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NOTE ON LEPTOMICRURUS COLLARIS (SCHLEGEL) (REPTILIA, SERPENTES)

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An attempt to prepare a survey of the poisonous snakes of Surinam led to the discovery of a specimen of the very rare coral snake *Leptomicrurus collaris* (Schlegel) in the Zoological Museum, Amsterdam, and to tracing another specimen in the Staatliche Museum für Naturkunde, Ludwigsburg (Stuttgart Museum). For long years the species was known under the name of *Hemibungarus collaris* (Schlegel), and as such it was supposed to occur in the Philippine Islands. The history of *Elaps collaris* Schlegel, 1837, was briefly discussed by Schmidt (1937), who transferred the species (together with *Elaps narducci* Jan, 1863) to a separate genus *Leptomicrurus* Schmidt, 1937. At the time, Schmidt believed the specimen of *Leptomicrurus collaris*, which he described from (British) Guiana to be the first which definitely proved in which part of the world the species is to be found. In this, and in other details, his historical account is incomplete and incorrect. In the present paper it is attempted to give a more complete and more correct survey of the history of *Elaps collaris*.

The first herpetologist to recognize *Elaps collaris* as a yet undescribed species was H. Boie, who intended to describe it in his "Erpétologie de Java", a work which was never published, and which, as we now know from his notes, was to contain several species that do not belong to the Javan fauna. Two people had access to Boie's manuscript and to his notes: Schlegel, and H. Boie's brother F. Boie. To safeguard H. Boie's rights to priority, endangered by other zoologists who had copied names of new species from the Leiden Museum's labels, Schlegel (1826a, 1826b) felt it to be his duty to announce to the zoological profession what H. Boie's "Erpétologie de

Java" was to contain. F. Boie (1827) also made use of H. Boie's notes to place some new names on record. Thus, Schlegel (1826a: 238; 1826b: column 293), and F. Boie (1827: column 556) mentioned *Elaps collaris* as a new species to be described by H. Boie; this name, also as a nomen nudum, was mentioned by Gray (1831: 84).

The species *Elaps collaris* was described for the first time by Schlegel (1837, I: 181; II: 448; 1843: 180). The description was based upon two specimens in the Leiden Museum. The country of origin of these specimens was not known. However, Schlegel added the following remarks: (1837, I: 181) "Peut-être identique avec l'Elaps des îles Philippines" (Perhaps identical with the Elaps of the Philippine Islands), (II: 449) "M. Wiegmann vient de publier la description et la figure d'un Élaps de Manille, qui me paraît identique avec notre Élaps collier" (Mr. Wiegmann has just published the description and the figure of an Elaps, which seems to be identical with our *Elaps collaris*), and in the English edition of his "Essai" (1843: 180): "Perhaps identical with an Elaps said to be found in the Philippines".

How Schlegel came to suggest that his *Elaps collaris* could be identical with Wiegmann's (1935: 253, pl. 20 fig. 2) *Elaps calligaster* from Manila is a riddle that I cannot solve. Not only do *Elaps collaris* and *Elaps calligaster* differ in colour pattern, but the fact that in *E. collaris* the sixth upper labial is in contact with the parietal (occipital of Schlegel's description), whilst Wiegmann distinctly mentions his *E. calligaster* to have two anterior temporals, should have been sufficient warning to Schlegel, that he was dealing with two completely different species. Schlegel's reference to the possible identity of his new species with *Elaps calligaster* from the Philippines is the source of all subsequent confusion about the country of origin of *Elaps collaris*.

In a later publication, Schlegel (1844: 137) apparently was not so certain about this identity, for he writes as follows: "In dieser im Essai p. 448 beschriebenen Art habe ich den Elaps calligaster Wiegmann, Nov. Act. XVII, p. 253, Tab. 20. F. 2, von Manilla wieder zu erkennen geglaubt. Da ich mich jedoch geirrt haben könnte, so gebe ich um andern Naturforschern das Vergleichen beider Arten zu erleichtern, die Abbildung des Kopfes unsres Elaps collaris." (In this species, described in the Essai, p. 448, I believed to recognize the Elaps calligaster Wiegmann, Nov. Act. XVII, p. 253, Tab. 20.F.2, from Manila. As I may have been mistaken in this, and to make it easier for other naturalists to compare the two species, I give a figure of the head of our Elaps collaris). Moreover, Schlegel states once again that the native country of this species (*Elaps collaris*) is unknown. However, subsequent authors did not heed the warnings contained in Schlegel's remarks.

Duméril (1853: 517, reprint: 121) mentions *Elaps collaris* without any indication as to its native country.

Duméril, Bibron & Duméril (1854a: 1203) mention *collaris* as being a synonym of *calligaster*, on p. 1204 they state that *collaris* is the same as *calligaster*, and on p. 1226 they write "Elaps Collaris. vel Calligaster. Schlegel et Wiegmann" above the description of the species; they mention a specimen from Manila in the Paris Museum. From the ninth volume of their "Erpétologie générale", it is clear that Duméril, Bibron & Duméril (1854b: 375) selected the name *Elaps collaris* for the composite species, giving Manila as the locality record.

In the meantime, Duméril (1853: 516, reprint: 120) had introduced the name *Elaps gastrodelus*, a nomen nudum, for a snake of unknown origin, presented to the Paris Museum by Dr. Kéraudren. This species was described by Duméril, Bibron & Duméril (1854a: 1212), and the authors suggest that it might have come from the Antilles, where its collector, Dr. Kéraudren, had stayed. Later, Duméril, Bibron & Duméril (1854b: 374) mention *Elaps gastrodelus* as occurring in the Antilles, without adding anything like a query. This species has a bearing on the history of *Elaps collaris* as it is considered to be identical with it, and, therefore, the locality "Antilles" appears among those mentioned for *E. collaris*.

Günther (1858: 231) mentions *Elaps calligaster* from the Philippines, and he refers *E. collaris* to its synonymy.

Jan (1858: 447, note 1 (reprint: 10, note)) mentions *E. collaris*, and Jan (1858: 518; 1859b: 7) states that it occurs in the Antilles; furthermore he states that he has examined specimens belonging to the museums of Paris, Stuttgart, and Vienna. From a subsequent paper (Jan, 1859c: 509, reprint: 5) it becomes clear how Jan (1858: 518; 1859b: 7) came to mention the Antilles as being the native country of *E. collaris*; considering *E. gastrodelus* to be identical with *E. collaris*, and accepting the suggestion that *E. gastrodelus* was an Antillean species, Jan (1858: 518; 1859b: 7) of course mentioned this locality for *E. collaris*. However, still convinced that these two species are identical, he emendates his previous papers, by reverting to the idea that *E. collaris* is a Philippine species, and Jan (1859c: 509, 510, reprint: 5, 6) adds that *E. collaris* should be transferred from the American species of the genus *Elaps* to the Asiatic species of this genus; Manila is mentioned as the locality. The only advance made is, that Jan (1858: 517; 1859b: 6) considers *E. calligaster* to be a distinct species, but for this he gives the locality "Carthagène (N.-Grenade)"; Jan (1859c: 509, reprint, 5, *Elaps caligaster*) states that this locality record is erroneous, and that the species occurs at Manila (also: Jan, 1859c: 510, reprint: 6).

Günther (1859: 84) still considering *E. collaris* to be a synonym of *E. calligaster*, transfers this species to the genus *Callophis*. He mentions *Callophis calligaster* from the Philippine Islands.

Peters (1862: 637) considers *calligaster* and *collaris* to be distinct, but congeneric species, which he places in the new genus *Hemibungarus*¹). It was Peters, who was responsible for referring *collaris* to the genus *Hemibungarus*, and not Boettger (1886: 117) as was assumed by Schmidt (1937: 362).

Jan (1863: 114) still keeps *E. collaris* (with *E. gastrodelus* as a synonym) among the Asiatic species of *Elaps*. Again he mentions having examined specimens belonging to three museums: "(Leyda) Manilla. (Stuttgart. P.M.) Manilla?". The specimens from the Leiden Museum must have been the syntypes of *E. collaris*, that from the Paris Museum will have been the holotype of *E. gastrodelus*. It must be stressed once more, that the locality, where these three specimens were taken, is not known. The tentative, but erroneous suggestion by Schlegel (1837, II: 449) that *E. collaris* might be identical with *E. calligaster* from Manila, although much weakened by his remark (Schlegel, 1844: 137) that he may have been in error, became so fixed in the mind of contemporary herpetologists, that whatever other suggestions were made (e.g., that about the possible Antillean origin of *E. gastrodelus*) were passed by without further notice, even after it had become quite clear that *collaris* and *calligaster* were different species. It is truly remarkable that no notice was taken of the only definite locality record available at that time. The specimen from the Stuttgart Museum, which Jan examined, must have been that, which is still present in the collection, and which was received in 1844 from A. Kappler, who captured it in Surinam. If Jan had not been completely biased, the problem of the native country of *E. collaris* could have been settled long ago, and much confusion could have been prevented.

1) Leviton (1964: 536) states that *Elaps calligaster* is the type species of the genus *Hemibungarus* Peters "by monotypy". This last statement is incorrect, because Peters (1862: 637) included two species in *Hemibungarus*, viz., *Elaps calligaster* and *Elaps collaris*. Peters wrote: "ob man diese Art (sowie *E. collaris* Schlegel) von den *Bungarus* trennen darf" (whether one may separate this species [i.e. *E. calligaster*] (as well as *E. collaris* Schlegel) from *Bungarus*), and: "Durch dieses letztere, so wie durch die doppelte Reihe unterer Schwanzschilder unterscheiden sie sich äusserlich von *Bungarus* und schlage ich vor, sie mit dem generischen Namen *Hemibungarus* zu bezeichnen". (By the last-mentioned feature, as well as by the double row of subcaudals, they differ externally from *Bungarus*, and I propose to designate them with the generic name *Hemibungarus*). It is true that Peters's notes (1862: 637) were mainly concerned with *calligaster*, and in a later paper Peters (1872: 587) wrote that earlier he had created the genus *Hemibungarus* for *E. calligaster*. Stejneger (1907: 387), and Smith (1943: 418) mentioned *calligaster* as the type species of *Hemibungarus* Peters, and in this respect no further problems arise.

Jan (1863: 115) mentions *Elaps calligaster* as a separate species, with the locality record Manila.

Jan & Sordelli (1873: pl. I fig. 1) published figures of *E. collaris*. In the index to the plates they state (Jan & Sordelli, 1881: 5) that these figures were made after a specimen from Manila in the Milan Museum. Here again, an erroneous locality record is mentioned as if it were a true fact.

Next comes a most important publication, which has been overlooked by all subsequent authors, i.e., a book by Kappler (1881), in which he describes his experiences during a stay of forty-three years in Surinam. From 1842 to 1846, Kappler was a professional collector of zoological specimens, and in the first part of his book he deals with his experiences as such. At the end of this part he gives a list of the species of which he sent specimens to the Naturalien Kabinett in Stuttgart (now: Staatliches Museum für Naturkunde, Ludwigsburg). I do not know, who was responsible for the identification of the specimens, but the noteworthy fact is, that Kappler (1881: 167) mentions *Elaps collaris* among the snakes which he collected. This is in fact the first mention in literature of *E. collaris* with a definite locality record, which is substantiated by a specimen. I am greatly indebted to Dr. H. Wermuth for tracing the specimen, and for sending it to me on loan; notes upon it will be given below.

Kappler's record escaped the notice of contemporary authors, for Boettger (1886: 117) still includes *Hemibungarus collaris* in the Philippine fauna. The fact that Kappler's record was overlooked may have been caused by the fact, that he did not mention Elapid snakes in two of his later publications (Kappler, 1885, 1887), which seem to have been better known to other authors.

Casto de Elera (1895: 440), in his catalogue of Philippine animals, not only mentions *Hemibungarus collaris* as a Philippine species, but he actually states that the species is represented in the museum of the Colegio de Santo Tomas; *H. calligaster* is recorded separately.

Boulenger (1896: 393) mentions *Hemibungarus collaris* as occurring in the Philippines, and in this he is followed by Griffin (1911: 266).

Thompson (1913) examined the syntypes of *Elaps collaris* in the Leiden Museum, and that of *Elaps gastrodelus* in the Paris Museum. He points out that *E. collaris* is a true *Elaps*, and that it is allied to *E. narduccii* Jan. It is remarkable, that this easily accessible paper, mentioned in the Zoological Record for 1913, escaped the notice of subsequent authors (except Werner, 1923) until Schmidt (1939: 45, note 1) referred to it, in this way amending his historical survey of *E. collaris* published two years earlier (Schmidt, 1937). Although Thompson does not explicitly state this, the fact that he gave

notes on the type of *E. gastrodelus* in a paper on "The correct status of *Elaps collaris* Schlegel" makes it clear that he considered *E. gastrodelus* as a synonym of *E. collaris*.

Phisalix (1922: 287) mentions *Hemibungarus collaris* among the Asiatic poisonous snakes, and (1922: 323) *Elaps collaris* among the poisonous American snakes.

Taylor (1922: 269) still includes *Hemibungarus collaris* among the Philippine snakes. He adds: "Obviously it is very rare and none appears to have been taken in recent years". Taylor also states: "The species is deadly poisonous". I have not been able to find any reference in literature to this species being deadly poisonous, and it is rather strange that such a statement appeared in a book on snakes of the Philippine Islands, where the species does not occur. Probably this remark refers to another species. It may be pointed out that Taylor (1922: 31) made use of a manuscript by Catanjal, which treats of the poisonous snakes of the Philippine Islands. Taylor (1922: 35, no. 65) writes: "*Camamalu* (Pampango); synonymous with *tadioco* and *carascaen*; a name applied to *Naja naja* and *Naja hannah*; deadly; Casto de Elera says that it is *Hemibungarus calligaster*". Therefore, it may well be that Taylor's (1922: 269) statement about *Hemibungarus collaris* being deadly poisonous is due to a confusion of vernacular names, and that it refers to *H. calligaster* (= *Calliophis calligaster*), or more probably to the cobras.

The only author, who took notice of Thompson's (1913) paper, and who acted accordingly, was Werner (1923: 188, 190). In his survey of the Elapid snakes (intended to be a supplement to Boulenger's (1896) catalogue) he places *E. collaris* in the genus *Elaps*, and not in the Asiatic genus *Hemibungarus*. However, he mentions the Antilles as its native country.

Bourret (1936: 382) mentions *Hemibungarus collaris* as occurring in the Philippines.

Schmidt (1937) discussed the history of *Elaps collaris*. The motive for writing his paper on this species was a specimen from (British) Guiana, which he supposed to be the first with a definite locality record. As shown above, Kappler's (1881: 167) record antedates this. In his paper, Schmidt (1937: 361) also mentions having seen a specimen in the Paris Museum (reg. no. 4626c) with the label "Guyane", and presented by Mrs. Hyver. Whether the quotation marks are on the label, or whether they were added by Schmidt, I do not know, but there seems to be little reason to doubt that the specimen may have been taken in French Guiana. About this specimen, Schmidt (1937: 362) also writes: "A further note suggests the possibility that this specimen may be the type of *Elaps gastrodelus* Duméril and Bibron,

which I think unlikely". Reference to the description by Duméril, Bibron & Duméril (1854a: 1212) would have shown that it could not be the type, because that was presented by Dr. Kéraudren. Moreover, Thompson (1913: 174) who did examine the holotype of *E. gastrodelus* states that it is entered into the registers under no. 3930. Schmidt's (1937: 362) statement that Boettger (1886: 117) was responsible for transferring *collaris* to the genus *Hemibungarus* is erroneous, for this was done by Peters (1862: 637), when he diagnosed the genus. Other slight errors will be evident when the present account is compared to that of Schmidt. *E. collaris* and *E. narduccii* were transferred by Schmidt (1937: 363) to the genus *Leptomicrurus* Schmidt. In a subsequent paper, Schmidt (1939: 45, note 1) pointed to Thompson's (1913) publication, which he had overlooked when writing his historical account.

Oshima (1944: 218, 326) tries to perpetuate the old error, and he mentions *Hemibungarus collaris* from the Philippine Islands (Manila).

Klemmer (1963: 299) mentions *Leptomicrurus collaris* as occurring in the Guianas.

Leviton (1964: 537) in dealing with the Philippine species of the genus *Calliophis*, mentions that Schmidt (1937) has referred *Hemibungarus collaris* to the genus *Leptomicrurus*. He adds, that Dr. J. Guibé, Muséum National d'Histoire Naturelle, Paris, has re-examined the type of *Elaps gastrodelus*, and that this is indeed a synonym of *collaris*.

This historical account may be summarized in the following synonymy:

Leptomicrurus collaris (Schlegel)

Elaps collaris Schlegel, 1826a: 238 (n.n.), 1826b: 293 (n.n.); F. Boie, 1827: 556 (n.n.); Gray, 1831: 84 (n.n.); Schlegel, 1837, I: 181, II: 448, 1843: 180, 1844: 137, pl. 46 fig. 10-11; Duméril, 1853: 517 (repr. 121); Duméril, Bibron & Duméril, 1854a: 1203, 1854b: 375 (part.); Jan, 1858: 447, note (repr.: 10, note), 1959b: 7, 1859c: 509, 510 (repr.: 5, 6); Peters, 1862: 637 (transferred to *Hemibungarus*); Jan, 1863: 114; Jan & Sordelli, 1873, pl I fig. 1, 1881: 5; Kappler, 1881: 167; Thompson, 1913: 171; Phisalix, 1922: 323; Werner, 1923: 188, 190; Schmidt, 1937: 361, 363 (transferred to *Leptomicrurus*).

Elaps collaris vel *calligaster*, part., Duméril, Bibron & Duméril, 1854a: 1226.

[*Hemibungarus collaris*], Peters, 1862: 367.

Hemibungarus collaris, Boettger, 1886: 117; Casto de Elera, 1895: 440; Boulenger, 1896: xii, 393; Griffin, 1911: 266; Acton & Knowles, 1921: 696; Phisalix, 1922: 287; Taylor, 1922: 268, 269 (reissued 1966); Bourret, 1936: 382; Oshima, 1944: 218, 326.

Leptomicrurus collaris Schmidt, 1937: 363, 1939: 45, note 1; Klemmer, 1963: 299; Leviton, 1963: 537.

Elaps calligaster, part., Duméril, Bibron & Duméril, 1854a: 1203; Günther, 1858: 231.

Calliophis calligaster, part., Günther, 1859: 84.

Elaps gastrodelus Duméril, 1853: 516 (repr. 120) (n.n.); Duméril, Bibron & Duméril, 1854a: 1205, 1212, 1854b: 374.

Of this species I have examined four specimens:

♂, locality?, don. Brugmans, Rijksmuseum van Natuurlijke Historie, Leiden, (ML) no. 1444, lectotype.

♂, locality?, don. Brugmans, Rijksmuseum van Natuurlijke Historie, Leiden, (ML) no. 1443, lectoparatype.

♂, Surinam, ex collection Vrolik, Zoologisch Museum, Amsterdam, (ZMA).

♂, Surinam, leg. A. Kappler, 1844, Staatliches Museum für Naturkunde, Ludwigsburg, (SMN) no. 113.

The specimens in the Leiden Museum are marked as coming from the "ancien cabinet", which means that they belonged to one of the collections, which were merged in 1820 to found the Rijksmuseum van Natuurlijke Historie. Schlegel (1837, II: 448) states that they were received from Prof. S. J. Brugmans.

The two syntypes (ML 1443, 1444) were examined in 1908 by J. C. Thompson, who redescribed them in 1913. Although Thompson (1913: 172-174) dealt more extensively with ML 1443 than with the other syntype, I have not selected it as the lectotype, because its colour pattern differs somewhat from the other three specimens. Therefore, I designate ML 1444 as lectotype. Some data on these specimens are given below. To these I have added the ventral counts of the specimen from (British) Guiana in the Field Museum of Natural History, Chicago (FMNH), and that of a specimen in the Muséum National d'Histoire Naturelle (MP 4626c) such as these are mentioned by Schmidt (1937: 361).

		Ventrals	Anal	Subcaudals	Length of head and body (mm)	Length of tail (mm)
ML 1444,	♂,	230	1/1	21/21 + 1	380	24
ML 1443,	♂,	228	1/1	21/21 + 1	419	26
ZMA,	♂,	234	1/1	20/20 + 1	399	27
SMN,	♂,	237	1/1	23/23 + 1	357	26
FMNH,	♂,	215				
MP,	♀,	250				

The four specimens examined by me have 15 scale rows throughout. In ZMA the number of scale rows is reduced to fourteen from the 221st to the 224th ventral by fusion of the third and fourth scale rows of the right side; at the 224th ventral the number of scale rows is restored to fifteen.

Three specimens (ML 1443, 1444, SMN) have seven upper labials on

either side, the third and fourth entering the orbit, and the sixth in contact with the parietal. In ZMA, this situation is found on the left side, but on the right side there are only six upper labials (the "5th" and "6th" having fused), the third and fourth enter the orbit, the fifth is in contact with the parietal. All specimens have seven lower labials on either side; those of the first pair are separated from each other by the mental, which is in contact with the anterior chin shields. All specimens have one preocular (which is in contact with the nasal), and two postoculars.

The colour pattern of all four specimens is the same in principle, but there are individual variations. The head is brown above. There may be a pale cross bar across the snout, or this may be broken up into spots. ZMA has only a pale area around the nostrils. ML 1444 has a pale area on either side, and a pale spot on the prefrontals; this prefrontal spot is mainly situated on the left prefrontal, but it just reaches the right prefrontal; ML 1443, and SMN 113 have a more or less complete pale bar across the snout. All four specimens have a whitish collar on the nape, behind the parietals. This collar may be narrowed by a more or less rectangular brown spot behind the parietals (ZMA). The back is uniformly brown without any indication of an annulate pattern. The sides have whitish spots on the first and second scale rows, sometimes just reaching the third scale row; these spots are in fact the outer ends of the whitish ventral spots.

The ventral surface shows a series of large whitish spots more or less oval in outline, as they extend on to the first and second scale row, occupying about two scales of the first row, and one of the second row. The whitish spots vary in size. As an example SMN 113 may be given; the first whitish spot covers five ventrals, then follow a number of spots which cover three to three and a half ventrals, towards the middle of the body these spots cover only two to two and a half ventrals, and posteriorly they become larger again, covering three ventrals. The whitish spots are separated from one another by transverse, brown bars. The ventral part of the collar may be separated from the first spot by a complete bar (ZMA, SMN) or it may be connected to the first spot by the brown bar being interrupted in the middle.

Not counting the ventral part of the collar, ML 1444 has 35 whitish spots, ZMA has 37, and SMN has 39 whitish spots. These specimens have 36, 38, and 40 dark cross bars respectively, the last of these crossing the anal shields. In ML 1443 the dark bars have been greatly reduced; of the 44 bars, only 28 are complete and these cover one to two ventrals at most; the other dark bars are widely interrupted in the middle, and some of them are only faintly indicated at the sides; there is no dark bar across the anal shields. Thus, in this specimen (ML 1443) a series of five whitish spots, and another

series of nine of such spots have fused, and in fact the ventral surface is whitish over a fairly long distance with only weak, brown indentations on the sides.

The tail is brown above, and white below; there is one brown cross bar across the lower surface of the tail, at about halfway between the vent and the tip of the tail; in ML 1444 this bar is interrupted in the middle. The lower surface of the terminal scale may show some dark dots as an indication of a dark terminal cross bar.

I have not examined the holotype of *Elaps gastrodelus* Duméril, Bibron & Duméril, a species which by all subsequent authors has been referred to the synonymy of *collaris*. Thompson (1913: 174), who examined this holotype (MP 3930) states that it is a female, but this may need confirmation. He mentions its having 228 ventrals and 22 pairs of subcaudals, counts which agree very well with those of the males examined by me, but the number of ventrals is very much lower than that given for a female by Schmidt (1937: 361, MP 4626c: 250 ventrals; Schmidt did not give the subcaudal count). With our very limited knowledge of sexual dimorphism and the range of variation in *Leptomicrurus collaris*, little can be said about the position of the holotype of *gastrodelus* at this moment.

Schmidt (1937: 363) separates *Leptomicrurus collaris* from *Leptomicrurus narduccii* on two characters, viz., the absence of an anterior temporal in *collaris* (present in *narduccii*), and the position of the collar (behind the parietal in *collaris*, across the parietals in *narduccii*). Therefore, it is interesting to note that Thompson (1913: 174-175) mentions the holotype of *Elaps gastrodelus* having an anterior temporal on the right side (thus agreeing with *narduccii*), whilst on the left side the sixth upper labial is in contact with the parietal (as in *collaris*).

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2) 1858, pp. 514-527, and 1859*a* have been reprinted and issued separately as 1859*b*, for which purpose the title was changed. It must be pointed out, that the text is not always the same. Thus, corrections to 1858, p. 518, which were published 1859*a*, p. 122, have been included in 1859*b*, p. 7, at the appropriate place. 1859*b*, pl. 6, was pl. 9 in 1859*a*; pls. A-C have been added in 1859*b*.

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