore-limb 1.05, hind-limb 1.3. It was found in a high open valley, which is covered with snow in the winter months.

De Filippi's specimen was from Kazvín, north-west of Tehrán. I saw this scinque more than once in Northern Persia, but I never met with it in the South except at Kushkizard.

51. *Ablepharus bivittatus* (Mén.)—De F. Pl. XXVII, fig. 2, 2 a.

Scincus bivittatus, Mén. Cat. Rais. p. 64.

Ablepharus Menestriesii, Dum. et Bibr. Erp. Gén. v, p. 811. — De F. Viag. in Persia, p. 355.

A. bivittatus, Gray, Cat. Liz. Brit. Mus. p. 64.

1-5. Kushkizard, between Shiráz and Isfahán .. 8000

The specimens obtained agree with Duméril and Bibron's description, except that the nasal shields in all my specimens are widely separate, instead of being 'assez rapprochées.' I have examined the examples of this species collected by De Filippi in Northern Persia, and preserved in the Turin Museum, and compared them with those collected by myself. The differences are trifling. The head in the former is rather longer, and there are only twenty-two rows of scales round the body. In the specimens from Kushkizard there are twenty-four rows, as in the type described by Duméril and Bibron.

The colour noted from living specimens is pale greyish olive above, with dusky mottling which forms three more or less well-marked longitudinal lines down the centre of the back. A broader and better marked dark line runs down the upper part of each side over the

shoulder, above the tympanum and through the eye, commencing from the nostril; below this is a whitish line, followed by a narrow dark line, the latter often ill-marked. The under parts in the specimens collected were salmon colour, deepest at the base of the tail; but it is highly probable that this tint is seasonal, and disappears during part of the year. The length of the largest specimen was 4.8 in., of which the tail from the anus measured 2.9.

I met with this scinque only in the locality mentioned, a high plateau, 8000 feet above the sea, traversed by the summer road between Shiráz and Isfahán. There it consorted with *Phrynocephalus Persicus*, De F., another Northern Persian species which, in the same way, was not noticed in any other part of the country south of the plains near Tehrán. De Filippi found the present species rather scarce at Tabriz and Kazvín.

Ablepharus bivittatus was met with rather commonly at the locality mentioned, on open ground, dry and level but not sandy, scattered over with very small thorny bushes, amongst the roots of which this little scinque buried itself when pursued.

52. *Ablepharus Brandti*, Strauch, Pl. XXVII. fig. 1, 1a¹.

Bull. Acad. St. Pet. xii, p. 367.

² *Blepharosteres agilis*, Stoliczka, Proc. As. Soc. Beng. 1872, p. 126.

A. pusillus, W. Bl. Ann. and Mag. Nat. Hist. July 1874, xiv, p. 33.

1-2. Basrah (Bussora), on banks of the Shat-el-Arab, the estuary formed by the union of the Tigris and Euphrates.

Two specimens of an *Ablepharus* belonging to the section with an undivided præfrontal were procured at Basrah, and were described by me l. c. as a new species under the name of *A. pusillus*. In the description, a serious error was printed, the number of scales between the axils being given as 26 instead of 36. I believe that this mistake was the principal cause of my describing the species as new, because the only important difference between the Basrah scinques and a typical specimen of *A. Brandti* in the British Museum consists in the latter having about fifty scales between the axils. The two scales above the eye forming a portion of the orbital ring are a little more developed in *A. Brandti*, but the difference is trifling.

¹ The name printed on the plate is *A. pusillus*.

In the species described by Dr. Stoliczka from the Panjáb as *Blepharosteres agilis*, the number of scales between the axils is said to be forty to forty-five, and as the description of this form agrees perfectly in every other character with *A. Brandti*, I am disposed to believe that it is the connecting link between that species and *A. pusillus*, and that the three must in all probability be considered as varieties of one species. It is true that so much variation in the number of the ventral scales is unusual, for the transverse rows on the abdomen correspond to the number of dorsal vertebræ. In *Blepharosteres agilis* there are said to be twenty-one to twenty-two longitudinal rows of scales round the body, instead of twenty, as in *A. Brandti* and *A. pusillus*, but I do not consider this a specific distinction.

The following is a full description of the Basrah *Ablepharus*.

Description:—General form slender; body rounded, the back being slightly flattened; tail nearly twice as long as the head and body; head rather short; limbs feeble, all with five toes; the fore-limb laid forward reaches the angle of the mouth; the hind-limb extends about two-thirds of the distance to the shoulder; third and fourth toes on the fore-foot nearly equal, on the hind-foot the fourth toe is a little the longer. The scales are in twenty rows round the middle of the body, and about thirty-six from the axil to the thigh; those on the back are the broadest, and those on the sides smallest; as usual, a few rows of scales on the back of the neck immediately behind the occipital shields are very broad. Feet granular beneath; toes with transverse plates below, which have a blunt keel in the centre. There are a pair of enlarged præanals, and a row of broad subcaudals. Ear-opening small, circular, with two or three small lobules in front. The largest specimen with the tail perfect measures just three inches, the tail from the anus is 1.9, head 0.2, the fore-leg is 0.25, hind-leg 0.35 long.

Head shields:—Rostral rather broad, but scarcely extending to the upper surface of the head. Nasal shields distant from each other. Two loreals, the anterior being perhaps rather a postnasal; it is narrower and higher than the posterior. Præfrontal large, hexagonal, forming a suture both with the rostral and vertical; postfrontals small, distant from each other. Vertical elongate, its broadest portion about one-third of its length from the front, with three sides in front, two straight lateral margins behind gradually approaching each other, and a rounded posterior extremity which just touches the

point of the large subtriangularly heart-shaped præoccipital. Superciliary shields three in number, the anterior much the largest, and the second larger than the third. A bell-shaped interoccipital, the anterior margin of which is slightly convex, and fits into a hollow in the broad posterior margin of the præoccipital. The postoccipitals meet behind the interoccipital.

There is a row of narrow shields, rather broader in front, between the superciliaries and the orbit; the latter is surrounded by very minute scales, in a single row except behind, two above the orbit being more elongate, but very narrow. Temples covered with large polygonal plates, the largest of which on each side above is in contact with the postoccipital. Upper labials seven, the fifth from the front being the largest, and forming the lower portion of the orbit; lower labials about six. A broad and large shield behind the mental, and three or four pairs of enlarged chin shields, in contact with the lower labials, behind it.

Colour :—Brownish olive above; a narrow pale line from above the eye down each side of the back, and a broad dark brown band below it, from the back of the orbit to above the shoulder, and continued, but less distinctly, down the side; below this are fainter lines. Limbs with rather faint longitudinal bands.

The only two specimens of this little scinque which were obtained were collected on the bank of the Shat-el-Arab (the river formed by the union of the Tigris and Euphrates), opposite the town of Basrah (Bussora), where it occurred with *Ophiops meizolepis*. I include it in the Persian fauna for the same reasons as I have given in describing that species.

This small scinque has much the form of *Ablepharus bivittatus*, but it is more slender. The largest specimen is nearly three inches long, and not thicker than a crowquill. It appears to be very closely allied to a species recently described from North-western India by Dr. Stoliczka, under the name of *Blepharosteres Grayanus* (Proc. As. Soc. Beng. 1872, p. 74), the type of the genus *Blepharosteres*, which is destitute of any external ear, and is, to use Dr. Stoliczka's phrase, 'a *Mocca* without eyelids or ears.' But as *B. agilis*, which Dr. Stoliczka has referred to the same genus, possesses an ear-opening, I doubt whether the generic distinction from *Ablepharus* can be maintained, the only remaining distinction of importance being that the anterior frontal is single in *Blepharosteres*, double in typical

*Ablepharus*¹. This character, however, is the only essential distinction of the genus *Cryptoblepharus* of Wiegmann and Gray, and, as Dr. Strauch has pointed out in his monograph of the genus *Ablepharus* (Bull. Ac. Imp. Sci. St. Pet. xii, p. 359), there is no difference of generic importance between *Cryptoblepharus* and *Ablepharus*. I am therefore inclined to believe that unless the absence of an ear-opening in *Blepharosteres Grayanus* be considered a generic character, that species must be included in *Ablepharus*.

53. **Hemipodium Persicum*, Steindachner.

Hemipodium Persicum, Steindachner, Sitzungsber. Akad. Wiss. Wien. 1867, lv, p. 263, Pl. I.

There is a specimen of this species in the British Museum, received from Vienna, and said to have come from Kúrdistán. The type is said to have been obtained by Kotschy in some part of Persia not specified.

54. *Anguis orientalis*, Anderson,—De F.

P. Z. S. 1872, p. 376, fig. 1.

A. fragilis, Mén., Cat. Rais. No. 223, p. 66.—Eich., Faun. Casp.-Cauc., p. 98.—De F. Viag. in Persia, p. 355.

A specimen obtained by Major St. John at Resht², in Ghílán, was described by Dr. Anderson as the type of a new species. It is distinguished from *A. orientalis* by the greater number of scales round the body (thirty one inch behind the head), and the greater division of the head shields.

I have examined the type and compared it with *A. fragilis*, and although the distinctions may possibly be individual, I think they are probably constant, and entitle the form to separation. The number of scales round the neck an inch behind the head is about thirty, but about half-way from the head to the vent there are only twenty-eight, and farther back twenty-six or less. Amongst several specimens

¹ Dr. Stoliczka says, l. c. p. 174, that *Blepharosteres* differs from *Ablepharus* by the total absence of eyelids, but I do not think he had specimens of *Ablepharus* for comparison, for in all the species of that genus which I have seen, the eyelids are precisely in the rudimentary form which he very clearly describes as occurring in *Blepharosteres*.

² Misprinted Rehst in the P. Z. S. l. c.

of *A. fragilis* from Great Britain, France, and Italy which I have examined, I can find none possessing more than twenty-six rows of scales round the centre of the body.

According to De Filippi, the Marquis Doria obtained *A. fragilis* at Tehrán. Ménétrics says it is common at Lankorán. I did not meet with it in Persia, nor could I find any Persian specimens in the museums at Turin and Genoa.

The next two species belong to that division of the scincoid lizards which was raised by Dr. Gray to the rank of a distinct family under the name of *Sepsidæ*; and of the forms belonging to which a list with notes was given by Dr. Günther in the Proceedings of the Zoological Society for 1871, p. 240. I feel great doubt as to whether it is better to raise this subdivision to the rank of a family than to retain the name of *Scincidæ* for the whole group, because it appears to me that there is quite as much structural difference between *Scincus*, *Euprepes* and *Anguis*, all of which are retained in the *Scincidæ*, as there is between any of them and *Seps* or *Sphenops*. In the same manner I cannot see any greater necessity for placing *Ablepharus* in a distinct family from *Mabouya* and *Hinulia* on account of the absence of eyelids, than there is of removing *Ophiops* from the *Lacertidæ* or *Eublepharis* from the *Geckotidæ*.

55. *Sphenocephalus tridactylus*, Blyth.

Blyth, Jour. As. Soc. Bengal, xxii, 1853, p. 654. — Günther, Rept. Brit. Ind. p. 98.

I was constantly on the look-out for this curious sepsoid lizard in Balúchistán, but I never saw it. Specimens were, however, obtained by Major Euan Smith at Nasirabád, in Sistán, and they are now in the British Museum. They differ in no respect from Panjáb specimens.

56. *Seps (Gongylus) ocellatus* (Forsk.)

Gongylus ocellatus, Anderson, P. Z. S. 1872, p. 377.

Specimens obtained from Bushire by Major St. John have been described by Dr. Anderson, l. c. I have compared one of them with African examples in the British Museum, with which it agrees perfectly.

57. * *Ophiomorus miliaris* (Pall.)

Dum. et Bibr. Erp. Gén. p. 799.

Anguis miliaris, Pall. Reise, ii, p. 718; Zoog. Ros. As. iii, p. 54.

Pallas states that a specimen of this peculiar limbless lizard was sent by S. G. Gmelin from Persia. The exact locality is not mentioned; it was probably Mazandarán or Ghílán.

*Zygnopsis*¹, gen. nov.

W. Blanf. Ann. and Mag. Nat. Hist. July 1874, xiv, p. 33.

Genus affine Ophiomori, naribus inter dua scuta, unum supra, unum infra, supranasalibus contiguís, sed membrís quatuor debilibus præditum.

This form resembles *Ophiomorus* in the character of its head scales, the nostrils being between two shields, an infranasal and a supranasal, the supranasals meeting behind the rostral. The central plates of the head, rostral, anterior frontal, vertical, and occipital are largely developed, as in many sepsoid forms. The essential distinction from *Ophiomorus* is in the possession of small limbs, the fore-feet in the only species known being tetradactylous, the hind-feet tridactylous. I can detect no trace of an external ear. The teeth are blunt, small, almost hemispherical. The palate is not toothed, and the palatal fissure, which is rather broad, extends forward to the level of the eye. The tongue is flat and scaly, but appears not to be cleft at the end; in the only specimen I have for examination, however, the tip of the tongue has dried slightly, and when fresh it may have a minute emargination, as in *Ablepharus*. The eyes are very small, and the lower eyelid well developed but transparent, as in *Ophiomorus*.

Ophiomorus is by Duméril and Bibron included in the family of *Scincoïdiens* or *Lepidosaures*, which comprises, besides the normal scincoids, *Seps*, *Acontias*, and other forms, which have been by Dr. Gray and other writers made the types of distinct families, distinguished principally by the characters of their nasal shields. *Ophiomorus miliaris* (Pall.) is thus made the type of the family *Ophiomoridae*, distinguished by having the nostrils between two plates, one above and one below. I feel much doubt as to whether the importance of the exact form of

¹ Etym. *ζυγνίς*, the name of a lizard, and a name employed by Oken, Fitzinger, and Wiegman for the genus *Seps*, and *ὄψις*, 'appearance.'

the nasal shields is sufficient to justify the foundation of families upon them, and, after all, the difference between some of the *Scincidæ*, e. g. *Euprepes* and *Ophiomorus*, consists only in the position of the nostril itself in the nasal shield; in *Euprepes* it is in the middle of the shield, in *Ophiomorus* it is on the upper margin; in *Seps*, again, it is in the front edge of the nasal. In all these forms we have a rostral shield, two nasals, one on each side, and two supranasals. In *Acontias* these are all united into one shield, the reverse condition being seen in *Anguis*, in which the supranasals are divided into several shields.

If *Seps* and its allies are separated from the *Scincidæ*, I am inclined to think that *Ophiomorus*, *Acontias*, and perhaps *Anguis* should be placed with them. In all there is a tendency to the development of the central plates of the head at the expense of the lateral plates, and the limbs are weak or deficient. But weak limbs are also common amongst the true scinques, and there is no trenchant character by which the sepsoid forms can be distinguished.

58. *Zygnopsis brevipes*, W. Blanf. Pl. XXVII, fig. 4, 4 a.

Ann. and Mag. Nat. Hist. l. c.

i. Sáadatabád, Sarján, between Karmán and
Shiráz, South Persia 5500

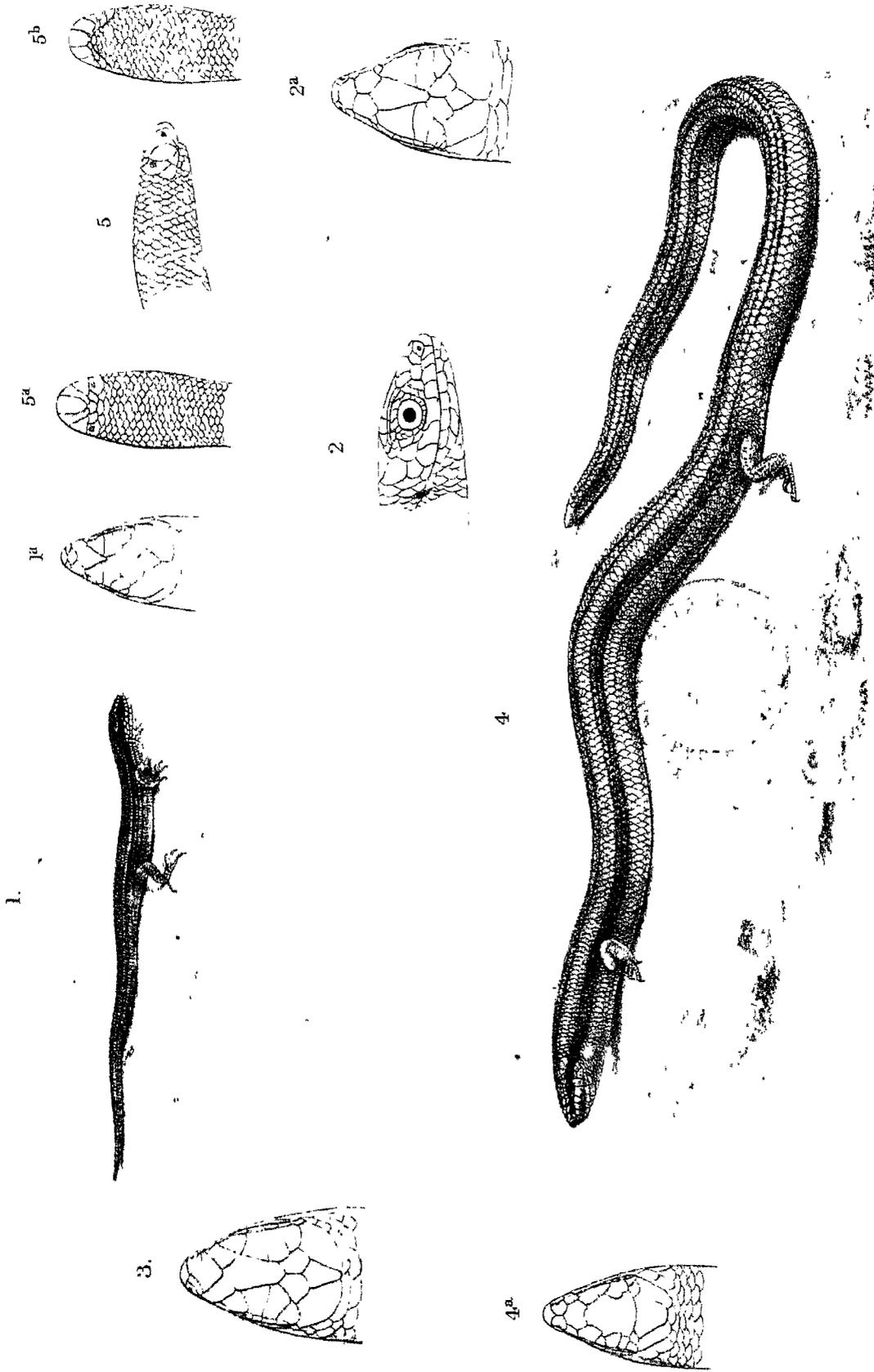
Z. corpore elongato, pedibus brevibus, anticis digitis 4, posticis 3 instructis, capite conico, rostro rotundato; scuto verticali magno, postice latiore, ad latera emarginato; occipitali magno, margine anteriore concavá, posticá valde convexá; præoccipitalibus nullis, postoccipitalibus minoribus oblique elongatis; oculis parvis, palpebris inferioribus transparentibus; meatu auditorio nullo; squamis corporis lævibus, in medio corpore in 22 series longitudinales dispositis; grisea, longitudinaliter fusco-fasciata.

Hab. haud procul a Karmán in Persia meridionali.

Description:—Form anguiform, slender; body elongate, cylindrical; the tail in the only specimen is imperfect, but must have been of considerable length, and diminishes in size very slowly. The head is conical, muzzle rounded; no trace of external ears; eyes small; lower eyelid well developed, transparent. The legs are small and rudimentary; the fore-foot when laid forward not extending half the distance to the snout, and falling far short of the mouth; the hind-leg about one-fifth of the length from the thigh to the shoulder, and about equal to the distance from the shoulder to

the eye. The fore-foot has four toes, the third a little the longest; the hind-foot three toes, the third the longest; all the toes, normally, are clawed, but some have lost their claws. Feet covered with smooth, imbricate scales, the toes with cross-plates below. Scales of the body smooth, all equal in size, in twenty-two longitudinal series round the middle of the body. Length of the only specimen, from the snout to the anus, 4 in., head 0.3, fore-limb 0.32, hind-limb 0.6.

Head plates:—The rostral rather large, extending to the upper surface of the head. The nostrils are in the upper part of the nasal shield, their upper margin formed by the supranasals, which are rather larger than the nasals, and meet in a broad suture behind the rostral. Præfrontal rather large, hexagonal, broader than long; it has a broad concave hinder margin, into which the front of the vertical fits. Postfrontals small, pentagonal, widely separated. Vertical very large, bell-shaped, with its broadest portion behind, and its posterior margin rather convex, meeting the occipital in a broad suture, its lateral margins rather deeply emarginate, each being cut out by a re-entering angle near the hinder edge. No præoccipitals; they are represented by two small rhomboidal shields, one on each side, between the hinder outer margin of the vertical and the postoccipital. Superciliaries four on each side, the second from the front the longest, its hinder angle on the inside projecting and fitting into the lateral emargination of the vertical. The anterior and posterior superciliaries are in contact with the granular scales of the small upper eyelid; a narrow shield between the eyelid and each of the central superciliaries. Occipital large, subtriangular, with the anterior angles truncated, anterior margin concave, hinder angle rounded. Postoccipitals represented by two obliquely elongate shields running along the outer margins of the occipital, and not meeting behind it. Two loreals, both longer than high, the anterior one in contact with the præfrontal, a small præocular behind the last. Lower eyelid transparent, a row of small shields beneath it separating it from the supralabials. Temporal region on each side covered by two large shields, that in front extending from the supralabials to the postoccipital, the hinder one touching the postoccipital only. Supralabials seven, the fifth the largest, fifth and sixth below the eye, the seventh much less in height than the others. Infralabials about six; mental rather small with two shields stretching across the chin behind it, and other enlarged shields along the edge of the lower labials.



1. ABLEPHARUS PUSILLUS
2. A. BIMITTATUS
3. EUPREPES SEPTEMFASCIATUS
4. ZYGNOPSIS BREVIPES
5. TYPHLOPS PERSICUS

Colour pale brownish grey, with longitudinal dark lines. Of these there are two narrow ones in the centre of the back and tail extending on to the head shields, and a much broader band from the nostril, through the eye, extending down the upper part of each side above the limbs and dividing into two lines on the tail.

The head is slightly injured, but not so much so as to render the plates indistinct. The only specimen obtained was brought to me at Sáadatabád, a village in Sarján, about 100 miles south-west of Karmán on the road to Shiráz, together with several specimens of *Eumeces auratus*. All were dead, and had been more or less injured in being captured, the people looking upon them as poisonous, a common belief with regard to all anguiform lizards.

OPHIDIA.

FAMILY TYPHLOPIDÆ.

59. *Typhlops Persicus*, W. Blanf. Pl. XXVII, fig. 5, 5 a, 5 b.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 34.

1, 2. Hills, north-east of Sarján, between Karmán
and Shiráz 8000

T. purpurascenti-brunneus, fere unicolor, subtus viæ pallidior, antice parum attenuatus; scuto rostrali mediocri, subtus parum angustiore, fronto-nasale latitudine haud æquante; nasali cum frontonasali supra narem juncto; præoculari antice valde convexo, oculare longitudine subæquante; frontonasalibus post rostrale approximatis, præfrontali frontali, interparietali, supra-ocularibus, parietalibusque subæqualibus, squamas dorsales latitudine paullo excedentibus; squamis corporis in 22-24 series longitudinales atque 376-390 transversas dispositis; caudá brevi, mucronatá seriebus 9 squamarum circumdatá.

Hab. in Persiá meridionali.

Description:—Body nearly cylindrical, rather thin, very little thicker behind than in front; the circumference in the middle is one-fifteenth of the total length. The tail is about equal in length to the width of the head, it is curved downward and terminates in a minute spine. Series of longitudinal scales twenty-four in one specimen, twenty-two

in the other; transverse rows 376-390, of which nine are round the tail. Length of the largest specimen 10.5 in., of the others rather less.

The rostral shield occupies about one-third of the surface of the head above, where its lateral margins are parallel; below it is a little narrower, but not much. Nostril lateral; a suture runs from its lower margin to the second supralabial, dividing the fronto-nasal from the nasal, but these two plates are united above the nostril, and those on the opposite sides of the head are close together, but do not quite touch each other behind the rostral. Præocular where broadest, which is just behind the nostril, of equal breadth with the ocular; the anterior margin of the former shield is very convex, and its distance from the nostril less than the breadth of the rostral below the snout. Eyes distinct; the ocular shield is slightly convex in front above the eye, nearly straight below it, and it extends back as far as the last supralabial does. The parietals, interparietal, frontal¹, præ-frontal, and supraoculars differ but little from each other in size; all are rather broader than the neighbouring shields of the back. Four supralabials increasing regularly in size backwards; the first is very minute, and in contact with the rostral and nasal; the second touches the nasal, frontonasal, and præocular; the third ascends somewhat between the præocular and ocular; the fourth is large, and situated below the ocular.

Colour dull rufous brown, rather paler below; all the scales uniform in colour.

This form is evidently closely allied to *T. Syriacus*², Jan, 'Icon. Oph.' p. 15, livr. 3, Pl. IV, V, fig. 5, but distinguished by having the dorsal scales of the same colour throughout, instead of being parti-coloured, whitish in front, light yellowish brown behind, as they are said to be in *T. Syriacus*. Compared too with Jan's figure, the Persian *Typhlops* differs in having the central plates of the head broader, the ocular and præocular wider, the anterior margin of the last-named shield more convex and extending to much nearer the nostril, and the labials much more unequal in size, the posterior one being much larger.

Compared with *T. vermicularis*, the present species may be distin-

¹ This shield is unequally divided obliquely in one specimen.

² Strauch, Mem. Acad. Imp. St. Pet. xxi, No. 4, p. 27, note, shows that *T. Syriacus* is probably identical with *T. vermicularis*, Merr.

guished by the division between the nasal and fronto-nasal shields not extending above the nostril, by the scales of the back being uniformly coloured, by the head being longer in proportion to its breadth, and the rostral shield comparatively narrower, both above and below. In *T. vermicularis* the fronto-nasal is narrower than the rostral; in *T. Persicus* the reverse is the case.

60. * *T. vermicularis*, Merr.—De F.

Strauch states (Schlangen des Russischen Reichs in Mem. Acad. Imp. St. Pet. xxi, No. 4, p. 28) that specimens of this blind snake, captured by Hohenacker at Lankorán, exist in the museum at St. Petersburg. The same *Typhlops* was found by De Filippi rather common at Erivan, by Ménétries at Tiflis and at Bákú, and it appears to abound in the Transcaucasian provinces generally. Major St. John informs me that he has seen a species near Tehrán which is probably the same, and I have little doubt of its existence in Ghílán and Mazandarán.

FAMILY ERYCIDÆ.

61. *Eryx jaculus*, (L.)—De F.

Anguis colubrina jaculus et *cerastes*, Linn Syst. Nat. i, pp. 390, 391.

Eryx jaculus, Dum. et Bibr. Erp. Gén. vii, p. 463.—Gray, Cat. Vip. etc. Snakes, Brit. Mus. p. 109.—Strauch, Mem. Acad. Imp. St. Pet. xxi, No. 4, p. 29.

E. Turcicus, Eichwald, Zool. Spec. iii, p. 176; Fauna Casp.-Cauc. p. 124, Pl. XVII.

Eryx jaculus, var. *Teherana*, Jan, De F. Viag. in Persia, p. 354.

1. Saidabád, 100 miles south-west of Karmán	..	6000
2. Between Karmán and Shiráz (label illegible)	..	—
3. Kohrúd, north of Isfahán	.. . . .	7000

Asiatic specimens of *Eryx jaculus* appear always to have the scales of the tail less strongly keeled than African; but I am not sure that the distinction is sufficiently marked to justify separation. In the three Persian examples the scales are rather convex than keeled, and in a specimen in the British Museum from Krasnovodsk, east of the Caspian Sea, larger than any collected by me, only a few scales on the upper part of the tail near its base are convex, those near the end of the tail being flat and smooth.

There is much variation in the head scales, and in the colouration of this species. The specimens brought by Doria from Tehrán, and which Prof. Jan described as his *var. Teherana*, differ somewhat in colour from those obtained in Egypt, and have smaller head scales, there being eleven to twelve round the eye instead of ten, and twelve supralabials instead of nine or ten. But one of my specimens from Southern Persia agrees in these characters with Egyptian examples. The number of scales round the middle of the body in the specimens examined by Jan was forty-five. In the specimen from Saidabád the series are forty-seven to fifty round the middle of the body, in that from between Karmán and Shiráz forty-four to forty-seven, in that from Kohrúd forty-seven is also the highest number. In the specimen from Krasnovodsk I count fifty. In all cases the largest number is to be found about half-way from the head to the tail, the number diminishing both in front and behind.

In two of the specimens the nostril is between three scales, an anterior and a posterior nasal and an anterior frontal. In the Kohrúd specimen these three plates are united above the nostril, but the two lower are separated below.

The number of ventral and subcaudal shields and the total length in the three specimens respectively are:—

	ventrals.	subcaudals.	length. in.	tail. in.
No. 1.	180	29	13	1.55
2.	189	34	8.5	1
3.	180	20	17.5	1.5

Colour pale brown, with irregular spots, largest along the middle of the back, smaller on the sides, and chiefly composed of blackish longitudinal lines along the edges of the scales.

This does not appear to be a very common snake in Persia. One specimen brought to me was found in a stable. The pupil is vertical, and the animal nocturnal in its habits.

*Eryx elegans*¹ (Gray), from Afghánistán (*Cursoria elegans*, Gray, Cat. Sn. Brit. Mus. pp. 84, 107, and Günther, Rept. Brit. Ind. p. 333),

¹ The following was written before I saw Dr. Strauch's recently published 'Schlangen des Russischen Reichs,' in which, p. 34, note 7, he comes to the same conclusions respecting *Cursoria elegans*, and on precisely the same grounds.

may probably be found in North-eastern Persia. The type specimen in the British Museum continues to be unique, and I was at first disposed to look upon it as possibly a variety of the present species; but the scales on the body are much larger, being in only thirty-five or thirty-six rows round the middle, and the muzzle is blunter. I was inclined to doubt whether the latter difference might not be due to injury or contraction, as the specimen is much dried; but Dr. Günther thinks not, and he is most likely to be correct, from his long experience of museum specimens. The tail scales appear smooth, but most of them are decorticated, and in that state the scales of *E. jaculus* also lose all convexity or carination, whilst a few in *E. elegans*, which retain the epidermis, appear to me slightly convex, and in any case, as I have shown, this character is variable, so that I have no hesitation in placing *E. elegans* in the same genus as *E. jaculus*, although it appears to be a distinct species. It certainly differs no more from *E. jaculus* than the latter does from *E. Johnii*.

Of the family *Calamariidæ* I cannot ascertain that any form has as yet been met with in Persia. In the Catalogue of the Colubrine Snakes in the British Museum, p. 61, a specimen of *Calamaria coronella*, Schlegel, is quoted from that country, but Dr. Günther informs me that he has since ascertained that this is a mistake, the specimen being really American.

FAMILY COLUBRIDÆ.

62. *Cyclophis modestus*, (Martin).

Coronella modesta, Martin, P. Z. S. 1838, p. 82.

Ablabes modestus, Gunther, Cat. Col. Sn. Brit. Mus. p. 27.—P. Z. S. 1864, p. 489.—Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 36, Pl. I, fig. 1.

Eirenis collaris, Jan, partim, Archiv. p. la Zool. Genova, ii, p. 256; ? Icon. Oph. livr. 15, Pl. IV, fig. 1, 2.

1. Kohrúd, north of Isfahán	8000
2. Lura valley, north of Tehrán, Elburz mountains ..	6000

It appears to me that the most important distinction between the genera *Ablabes* and *Cyclophis* consists in the presence of two nasal shields in the former and only one in the latter. The genus *Eirenis*

of Jan was proposed for species of *Ablabes* with united nasals, and it is consequently identical with *Cyclophis*.

The following is a description of the Persian specimens, which differ but little from each other. Head distinct from trunk, rather depressed; snout short, rounded; body cylindrical, moderately stout; tail of moderate length. Scales smooth, in seventeen longitudinal rows. Ventrals 168 in one, 156 in the other specimen; anal divided; subcaudals in sixty-four to sixty-eight pairs. In one specimen the shield before the anal is divided, and the second and third pairs of subcaudals are united. Length of the Kohrúd specimen 20 in., of which the tail measures 4.5; of the Karij specimen the whole length is 21 in., tail 5.5. Both are males.

The rostral is broader than high, just reaching the upper surface of the head. Præfrontals quite as long as the postfrontals, and about two-thirds their breadth, the median suture of both rather oblique. Vertical square in front, its lateral margins very slightly converging behind. Occipitals rather broad in front and in contact with both postoculars. slightly rounded behind; they are about one-third longer than the vertical. Nasals about twice as long as high, and higher in front than behind, the nostril in their centre. Loreal small, square. One præocular, which just reaches the upper surface of the head, but is widely separated from the vertical; two postoculars equal to each other. Temporals 1 + 2 + 3. Supralabials seven, the third and fourth entering the orbit; eight infralabials. Two elongate pairs of chin shields, the first twice the length of the hinder pair, and in contact with four or five pairs of infralabials. Pupil round. Teeth small and equal.

Colour grey with an olive tinge when living, greyish brown in spirit. A few faint darker spots forming imperfect transverse bands on the back. No trace of a collar. Lower parts yellowish white.

The type of *Coronella modesta*, Martin, was brought from the Euphrates valley. This species has also been found in Palestine (Günther, P. Z. S. 1864, p. 489), Syria, Transcaucasia, and the neighbouring countries.

Tyria argonauta, Eichwald, Bull. Soc. Nat. Mosc. 1839, ii, p. 306, and Fauna Casp.-Cauc. p. 114, Pl. XXVI, fig. 1, 2, is referred to the present species by Günther, Jan, and Strauch, but it appears to be distinguished by having two præoculars. Jan, who unites *Ablabes decemlineatus*, Dum. et Bibr., and forms belonging to the present

Scales smooth, in fifteen very regular longitudinal rows without any apical groove. Body and tail moderate; head scarcely distinct from neck.

Nasal shield single. Loreal present, small and square. One anterior, two posterior oculars. Rostral very little broader than high. All the frontals broader than long, and rather pointed exteriorly; the anterior subtriangular, about half the size of the posterior. Vertical nearly square in front, sides straight and parallel for some distance back, then converging with a curve. Superciliaries nearly as broad in front as behind. Occipitals comparatively large, nearly twice as long as the vertical, slightly rounded behind. One præocular not extending to the upper surface of the head; two postoculars nearly equal to each other. Temporals 1+2. Seven upper labials, the third and fourth enter the orbit. Eight lower labials. Two pairs of subequal chin shields, neither very elongate, the anterior each in contact with four, the posterior with two lower labials. Ventrals 174 and 171; anal divided; subcaudals in 55 and 54 pairs.

Colour in spirits nearly uniform grey; a black half-collar three or four scales broad on the nape, interrupted beneath, commencing just behind the occipitals. In one specimen there is a black band between the eyes, and a line from the end of it running inward and backward on to the occipitals. This band is but faintly indicated on the other specimen.

64. *C. fasciatus* (Jan).

Eirenis fasciatus, Jan, Archiv. p. la Zool. Genova, ii, p. 260.—Icon. Oph. livr. xv, Pl. V, fig. 2.

1. Dehgirdú, about half-way between Shiráz and
Isfahán 8000

This specimen agrees excellently in colour with the description and figure of Jan's type from Palestine. The only differences in the head shields are that the præfrontals in the Persian form are of the same length as the postfrontals, whereas in the 'Iconographie des Ophidiens' the former are represented as shorter; and in the specimen collected by me the occipitals are much broader in front, coming down so far as to touch both postoculars. The anterior temporal is consequently elongate and narrow, and only in contact with the lower postocular. In Jan's figure the anterior temporal is represented as much broader

and in contact with both postoculars, whilst the occipital only reaches the upper one. The scales are represented as minutely punctulate in *C. fasciatus*, which they are not in my specimen.

The following is a description of the Persian specimen. Head short, depressed, rather broader than the neck; snout short, rounded. Body cylindrical, rather stout. Scales smooth, diamond-shaped, but with the terminal points truncated or rounded, in fifteen rows. Ventrals 158; anal divided; subcaudals in 63 pairs (the second, third, and fourth behind the anus undivided in the specimen obtained). There are about ten short equal teeth on each side of the upper jaw and of the palate. Length 13.5 in., of which the tail measures 3.25.

Head plates:—Rostral broader than high. Anterior frontals of equal length with the postfrontals, and rather more than half as large; the sutures of both pairs of frontals oblique. Vertical pentagonal, square in front, lateral margins straight and parallel. Superciliaries about equally broad before and behind. Occipitals about $1\frac{1}{2}$ times as long as the vertical, rather broad in front, and in contact with both postoculars, slightly rounded behind. Nasal nearly twice as long as it is high, with the nostril in the centre. A small square loreal, much less in height than the nasal. One præocular, not reaching the top of the head. Two postoculars of equal size. Temporals 1 + 2, the first an elongate shield, only touching the lower portion of the lower postocular in front. Eye moderately large, pupil circular. Seven upper labials, the third and fourth enter the orbit; seven lower labials. Two pairs of elongate chin shields, the anterior in contact with four infralabials, the second, about half the length of the anterior, in contact with the fourth and fifth.

Colour (noted when fresh) sandy grey, with numerous narrow slightly waved cross-bands of brownish olive on the back, breaking into spots on the sides and tail. Belly salmon colour; the anterior portion of each ventral shield brown near the sides. Head above sandy, with small rather diffused spots of brown; labials white, the hinder edges of the upper labials brown.

The only specimen obtained was found amongst stones on a dry barren hill-side, at an elevation of 8000 feet above the sea, at Dehgirdú, about half-way between Shiráz and Isfahán on the summer route. Like most of the *Coronellinæ*, it was very gentle, not attempting to bite when handled.

65. **C. frenatus*, Günther.

Cat. Colubr. Sn. Brit. Mus. p. 120.—Rept. Brit. Ind. p. 230, Pl. XIX, fig. 1.

The type of this species was said to be from Afghánistán. A specimen now in the British Museum was obtained by Captain Jones in Mesopotamia, so there can be little or no doubt of its occurrence in Persia. It is somewhat startling to learn that it also occurs in the Khasi Hills in North-eastern India, a locality with a fauna differing in every respect from that of Afghánistán and Persia, but there is a specimen in the British Museum brought by Dr. Jerdon. I confess that even on such high authority I have much difficulty in believing that this snake is found in both localities.

C. frenatus has fifteen rows of scales round the body, ventrals 165, subcaudals in 95 pairs. There is a small square loreal, one præ- and two post-oculars. The vertical is broad in front, the lateral margins converging much behind. Seven upper labials, the third and fourth entering the orbit; temporals large, 1 + 2. The head is rather broad and short, distinct from the neck. The body and head are uniform olive above, yellowish below; three black stripes from the side of the head down the anterior portion of each side, one from the eye, another from the throat along the edges of the ventral plates, the third intermediate.

66. *C. Persicus*, Anderson, Pl. XXVIII, figs. 1, 1 a, 1 b.

P. Z. S. 1872, p. 392, fig. 8.

1. Niríz, east of Shiráz 5000

C. corpore elongato, scutis ventralibus 194-216, squamis corporis in 15 series longitudinales dispositis, scuto loreali nullo, præoculari uno, postoculari quoque unico; verticali pentagonali, lateribus parallelis; capite colloque supra nigris, corpore pallide olivaceo, subtus pallidiore.

Hab. in Persiâ meridionali. Specimen typicum a Bushire allatum fuisse dicitur.

Owing to a very serious misprint in the description of this species in the Proceedings of the Zoological Society, by which the number of ventral shields was given as 144, instead of 194, and also to the head of the only specimen obtained by me being narrower than that of Dr. Anderson's type, I supposed that the two specimens represented

distinct species until I compared them. There are one or two other misprints or slight mistakes in the description of *C. Persicus*, due to the paper having been printed in the author's absence, and I therefore give a fresh description.

Description :—Head rather short, broader than the neck in the type, though scarcely so in the Niríz specimen ; snout depressed, obtuse ; body cylindrical, slender ; tail moderate. Scales of the body smooth, rather short, rhomboidal with slightly blunted apex and no apical groove, in fifteen rows. Ventrals 194–216, not angulate at the sides ; anal divided ; subcaudals in 74 to 77 pairs, the third pair behind the anus undivided in one specimen. Isodont, there being about twelve or fourteen short equal teeth on each side of the upper jaw ; palatine teeth small, equal. Length of one specimen 13.5 in., the tail being rather more than 3 ; of the other, 16 in., of which the tail is 3.5.

Head plates :—Rostral shield very low, just reaching to the upper surface of the head. Anterior frontals rather broader than long, very little inferior in size to the postfrontals, which are the same length but much broader, extending to the side of the head, and nearly touching the second labial on each side. Vertical nearly twice as long as broad, with a very obtuse angle in front ; lateral margins parallel, hinder margins slightly rounded. Superciliaries as broad behind as in front ; occipitals rather broad in front, extending to the side of the head behind part of the postocular, rounded behind. Nasal shield long, triangular, highest in front, pointed behind, only just touching the præocular ; the nostril is situated about the middle of the shield. No loreal. One præ- and one post-ocular, both of moderate size, neither extending to the upper surface of the head. Temporals 1 + 1. Upper labials seven ; the third and fourth enter the orbit ; seven lower labials. Two pairs of elongate chin shields, the first in contact with four lower labials, the second with one ; the second about half the size of the first.

Colour (noted when fresh) :—Head and anterior portion of neck above black, this colour coming down the sides of the neck to below the gape ; lower portion of the upper labials white ; black patches on the anterior lower labials. The remainder of the body is pale olive, rather lighter below than above. In the type specimen described by Dr. Anderson the black of the head is divided by a pale transverse band across the occipitals (fig. 1 b).

This species agrees with *C. calamaria*, Günther, and *C. nasalis*, Günther, in having no separate loreal; but it is easily distinguished from both of them by having only one postocular, and by the much larger number of ventral shields. I am not quite sure that it ought not to be separated from *Cyclophis* as a distinct genus on account of its elongate form, but as similar variation exists in the allied genus *Ablabes*, in one species of which, *A. Humberti*, I have found the ventral shields vary from 155 to 240 (Proc. As. Soc. Bengal, 1871, p. 174), I hesitate to propose a new generic name for it. In its slender form it approaches *Homalosoma*.

The figures in the plate are of the natural size. Fig. 1 represents the specimen from Niríz, 1 a being the head with the colouration omitted to show the form of the head shields; 1 b is the head of the typical specimen described by Dr. Anderson.

67. **Coronella austriaca*, Laur.

Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 43.

Coluber nebulosus, Mén. Cat. Rais. No. 239, p. 73.

Zacholis lævis, Eichwald, Fauna Casp.-Cauc. p. 118.

Coronella austriaca, var. *Caucasica*, Jan, Archiv. p. 1. Zool. Genova, ii, p. 250.

The type of Ménétries's *Coluber nebulosus*, which Strauch has identified with *Coronella austriaca*, was obtained from the Tálísh mountains, within the Persian boundary. The species has not hitherto been found elsewhere in Persia, but it is common in the Caucasus and in Georgia.

The above are the only species of colubrine snakes belonging to the *Coronella* group which have, so far as I know, actually been found in Persia. Two other species were described by Martin from the collections brought back by the Euphrates expedition, under the names of *Coronella multicineta* and *C. pulchra*, (P. Z. S. 1838, p. 82). As however only the colours were described, and the types do not appear, as in the case of *Coronella modesta*, to have been preserved in the British Museum, it is impossible to identify these species.

68. **Sphalerosophis microlepis*, Jan.—De F.

Sphalerosophis microlepis, Jan, De F. Viag. in Persia, p. 356.

*Loxodon*¹ *microlepis*, Jan, Icon. Oph. livr. 20, Pl. III.

Of this very interesting form the original specimen was obtained by the Marquis Doria in Láristán, on his journey from Bandar Abbás to Shiráz. It could not be found when I was in Turin, so that I have had no opportunity of examining it, and I am only acquainted with it from the description and the figure quoted above. Judging from the latter, it appears to approach in character to *Zamenis diadema*. The following is a translation of Professor Jan's description: (I employ Günther's names for the head shields, as I have done throughout, instead of Duméril and Bibron's, which Jan uses).

'*Sphalerosophis*, n. gen. Belongs to the family of the *Colubridæ* and has somewhat the appearance of *Periops*, but is distinguished by the following generic characters. Anterior portion of the head covered above by twenty to twenty-five small irregular shields in the place of the præ- and post-frontals; behind these are a vertical, two superciliaries, and two occipitals. Eye entirely surrounded by ten to thirteen small shields of various shapes, which separate it entirely from the labials. Rostral truncate at the apex, with six well-marked angles. Nasal divided. Loreal and temporals replaced by small and numerous scales. Upper labials fourteen or fifteen, lower fifteen to seventeen. Two pairs of chin shields. Scales of the body small, smooth, convex, arranged in forty-one to forty-three longitudinal series. Anal entire. Subcaudals double. Teeth of the upper jaw smooth, equal in size, without interval.'

'*Sphalerosophis microlepis*, Jan. Ground colour that of the chamois (or rather of *café au lait*). Above there are blackish rectangular spots, narrow and transverse to the back, flanked by others, longitudinal near the neck, farther back smaller, subquadrate and alternating; a black stripe runs from the eyes and is prolonged to behind the mouth. Below the colour is yellowish, without spots.'

'The specimen obtained by Doria in Láristán measures 4 ft., head

¹ *Loxodon* appears to be a generic name invented by Professor Jan for this species because *Sphalerosophis* had been objected to. But *Loxodon* having been already applied by Falconer to a genus of elephants, cannot be used for this snake. On the cover of the 'livraison' the generic name is printed *Toxodon*.

1.5 in., tail $9\frac{1}{2}$ in. Behind four or five pairs of gular scales there are 263 ventral and 100 double subcaudal shields.'

'Another individual belonging to the Milan Museum, and apparently coming from Shiráz, is 28 in. long and the tail 6 in. It is in all respects similar to the first.'

It appears to me that this form is simply a *Zamenis* (or *Periops*) in which the division of the head scales has been carried farther than in *Z. diadema* and its allies. It resembles those species in its undivided anal and in its colouration. One character not mentioned in the preceding description, but shown in Jan's plate, consists in the presence of two small pores at the apex of each scale.

69. *Zamenis diadema* (Schl.), var.—De F.

Coluber diadema, Schlegel, Essai Phys. Serp. ii, p. 148.

Zamenis diadema, Gunther, Rept. Brit. Ind p. 252.—Anderson, P. Z. S. 1871, p. 174.—Stol. Proc. As. Soc. Bengal, 1872, p. 82.

Periops parallelus, Geoff, var. *Schiraziana*, Jan, De F. Viag. in Persia, p. 356.—Jan, Icon. Oph. livr. 20, Pl. II.

Z. Cliffordi, Anderson, P. Z. S. 1872, p. 393.—Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 105.

1. Samán, Dasht, Balúchistán ..	..	..	..	—
2. Zamrán, Balúchistán ..	..	..	..	2500
3. Dizak, Balúchistán . . .	..	..	..	4000
4. East of Bampúr, Balúchistán	..	..	..	2500
5, 6. Karmán, south-eastern Persia	..	..	..	5000
7-11. Between Karmán and Shiráz	..	..	..	—

I must confess feeling much doubt as to whether this species and its ally or variety *Z. Cliffordi* (Schl.) should not be separated from *Zamenis* and placed in the genus *Periops* of Wagler, a genus admitted by Duméril and Bibron, though not by Günther, doubtless because of the difficulty of deciding to which generic group *Coluber hippocrepis*, L., the type of *Periops*, should be assigned. The circle of small plates round the eye, to which the genus owes its name, is occasionally found, as I shall show, in *Zamenis ventrimaculatus*. There is a specimen of *Z. hippocrepis* in the British Museum with an undivided anal, as in *Z. Cliffordi* and *Z. diadema*, but this plate is usually bifid in the first-named species, as in typical *Zamenis*. Similarly as regards dentition, the number of scales round the body, and other characters, *Z. hippocrepis* is in some respects allied to *Z. Cliffordi*, in others to typical *Zamenis*. On the other hand, it is difficult to class *Z. diadema*, one of

the gentlest of snakes, in a genus which derives its name from its ferocity.

I find it almost equally difficult to decide whether *Z. Cliffordi* (Schl.), the African form, should be united to the Asiatic *Z. diadema* (Schl.)¹, or whether the two should be kept distinct. Günther, in his 'Reptiles of British India,' distinguishes the Indian form because of its having supplementary shields behind the frontals and of its ventrals being keeled. Both these characters are liable to variation. I have one specimen from near Karmán, in which the post-frontals are in contact with the vertical, as in *Z. Cliffordi*, and in scarcely any of the Persian examples is there more than slight angulation of the ventral shields, while even this appears to be wanting in adults. But I have kept the two races distinct, although there are evidently intermediate forms, precisely on the same principle on which I have kept *Sylvia Jerdoni* separate from *S. orphea*; the Eastern race being distinguished by constant characters, although the two forms blend where they meet. This is a different case from that of *Zamenis ventrimaculatus*, *florulentus*, and *rhodorachis*, amongst which all the forms appear to have nearly an equal range.

If the presence of four supplementary shields behind the post-frontals be a constant character in the Indian form, the Persian race might be distinguished, for in the latter there are almost as constantly three, as shown in all my specimens except two, one of which, as already mentioned, agrees with *Z. Cliffordi*, and in the other, a large snake, the central supplementary shield is irregularly divided, not equally, as in the Indian *Z. diadema*. Jan also states that several specimens examined by him had three scales behind the frontals. In a snake, however, which shows so much variation, and in which so many of the head shields are liable to division, the circumstance of the central supplementary frontal being single or double can scarcely be thought of sufficient importance for specific distinction, although each variety seems remarkably constant locally.

The number of ventral scales appears about the same as given by Günther for *Z. diadema*, or about 240, but the subcaudals are in only eighty-four to eighty-seven pairs in several specimens in which I

¹ If they are united, the specific name *diadema* should have precedence, being employed by Schlegel on p. 148, vol. ii, of the 'Essai,' whilst *Coluber Cliffordi* is not described before p. 163.

have counted them, instead of 110 as in the Indian *Z. diadema*; and in one large specimen from Karmán there are only sixty-six pairs.

The keels on the scales of the hinder part of the body are very often faint or entirely wanting, in young specimens at all events. The largest specimen obtained, however, shows them distinctly. This specimen is four feet long; the snake doubtless grows to a larger size.

I have never seen in Persia the rich red colouration described by Stoliczka as exhibited by males of the Indian variety. Young Persian specimens show very distinctly the colouration figured by Jan, and the following description was taken from a fresh specimen. Colour above sandy, with rather pale olive spots; of these there is a row of peculiar shape, something like a 'spread eagle,' down the middle of the back, and smaller spots on the sides. On the head is a broad olive band between the eyes, the rest of the upper part of the head is more or less mottled with olive, and there is a spot on each occipital; a dark line runs back from the eye to the gape, and the posterior edge of the upper labials are olive. Lower parts whitish.

I found this rather handsome snake common in Balúchistán and Southern Persia. It inhabits barren plains and hill sides, living, I expect, in great measure upon insects. It is very gentle, never attempting to bite, so far as I have seen, and I have had many in my hands alive. At Genoa are specimens obtained by Doria at Tehrán, so this species is doubtless found throughout Persia, and Strauch records its occurrence on the eastern shore of the Caspian Sea.

70. *Z. ventrimaculatus*, (Gray).—De F.

Coluber ventrimaculatus, Gray, Ind. Zool. ii, Pl. LXXX, fig. 1 (1834).

C. florulentus, Schlegel, Phys. des Serp. ii, p. 166 (1837).

C. Chesnei, Martin, P. Z. S. 1838, p. 81.

C. (Tyria) Karelinii, Brandt, Bull. Acad. St. Pet. iii, p. 243 (1838).

Zamenis florulentus, Dum. et Bibr. Erp. Gén. vii, p. 693.

Z. ventrimaculatus, Günther, Cat. Col. Sn. Brit. Mus. p. 105; Rept. Brit. Ind. p. 253.

Z. rhodorachis, Jan, De F. Viag. in Persia, p. 356.

Z. Persicus, Jan, Icon. Oph. livr. 23, Pl. II, fig. 1.—Anderson, P. Z. S. 1872, p. 393.

Z. ladacensis, Anderson, Jour. As. Soc. Bengal, 1871, xl, Pt. 2, p. 16.

Gonyosoma dorsale, Anderson, P. Z. S. 1872, p. 395, fig. 9.

Zamenis Karelinii, Strauch, Mem. Acad. St. Pet. xxi, No. 4, p. 110, Pl. III.

1. Húng, Balúchistán	2500
2, 3. Zamán, Balúchistán	2500
4 Askán, Balúchistán	3000
5. Kalagán, Balúchistán	3500
6, 7. South of Rígán, Narmashir, south-eastern Persia	3000
8-10. Karmán	5000
11. Southern Persia (? near Shiráz)	—
12 Cape Massandm, Arabian coast, entrance to Persian Gulf	—

I agree with Dr. Günther, to whom I am indebted for several of the preceding identifications, and especially that of *Gonyosoma dorsale*¹, in uniting all the supposed species above enumerated. This *Zamenis* is very variable, both in colour and in the characters of the head shields. There are three well-marked forms found in the Persian area, all of which were described by Günther in his 'Catalogue of Colubrine Snakes,' l. c.

Var. A. of Günther, the type of Dr. Gray's species, is a pale-coloured snake with black marks more or less developed on the back and head, and a black cross-band between the eyes, running back between the occipital shields and continued below the eyes on the labials. There is also a black temple streak. This, with the black marks rather more developed, is *Coluber Chesnei*, Martin, *Zamenis Ladacensis*, Anderson, and *Zamenis Persicus*, Jan, the figure of the last of which in the 'Iconographie des Ophidiens' might almost have been taken from the type of *Coluber Chesnei* in the British Museum. *Coluber Chesnei* was brought from the Euphrates valley, and there are specimens in the British Museum closely resembling it from Bushire, whilst Anderson received specimens from Shiráz. I did not meet with this variety in Balúchistán or Persia, but a young specimen was captured by Major Euan Smith at Kila-i-Fath, Sístán, which wants the transverse mark on the head. This individual, however, is chiefly curious from having all the labials below the eye divided², so that none of them enter the orbit, and the eye is surrounded below with small shields as in *Z. hippocrepis*, *Z. Cliffordii*, etc. The ventrals are 218 in number, subcaudals 108.

¹ Since the above was written I have been able to examine the type of this species. It was rightly identified.

² It appears to agree, both in colouration and the circumstance of having the eye surrounded by small shields below, with two specimens described by Strauch as varieties of *Zamenis Karelinii*, Brandt, Mem. Acad. St. Pet. xxi, No. 4, p. 113.

Var. B. of Günther, with black-edged ocelli, is not, so far as I know, found in Persia; but var. C., 'Olive, without cross-bands, a broad rose-coloured band along the whole back,' is the type of Jan's *Z. rhodorachis* and of Anderson's *Gonyosoma dorsale*. Jan says that it is distinguished by having only nineteen rows of scales, whereas *Z. florulentus* (*ventrimaculatus*) has twenty-one, but he is in error; the latter species has usually only nineteen rows, and in two specimens in the British Museum, from Egypt, with the colouring of *Z. rhodorachis*, one has nineteen, the other twenty-one rows.

This form passes into another, to which some of the specimens collected by me belong, without the rose-coloured stripe down the back, but also without any indication of cross-bands. An individual of this variety brought from Shiráz exists in the Museo Civico of Genoa, and was identified by Jan with his *Z. rhodorachis*. This colouration again passes into the common Persian form, which is allied to Günther's var. D. It is pale greyish-drab in colour, with darker cross-bands of varying breadth, often breaking up into spots, and with dusky or grey spots along the edges of the ventral shields. The head is uniformly coloured above, the lower parts pale.

Of these different forms the most distinct is var. A., the true *Zamenis ventrimaculatus*, but all have the same peculiarly formed occipital shields, abruptly truncated behind¹, and nine upper labials, of which usually the fifth and sixth enter the orbit. In three of my specimens, however, two from Karmán and one from Zamrán in Balúchistán, the sixth supralabial is divided, so that there are three postoculars, and only the fifth supralabial enters the orbit. This form is *Zamenis Karelinii* (Brandt), but as the division of plates, and especially of the supralabials, is so common as almost to be characteristic of the genus *Zamenis*, I do not think the distinction specific. For if it be, why should not the variety already mentioned from Sístán, in which none of the supralabials enters the orbit, also be distinguished? In all the forms of this snake the markings of the side of the head are similar, the præ- and post-oculars being pale, and a spot under the eye and the hinder supralabials with the temporal region dark coloured. The pupil is slightly elliptical horizontally, but becomes circular in spirit.

This is one of the commonest Persian snakes, and occurs throughout the whole country, both in the highlands and lowlands, being found in

¹ I have in no case found the larger rounded scales mentioned by Günther as occurring behind the occipitals.

semi-desert plains and on stony hill-sides. So far as I have seen, it exhibits little or none of the ferocity characteristic of some species of *Zamenis*.

71. **Zamenis Caspius* (Iwan).—De F.

Coluber Caspius, Iwan, Voy. en Russ. i, p. 317, Pl. XXI (1769), teste Strauch.

C. atrovirens, Shaw, Zool. iii, p. 449.

Hæmorrhoids trabalis, Boie, Eichw. Faun. Casp.-Cauc. p. 113.

Zamenis viridiflavus, Dum. et Bibr. Erp. Gén. vii, p. 686. — De F. Viag. in Persia, p. 350.

Z. trabalis, Dum. et Bibr. l. c. p. 689. — Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 116.

Z. atrovirens, Günther, Cat. Col. Sn. Brit. Mus. p. 101.

I did not obtain this species. There are two specimens in the museum at Genoa, collected by the Marquis G. Doria. One of these is from Tehrán, and has the colouration of European specimens (*Z. atrovirens*, var. *viridiflavus*). The other is from Hamadán, and is of a bluish grey colour, with numerous small black spots much broken up by the general ground colour. This appears to approach the form distinguished by some authors as *Zamenis Caspius*, var. *trabalis* (*Hæmorrhoids trabalis* of Boie and Eichwald).

72. **Z. Dahlii* (Fitz.)—De F.

Coluber ocellata, Mén. Cat. Rais. p. 70.

Tyria najadum, Eichwald, Fauna Casp.-Cauc. p. 115, Pl. XXVII, fig. 1, 2.

Zamenis Dahlii, Dum. et Bibr. Erp. Gén. vii, p. 692.—Günther, Cat. Col. Sn.

Brit. Mus. p. 107.—Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 123.

Tyria Dahlii, De F. Viag. in Persia, p. 355.

This snake also escaped my researches. It was obtained at Isfahán by Doria, the specimen being preserved at Genoa, and two specimens were in Aucher-Eloy's collection. Eichwald and Ménétries state that it is found in the Tálísh mountains near the Caspian.

73. *Z. Ravergieri*, (Ménétries).—De F.

*Coluber maculatus*¹, Dwigubsky (1832).

C. Ravergieri, Mén. Cat. Rais. p. 69, No. 235 (1832).

¹ This name cannot be adopted because there is a previous *Coluber maculatus* of Merrem. The quotation of Dwigubsky's name is of course taken from Strauch's Memoir 'On the Snakes of Russia.'

Zamenis caudalineatus, Günther, Cat. Col. Sn. Brit. Mus. p. 104.—Jan, Icon.

Oph. livr. 23, Pl. III.

Periops caudalineatus, Jan.—De F. Viag. in Persia, p. 255.

Zamenis Ravergieri, Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 128.

Z. Fedtschenkoi, Strauch, ib. p. 135, Pl. IV.

1. Karmán	..	..	..	..	..	5000
2. Between Karmán and Shiráz	..	..	..	..	..	—
3-5. Southern Persia, near Shiráz	..	..	..	..	..	4000-6000
6, 7. Kohrúd, north of Isfahán	..	..	..	..	..	7000

Jan, in his notes on De Filippi's snakes, places this species in *Periops* with *Z. hippocrepis* and *Z. Cliffordii*, but in his 'Iconographie' he restores it to *Zamenis*. I should have thought that if it be removed from *Zamenis* it should be placed in *Tropidonotus*, from which genus it is only distinguished by its more numerous ventral shields and the tendency to division in some of its labials, for some *Tropidonoti* have the same dentition as *Zamenis*.

The scales are usually smooth in the anterior portion of the body, keeled behind. The number of rows of scales is normally twenty-one, but not unfrequently twenty-three in parts of the body, and less commonly nineteen. There is usually a small shield below the loreal, and in one specimen two are present. The colouration is very constant, but in two specimens, from Shiráz and Kohrúd, the tail is spotted as well as the body; not streaked. This is the form called *Z. Fedtschenkoi* by Strauch, my specimens being somewhat intermediate in colouration between Strauch's species, which he considers as probably only a variety, and the true *Z. Ravergieri*, and proving clearly that the two pass into each other.

I have no notes of the habits of this species. All the specimens obtained were, I believe, brought to me.

Z. Ravergieri appears to be found throughout the Persian plateau, for besides the localities quoted it has been found at Tehrán by Doria, and at Sháhrúd, south of Astrabád, by Christoph (Strauch, l. c.). In the British Museum are specimens from Shiráz and Kúrdistán. Outside of Persia it has been found in Transcaucasia, in Palestine, and in some of the countries to the east of the Caspian.

74. *Tropidonotus natrix* (L.)

Dum. et Bibr. Exp. Gén. vii, p. 533.—Günther, Cat. Col. Sn. Brit. Mus. p. 61.

—Anderson, P. Z. S. 1872, p. 393.

Coluber natrix, scutatus, Persa et minutus, Pall. Zoog. Ros. As. iii, pp. 35—

41.

T. Persa, natrix, ater et scutatus, Eichwald, Fauna Casp.-Cauc. pp. 105-109, Pl. XXI, XXII, XXIII.

1, 2. Enzeli, in Ghilán, on the Caspian Sea.

The two specimens obtained agree very well in colouration with the description given by Eichwald of *T. scutatus*, which, as he remarks, is merely a black variety of *T. natrix*. The plate labelled *T. scutatus* represents however, as is stated by Eichwald, another variety with which he identifies *T. elaphoides*, Brandt. Anderson describes specimens somewhat similarly coloured, which were collected at Resht. Those which I obtained were brought to me with others of *T. hydrus*, and I believe the two live together in the creeks around the great marsh called the Mardáb, between Resht and Enzeli. Eichwald describes *T. scutatus* as living thus near Astrabád.

Hitherto, so far as I am aware, *T. natrix* has only been found in Persia in the Caspian provinces.

75. *T. hydrus* (Pall.)—De F.

Eichwald, Fauna Casp.-Cauc. p. 110, Pl. XXIV.—Dum. et Bibr. Erp. Gén.

vii, p. 564.—Gunther, Cat. Col. Sn. Brit. Mus. p. 63.—De F. Viag. in Pers.

p. 357.—Anderson, P. Z. S. 1872, p. 394.

Coluber reticulatus, Ménétries, Cat. Rais. p. 71.

1. Tang-i-Kerím, near Niríz, east of Shiráz	5000
2, 3. Anán, Mazandarán, in the Elburz mountains, north of Tehrán	7000
4-8. Enzeli, in Ghilán, on the Caspian Sea	—

All the Persian specimens collected by me, except one, have three præoculars and four postoculars, the exception has two præoculars and five postoculars on one side, four on the other. The lowest postocular varies much in size, being sometimes very minute. In one specimen the third supralabial is divided into two.

This snake is common in the marshes and streams of the Persian highlands, and is peculiarly abundant in the creeks about Resht and Enzeli, near the Caspian. Wherever I have met with it, it lives in the water.

76. * *Coluber longissimus* (Laurenti).

Zamenis Æsculapii, Eichwald, Fauna Casp.-Cauc. p. 119.

Coluber Æsculapii, Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 57, nec L.

Coluber Æsculapii, L., being a different species, the name cannot be employed for this snake, although used by Duméril and Bibron, Günther, and others. According to Strauch, this snake has been found at Lankorán by Radde.

C. Hohenackeri, Strauch (*C. rubriventer*, Dwigubsky), has been described from the Transcaucasian provinces. It is said to differ from *C. longissimus* in the number of lower labials, in the ventrals not being keeled, and in colouration. Like other Transcaucasian forms, it probably extends into Persia.

77. * ? *Elaphis dione* (Pall.)

Dum. et Bibr. Erp. Gén. vii, p. 248.—Günther, Cat. Col. Sn. Brit. Mus. p. 92.

Coluber Dione, Pall. It. ii, p. 717; Zoog. Ros. As. iii. p. 39.

Cœlopeltis Dione, Eichwald, Fauna Casp.-Cauc. p. 120, Pl. XXVIII.

This snake is said by Pallas to have been sent from Persia by Gmelin, and as it inhabits the countries both east and west of the Caspian, it may probably be found within our limits. Strauch says it is rare in Transcaucasia, and that it was only obtained by Ménétries from the Mogan steppe, between Báku and Salian, and he suggests the possibility of Gmelin's having procured it in the same country, which does not now belong to Persia, although it did so in Gmelin's time, a century ago.

Elaphis Sauromates, Pallas (*Tropidonotus Sauromates*, Eichwald, Fauna Casp.-Cauc. p. 111, pl. XXV) is said by Eichwald and Strauch to be found throughout the Caucasus and Transcaucasia. It also extends east of the Caspian Sea, and may very possibly inhabit parts of Northern Persia.

FAMILY PSAMMOPHIDÆ.

78. *Psammophis Leithi*, Günther.

P. Z. S. 1869, p. 505.—Stoliczka, Proc. A. S. B. 1872, p. 83.

1. Pishín, Balúchistán	800
2. Húng, Balúchistán	2500
3. Isfandak, Balúchistán	4000
4. Dizak, Balúchistán	4000
5. Near Bam, south-eastern Persia	4000
6-8. Karmán, south-eastern Persia	5000
9. Near Karmán	—
10. Niríz, east of Shiráz	5000

The only constant difference that I can see between Persian specimens and the types described by Günther is that in the former there are always two temporals in contact with the postoculars. The nostril is always between three shields, one in front, the hinder edge of which forms a re-entering angle, in the point of which the nostril is situated, and two postnasals, the upper being narrow and elongate, extending for a varying distance above the loreal, and separating it from the præfrontal, the lower much higher, but shorter. In the type specimens of *P. Leithi*, the head is somewhat injured and the nasals not easily distinguished, but I think there are two shields behind the nostril. This does not, however, appear to have been the case in the specimens obtained by Stoliczka, and should Sind specimens prove always to have an undivided postnasal, the Persian form may be distinguished by this character, and by the constant presence of two temporals in contact with the postoculars.

The loreal is always very long, more than twice its height. The præocular is usually partially cleft in front, and in two specimens it is completely divided on one side of the head only, just below the superciliary ridge. It is always in contact with the vertical. Postoculars two always. Supralabials eight or nine, the latter number being the more common, and due to the third being divided, the fourth and fifth in one case, or the fifth and sixth in the other, entering the orbit, and the four posterior shields being larger than those in front.

The anterior frontals are comparatively small, being only about half the length of the postfrontals. The vertical is long, of moderate

width in front, then it contracts suddenly, and is very narrow behind; it is nearly or quite as long as the occipitals. There is always a large temporal shield against the hinder part of each occipital.

The chin shields are very elongate, the hinder pair rather the longer of the two. The ventrals are not angulate, 180-188; subcaudals in three specimens selected for description 122-124 pairs.

The only young specimen I possess, about 20 in. long, has four broad longitudinal bands on the back, separated by narrow yellowish lines, but in no adult are these longitudinal stripes represented by anything more than lines of dark dots, and most of the specimens are uniform pale sandy brown or sandy grey above. There are sometimes one or two rows of small dots along each side of the ventrals. There is always a dark band along the loreal region continued behind the eye.

The first and second maxillary teeth are large, then there is a space followed by a still larger tooth, and after another shorter space six smaller teeth. At the back of the jaw are two large teeth, the anterior the larger. Altogether there are eleven teeth in each maxillary.

The largest specimen obtained measures 4 ft. In this the tail is slightly imperfect; when perfect it is about half the length of the head and body.

P. Leithi is common in Balúchistán and on the highlands of Southern Persia, inhabiting bushy plains and valleys. I have seen it, like *Passerita*, on bushes apparently hunting for prey. I did not observe it in Northern Persia.

79. *Taphrometopum lineolatum*, Brandt.—De F.

Coluber (Taphrometopon) lineolatus, Brandt, Bull. Ac. Sci. St. Pet. iii, p. 243, 1837.—Peters, P. Z. S. 1861, p. 47.

Psammophis Doriæ, Jan, De F. Viag. in Persia, p. 356.

Taphrometopon lineolatum, Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 185, Pl. IV.

1. Near Sáadatabád, 100 miles south-west of Karmán 7000

The only individual obtained agrees perfectly in external characters with specimens from Central Asia in the British Museum; the dentition appears to differ from Peters's description, but this may be due to some teeth being deficient; there appeared, when I examined the specimen just after capture, to be three small breaks in the series. The

last tooth is longer than the others. I give a brief description, as that in the 'Proc. Zool. Soc.' scarcely mentions the characters of the head shields. The following account of the colouration and form was taken from the fresh specimen.

Body rather depressed; back flat. Head short, scarcely broader than the neck. Loreal region slightly concave. Pupil very small, slightly elliptical, being lengthened horizontally. Scales smooth, lanceolate, minutely punctated with brown, in seventeen rows. Ventrals 178; anal bifid; subcaudals in eighty-six pairs. Length 17.75 in., of which the tail from the anus measures 4.1.

Rostral rounded above, about as broad as high. Nostril between two shields; one large prænasal, with the hinder edge forming a re-entering angle to receive the point of the postnasal, the upper part of which is elongate horizontally, and runs back between the loreal and the frontals; on one side the postnasal is divided into a small lower shield and an elongate upper one. Præfrontals small, scarcely half the length of the postfrontals; they are convex in front and concave behind to receive the convex anterior margins of the postfrontals. The latter have very sinuate anterior and posterior margins, and are at least twice as long where they meet each other in the middle of the head as they are at the side, where their posterior margin is hollowed out to receive the præocular. Vertical elongately bell-shaped, square in front, rapidly decreasing in breadth just behind, and with its posterior portion long and narrow. Occipitals about the same length as the vertical, rather broad in front, their united posterior edge forming a re-entering angle, which receives a scale rather larger than those of the back. Loreal elongate, twice as long as high. Præocular single, large, in contact with the vertical. Postoculars two, equal. Temporals 2 + 2 + 3 on one side, 2 + 3 + 3 on the other, there being on each side a rather large shield against the occipital separated by two shields from the postoculars. Supralabials nine, the fourth, fifth, and sixth entering the orbit, the hinder four larger than those in front. Two pairs of chin shields, elongate, about equal to each other, each of the anterior in contact with five lower labials.

Colour:—Centre of the back light grey, bordered by a black band, the inner margin of which is broken, being formed of the black edges of whitish scales. Below the black stripe down each side is a whitish line of the same breadth, and then an olive-grey band which extends to the margins of the ventrals. These are white towards the side, with

one dotted dark line down each side, cream-colour slightly mottled in the middle. Tail pale yellow below. The head has three longitudinal olive bands above, which coalesce on the frontals; the two outer run into the dark lines on the sides of the back. Another olive band runs along the side of the head through the eye and joins the dark stripes on the sides, and there are grey spots on the labials and chin shields.

I have compared my specimen of this snake with the type of *Psammophis Doriae* in Turin, and they appear to correspond. As the post-nasal in my specimen is divided on one side but not on the other, it is evident that this character, mentioned by Jan in his description of *P. Doriae*, is of no importance. The type of *P. Doriae* has three post-oculars instead of two, but I doubt if this be a specific distinction.

80. * *Cœlopeltis lacertina* (Wagler).

Günther, Cat. Col. Sn. Brit. Mus. p. 138. — Eichwald, Fauna Casp.-Cauc. p. 122. — Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 179.

Coluber vermiculatus, Mén. Cat. Rais. p. 72.

Cœlopeltis vermiculata, Eichwald, Fauna Casp.-Cauc. p. 123, Pl. XXIX.

C. insignitus, Dum. et Bibr. Erp. Gén. vii, p. 1130. — Jan, Icon. Oph. livr. 34. Pl. I. fig. 2.

There are three specimens from Tehrán collected by the Marquis G. Doria in the collection at Genoa, but this snake has been omitted from De Filippi's list, and neither Major St. John nor I had the good fortune to meet with it. A Tehrán specimen has been figured by Jan (l. c.)

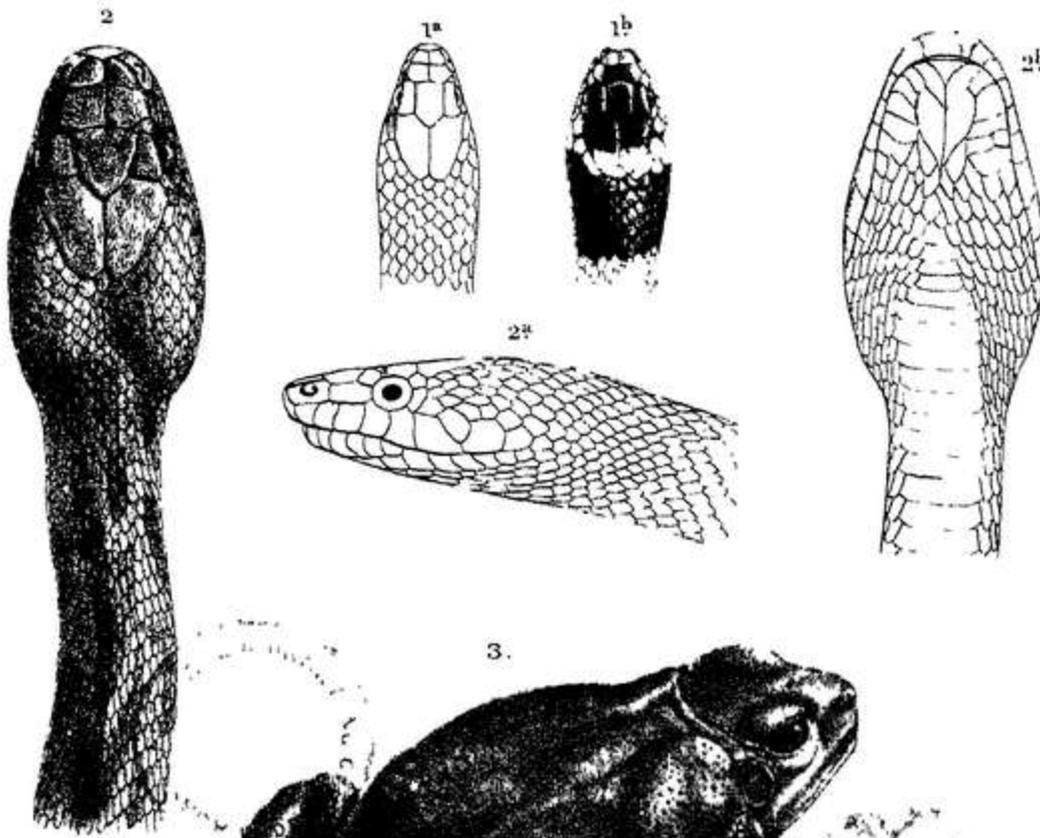
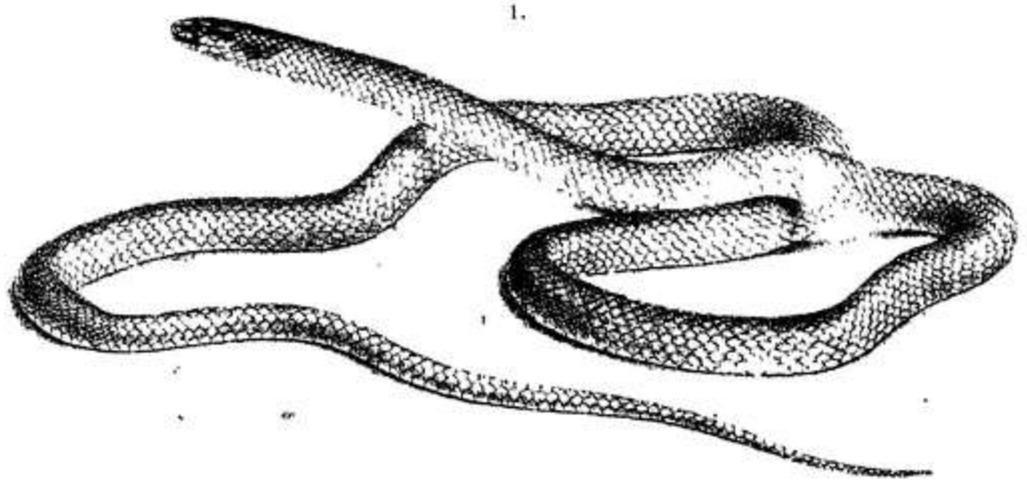
FAMILY DIPSADIDÆ.

81. *Dipsas rhinopoma*, W. Blanf. Pl. XXVIII. figs. 2, 2 a, 2 b.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 34.

1, 2. Karmán 5000

D. capite brevi, depresso; squamis corporis imbricatis in 23 (24) seriebus longitudinalibus, serie mediâ parum majore; naribus valvulis instructis; scutis supralabialibus 8-10, quarto quintoque oculum tangentibus, verticali brevi, viâ longiore quam lato, subtriangulari; præocularibus duobus,



O H Ford.

Mintern Bros imp.

1. CYCLOPHIS PERSICUS
2. DIPSAZ RHINOPOMA.
3. BUFO OLIVACEUS.

superiore ad verticale, inferiore ad nasale attingente, loreali distincto nullo; scutis ventralibus 268-274, anali haud bifido, subcaudalibus 76-77; pallide griseo-fusca, transversim albido-fasciata, squamis nigro-punctulatis.

Hab. in Curmanid, Persiæ meridionalis.

Description :—Head of moderate length, broad and flat, considerably broader than the neck; body very slightly compressed; tail moderate, flat beneath. Scales of the body smooth, rhomboidal, imbricate, in twenty-three (occasionally twenty-four) rows, the dorsal row being a little larger than the others. Ventrals 268-274; anal undivided¹; subcaudals in seventy-six or seventy-seven pairs. Teeth seven in each maxilla, four large ones in the front, then a space followed by two smaller teeth; the last is again large and grooved, and rather farther from the penultimate than that is from the next. Eye rather small, pupil vertical. Length of the largest specimen 47.5 in., of which the tail measures 6.75.

Head shields :—Rostral rather broader than high, just reaching the upper surface of the head. Præfrontals very narrow in front, rather shorter than the postfrontals and barely half as large. Postfrontals a little broader than long, slightly bent over on the side. Nostril large, in the centre of a nasal plate which is divided above the nostril, but not below; nasal valvules distinct. The vertical is very short, and almost triangular, square in front, the lateral margins converging rapidly behind. Superciliaries rather short, much broader behind than in front. Occipitals rather short, about one-third longer than the vertical, in contact with the upper postocular only in front, much rounded behind. Two præoculars; the lower is united with the loreal, forming a shield about twice as long as high, and in contact with the second, third, and fourth supralabial: the upper præocular is in contact with the vertical. Postoculars two. Temporal shields not enlarged. Supralabials normally apparently eight, of which the fifth and sixth enter the orbit; but in one of the specimens there are nine on one side and ten on the other. Two pairs of elongate chin shields, the anterior much the larger.

Colour, when living, pale sandy brown, with numerous irregular pale waved transverse bands, much narrower than the intervening dark spaces, and more distinct near the head than farther back. All the

¹ In one of the two specimens procured the anal shield is cleft, evidently by accident, the integument beneath being also divided.

scales are more or less minutely punctulated with black. Ventral scales dusky, with sandy mottling. Head sandy above, with minute irregular black specks.

The nearest ally of this species appears to be *Dipsas obtusa*, which, however, differs in having a separate loreal. The head shields bear a considerable resemblance to those of *Tachymenis vivax*, but the scales of the body are very different.

82. **Tachymenis vivax* (Fitz.)—De F.

Gunther, Cat. Col Sn. Brit. Mus. p. 33.

Trigonophis iberus, Eichwald, Zool. Spec. iii, p. 175; Fauna Casp.-Cauc. p. 101, Pl. XVIII.—Mén. Cat. Rais. p. 66.

Tarbophis vivax, Dum. et Bibr. Erp. Gén. vii, p. 913.—Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 194.—Cope, Proc. Acad. Phil. xiv (1862), p. 338.

T. fallax, De F. Viag. in Persia, p. 355.

This snake is common in Transcaucasia and in many parts of Western Asia. The only known Persian locality is on the shores of Lake Urumiah, whence a specimen was procured by the Museum of Philadelphia.

FAMILY ELAPIDÆ.

83. *Naja*, sp.

Major St. John informs me that he once killed an unmistakable cobra in the plain of Bushire; he was riding, and his horse nearly trod on it, when it rose up and struck its head against the stirrup. It had an expanding hood, but so far as Major St. John can recollect, no spectacle mark. The belly was marked with orange or rose colour. No colouration of this kind is found, so far as I am aware, in either the Indian cobra *N. tripudians*, or in the African species *N. haje*, and it is possible that the snake seen by Major St. John may have been *Tomyris oxiana*, Eichwald, Faun. Casp.-Cauc. p. 104, Pl. XX, which is said by Strauch (Bull. Acad. St. Pet. xiii, p. 81) to be a *Naja*, and the throat of which is described as *flavo-rosea*. It inhabits the countries east of the Caspian, and may be found in Persia.

FAMILY HYDROPHIDÆ.

Sea snakes abound on the Balúchistán coast and in the Persian Gulf. Those enumerated below are doubtless but a very small portion of the species existing in those seas.

84. *Hydrophis gracilis* (Shaw).

1. Gwádar, Balúchistán coast.
2. Jashk, Persian coast, outside entrance to Persian Gulf.

Both specimens are very dark coloured, the head, anterior portion of the neck, and end of tail being dusky black throughout, whilst along the sides of the body are large white or yellow oval spots.

85. **H. viperinus* (Schmidt).

Anderson has received this from Maskat, it must therefore be found on the Persian coast also.

Stoliczka obtained *H. curtus* (Shaw) and *H. Dayanus*, Stol., a new species allied to *H. Belcheri*, at Káráchí, and doubtless both may be found on the Balúchistán coast.

86. *Enhydrina Valakadyen*, Boie.

E. Bengalensis, Gray, Cat. Vip. Sn. Brit. Mus. p. 48.

1. Gwádar, Balúchistán coast.

87. *Pelamis platurus* (L.)

P. bicolor (Schneid.), auct.

1. Gwádar, Balúchistán coast.

The only specimen procured is greyish on the back, yellowish white below, the tail only marked with transverse blackish bands forming imperfect rings. There is one postocular only on one side, two on the other.

FAMILY VIPERIDÆ.

88. *Vipera obtusa*, Dwigubsky.—De F.

V. Euphratica, Martin, P. Z. S. 1838, p. 82. — Strauch, Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 221, Pl. VI.

Echidna Mauritanica, Dum. et Bibr. Erp. Gén. vii, p. 1431.

Vipera Mauritanica, Strauch, Synopsis der Viperiden in Mem. Acad. Sci. St. Pet. xiv, No. 6, p. 79.

V. libethina, De F. Viag. in Persia, p. 357.

1. Niriz, east of Shiráz 6000

The *Vipera Euphratica* of Martin is so imperfectly described that only the preservation of the type in the British Museum could enable it to be recognised with certainty. The name of Dwigubsky has priority, and must therefore be retained, in the same manner as Hemprich and Ehrenberg's names for *Saxicolæ*, etc. are.

The following is a brief description of the specimen obtained. Head rather broad; snout broad, obtuse; *canthus rostralis* well marked; loreal region slightly concave; nostril below the canthus with a large plate in front of it, one of a row of somewhat enlarged plates which are in contact with the rostral. The latter is about as high as broad. A slightly enlarged plate above each nasal; eleven upper labials; one pair of chin shields.

Scales of the upper surface of the head, except on the end of the snout, and all the body scales rounded behind, imbricate, and with a filiform central keel; twenty-five longitudinal rows round the body. Ventrals 178; anal single; subcaudals in forty-six pairs.

Colour sandy grey, approaching cream colour, with ill-marked spots forming imperfect transverse bands towards the tail. The specimen obtained measures 32.5 in., of which the tail is 4.25.

I heard of a large viper in Balúchistán which may have been the same species. It does not appear to be common in Persia, but it is probably found here and there throughout the country. My specimen was from near Shiráz. Strauch states that it was found by Hohenacker in several parts of Transcaucasia, and the Marquis Doria obtained a specimen, now in Genoa, at Hamadán.

89. **V. xanthina*, Gray.

Strauch, Syn. Vip. p. 73, Pl. I.

Daboia xanthina, Gray, Cat. Sn p. 24.

A specimen is said by Strauch to have been obtained by Wagner in Adarbaján, on the shores of Lake Urumiah.

Vipera berus and *V. ammodytes* are said by Strauch to be found in the Transcaucasian provinces of Russia, and may therefore very possibly occur in North-western Persia.

90. *Cerastes Persicus*, Dum. et Bibr.

Dum. et Bibr. Erp. Gén. vii, p. 1443.

Vipera Persica, Strauch, Syn. Vip. p. 103, Pl. II; Mem. Acad. Sci. St. Pet. xxi, No. 4, p. 225.

1. Isfandak, Balúchistán 3500

In the only specimen obtained, a young individual measuring 13 in., the horn-shaped scale above the eye is about as long as the diameter of the eye. The nostrils are small, provided with distinct valvules, and situated between two shields, the lower of which is large and has a deep concave upper surface to receive the small upper nasal; there is an elongate shield above both. Pupil vertical. Two large chin shields, each in contact with four infralabials. The scales of the upper part of the head are distinctly imbricate, and all, except on the snout, keeled. Scales of the body finely keeled in twenty-five to twenty-seven longitudinal rows on the neck and twenty-four in the middle of the body. Ventrals 151; anal single; subcaudals in 43 pairs.

Colour, when fresh:—The head and back earthy grey, with a row of anvil-shaped or subtrapezoidal olive spots along each side, the outer edges of these spots elongate and very dark. Sides sandy with dusky spots, which are more numerous and closer together behind near the tail. A small spot on each side of the occipital region. A dark band, darkest on its upper margin, from the eye to behind the gape. Lower parts whitish.

This species was named by Duméril and Bibron from specimens collected by Aucher-Eloy. These were probably procured in Southern Persia, for Major St. John informs me that a horned viper, which is

probably this species, abounds on the shores of the Persian Gulf, near Bushire. Strauch obtained this viper from Khorassán.

91. *Echis carinata* (Schneid.)—De F.

Dum. et Bibr. Erp. Gén. vii, p. 1448.—Günther, Rept. Brit. Ind. p. 397.—
Strauch, Syn. Vip. p. 121.

E. arenicola, Boie, Isis, 1827, p. 558.—Strauch, Mem. Acad. Sci. St. Pet. xxi,
No. 4, p. 228.

E. frænata, Dum. et Bibr. Erp. Gén. vii, p. 1449.

1, 2. Samán, Dasht, Balúchistán	..	..	..	—
3, 4. Kalagán, Balúchistán	..	..	..	3500
5. West of Bampúr, Balúchistán	..	..	..	1800
6. Near Karmán	..	..	..	—
7. Between Karmán and Shiráz	..	..	..	—

This viper is common in Southern Persia and Balúchistán, but I did not meet with it north of Shiráz; it has, however, been found on the east coast of the Caspian. A specimen was brought from Sistán by Major Euan Smith. Some are much darker in colour than others, and whilst a few specimens have numerous black spots on the ventral scales, others have none.

The largest specimen I obtained measured 23 in. Its bite killed a small chicken in six minutes and a half.

FAMILY CROTALIDÆ.

92. *Halys Pallasii*, Günther.

Günther, Rept. Brit. Ind. p. 392.

Vipera halys, Pallas, Zoog. Ros. As. iii, p. 49.

Trigonocephalus halys (Pall.)—Mén. Cat. Rais. p. 73.—Eichwald, Fauna
Casp.-Cauc. p. 102, Pl. XIX.—Dum. et Bibr. Erp. Gén. vii, p. 1495.—
Strauch, Mem. Acad. St. Pet. xxi, No. 4, p. 231.

1-3. Anán, Mazendarán, Elburz mountains, north of					
Tehrán	..	..	..	..	6500

A specimen from Mangyschlak on the east coast of the Caspian, in the British Museum, precisely resembles those collected in the Elburz. I give a short description of the latter, as I can find no good one in any English work.

Description :—Head flat, moderately broad; snout rounded in front; pupil vertical. Scales of the body imbricate, in twenty-three longitudinal rows, all, except the two lowest rows on each side, with a sharp central keel. Ventrals 149–164; anal undivided; subcaudals in 36 to 44 pairs. The largest specimen obtained measures 22 in., of which the tail is 3. In a small specimen (probably a female), 10¹ in. long, the tail measures less than an inch.

Head plates :—Rostral about as high as broad, only just reaching the top of the head. Anterior frontals small, triangular; posterior frontals rather rounded, about as broad as long, not bent over the side of the head. Vertical a little longer than broad; occipitals rather longer than the vertical, rounded behind. Nostrils between two shields; loreals and præoculars in two rows, the lower of which enclose the præocular pit. Two postoculars, the lower much the larger, extending under the eye. Upper labials usually seven (eight in one case), the third entering the orbit; the hinder labials are low, and above them is a row of large temporal scales. Lower labials about ten. A pair of large chin shields, each in contact with four lower labials.

Colour (noted when fresh) dusky olive brown, with numerous fainter rather narrow cross-bands; sides paler, with a row of diamond or arrow-head shaped spots along the edges of the ventrals. Head dusky above, a dark band surmounted by a pale superciliary streak along the side, broad on the temporals. Upper labials and chin whitish.

This species appears to be common in the Elburz mountains, but it is unknown in other parts of Persia. It does not appear to have been found in the Caucasus, its western range, so far as is known, terminating in the mountains of Tálisch¹. In the countries south of the Caspian it inhabits forests. It has the farthest western range in the old world of any crotaline snake.

¹ As Ménétries's statement of the occurrence of this snake in the Tálisch mountains had not been confirmed by later collectors, and as the original specimen could not be found, Strauch was rather inclined to suspect an error in the locality. The rediscovery of the species in the Elburz shows that Ménétries was in all probability right.

AMPHIBIA.

THE *amphibia* are very poorly represented in Persia. But two species of *Batrachia* are known to be generally distributed throughout the highlands, a few others being met with either in the Caspian provinces or in Balúchistán. Of the *Urodela* two species of newts have been described by Strauch from Northern Persia.

BATRACHIA.

FAMILY RANIDÆ.

1. * *Rana temporaria*, L.—De F.

R. oxyrhina, Steenstr., De F. Viag. in Persia, p. 357.

Eichwald mentions (Fauna Cauc.-Casp. p. 125) the occurrence of the common frog of Europe in the parts of Persia near the Caspian Sea. De Filippi met with the variety distinguished as *oxyrhina* by some naturalists at Sultániah, between Tabriz and Kazvín, and suggests that this form replaces the typical *R. temporaria* in Western Persia.

2. *R. esculenta*, L.—De F.

Günther, Cat. Bat. Sal. Brit. Mus. p. 12.

R. Tigrina, Eichwald, Fauna Casp.-Cauc. p. 125.

R. cacchinans (Pall.), Ib. p. 126, Pl. XXX.

- 1, 2. Basráh, on the Shat-el-Arab (the Tigris and Euphrates united).
- 3, 4. Near Shiráz.
5. Near Resht.

This is the common frog of the Persian highlands. I did not, however, meet with it far east of Shiráz. There are specimens in the British Museum brought from the Euphrates.

Eichwald's figure represents the common colouration of Persian specimens, olive above, with large black spots and a pale dorsal stripe.

In some the stripe is wanting, and the ground colour is sometimes bright green, with or without spots.

The specimens from the Euphrates valley have decidedly longer webs to the hind feet than those from the Persian highlands, and there is no trace of emargination in the former, but similar differences are to be found amongst European specimens.

3. *R. cyanophlyctis*, Schneid.

Günther, Rept. Brit. Ind. p. 406.

1-20.	Píshín, Balúchistán	..	..	..	..	700
21.	Húng, Balúchistán	..	..	..	..	2500
22.	Ghistigán, Bampúsht, Balúchistán			..	..	3000
23, 24.	Dizak	..	..	..	..	4000

I can see no difference between Balúchistán and Indian specimens. Stoliczka has already (Proc. As. Soc. Beng. 1872, pp. 85, 102, 130) noticed the occurrence of this species in Sind, the Panjáb, and Kachh, so that its extension into Balúchistán is not surprising.

I found *R. cyanophlyctis* common in Balúchistán up to an elevation of 4000 feet wherever there was water. I did not notice it in Persia proper.

FAMILY HYLIDÆ.

4. *Hyla arborea* (L.).

Günther, Cat. Bat. Sal. Brit. Mus. p. 107.—Anderson, P. Z. S. 1872, p. 403.
Hyla viridis, Laur.—Eichwald, Fauna Casp.-Cauc. p. 124.

1. Basráh, on the Shat-el-Arab (Tigris and Euphrates joined).
- 2-7. Párchapá, south of Resht, Ghilán, Northern Persia.

This species has not been found in Persia proper. Its occurrence in the Caspian provinces and in Mesopotamia was known before. I found it abundant amongst grass and bushes on the banks of a stream close to a caravanserai called Párchapá, on the road from Kazvín to Resht. All the specimens seen were small, about an inch in length.

FAMILY BUFONIDÆ.

5. *Bufo viridis*, Laur.—De F.

Gunther, Cat. Bat. Sal. Brit. Mus. p. 58.—Anderson, P. Z. S. 1872, p. 402.
B. variabilis, Pall. — Eichwald, Fauna Casp.-Cauc. p. 126. — De F. Viag. in
 Persia, p. 357.

1. Dizak, Balúchistán	4000
2-4. Near Bam, South-eastern Persia	4000
5, 6. West of Bam	5500
7, 8. Near Resht, Ghilán, Northern Persia	—

Some specimens are marked with large spots above, others are unspotted. This toad is found throughout Persia, and extends into the Himalayas. I have even obtained specimens as far east as Sikkim. In Balúchistán it appears to be replaced by the next species.

6. *B. olivaceus*, W. Blanf. Pl. XXVIII, fig. 3.

Ann. and Mag. Nat. Hist. July 1874, xiv, p. 35.

1, 2. Dasht river, Balúchistán	—
3. Báht Kalát, Balúchistán	—
4. Ghistigán, Bampúsht, Balúchistán	3000

B. affinis *B. viridi* *B. vulgarique*, *ab ambobus differt glandulis parotoides majoribus valde latioribus, ovalibus, dorso subglabro; supra pallide olivaceus, subtus albescens.*

Hab. in Gedrosiá (Balúchistán).

Description:—Tympanum distinct, about half the size of the eye; head short, muzzle rather pointed; crown of the head slightly concave, quite smooth, without any trace of bony ridges; *canthus rostralis* rounded. Parotoids very large, but not much raised; they are oval in form, the posterior portion being slightly produced; they extend from a third to nearly one-half the length of the body behind the head, and their breadth equals or exceeds half their length; they are nearly flat, being slightly concave in front and convex behind. Upper parts nearly smooth; lower abdomen finely tuberculate. Limbs moderate; the hind-limb exceeds the body by about the length of the foot. Soles

of feet and under surface of tarsus covered with small tubercles; two small subequal prominences on the metatarsus; toes half webbed; the first finger longer than the second.

Colour pale olive above, whitish below. In adults the tips of the fingers and toes are dark coloured, and in two specimens the first and second fingers are blackish above.

This toad is near *B. viridis* and *B. vulgaris*, but distinguished from both by its very large broad flat parotoids, and to judge by the specimens collected, by its much smoother back.

I found a few specimens in Balúchistán, none of them at elevations exceeding 3000 feet above the sea. Above that height this species was replaced by *B. viridis*.

7. *? *Bufo vulgaris*, Laur.

Rana Bufo, L., Pall. Zoog. Ros. As. iii, p. 14.

I insert the common toad on Pallas's authority. It does not appear to have been noticed in Persia by later travellers, though it probably exists in the Caspian provinces.

URODELA.

FAMILY SALAMANDRIDÆ.

8. * *Triton Karelini*, Strauch.

Strauch, Mem. Acad. Sci. St. Pet. xvi, No. 4, p. 42, Pl. I, fig. 1 (1870).

Of this species and of that next mentioned I know nothing beyond the description which is given in Strauch's 'Revision der Salamandriden-Gattungen,' l. c. The specimens described as *Triton Karelini* were collected by Karelin in North-eastern Persia, but no exact locality was recorded.

9. * *T. longipes*, Strauch.

Strauch, Mem. Acad. Sci. St. Pet. xvi, No. 4, p. 44, Pl. I, fig. 2 (1870).

This species is from Mazandarán, near Astrabád.

Triton cristatus, Laur., and *T. ophryticus*, Berthold, are found in Transcaucasia, and *T. tæniatus* (Schn.) in Armenia.

I did not see any newts in Persia, and Major St. John tells me that during a residence of several years he never met with one. I think it probable that there are none except in the northern parts of the country.

ERRATA.

The number of species of birds, as stated at p. 7, known to inhabit Persia should be 384 instead of 383. The *Grallæ* are 54 in number instead of 53, the *Gaviæ* 21 instead of 22, and the *Steganopodes* 7 instead of 6.

At page 20, for '*Vespertilio desertorum*,' substitute:—

***Vespertilio emarginatus*.**

Vespertilio emarginatus, Geoffroy, Ann. du Muséum, vol. viii, p. 198 (1806).

Sub-species a, *V. desertorum*, Dobson, n. subsp.

At page 23, for '*Vesperugo leucotis*, Dobson,' substitute:—

***Vesperugo Kuhlii*.**

Vesperugo Kuhlii, Natterer: in Kuhl, Deutsch. Flederm.—Wetterau, Ann. iv, p. 58.

Var. *V. leucotis*.

Vesperugo (Pipistrellus) leucotis, Dobson, J. A. S. B. (1872), pt. ii, p. 222.

At p. 51, FAMILY MYOXIDÆ has been omitted before *Myoxus pictus*, which is thus represented as if belonging to the *Castoridae*.

In the measurements of rodent skulls, pp. 55, 57, 67, 69, 71, for 'breadth of frontal bones behind postorbital processes,' read 'breadth between orbits.'

On Pl. XV, for SITLA read SITTA.

On Pl. XXVII, for ABLEPHARUS PUSILLUS read ABLEPHARUS BRANDTI.