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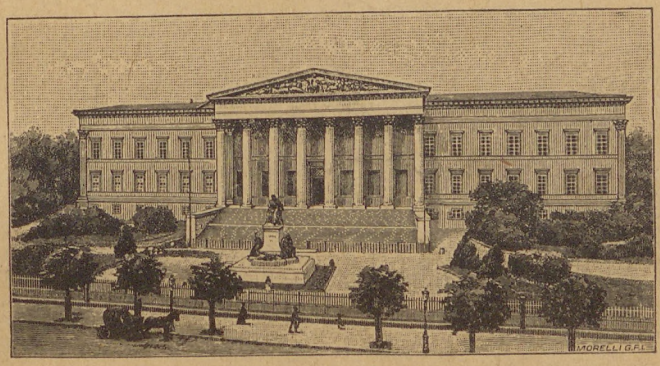

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XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1935.
PARS ZOOLOGICA.

FURTHER CONTRIBUTIONS TO A MONOGRAPH OF THE MEGALANIDAE AND FOSSIL VARANIDAE — WITH NOTES ON RECENT VARANIANS.

(With Pls. I to XIV. & Text figures 1 to 8.)

By the late Baron G. J. DE FEJÉRVÁRY.

To the Memory of my great Friend, the capable Hungarian Biologist STEPHEN JOSEPH BOLKAY, Ph. D., to whom herpetological research is especially indebted.

The first part of this paper appeared in vol. XVI, 1918, of this periodical (p. 341—467). This second part, left among the manuscripts of the deceased author, was, according to his last wish and on his directions, put in print by his widow. Nearly three years have gone since author died, but the edition of this paper was retarded by financial reasons. The Hungarian Academy of Sciences and the Royal Hungarian Elisabeth University, Pécs, offered now their generous aid in this difficulty. To both these institutions, as well as to H. E. J. BALOGH, Secretary-General of the Hungarian Academy of Sciences and to the Elisabeth University heartfelt thanks are due for their understanding and helpfulness which promoted the edition of this posthumous paper.

*

Since the publication of the first part of this monograph I had the opportunity of making further studies on the subject, which are based upon a rather rich series of specimens, both recent and fossil, belonging partly to the Hungarian National Museum, and partly to the Palaeontological Collections of the Bavarian State, Munich and to the Vienna Natural History Museum, respectively. The substance of the present monographical essay consists in the exposition of the new data thus obtained, as well as in a historico-critical review of all those outstanding works and papers that appeared since 1918 on the fossil Varanians and their allies. Such literary rewiew is complemented by the consideration of two important papers previous in date to the appearance of my Monograph published in 1918, which — owing to the most regrettable interruption

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international scientific contact was subjected to, during the Great War — were not available to me at that time. Very remarkable are, in the literature published since 1918 on the subject, the papers dealing with the American Varanian *Saniva*, and with the famous „Komodo Dragon", *Placovaranus komodoënsis* Ouw., respectively. There is, moreover, a most remarkable literary communication I owe to the obliging courtesy of Mr. Heber A. Longman, Director of the Queensland Museum, Brisbane, Australia, which claims further discussion of the zygosphene and zygantrum question in *Megalania*, such discussion aiming at the correct valuation of the osteological feature concerned.

Besides the results owing to the examination of the material referred to here above, the present Monograph also contains data due to a re-examination of some of the originals described and figured in my earlier publication on the subject; these specimens belong to the Roy. Hungarian Geological Survey, and the statements concerned are, in the case of *V. marathonensis* Weith., complemented by the communication of such facts that are evidenced by new finds collected, by Dr. Th. Kormos, in S. Hungary.

Thus, on the grounds of autoptical investigation on the one hand, and literary information on the other, a remarkable set of details have been elucidated by the writer, which fact requires a thorough systematical and diagnostical revision of the whole Suborder Platynota to which both Megalanidae and Varanidae belong. The lines along which such systematical and diagnostical revision shall be carried out in the following pages, are, with respect to the methodics to which the writer applied throughout his work, essentially b i o n o m i c a l, and not merely descriptive. The characters of the fossil organism will always be considered in their coherence with those set forth by the recent one next allied to it, and morphological features will always be valued in the suggestive light of phylogenetical and functional analysis. Thus, the diagnostical importance and significance of the characters accessible to our knowledge will be established by keeping to really n a t u r a l, and not artificial, moments, in order that the System thus founded should be entitled to claim the rank of a Natural one, i. e. of one that is based upon genetical relation.

From the fact of constantly referring the reader to details afforded by the study of the recent organism, it quite naturally follows that he will find in this work a series of evidences that bear on the anatomy of living forms, for it is only by applying to these that

soft parts could be examined. Thus, some paragraphs of the present paper may prove to be of interest not only to the „palaeontologist", but — precisely in consequence of a modern, i. e. biological, and not physiographical (more exactly geological), treatment of the subject — to the anatomist as well. Such are, in particular, the paragraphs dealing with the eidonomy and anatomy of the nario-loreal region, and with the lacrimal canaliculi, the naso-lacrimal duct and their osteological relations.

Zoogeographical and paleogeographical problems turning up in the course of the present investigations have always duly been appreciated, what means that the writer did not omit giving them the full interest they actually deserve. From this point of view both the bio- and physiogeographer may find some notes entering the realm of their consideration which is always more or less intimately linked to facts emerging on the horizon opened by the phylogeneticist's work.

On the whole, the present publication aims at being of some interest not only to the paleobiologist and zoologist or anatomist, but also to the modern Naturalist in general. It is upon the same fundaments of scientific outlook and treatment of the subject that the present Further Contributions rely, which obtain in the case of my 1918 Monograph. In fact, these Further Contributions may well be looked upon as constituting a sort of Complement, or Supplement, to the Monograph of 1918, containing quite a series of important additions to, as well as modifications of, the previous text. Therefore I will have to refer the reader quite often to that work of mine.

Considering the most gracious literal echo my first work met with — in the publications by Baron NOPCSA and Prof. BROILI in Europe, Messrs. GILMORE, CAMP, DUNN and BURDEN in the United States, and Mr. LONGMAN in Australia — I dare hope that the present paper will enjoy the same liberal admittance. I have to express, further, my most hearty thanks to Prof. VERSLUYS, Vienna, for his helpful advices and the use of his university notes on the subject he most kindly put at my disposal.

Part I: Historical Prodrome.

In this part I intend to give a short review of all the publications, appeared s i n c e 1918, which deal with f o s s i l remains entering the systematical compass of the families Varanidae and Megalanidae, as well as with those papers and books, respectively, that, in

spite of their concerning recent forms, prove to be of some outstanding import to us by their bearing upon a more general and synthetic valuation of our problem. Also those of the publications regarding recent material will here be considered, which supply us with data affording a possibly complete systematical oversight of the Group under inspection. By sticking to such principle, I hope to eliminate, ab ovo, the chance of reproaching me with any arbitrariness that otherwise might somehow have prevailed in the consideration of the literature on recent forms.

Before proceeding, however, to the enumeration of the works concerned that have left the press since 1918, I have to mention s u p p l e m e n t a l l y, two papers, previous in date of publication to my 1918 Monograph.

The first of these is Mr. C. W. De Vis's „On Bones and Teeth of a large extinct Lizard", appeared in the Proc. Roy. Soc. Qd., II. Pt. 1, Brisbane, 1885 (p. 25—32, Pls. I—III), which was most kindly handed over to me, as a gift, in 1923, by Mr. Heber A. Longman, Director of the Queensland Museum, Brisbane. The late Mr. De Vis — one of the most well known Paleontologists of Australia in the last century — describes and figures in that memoir of his a couple of Lacertilian remains, viz. a left humerus, a left scapula and one tooth, which originate from Queensland, and have been „drawn from deposits abounding in Diprotodont and other remains which the writer has been accustomed to regard as, in Queensland, newer pliocene, not strictly pleistocene."[1] Mr. De Vis identified these remains with Owen's *Notiosaurus dentatus*, a large pleurodont lizard described by the veteran English anatomist on the base of „a fragment of a jaw with roots and teeth, submitted to him by the Department of Mines, New South Wales", and found in deposits that were stated to be Pleistocene.

The second of the two papers referred to here above, is one by Mr. R. Etheridge Jr. having appeared in 1917, in the Proc. Roy. Soc. Victoria, XXIX. N. S., Pt. II, p. 127—133, Pl. VIII, and bearing the title „Reptilian Notes: Megalania prisca, Owen, and Notiosaurus dentatus, Owen; Lacertilian dermal armour; Opalized remains from Lightning Ridge."

In the first part of this paper the author describes, under the title the „Identity of Megalania (vel Varanus) prisca, Owen, with

[1] Op. cit. p. 25—26.

Notiosaurus dentatus, Owen", a rather well preserved maxillary[2], the characters of which show to be perfectly correspondent with those exhibited by the dentary of Owen's *Notiosaurus*. The maxillary was found in the „fluviatile deposits near Clifton Station, King Creek, Condamine River."[3] This remain was associated with „numerous vertebrae, undoubtedly those of Owen's *Megalania*". With respect to the condition of fossilization and the association in which the maxillary was found, I merely refer to Mr. ETHERIDGE's following statement[4]: „Associated with these," — i. e. with the Megalanian vertebrae just mentioned — „like in appearance, colour, and condition of petrifaction, are a few limb bones, and the larger portion of a right dentary, with part of a tooth in situ; there can be no reasonable doubt that these remains all belonged to one and the same species of reptile." Photographs of the maxillary (external and lingual view) are given on Pl. VIII (Figs. 1—2) of the same paper.

The second part of this publication bears the title „Megalania prisca, a Cave Fossil"[5], being accompanied by two photographs (Pl. VIII, Figs. 3—4) of a dorsal vertebra of *Megalania* originating „from the ossiferous deposit at the Wellington Cave Reserve." After the description of the vertebra, which „was found to correspond in every detail with the dorsal vertebra forming a portion of the series already referred to from near Clifton Station", the author communicates, on p. 130, its measurements. After this the enumeration of the localities follows, in which, up-to the end of 1916, Megalanian remains were found. These localities are:

1. Fluviatile deposits of the Condamine River and of its branches (King Creek, &c.), Queensland; near Melbourne, Victoria; South Australia; Castlereagh River, N. S. Wales.

2. Mound Spring deposit of Cuddie Springs, East of Gulgong, N. S. Wales.

3. Cave deposits of Wellington Caves Reserve, N. S. Wales.

It is owing to the most regrettable interruption international scientific contact has undergone during the Great War, that Mr. R. ETHERIDGE Jr.'s important paper just mentioned has not been available to me at the time in which I was preparing my Monograph

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[2] Referred to by Mr. ETHERIDGE under the anatomically erroneous designation „Dentary".

[3] Op. cit. p. 127.

[4] L. c.

[5] Op. cit. p. 129.

published in 1918; in 1921, however, I obtained, through the kindness of Mr. C. ANDERSON, of the Sydney Museum, a reprint of this publication, for which I beg him, in this place too, to accept my heartfelt thanks.

And now let me make pass in review those publications on Varanians, which enter the confines of our present consideration as outlined above.

In 1919 Mr. R. STERNFELD published a paper „Neue Schlangen u. Echsen aus Zentralaustralien", which appeared in the Mitteil. Senckenberg. Naturf. Ges., 1, Frankfurt a/M., p. 76—83, and in which, on p. 78, a new form of *V. acanthurus* BLGR. is described under the name of *brachyurus*.

In 1921 Mr. A. WETMORE published his note on „† Minerva saurodosis Wetm., a Fossil Owl from the Bridger Eocene", in: Proc. Acad. Nat. Sc. Philadelphia, 73, p. 435—438, Figs. 1—2. In this paper the author refers the humerus described and figured by LEIDY[6] as that of *Saniwa maior*, to a fossil species of Owl, fully justifying thus the correctness of my opinion concerned, emitted by me in my 1918 Monograph, p. 421, according to which „The humerus described (p. 182) and figured (Pl. XV, Fig. 14) by LEIDY as belonging to *S. maior* is undoubtedly not reptilian and therefore cannot belong to *Saniwa*." On p. 363, op. cit., I even pointed out that „The humerus" ..... "presents a particularly bird-like appearance, as LEIDY himself very judicially remarks."

In 1922 Mr. CH. W. GILMORE offered „A New Description of Saniwa ensidens Leidy, an Extinct Varanid Lizard form Wyoming", in: Proc. U. S. Nat. Mus., 60, Washington, Art. 23 (No. 2413), Figs. 1—22, Pls. 1—3. The results contained in this excellent paper of the famous American Reptile paleontologist will be duly considered in the Chapter[7] dealing with *Saniwa* and *Tinosaurus (= Thinosaurus)*.

In 1923, Baron NOPCSA's[8] recent investigations threw some fresh light on the systematical position of a fossil form yet dealt with in my Monograph. By this fossil form I mean PORTIS's *Progonosaurus pertinax*, a „reptile represented by four fragmentary vertebrae"

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[6] Contr. to the extinct Vertebrate Fauna of Western Territ., HAYDEN's Report U. S. Geol. Survey of the Territories, I, Pt. I, Washington, 1873.

[7] Discussion of the family, and genetic relationships of the genus Saniva, p. 23.

[8] Die Familien der Reptilien (Fortschritte der Geol.-Pal. Heft 2). 1923.

„from the Pliocene of Volterra (on the road to Siena)".[9] PORTIS,[10] after having found the very badly preserved Valdarno vertebrae to be similar to, though not identifiable with those of Crocodilians, referred them, provisionally and with hesitation, expressed by the addition of an interrogation mark, to the „Famiglia dei Varanidi?", a procedure I could not, however, approve of. After a close examination of PORTIS' paper I came to the conclusion that his „drawings in natural size give us almost absolute certainty that no sort of connexion can be proved between the *Progonosaurus pertinax* PORT. and the Varanidae presenting a totally different structure of the vertebrae and showing already in the lower Oligocene a differenciation corresponding to their present form."[11] So I thought „it best for the present to treat the former genus as „Incertae Ordinis" and eliminate it altogether from the system of the Varanidae.[12] Since that time these vertebrae were thoroughly examined by Baron NOPCSA himself, who went to Florence directly on the purpose to clear up the *Progonosaurus* problem. The result of this examination is given on p. 37—39 of his book already referred to, being resumed in the last sentence by which he terminates the discussion of *Progonosaurus*: „Da sich dieses alles bei Progonosaurus wieder findet und P o r t i s in der zitierten Arbeit von P l i o c h e l y s aus dem Valdarno auch Schildkrötenpanzer-Fragmente beschreibt die auf das Vorkommen einer sehr grossen Pleurodire weisen, eine sternothaerusartige Form schliesslich auch aus dem Miozän bekannt ist,[13] so scheint es gar nicht unmöglich, dass die als Progonosaurus beschriebenen Wirbel zu Pliochelys gehören."[14]

The last point to be touched upon in this part of my paper regards the „Komodo Dragon", in which, according to Mr. DOUGLAS BURDEN's fascinating field report on the Komodo Expedition of the American Museum of Natural History[15], „each scale is underlaid by

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[9] FEJÉRVÁRY, op. cit. p. 345. — Baron NOPCSA (op. cit. p. 37) refers but to t h r e e vertebrae.

[10] I Rettili pliocenici del Valdarno Superiore e di alcune altre località pliocenisce di Toscana, Firenze, 1890. p. 25—28, Tav. I, fig. 5—7.

[11] FEJÉRVÁRY, op. cit. p. 346.

[12] PORTIS, Les Chéloniens de la Molasse Vaudoise. Mem. Soc. Paléont. Suisse. Vol. IX. 1882.

[13] L. c.

[14] NOPCSA, op. cit. p. 38—39.

[15] The Quest for The Dragon of Komodo, Nat. Hist., XXVII, New York, 1927, p. 3—18.

a plate of bone",[16] what means the presence of a „bony armor",[17] i. e. an exoskeleton. Besides, the „Komodo Dragon", or „Boeaja darat" („Land Crocodile"), is known for its moving about in a way quite different to that observable in other Varanians: for it does not creep, but keeps up high on its extremities, just like most of our Mammalians do, or like the orthopodous Dinosaurs did, the belly of the moving animal never touching the floor.[18] It should also be noticed that this strange looking animal is, in many details of its habit, strikingly "unvaranian", a circumstance which struck me at first sight when contemplating the fine photographs in Mr. BURDEN's paper, representing the walking and feeding specimens.[19] The most peculiar habit of the Komodo Lizard was first pointed out by Mr. J. K. DE JONG, in his recent paper on the kinetomechanism of this animal's skull:[20] „Außerdem war der Kopf, namentlich die Schnauze, so wenig varanusähnlich, daß ich beim ersten Anblick nicht umhin konnte, zu zweifeln, ob wirklich eine *Varanus*-Art vorlag." But, immediately after, he adds: „Die vorläufige anatomische Untersuchung hat mir aber gezeigt, daß das Tier zu der Gattung *Varanus* gehört, während eine eingehende Betrachtung des Skelettes zeigen muß, inwiefern es innerhalb dieser Gattung eine gesonderte Stellung einnimmt." Shortly after this paper of Mr. DE JONG had appeared, a second one reached me, kindly sent by Mr. L. D. BRONGERSMA (Bloemendaal, Holland), Student of Natural Sciences, by whom Mr. DE JONG was assisted in his anatomical research on the Komodo Lizard, and dealing with the eidonomical conditions of the same species. The paper I am referring to is Mr. DE JONG's note bearing the title „Varanus komodoensis, Ouwens", published in the Ann. & Mag. N. H., Ser. 9, XIX, London, 1927, p. 589—591; J. K. DE JONG und L. D. BRONGERSMA, Anatomische Notizen über Varanus Komodoensis Ouwens, 1. Die Bewegungen im Schädel von V. Kom. Zool. Anz. Leipzig, 70. 1927, p. 65—69. Mr. DE JONG's description aims to complete Miss DE ROOJ's, given in her valuable work on „The Reptiles of the Indo-Australian Archipelago", I, Leiden, 1915, p. 150—151, based on „a skin and a skull in the Leyden Museum," in which

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[16] Op. cit. p. 3. (under Figure).

[17] Op. cit. p. 11.

[18] Cfr. OUWEN's paper containing the species' first description, in: Bull. Jard. Botan. Buitenzorg, (2) VI, 1912 (fide DE JONG, see footnote 8th).

[19] Op. cit. p. 14—15.

[20] Anatom. Notizen üb. Varanus komodoensis Ouwens. Zool. Anz., LXX. 1927, p. 65—69.

„some details of the outer form remained still" obscure.[21] The material subject to Mr. DE JONG's description consists in a male specimen which died, on Dec. 3rd, 1927, in the Amsterdam Zoo. Finally, in a Hungarian periodical for Natural Sciences, bearing the title „Természettudományi Közlöny" (59, Budapest, 1927, p. 283—285), the writer of the present paper reported on Messrs D. BURDEN's and K. J. DE JONG's publications just referred to, pointing out the fact that no Varanian known up to now possesses a bony dermal armour, and proposing, on account of this character, to establish a new genus for the Komodo form, named by him, with especial reference to the dermal bone plates occurring in it, *Placovaranus*. It is interesting to observe that, as far as I am informed, Mr. D. BURDEN was the first, and, up to the appearance of my brief Hungarian note (Mit tudunk a komodói óriásgyíkról?, in l. c.) quoted above, the unique author wo payed and drew attention to the Komodo Lizard's bearing an e x o s k e l e t o n, a fact even Miss NELLY DE ROOJ omitted to mention in her valuable work.

Part II: Criticism, additional notes and new descriptions.

Chapter 1: † *Progonosaurus* PORTIS, 1890

There remains no doubt, anymore, about the correctness of author's statement published in 1918 that the respective Valdarno Reptile is to be altogether secluded from the relationship of the Varanidae, *Progonosaurus* not even entering into the frames of the Order Lacertilia. This form might be, provisionally, referred to some Pleurodiran Chelonian, presumably to a form akin to *Pliochelys*.

Chapter 2: † *Notiosaurus* OWEN, 1884.[22]

The Lacertilian remains described under this name positively proved to belong to *Megalania*, Mr. R. ETHERIDGE Jr's respective statements offering full evidence with regard to this question, and definitively confirming the correctness of the writer's view emitted, in 1918, on the subject, according to which „the dentary-fragment from" Cuddie Springs, „New-South-Wales, described" „under the name of *Notiosaurus dentatus*" „undoubtedly must be regarded as a fragment of *Megalania prisca*, the denomination *Notiosaurus dentatus* being thus a synonyme".[23] The same statement has been repeated

[21] Cfr. DE JONG, op. cit. p. 590, & N. DE ROOJ, op. cit. p. 151.
[22] In my Monograph this date is erroneously (p. 446, 450) cited as 1885.
[23] FEJÉRVÁRY, op. cit. p. 446. (Cfr. also p. 447—448).

some pages after the place just quoted, in the same publication, when I dealt with the Cuddie Springs mandible.[24]

Chapter 3: † *Megalania* Owen, 1860.

a) Skull: The data regarding this subject contained in my Monograph (p. 449—455) may be completed, at present, only as far as the shape of teeth and the knowledge of the maxillary be concerned.

In op. cit. the teeth of *Megalania* were dealt with on the base of Sir R. Owen's note regarding the type of *Notiosaurus,* consisting in a small fragment of the mandible's os dentale. In this specimen only the basal part of two teeth is preserved, so that the exact shape and structure of them could not be established. I supposed the teeth to be „pointed" and „curved backwards", though adding to these hypothetical data of mine an interrogation mark.[25] Mr. De Vis' paper (1885) cited above — unkown to me when I was writing my Monograph — proves that the supposition just quoted fully covers the facts. Mr. De Vis[26] describes the tooth he obtained from Clifton, Darling Downs, and determined by him as Notiosaurian, as follows: „The teeth in Monitor, compared with those in Hydrosaurus, are broad and thick; the tooth of the latter" — i. e. of *Notiosaurus* — „is distinctly serrated on both edges, while in the Monitor tooth the fore-edge only is serrated, and that faintly. The outline of the tooth of the extinct lizard resembles that of Hydrosaurus, but it is proportionately thicker; its fore-edge is smooth and also like the Monitor tooth, it has the basal fluting extended higher on the inner side towards the crown than in Hydrosaurus. On the other hand, its shape and the almost entire want of the ridge descending upon the outer side of the tooth sufficiently differentiate it from a Monitor proper. We have, therefore, here additional evidence that the extinct lizard had greater affinity with the smaller than with the larger of those two living genera."[27] I do not find anything I could add to this description, offering plenty of evidence with respect to the morphology of Megalanian teeth, being, besides, completed by a drawing representing the Clifton tooth in natural

[24] Op. cit. p. 454—455.

[25] Op. cit. p. 449.

[26] De Vis, op. cit. p. 31—32.

[27] Under „Hydrosaurus" *Varanus giganteus* Gray is meant, whilst under „Monitor" *V. Gouldi* Gray is to be intended.

size and accompanied by two natural size drawings of each a tooth of *V. giganteus* GRAY and *V. punctatus* GRAY.[28]

With respect to the tooth described and figured by DE VIS I must yet observe that Mr. R. ETHERIDGE Jr. expresses, when recording it, some doubts with regard to the correctness of its identification in the above sense. He writes as follows: „I very much doubt if the tooth figured by Mr. de Vis as *Notiosaurus dentatus*[30] is in any way related to OWEN's fossil of the same name."[31] I must confess to be fully unaware of the causes of Mr. ETHERIDGE's doubts, who does not give any explanation in view of supporting, somehow, his quoted personal impression.

Mr. ETHERIDGE's paper just mentioned[32] does not contain new data about the teeth of *Megalania,* and its author merely refers to a part of OWEN's „Odontography" (pt. II, p. 265) applicable to the one tooth base preserved in the Clifton Station maxillary described and figured by him.

Now, as regards the maxillary, the consideration of the two photographs given by Mr. R. ETHERIDGE Jr. (op. cit. Pl. VIII, Figs. 1—2) afford the following details.

Habit of Varanian type; very massive in structure, strongly widened in dorsoventral sense, most resembling, by this feature, the maxillary of *V. niloticus* L. It „is fractured in front at about the premaxillary suture, and as preserved measures six and a-half inches in length."[33] Processus praemaxillaris ossis maxillaris, proc. zygomaticus oss. max., terminal part of proc. praefrontalis oss. max. and lamina horizontalis oss. max. broken off, whilst ala intranasalis ossis maxillaris (FEJÉRV., 1918, emend. FEJÉRV., nunc = ala superior oss. max., FEJÉRV., 1918) — i. e. the dorsal-crest-like part meeting the intranasal (= turbinal) — preserved only in its very basal portion. Margo lacrimalis oss. max.(mihi) preserved in greatest part of its course apperently but trifling portions wanting of it at the ends of both its dorsal and ventral rami. Excavatio nasalis ossis maxillaris (FEJÉRV., 1918) — so far as discernible on figure — moderately impressed, rather shallow, and not presenting any acute delimitation ridge. Crista dentalis oss. max. intact, serrated, the spaces between the serrations presenting a broadly rounded, quasi lobi-

[28] Figuring under the name of *„Odatria punctata"*.
[30] DE VIS, Proc. Roy. Soc. Queensland, ii., 1886. pl. iii., fig. 2.
[31] R. Etheridge Jr., op. cit., p. 128.
[32] Op. cit.
[33] Op. cit. p. 127.

form outline, whilst each serration appearing in the form of a small, subtriangular bony lamella slightly emarginate at its lower edge. On the outer surface 7 foramina are present, being the outlets for the rami gingivales & cutanei rami alveolaris superioris which is given off by the nervus infraorbitalis. The two last foramina are quite close to one another, so as to form a sort of one double, „dumb-bell"-shaped foramen[34] which „enlarges inwards and upwards immediately beneath the lachrymal bone (Pl. 8, fig. 1)".[35] According to Mr. ETHERIDGE Jr. the second foramen too is double,[36] a feature not to be discerned on the figure. Thus the full number of the foramina in question would amount to 8, or, if the double foramina be counted in both cases as one only, to 6, equalling the number communicated by Mr. ETHERIDGE Jr.[37] According to this author „the two meati are united whilst still exhibiting evidence of a former separation."[38]

I should like to point out the fact that the number and disposition of these foramina varies, more or less, within all Lacertilia, as long ago stated by the late Vienna Osteologist F. SIEBENROCK in his various papers dealing with the skeleton of Lacertilians, so that one ought to abstain, in general, from indicating one certain number of them as characteristic of a species. According to Mr. ETHERIDGE Jr.: „In the Water Monitor *(Varanus salvator)* these foramina are nine in number. The posterior terminal is simply transversely elongated instead of dumb-bell shaped, and it is the most anterior, instead of the second anterior as in *Megalania,* that is double. In the Australian *V. varius* Shaw, there are again nine foramina, all single, and the posterior opening as in *V. salvator.*"[39] In a young *V. salvator* (Mus. Hung.) I too found nine foramina, though none of them being double. In an old specimen of *V. niloticus* L. (Mus. Hung.) there are 10 foramina on the right side maxillary, 6 of them lying in one line just above the crista dentalis, and 4 much higher, on, and inward from, respectively, the strong crest delimiting, in senil specimens of the species, the base of the ala superior,[40] whilst

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[34] ETHERIDGE, op. cit. p. 128.

[35] L. c.

[36] L. c.

[37] Op. cit. p. 127 & 128.

[38] Op. cit. p. 128.

[39] L. c.

[40] This one ends in a crest meeting the intranasal bone, and was named, by me, in my Monograph (op. cit. p. 383 & 414: on Fig. 16c), crista nasalis. I

the left maxillary of the same individual exhibits 13 foramina, 9 in one line above the crista dentalis, and 4 on, and inward from, respectively, the crista narialis oss. max. (mihi); another, nearly grown up, though considerably smaller specimen of the same species (Mus. Hung.) counts 15 foramina on the right, and 13 on the left maxillary both their number and disposition varying on either side. The skull of an adult *V. Dumérili* (MÜLL.) SCHLEG. (Mus. Hung.) counts 9 foramina on the right, and 8 on the left maxillary, none of them passing over to the ala superior. — These accidentally choosen examples, drawn from Varanians, may sufficiently prove what an inconstancy with respect to number and disposition the foramina in question are setting forth within the Lizards.

With respect to these nerve-outlets there remains but one point I should like to touch upon. Mr. ETHERIDGE Jr., in referring to the foramina dealt with, designates them as „foramina of the maxillary artery branches (anterior branch of external carotid)",[41] and this designation prevails throughout all his discussions of, or references to, the subject.[42] This designation, though not being, in any way, incorrect, is, nevertheless, unusual and not precise enough.

The osteology of Reptiles is very well known and thoroughly studied, indeed, whilst most insufficient attention has been paid to those details, even within the domain of osteological research, which bear upon neurological and angiological conditions. There is, so far as I am informed, but one monographical work dealing with the brain-nerves of Saurians, i. e. a paper by J. G. FISCHER, „Die Gehirnnerven der Saurier", appeared in 1852 (Abh. aus d. Geb. d. Naturwiss., II, Abth. 2, Hamburg, 1852, p. 109—212, Taf. I—III), and but little work has been done since in that part of anatomical research.[43] No doubt, there are some modern studies on saurian neurology, among which especially those by Miss TILLY EDINGER, Francfort o/M., on the cranial nerves in fossil forms should be here mentioned, but all these papers are merely discussing various de-

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find this name to be, from the standpoint of topographical anatomy, misleading, and so I propose to change it into the correct term crista intranasalis.

[41] Op. cit. p. 127.

[42] Op. cit. 128, & 133: Expl. of Pl. VIII, sub Fig. 1.

[43] The best synoptic work we possess on the subject is, still, C. K. HOFFMANN's, in BRONN's „Klassen u. Ordnungen", but this one dates from the end of the last century, and cannot, thus, correspond to all the requirements arising in the course of modern inquiry. It is just a base, and a solid one too, to build upon.

tails, so that we are, to-day, in an absolute want of a reliable, comprehensive work on the matter.

The foramina on the maxillary of Lizards are the outlets for the rami gingivales & cutanei given off by the ramus alveolaris superior — represented, in this Order, by a single nerve — of the nervus infraorbitalis, which is the second branch of the nervus maxillaris, viz. of the IInd nerve originating from the trigeminus stem. The correct name of these foramina is, thus, foramina maxillaria pro exitu ramorum gingivalium & cutaneorum rami alveolaris superioris nervi infraorbitalis, or, briefly, foramina maxillaria gingivalia & cutanea. They are known, in osteological literature, as „foramina alveolaria", an accepted, though unprecise term, the suppression of which is, hence, to be recommended. The artery passing the canalis maxillae pro ramo alveolari superiori n. infraorb. is the arteria alveolaris superior — referred to by C. K. HOFFMANN[44] as „A. dentalis superior" — belonging to the sphenomaxillary complex of the arteria maxillaris interna given off by the art. carotis externa. Its rami gingivales, and cutanei — for, apperently, such are also present — are going through the foramina gingivalia & cutanea maxillae. May be however, that the small artery branches passing through the foramina cutanea of the maxillary, lying above its foramina gingivalia, are sent off by the arteria infraorbitalis, constituting, thus, inlets instead of outlets as far as angiological conditions be concerned, a supposition based on the topographical conditions related to the course of the arteria infraorbitalis in Lizards, as well as on the fact that some small branches of the art. alveol. superior posterior of Mammals — man, e. g. — exhibit the tendence to fuse with adjacent branches of the art. infraorbitalis. These conditions point toward the necessity of a close examination of the relation existing between the branches sent off by the ramus alveol. sup. n. infraorb. and those taking their origin from the same nerve (n. infraorb.) in its more terminal course, i. e. rostrad from the origin of its superior alveolar ramus. It is possible, that such investigations will prove that some of the maxillary foramina here dealt with have to be looked upon also from a neurological point of view as inlets, and not as outlets, an anatomical difference to which no sufficient attention has been paid during osteological work. The terminological conclusion to be drawn from such neurological conditions would

[44] In: H. G. BRONN's Klassen u. Ordn. d. Thier-Reichs, VI, III. Abth., Rept., II. Eidechsen u. Wasserechsen, Leipzig, 1890, p. 992.

be that the rami cutanei (not the gingivales) — some or all of them — ought to be designated as rami cutanei nervi infraorbitalis, instead of rami cutanei rami alveol. sup. n. infraorb. The phlebological side of the problem is still more obscure than the neurological and arteriological one. We merely know of the existence of a vena maxillaris interna,[45] which branches off from a vena facialis — is there any v. facialis anterior and posterior in Lizards? — belonging to the system of the vena jugularis interna, and follows, somehow, the art. alveolaris superior in its course.[46]

b) Vertebral Column: With respect to the vertebral column the recent researches did not add much to our respective knowledge of some years ago. Mr. ETHERIDGE draws, in his paper mentioned, attention to certain divergences existing, in his mind, between the conditions obtaining in the figure given by OWEN of the Darling Downs dorsal vertebra and the dorsal „from the ossiferous deposit at the Wellington Caves Reserve,"[47] dealt with and figured by himself. Mr. ETHERIDGE states that the processus obliqui anteriores (or praezygapophyses) „are relatively lower in position" in his specimen than it is to be observed on OWEN's figure, they being situated „nearly on a level with the upper margin of the ball articular surface of the centrum", whilst the proc. obl. posteriores „appear to have a more solid base than those in the figure quoted." The transverse process, which is, on the right side of the fossil inspected by Mr. ETHERIDGE, „practically complete", „would seem to be constructed on somewhat more solid lines than in the type examples." On comparing the photographs accompanying Mr. ETHERIDGE's text[48] with the figures by OWEN, also reproduced in my Monograph,[49] I must confess to be unable to make out the existence of the majority of these pretended differences. The Megalanian vertebra our Museum received from Mr. LONGMAN, and referred to above, agrees in every respect with OWEN's Figs. 1 & 2 on Pl. 34 in the Phil. Trans., Vol. 171, 1881, and I find nothing to be emended on them, whatever a detail be concerned; they will ever remain classical and reliable reproductions of the very conditions existing in this singular Reptilian form. I must remark, however, that the vertebra figured by Mr. ETHERIDGE cannot, in matter of fact, be well com-

[45] Called by HOFFMANN „V. dentalis superior", in op. cit. p. 1006.
[46] Cfr. l. c.
[47] Op. cit. p. 129.
[48] Op. cit. Pl. VIII. Figs. 3 & 4.
[49] Cfr. op. cit. pp. 456—459, Figs. 32—35.

pared with the specimens shown in OWEN's figures because the originals concerned do not belong to the very same portion of the vertebral column, and so no satisfactory result can be obtained if absolute identity be searched for. OWEN's specimen referred to above, e. g., belongs to the series of the middle dorsals — neither it might be one of the anteriors within this set — whilst Mr. ETHERIDGE's remain is either a member of the series immediately precedent to the sacrum, about a dorsolumbal, or, if conclusion may be drawn from evidences obtaining (in many) a Varanian species and other Lacertilians, a second sacral, or a first or a second caudal, not yet provided with the chevron bones characteristic to the overwhelming majority of caudal vertebrae — only the first one, or ones, and, to a certain degree and in special cases, the very terminals constituting exceptions to this general rule. Thus the two vertebrae here dealt with must, eo ipso, exhibit differences evolved from their topographically aberrant lay, it being a well known fact that the vertebral column had to differentiate, with respect to function and cast of its elements, into several divisions, the mode of this portioning off mainly depending on kinetomechanical factors, which are the determiners of most the seriate gradations and modifications occurring within this range. To conclude: there are, in fact, differences to be established between OWEN's and ETHERIDGE's specimens, but these are, by no means, of any systematic or individual bearing, nor do they point to some inaccuracy obtaining in OWEN's figures; indeed, they are self-evident and compulsive, a fact that is not outstanding at all in Mr. ETHERIDGE's dealing with the subject.

Division characteristics of this vertebrae are: the very large and rather rounded ball, its height (measured vertically to the axis of body) markedly exceeding its breadth, contrarily to those vertebrae which we are acquainted with as representatives of the more rostrad series, differing in the same marking from the sacral (cfr. OWEN, op. cit. Pl. 35, Fig. 1) and, though to a less degree, from the mesial caudals (cfr. ibid.). If approximate conclusions may be drawn from conditions obtaining in the Varanians, the fact should be pointed out that in *V. griseus* DAUD., e. g., the first sacral (vert. XXX.) presents a broad and dorsoventrally much flattened ball, whilst the same part being narrower and more spherical in the second sacral; in the first and second caudal (XXXIIth & XXXIIIth vert.) we again meet with a more widened and flattened ball, the spherical form emerging again with the XXXIVth vertebra, which is the third caudal, and this shape prevails unto the terminal series, in the elements of

which this feature becomes dulled again, giving place, in the very last vertebrae, to a tiny, knob-like formation. As regards the occurrence of chevron-bones (haemapophyses), these are, to remain at the example rather accidentally chosen in *V. griseus*, absent in the first caudal, beginning with the second only, and obtaining then in every member of the caudal scale, marked even in the smallest of terminal vertebrae. The consideration of these statements may bear upon the topographical identification of the Wellington Caves Reserve vertebra, in which we have to note, furthermore, the considerable development of the upper median part of the neural arch turning into the proc. spinosus, a feature especially prevailing in the caudad aspect of the bone (cfr. ETHERIDGE, op. cit. Pl. VIII, Fig. 3), as well as the very remarkable perimeter of the (almost completely preserved right) processus transversus' swollen base. These details give raise to the suggestion that the remain here dealt with is most likely to be a second sacral, or, perhaps, as pointed out above, one of the very anterior caudals, or, finally — what seems to be the less probable — a member of the dorsolumbal division. Mr. ETHERIDGE[50] has also published the measurements of the vertebra in question, unfortunately not according to the international metric scale, but in inches. The specimen is pretty large, it belongs, thus, to an adult individual, the centre measuring 3 inches, i. e. 76·1 mm, in length. The substance of this statement is in full accordance with our knowledge about the metric conditions obtaining in *Megalania*, and its being somewhat shorter than the centrum of dorsals belonging to series more rostrad in position, strengthens, by means of analogies gathered from modern Reptiles, especially Varanians, the suggestion that it may be looked upon as a second sacral (or one of the very first caudals?). The „Vertical, or longitudinal, diameter of ball" measures 1 inch & ½ i. e. 38.15 mm, whilst its transverse diameter measuring 1 & 5/8 of an inch, i. e. 41.27 mm; the difference between its height and breadth results thus, in 3.12 mm. In the anterior dorsal our Museum received from Mr. LONGMAN, the vertical (correctly subvertical) diameter of ball measures 41.4 mm, and the transversal 52.8 mm, the difference between the two diameters consisting in 11.4 mm, what means that the difference between height and breadth of ball is, in the anterior dorsal examined, but 8.28 mm more than it is in the presumable IInd sacral described by Mr. ETHERIDGE. Despite of this trifling metrical aberration in the proportion between height and width of the ball in

[50] Op. cit. p. 130.

the two vertebrae concerned, a very marked difference is set forth in their shape. The caudad aspect of the ball proves spheroid in the supposed IInd sacral, whilst appearing hemispheroid in the anterior dorsal, where the basal plane of the hemisphere is level with the centre's flat ventral surface. With respect to the measurements communicated by Mr. ETHERIDGE I am obliged to add the remark that I am unable to make out what is to be meant under the "Vertical, or longitudinal, diameter of centrum", the l e n g t h of the latter being indicated at the head of the measurement's column, and this plainly intelligible datum (3 inches) considerably differing from the unintelligible one just cited (1 inch & $^3/_8$) — though, no doubt, everybody will, and with full right, suppose that the "length" and the "longitudinal diameter" of the very same object have to represent the very same distance too!

With respect to our knowledge gained, by means of a pretty large material, of *Megalania*, we come, thus, to a rather unsatisfactory conclusion. Notwithstanding all the particulars having been published on this huge Pleistocene Reptile, we do not possess, as yet, a detailed and precise description of its single skeletal elements, nor a synoptic one throwing light upon the question how its skeleton was built up as a whole. And though, such a study, done with system, from step to step elucidating the various problems offered by the so little-known and so much neglected topographical morphology of the skeleton, is the only means to throw light upon the organization of this importaint fossil being. Nay, it's the only way to catch sight of its kinetomechanical peculiarities, enabling us to give an outline of its mode of life and to offer a reliable reconstruction of both its whole skeleton and exterior habit, complying thus with the fundamental requirements of modern Paleobiology. It should be, thus, suggested to those who are lucky enough to dispose of a large Megalanian material, I mean especially to the Australian Colleagues, to fill up, at the earliest convenience, these gaps left untouched by our scientific precursors.[51]

Turning to the question whether *Megalania* possesses or not structures to be identified as zygosphenes and zygantra, facts concerned may be resumed as follows: Mr. LONGMAN is perfectly right when stating that the Megalanian vertebrae do not possess "strongly developed" structures of that kind. The ostoses I designated as zygosphene and zygantrum are "strong" only if they be considered in se, but

[51] Cfr. p. 460 of my quoted Monograph.

they are rather weak, indeed, if they are compared to the considerable bulk of the whole vertebra. With respect to this proportion I should like to refer to another one, paralleling it, as offered in the relation existing between the size of the neural aperture and canal, respectively, and the dimensions of the vertebra itself. I have already pointed out, in my Monograph previously cited, the extreme smallness of the neural canal in *Megalania*,[52] a feature proving the predominance of the skeletal system upon the nervous one, and characteristic of many a fossil representative of the Reptilian Order.[53] Very like this hypo-development of the spinal canal, we notice an „underdevelopment" of the zygospheno-zygantral structure, which might, somehow, even be dependent on, or rather causally related to, the special vertebral mechanism arisen by means of the hypertrophy of both the neural arch and centrum on the one hand, and the reduction of the neural canal on the other. For, in the course of Reptilian phylogeny, the neural canal, which was originally of an average size, has first undergone a process of reduction, to be, afterwards, secondarily increased. And inversely the same course of evolution was followed by the bony tissue's mass, consisting in an originally moderately developed centre and arch, gradually augmenting in bulk, to be again weakened in the modern offshoots. We must not forget that the zygospheno-zygantral articulation determines, in a very definite way, the kinetomechanism of the vertebral column, and that the bulk and the lumen of the vertebrae are most important determiners in their bearing upon the actions of animal movement in general, and upon the development of vertebral detail structures in particular. So it will surely not be indifferent to the formation of a zygosphene and zygantrum, whether the vertebra concerned is of a great bulk and provided with a small spinal canal, or if it is, on the contrary, light-built and presenting a spacious lumen. I do not think, however that there is any c o r r e l a t i o n obtaining between the formation of a zygospheno-zygantral articulation and the degree of spaciousness of the spinal canal — I do merely believe that the special type of the former may be very much dependent on the latter. That means my supposing the existence of a r e l a t i o n between the two structural peculiarities mentioned, viz. of a one-

[52] Op. cit. p. 455 & 460.

[53] Cfr. Dr. Baronin A. M. v. Fejérváry—Lángh, Beitr. z. einer Monogr. d. fossilen Ophisaurier, Palaeont. Hungar., I, 1921—1923, 1923, p. 215—216.

sided evolutionary dependency of one character on another.[54] After this remark bearing upon the biomechanically determined development of the Megalanian ostoses here dealt with and of their antagonistic hollownesses, I wish to point to the conclusion I draw from all evidences concerned: The ostoses at stake are epistatic orirments of zygosphenes, what means that the zygosphenes of *Megalania* are fixed in a phase of paracmic evolution, i. e. they are in a state of paracmic epistasy. And the same obtains, of course, for the shallow impressions on the caudad surface of the neural arch, interpreted by me, in my Monograph, as zygantra. Thus, though on the one hand accepting without reservation Mr. LONGMAN's opinion that I was mistaken in stating *Megalania* to possess „strongly developed" zygosphenes and zygantra, I am compelled on the other to positively state, under the weight of compulsory evidences, that the homologization of the features in question as zygosphenes and zygantra, objected to by the eminent Australian Zoologist, proves to be practically correct. It is absolutely impossible to acknowledge that the „small lateral tubercles" given off by the „small and irregular area above the neural canal on the anterior side" are to be regarded, with respect to their homology, as outgrowths belonging to a recess „mainly composed of the anterior ridge of the neural spine." A processus praespinalis (F.-LGH., 1923) as described by HILGENDORF[55] in *Ophisaurus moguntinus* BTTG. (= *Propseudopus Fraasi* HILG.) and by Baroness DE FEJÉRVÁRY-LÁNGH[56] in *O. moguntinus*,

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[54] I care to observe that I consequently adhere to Prof. DÜRKEN's terminology bearing upon what I whish to designate as the aetiognosy and nomognosy of the organic features' individual and ultra-individual, i. e. euthygenetical and phylogenetical, evolution. If characters be bionomically examined and parallelled from the view-point of organic mechanics, we may distinguish, according to DÜRKEN, three main types of their co-occurrence: 1° the relation, consisting in a one sided evolutionary dependency of a character from another; 2° the correlation, which is the mutual biomechanical affect directly produced by the parts or organs at stake (functional interaffect, reciprocate irritation, determining individual and ultra-individual mode of development, either „growth" or decrease); 3° the combination, consisting in a functionally and, thus, morphogenetically so to say „independent" co-existence of the features bionomically (i. e. aetiognostically and nomognostically) analysed with respect to the fact of their simultaneous presence in the organism dealt with. (Cfr. B. DÜRKEN, Einführung in d. Experimentalzool., Berlin, 1919, p. 129).

[55] Die Steinheimer Gürteleidechse Propseudopus Fraasii, Zeitschr. d. Deutsch. Geol. Ges., XXXVII, 1885, pp. 358—378, Taf. XV—XVI.

[56] Op. cit. p. 175 & 211, Taf. III, Fig. 4, Taf. IV, A: Fig. 16 (process marked „z").

O. pannonicus KORM. and *O. ventralis* L. — it being in the latter species extremely developed, so as to form quasi a second proc. spinosus — occurs in many Reptiles, among them in Varanians too,[57] but this formation, effectively belonging to the neural spine recess, is absolutely different from what we are discussing in *Megalania*. The vertebrae of *Megalania* are, without being in any way pachyostotic, so heavy-built, so massive — rather hyperostotic — that it is quite natural that the formation of the orimental zygosphenes, as well as that of the zygantra depending upon them, shows quite different particulars than in the cases of light-built, slender skeletons. The „irregular area above the neural canal on the anterior side" proves, however, both in position and structural details, a typical zygosphene, and my interpretation concerned has been strengthened upon the autoptical evidence offered by the splendid vertebra our Museum owes to the much obliging generosity of Mr. LONGMAN. Besides, my indentification has been smoothly accepted, without the slightest objection, by a series of specialists, so by Prof. BROILI, Dr. CAMP and Baron NOPCSA, who all, since, refer to *Megalania* as possessing vertebrae provided with zygosphenes and zygantra. In the characterization of the group referred to by Baron NOPCSA,[58] under the name of „Megalaninae" this author very correctly remarks: „small zygosphen present", in opposition to his Dolichosaurinae — gathered with the former „subfamily" and with his „Varaninae" into the compass of his (nomenclaturally non-valid) family „Platynotidae" — which are stated to possess a „strong zygosphen". By this morphologically exact statement my previous mistake has been silently emended in literature, and, so far as the actual estimation of the detail in question be concerned, nothing remains to be added to the subject.

Closely connected with considerations bearing upon the bionomical and biohistorical evaluation of the structure peculiar to Megalanian vertebrae, one point is still left to be here discussed. That point consists in the determination of the systematical position, i. e. the phylogenetical relation, of this Australian Reptile. In my Monograph of the fossil Varanidae and the Megalanidae (1918) I assigned the systematical place of the latter family, provisionally, within the bounds of the Suborder Platynota D. & B. (fam.) emend. FÜRBR. (sensu FÜRBR.), marking the conditionality of such arrangement by

[57] Cfr. LONGMAN, op. cit. p. 22.

[58] The Genera of Reptiles. Palaeobiologica, I. Band, 1928, p. 177.

a note of interrogation appended to the suborder name.[59] The name of the Gens was left as problematic throughout, it being substituted by an interrogation mark only. To-day, after our notions of the Platynota have been maturated and more clarified by further work and new evidence, I am up to say more about that question too. *Megalania*, though very specialized in its osteological characters, the most prominent feature of which consists in the decidedly p a c h y o s t o t i c construction of the vertebrae, proves, nevertheless, intimately related to the Varanians, so that we have, indeed, to assign its place within the genetical unit formed by the Suborder Platynota. Now, that we know the upper jaw too, there cannot be any doubt about the correctness of such arrangement. *Megalania* represents an extinct, Pleistocene side branch of the Platynota stem, characterized by, if one may say so, a „pathological" penchant in its skeletal evolution, and resulting in a sort of incipient pachyostosis, and a series of other peculiarities, partly dependent on, and, probably, partly responsible for, its phylogenetical and, thus, morphological and systematical, differentiation. It certainly deserves, in systematics, a family rank, but there is no evidence at all to be produced in favour of a suborderly or at least gential separation from the Varanians. In my mind it has to enter the Gens Varanomorpha FÜRBR., though as a separate family, Megalanidae FEJÉRV. In the present osteological discussion that hasty touch upon the systematical position of the form shall suffice to the purpose, for the train we are following in the general treatment of our subject will, in this case too, require a final and conclusive revision of the phylogenetosystematic results we arrived at by means of considering and reconsidering the results afforded by morphological analysis. So I will have to return, at the end of this paragraph, to this subject.

D e s c r i p t i o n o f t h e D a r l i n g D o w n s v e r t e b r a i n t h e H e r p e t o l o g i c a l C o l l e c t i o n s o f t h e H u n g. N a t. M u s e u m s ' s Z o o l o g i c a l D e p a r t m e n t (Mus. Hung. Rept. No. 2778). H a b i t stout, arcus nearly twice as broad as long, heavy built in its anterior part, comparatively light built in the posterior one; ball large, hemispheric, strongly projecting; shaft (glenoid cavity) of medium depth, broadly and rather deeply sinuate caudad; neural canal very narrow, anterior vault tripartite; spinous process anteroposteriorly pretty broad, rather steep. — D i v i s i o n c h a r a c t e r i s t i c s pointing to its being an anterior

[59] Op. cit. p. 449.

dorsal vertebra, i. e. to its belonging to the series immediately following upon the cervicals; owing to lack of material numeric identification inexecutable.

Centre very massive, short and broad, gradually tapering towards the ball. Greatest width of ball but somewhat less than greatest width of shaft.

Shaft, in the whole, deeply hollowed, subhemispheric, its dorsal edge is damaged severely enough, so as to prevent the establishment of the morphological details concerned. Ventral edge not complete either, though much better preserved; not sharp, rather rounded, but moderately protruding, only laterally somewhat torous. The shaft is about 1.4 times as broad as long (breadth and length reckoned in accordance with the natural orientation of the vertebra as afforded by the conventional morphological estimation of the Vertebrate organism). Depth of shaft, measured from the middle of its (damaged) upper margin to the deepest point of the concavity, about 2.5 times contained in its horizontal diameter, i. e. in its greatest width referred to above. Lateral parts of lower edge rather acutely bending upwards, so as to meet the upper edge (as it appears in its damaged state) in a visibly protruding point forming an angle of about 115°. The broken surface shows a pretty high degree of mineralization, also proved by the considerable weight (655 g.) of the specimen. The spongiosa becomes clearly visible, especially on a larger fracture present on the left side, on the limit between centre and neural arch, and, so far as structural details may be revealed on ground of macroscopical inspection, a slight indication of pachyostotis's having set in appears to be ascertainable.

The ventral surface (Text fig. 1)[60] of the centre is smooth enough, presenting a faint sculpture only, which consists in medially converging fine structure furrows implied by the genesis of the bone. No margo inferior centri vertebrae (Fejérv., 1918), and no sulcus medianus centri vertebrae (Fejérv., 1918, emend. Fejérv., nunc) either, the latter being, as a rule, characteristic, in Lacertilians, of caudal vertebrae only. Two vascular canals open, by foramina almost symmetrically disposed, on the ventral surface of the centre, at a distance of 27.4 mm. from one another, and close enough (7.4 mm., on the less injured left side) to the medioposterior edge of the cup. These foramina that are to be found in the cervicals and dor-

[60] The text figures are made after drawings of Mrs. T. Szalai, after the death of the author, on directions of the editor.

sals of most Lacertilians, appear to be the inlets for nutritive branches given off by the dorsal branches of the intercostal arteriae, which, in turn, are the ramifications of the common stem of the arteriae subclaviae, and of the geminous blood vessel RATHKE designated as representing the arteriae vertebrales in Lacertilians, respectively.[61] These foramina may be named,

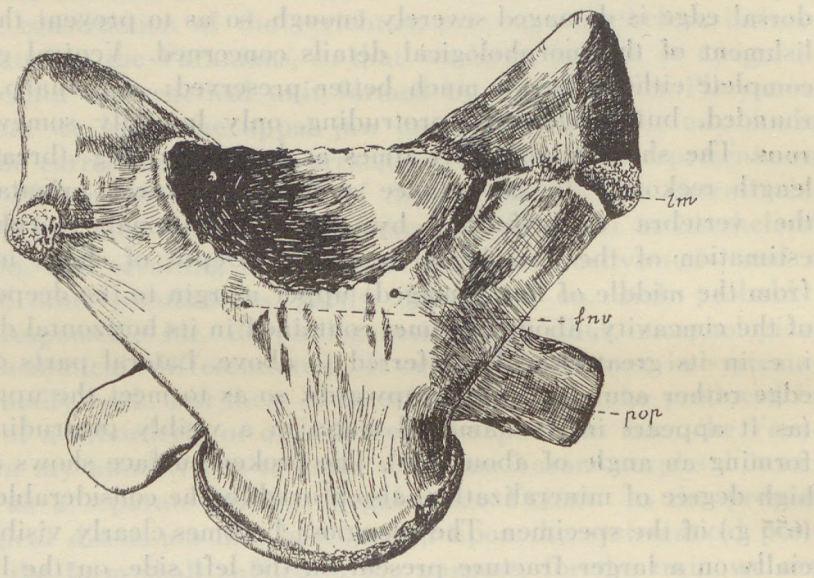

Fig. 1. Dorsal vertebra of † *Megalania prisca* OWEN. Darling Downs, Queensland, Australia. — Mus. Hung. Rept. No 2778. — ⅔ of the nat. size from the ventral side. — *fnv* = foramina nutritiva ventralia; *tm* = tuberculum II. (mediale) faciei costalis processi transversi; *pop* = processi obliqui posteriores.

thus, foramina pro introitu ramulorum nutritivorum ventralium ramorum dorsalium arteriarum intercostalium, or briefly foramina nutritiva ventralia. The centre is slightly but distinctly swollen in its anterior half, the swellings occurring bilaterally, and gradually going over into the more flattened ventrolateral part of the centre, which meets the antero-lateral portion of the neural arch's basal recess, with which it confounds itself without being marked off by any macroscopically available trace of delimination. Ventrally these swel-

[61] Cfr. C. K. HOFFMANN, in: H. G. BRONN's Klassen u. Ordnungen, vol. cit., p. 994—995. — I wish to express, in this place, my very best thanks to Prof. Dr. A. ZIMMERMANN in Budapest, to whom I am indebted for valuable informations on angiological lines.

lings are gradually disappearing within the area of the centre's two lateral thirds, the foramina nutritiva still lying on the „slopes" of them, but quite close to the practically even, nay, in the anterior part rather slightly sunken, median zone of the centre. Posterior to the bilateral swellings here described, the ventral surface of the centre appears sinuate, the sinus resulting in a moderate lateral furrow on either side, submarginally delimiting the ball. The angle described by this sinuation measures about 15°. The lateral edges of the ball are fairly projecting, whilst the rest of its ventral margin is so much worn that nothing else than the presence of a very shallow furrow can be established.

The dorsal surface of the ball is pretty smooth, nay glossy in many a part. The injured portions reveal a fine and rather dense texture. The shape of the ball's dorsal surface is practically that of a tetartosphere's. The furrow described as a prominent feature of the centre's sides proves to be yet more sharply marked, i. e. deeper and better delimited, if its dorsal course be followed. It delimits the ball from the rostrad portion of the centre, and acquires its greatest width in the part that faces the neural canal. It constitutes the very precondylar circuit of the centre, and may be, therefore, designated as sulcus pericondyloideus centri vertebrae (Text fig. 2). That pericondyloideous furrow is very characteristic of the Megalanian vertebrae, being much less marked in Varanians, even if large species — either recent or fossil — be concerned. The greatest width of the furrow measures, in the median line, where it separates the ball's margin from the very prominent, sharp edged, triangular elevation constituting the posterior end of the crista medialis canalis vertebralis (Fejérv., 1918), about 3.9 mm.

The dorso-lateral part of the centre ascends, immediately anterior to the pericondyloideous furrow, in forming a fairly wide angle which measures about 80°, unperceptibly going over into the neural arch. That dorso-lateral surface is plane enough producing, on either side of the centrum, a hardly perceptible swelling, anterior to which a very shallow suboval hollowness appears on the latero-basal part of the neural arch. A broadly rounded edge, or rather bending, delimits the dorso-lateral surface of the centre from its ventro-lateral one. This bending continues in forward direction, extending upon, and becoming more marked in, the transverse process of the neural arch. The mean angle of the bending measures about 107°, what corresponds to the width of the angle enclosed by

the postero-dorso-lateral and postero-ventro-lateral demarcation lines of the facies costalis.

The vertebral (or neural) canal presents very peculiar features with respect to both its size and structure. It is, as stated above, very narrow, though broad enough at its anterior opening; its anterior

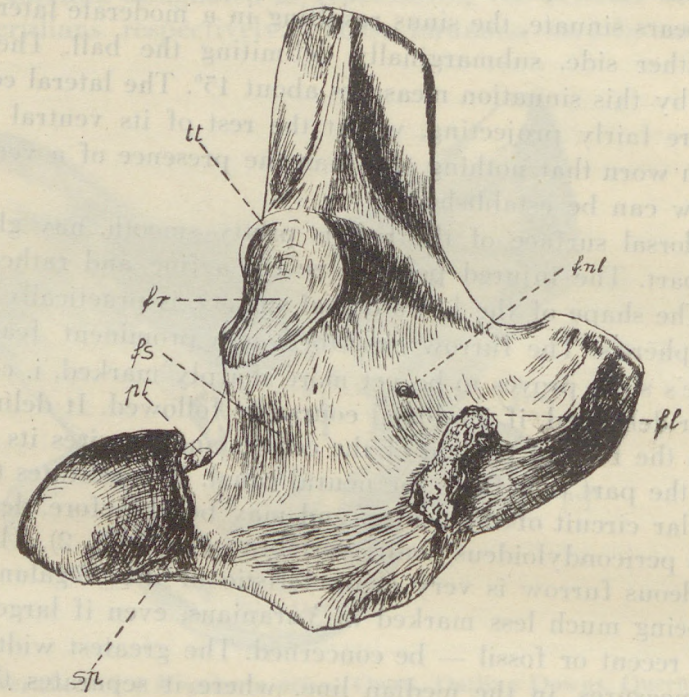

Fig. 2. Same dorsal vertebra, lateral view. — *tt* = torus terminalis proc. obl. post.; *fr* = facies rhomboideae; *fs* = facies subrhomboideae; *pt* = proeminentia triangularis anterior canalis vertebralis; *sp* = sulcus pericondyleoideus centri vertebrae; *fnl* = foramen nutritivum lateralis; *fl* = fossa lateralis arcus vertebrae.

width is contained about 5.85 times in the distance between the most prominent points of the facies costales, which measures (with the addition of 2 mm that are reckoned for the benefit of the damaged surface of the left side facies costalis) 132.1 mm, whilst the mentioned width of the vertebral canal equals to 22.5 mm. This measure does not yet strikingly reveal the narrowness of the vertebral lumen, which will be brought into prominence if the relation between the, let us say so, „normal"-sized shaft and the maximum anterior height of the spinal channel be considered. The shaft's height being comparatively somewhat more than it uses to be, in the next related Varanians, it

is its width—which proves of the average Lacertilian type — that shall stand here. Anterior height of vertebral canal at highest point, i. e. in median line, 8.61 mm, whilst greatest width of shaft (i. e. in its horizontal median line) 57 mm. If the former measurement be compared to both the latter one and the greatest width of the spinal channel, as indicated above, the result will prove self-speaking, affording clear evidence as to the singular form and size of the vertebral lumen in *Megalania*.

It is important to note, in this place, that such conditions are obtaining throughout the whole course of the vertebral canal, as may easily be stated from the respective figures published by Sir R. Owen and Mr. R. Etheridge Jr. I wish to point out that circumstance because of some parallelism obtaining between *Megalania* and Dinosaurs: *Megalania* is a heavy-bodied form, its skeleton shows an excess of ossification, at least so far as the vertebrae are concerned — strangely enough the cranial elements and limb-bones do not take share in that physiological process — and the pituitary cavity (fossa hypophyseos or pituitaria) of the skull is, in comparison to the capacity of the osseous cranium, abnormally large, a fact which suggested to the writer the inference that in *Megalania* a pathological gigantism might have set in as a consequence of the hypertrophy of the pituitary gland.[62] Now, in spite of such analogies, there are marked differences in the bionomy of the evolution of *Megalania* and Dinosaurs. Though the brain-case is very small in both forms, we are facing in Dinosaurians structures that point to a very voluminous content of the spinal canal, the latter one getting very spacious in the sacral region, so as to prove, in that place, of a very much larger capacity than the osseous cranium — whilst in *Megalania* the relation existing between these two capacities keeps close enough to the proportion-rate characteristic of Lacertilians, nay there is a decided shifting of the values to the benefit of the brain case's content. Briefly: the brain case of *Megalania* proves very small in comparison to the huge body and the spacious pituitary cavity, but it is still relatively large if compared to the spinal canal. It must be confessed that the bionomical interpretation and explanation of these highly interesting facts is yet a matter of future investigation, since both the aetiognostic and nomognostic sides of the problem are, at the present day, totally obscure. The one thing I dare to fix is

[62] Nopcsa: Über Dinosaurier. II: Die Riesenformen unter den Dinosauriern. — Centralb. f. Min. 1917, pp. 332—348, 3 Fig.

that in *Megalania* there are decided traces of a rather pathogene gigantism, that process having mostly affected the vertebral column, and being at the same time combined with another pathogene train of development, apparently prevailing in vertebrae and ribs, the structure of which seems to be retraceable to something like pachyostosis and osteosclerosis.[63] If there is any direct connection between the factors that produced the gigantic characters and those

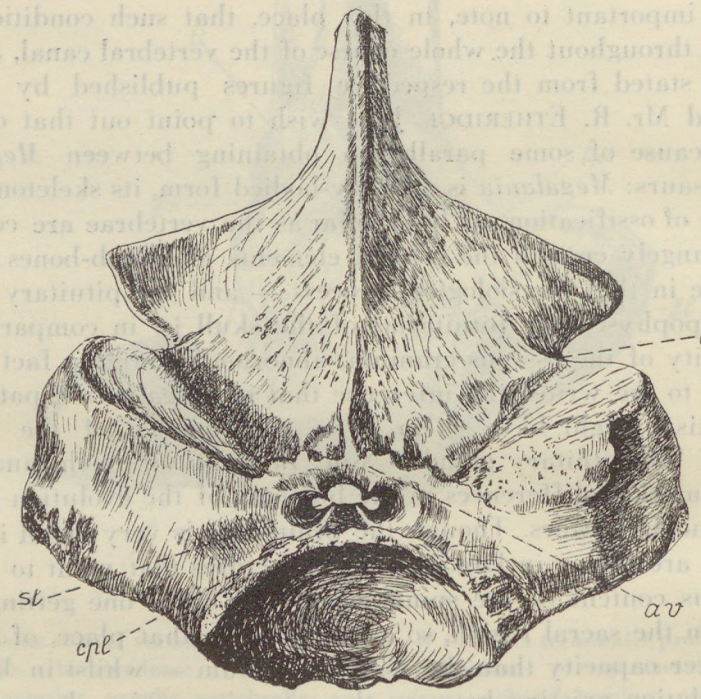

Fig. 3. Same dorsal vertebra, anterior view. — *sl* = sulcus lateralis canalis vertebralis; *cpl* = cristae posterobasilaterales canalis vertebralis; *av* = pars tectiformis arcus vertebrae; *il* = incisura lateralis arcus vertebrae.

which provoked the pachyostotical features, and, supposed that such should have existed, in what they consist, and if they enter the biodynamism of relations or correlations — these are questions which we cannot answer until further notice.

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[63] Nopcsa: Vorläufige Notiz über Pachyostose und Osteosklerose einiger mariner Wirbeltiere. Anat. Anz. 36, 1923, pp. 353—359, and Eidolosaurus und Pachyophis, Zwei neue Neocom-Reptilien, Palaeontographica, 65, 1923, pp. 99—154, 2 Taf. (see pp. 112—117).

Inspecting the spinal canal in front view, it appears, as stated above, tripartite (see Text fig. 3). This tripartition is due to the very strong development of the cristae laterales canalis vertebralis (FEJÉRVÁRY, 1918) which are debouching from the spinal canal in the form of v-like thickenings projecting from the sides of the upper vault, formed by the neural arch, of the spinal canal and well visible on its anterior limit. The medial part of the vault is about twice as broad as a lateral one, the lateral parts being the front ends of the sulci laterales canalis vertebralis (FEJÉRV., 1918). These lateral furrows are very strongly marked, because of the most prominent keel formed by the cristae laterales dorsally delimiting them, and deeply hollowed into the fusion zone of arch and centre. These furrows, characteristic of other Lacertilians, Varanians, e. g., as well, are apparently the osseous „beds" for two, out of the three, venae spinales — I would suggest to call them venae spinales laterales — which are given off by the venae intervertebrales, the latter opening, in their turn, into the vena cava inferior. Thus the furrows, designated by me as sulci laterales canalis vertebralis should be, more correctly, called sulci canalis vertebralis pro venis spinalibus lateralibus. The crista medialis canalis vertebralis (FEJÉRV., 1918) appears, in its anterior part, in the form of a large, feebly convex, almost flat triangular prominence, the triangle thus formed being isosceles. The basis of the triangle cannot be seen, for the anterior margin of the neural canal's floor is severely damaged. The point in which the two (lateral) sides of the triangle are meeting is directed caudad, and protrudes into a sharp crest gently sloping to, and vanishing in, the floor of the spinal canal. A faint indication of the crest again appears at the posterior mouth of the vertebral channel, where it rises abruptly, nearly vertically, into a small, equilateral triangular elevation, separated from the ball by the submarginal furrow designated, here above, as sulcus pericondyloideus centri vertebrae. The two lateral points of that triangle are protruded into very fine, but sharply prominent crests anteriorly delimiting the pericondylear furrow and ending with the two lateral corners of apparently the spinal canal's posterior opening, which are, in fact, the posterior ends of the furrows for the lateral spinal venes, and practically lying already without the real confines of the vertebrae's canal, and though at the very base of the neural arch. The anterior triangle should be termed proëminentia triangularis anterior canalis vertebralis, whilst to the posterior one the name proëminentia triangularis canalis

vertebralis should be conferred. The median crest, interrupted in the middle, and connecting the two prominences mentioned is the crista medialis canalis vertebralis. For the two fine, though strongly marked, crests sent off by the two lateral points of the posterior prominence I wish to propose the name cristae posterobasilaterales canalis vertebralis. The posterior opening of the neural canal appears horizontally bipartite, the bipartition being due to the cristae laterales

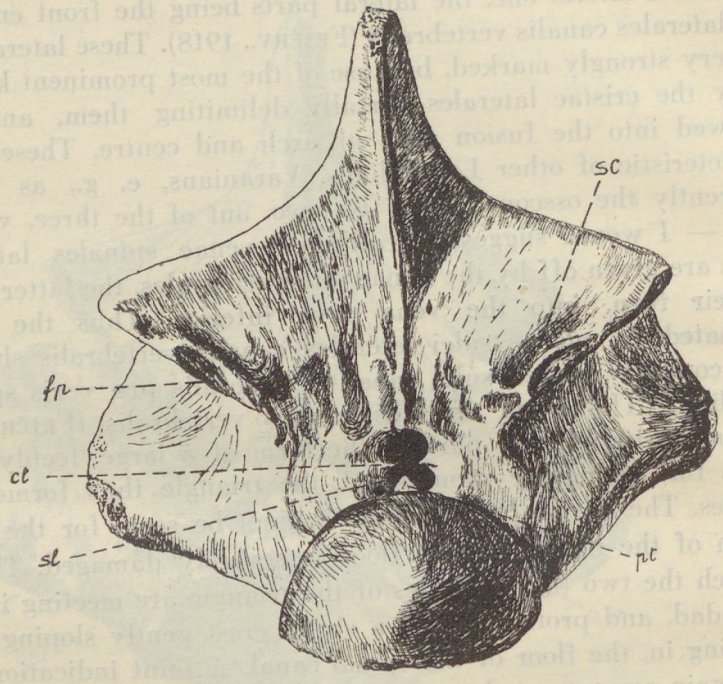

Fig. 4. Same dorsal vertebra, posterior view. — *fp* = fovea paraglenoidea; *cl* = crista lateralis canalis vertebralis; *sl* = fossa lateralis arcus vertebrae; *sc* = sulcus connectens arcus vertebrae; *pt* = proëminentia triangularis anterior canalis vertebralis.

canalis vertebralis, which are terminating in this place, diverging from one another in lateral sense and gradually vanishing in the sides of the neural arch.

The spinal cord evidently occupied the upper portion of the vertebral lumen, i. e. the part superior to the cristae laterales and immediately underlying the vault of the canal. The spinal cord must have been, thus, according to the moderate space left for it, but of about the same volume per dorsal vertebra as the lateral spinal venes together. It obviously touched the floor of the canal, i. e.

the dorsal surface of the centre, in its anterior recess only, viz. so far as the anterior triangular prominence of the spinal canal reaches. Proceeding caudad, just before reaching the intervertebral space, it might have skimmed the vertebral canal's posterior triangular prominence (Text fig. 4.) though there are no cogent morphological proofs in favour of its having really done so: for the morphological and topographical conditions obtaining in the posterior portion of the neural canal make allowance for the supposition of the spinal cord's eventually having been separated from the said prominence by means of connective tissue that partly sundered, and, may be, partly overlaid the lateral spinal venes at their exit. In the latter case the spinal cord would have been excluded from the contact with the posterior osseous floor of the canal. There is, of course, no coercive evidence to be adduced to the benefit of such possibility. The osteological conditions, upon which these neurological and angiological inferences are based, are so plain (cfr. Pl. II. Fig. 3 & Pl. III. Fig. 1) that they need not to be more closely explained to the reader who will find them speaking for themselves. The striking fact resulting from such analytic considerations is that the volume of Megalanian spinal cord proves to have been smaller even than we actually thought up to now. Those who are in the lucky position to dispose over full material may easily calculate the proportional ratio of spinal cord's volume and general body bulk, vertebral column bulk, &c., in *Megalania*, deriving, herefrom, valuable bionomic conclusions as to the peculiarities of this gigantic Lizard if compared to other forms, its nearest allies, the Varanians, in particular. I would, especially, recommend a thorough comparison with the famous Komodo „Dragon", *Placovaranus komodoënsis* Ouw., the habit, skull and geographical occurrence of which seems particularly suggestive of drawing such parallel. We should also think of the question if *Megalania* too did not, after all, possess dermal ossifications? That possibility should be kept in view in both instances: either palaeontological field work or museal revision be concerned.

As to the neural arch the most striking peculiarity consists in its shortness and considerable breadth — *Megalania* is, herein, approached, among Varanians, by *V. sivalensis* Falc. only — as well as in its dorsal surface being very oblique: the angle enclosed by it and the median surface of the vertebral canal's anterior triangular prominence measuring about 41°. It is by this strong declivity and the very narrow spinal canal running, as it obviously has to, horizontally enough, that the enormous bulk of the neural arch, especial-

ly in its posterior portion, is brought about as a geometrical and mechanical implication. Despite of the considerable mass of bone occurring in consequence of the configuration just referred to, the anterior part of the neural arch appears even more massive and heavy built, than the posterior one, for it is much broader, the processus obliqui anteriores being considerably larger than their posterior analoga. Left proc. obl. ant. damaged on its anterior surface. Spinal canal anteriorly fully protected by the neural arch rather protruding over the limit of its floor in rostrad direction, whilst the posterior end of its floor remains, to about the half length of the posterior triangular prominence, uncovered, because of the neural arch's being, in that place, slightly concave in postero-anterior sense.

The articulation surface of the processus obliqui anteriores is, on the whole, smooth and even, rounded on the lateral (exterior) edge, leaf-shaped, with obliterate, though comparatively broad structure lines running parallel with its outlines. Greatest distance between lateral edges of proc. obl. ant. 112.1 mm. Angle enclosed by proc. obl. ant. and the imaginary line connecting the medio-basal (interior-basal) points of them, measuring about 140°. Anterior intervertebral surface of them, i. e. the facies subrhomboidae (FEJÉRV., 1918, emend. F.-LGH., 1923), very large, gradually gaining in convexity toward the supero-lateral edge, rather even in the supero-medial portion. Sulci connectentes arcus vertebrae (FEJÉRV., 1918) very shallow, faintly marked. Lower anterior surface of facies subrhomboideae slightly concave in their medial portion forming an expanded continuation to either of the sulci connectentes, and going over into a slight convexity in the lateral portion. Comparatively faint indications of the foveae paraglenoideae (FEJÉRV., 1918, emend. F.-LGH., 1923, & FEJÉRV., nunc[64]) are to be found at the infero-lateral basis of the facies subrhomboideae, medially of, and contiguous to, the inferior part of the facies costales. This structure is very obliterate on the left side, whilst on the right it assumes the aspect of a horse-shoe-like impression, the open part of which is turned upward, with a small, though well marked, tubercle lying interior to the outer (lateral) arc of the horse-shoe. Ventrally the right side fovea paraglenoidea is delimited by a strong bone ridge. It is interesting to

[64] This excavation was first described as „cava paraglenoidalis (FEJÉRV., 1918) an orthographically (for „cavum" should have stood instead of „cava") and grammatically wrong denomination, which I wish to replace by the term foveae paraglenoideae, used here above.

remark that the foveae paraglenoideae are, in *Megalania*, displaced, for they are situated on the anterior surface of the vertebrae, i. e. they lie on a subvertical plane instead of being ventral in position — contrarily to other Lacertilians, *Varanus*, e. g., in which the paraglenoidal foveae are, as a rule, of ventral position. This fact obviously demonstrates that surface location had undergone considerable change in Megalanian vertebrae: The very ventral surface of the vertebra reached, in this form, a state of visible reduction, for both the latero-ventral and antero-ventral parts got raised, such shifting in upward direction, or dorsad surface dislocation, resulting in the increase of the anterior (rostrad), the lateral and sublateral bulk of the vertebrae. It is clear that the cause of such change could hardly be other than mechanical, though the kinematic factors responsible for it are, as yet, not yet brought to light. —The lateral surface of the proc. obl. ant. is suboblong, visibly convex in the part just above the facies costalis, and vertical on the whole. The top part, superior to the convexity mentioned, shows a supine inclination. Ventrad the proc. obl. ant. are gradually going over into the proc. transversi which are bearing the facies costales, and also caudad no sharp delimitation is to be found: the lateral surface of the proc. obl. ant. is bending in medial direction and merges into the sinuation termed incisura lateralis arcus vertebrae (F.-Lgh., 1923).

Processus transversi not sharply marked, hardly standing out against the adjacent surfaces, and following an antero-lateral direction. Facies costales moderately prominent; upper border 24.6 mm distant from the supero-lateral edge of the proc. obl. ant. (vertically measured on right side); subsemilunar, with the convexity turned caudad, upper and lower outlines arcuate, moderately broad; greatest width reached in middle region, which constitutes the most prominent part of these surfaces, and measuring 8 mm; this prominent part represents the rest of the broken off tuberculum II. (or mediale) faciei costalis proc. tranversi (F.-Lgh., 1923). Otherwise the tubercula fac. cost. proc. transv. are not discernible any more; no fovea pro insertione ligamento tuberculi medialis capitis costae (F.-Lgh., 1923 emend. Fejérv., nunc). A rounded edge is running from the lower (ventral) part of the tub. II. fac. cost. — the latter being the most prominent point of the lateral surfaces — obliquely downward to the very lateral part of the sulcus pericondyloideus, gradually vanishing caudad and loosing itself in the anterior limit of the furrow just mentioned. Superior to that edge marking the postero-

ventral limit and origin, respectively, of the transverse process, a faint impression situated about 1 cm below the articular surface of the proc. obl. post. represents the fossa lateralis arcus vertebrae described by baroness de FEJÉRVÁRY-LÁNGH in the caudal vertebrae of *Ophisaurus*. On a level with the upper limit of the facies costales, or just a little above it, there is, on each side, a small nutritive foramen —foramina pro introitu ramulorum nutritivorum lateralium ramorum dorsalium arteriarum intercostalium, briefly: foramina nutritiva lateralia — which lie about midway between the facies costales and the antero-ventral edge of the proc. obl. posteriores.

Incisura lateralis arcus vertebrae subparaboloid, more rounded and open in the anterior part, because of the anterior outline's following an antero-lateral direction, more strongly bent and rather closed in the posterior one, for the posterior outline's forming an almost right angle with the longitudinal axis of the vertebra.

Processus obliqui posteriores considerably smaller than the anterior ones. Such configuration seems to be brought about by the special conditions of strain obtaining in the anterior and posterior parts, respectively, of the vertebrae: the anterior part has to support the considerable bulk of the posterior portion of the neural arch, that bulk being implied by the very strongly marked caudado rostral declivity of the neural arch and the striking narrowness of the spinal canal. The clarification of the various kinetomechanical moments that bore upon the peculiar development of the single skeletal elements in *Megalania* is, as stated above, a task incumbent upon those specialists who are gratified with more or less full sets of the material concerned. — The dorsal surface of the processes under inspection is slightly convex, following a downward direction in distal sense; it is rather smooth, with fine structure lines running parallel to the direction followed by the processes themselves, i. e. at right angles to the longitudinal axis of the vertebra. Greatest distance between lateral edges of proc. obl. post. 111.5 mm. — The posterior (caudad) surface is very large, presenting the shape of an acute-angled equilateral triangle on either side; the facies rhomboideae (FEJÉRV., 1918, emend. F.-LGH., 1923) are, thus, pretty large; they are marked with faint subvertical structure lines, slightly converging towards the linea medialis (FEJÉRV.) visible on the posterior surface of the neural arch. The posterior edge of the articulation surface of the proc. obl. post. is enlarged into a visibly projecting, rather broad torus terminalis proc. obl. post. (F.-LGH., 1923) which marks the limit between the oblique processes' articulation surface and their facies

rhomboideae. Close to the ventral end of these tori a small and narrow ridge is sent off on either side, ventrally delimiting the facies rhomboideae and following a slightly dorsad direction. — The articulation surface is narrow, elongate, leaf-shaped, with a few strongly marked and broad structure lines running parallel with its outlines. Distal end broadly rounded, proximal rather pointed, a moderate sinuation occurring on the posterior (caudad) edge, i. e. in the torus terminalis, the sinuation reaching from about the middle region of the posterior edge to about 1 cm before the proximal point of the articulation surface; the sinuation mentioned, which is symmetrically present on both sides, seems to be original, i. e. not due to injury during fossilization. Greatest breadth of articulation surface (measured on right side) 24.6 mm. The articulation surface is strongly oblique in proximalodistal sense, with a slight lateralorostrad-medialocaudad inclination of its plane: it meets the lateral surface of the neural arch in an angle of approximately 100°. The angle enclosed by the articulation surface and the dorsal surface, measured on the side of the facies rhomboideae, counts about 63°, being somewhat more acute if viewed from the front side.

The processus spinosus is severly injured. It is strongly developed, bilaterally much flattened, so as to be, especially in its rostrad part, actually compressed, sharply rising, though enclosing at its anterior origin, on account of the very oblique dorsal surface of the neural arch, an angle of but 33° with the latter. Thus, in comparison to the dorsal surface of the neural arch, the spinous process appears to be but a little more prone than the superior vertebral plane which in turn, forms an angle of 38° with the rather plane ventral surface of the centre. As observed usually in the bilaterally much compressed type of proc. spinosus, the said process gains in antero-posterior dimension, the present one measuring 38.53 mm in (rostrado-caudad) length. Its height cannot be established, for the distal part is wanting. A marked bilateral swelling beginning with a broad base and upwards gradually diminishing in bulk, a sort of obliterate torus, occurs on it, running parallel to its posterior edge, and forming a continuation of the postero-superior edge of the proc. obl. posteriores. This bilateral swelling gradually diminishes towards the subhorizontal posterior edge of the processus spinosus, which, however, is still about double as broad as the anterior edge, and follows its course downward, as far as the posterior dorsal vault of the spinal canal, thus constituting the strongly marked linea medialis arcus vertebrae which gradually

looses in breadth while proceeding from above to below, thus assuming an acicular form. This medial line does not appear to have formed a sharp crest, but, on the contrary, it seems to have been of a rather rounded relief. It separates the facies rhomboideae from one another. The front edge, which appears to be throughout of subequal thickness, but slightly incrassating towards the upper end of the process, gradually looses itself into the pre-median part of the neural arch, where it is marked by a faint and narrow line only, again rising then in rostrad direction, suddenly thickening, and meeting, after having thus followed its course for the distance of about 11.3 mm, the much swollen torus formed by the pars tectiformis arcus vertebrae (F.-Lgh., 1923); no pre-spinose spine.

Pars tectiformis arcus vertebrae forming an actual torus; it is posteriorly delimited by a much deepened impression, especially hollowed out at both sides of the foremost bit of crest representing the very anterior recess of the proc. spinosus and referred to at the end of the precedent paragraph. Basal width of pars tectiformis, measured between the medio-basal ends of the proc. obl. ant., 37.9 mm.

Two small tubercles, each 6.5 mm distant from the foremost crest of the proc. spinosus, and situated at both sides of the latter, are representing, together with the torus-like pars tectiformis, the primordials of a zygosphene which, in the case of *Megalania*, proves, thus, an o r i m e n t a r y formation evidently arrested in its phylogenetical development. The zygosphene of *Megalania* is, therefore, e p a c m i c a l l y e p i s t a t i c. — Corresponding to that primitive zygosphene, there is, on the mediano-caudal surface of the neural arch, just above the vault of the spinal canal, at both its ends, a vertically oval impression that represents the very primordials of a paired zygantrum which were contiguous to the two zygosphenal tubercles of the following vertebra. — Two further impressions, somewhat smaller than the precedent ones which are subequal and measure about 9.5 mm in vertical direction and 6 or so in transversal, are present at both sides of the very basal part of the linea medialis; each of them is separated from the adjacent zygantral impression by a well marked, though feebly prominent, ridge.

The dorsal surface of the neural arch is rough because of the convergent structure lines and pits arranged into series running towards the spinous process. The sculpture thus formed is most conspicuous, because most carved out, in the recess delimited by the

anterior and posterior oblique processes, being but faintly marked on the dorsal surface of the posterior proc. obliqui.

Measurements:

Total length of centre (from anterior margin of cup to postero-ventral edge of ball, in median line)	86.7 mm
Length of cup (longitudinally)	41.2
Width of cup (transversely)	57.2
From deepest point of cup to medio-posterior margin of it	25.35
Length of ball (from antero-dorsal edge to postero ventral one, in median line)	42.25
Width of ball	53.21
Height (thickness) of ball (vertically, in median line)	33.32
Median length of neural arch (horizontally, in median line)	33.6
Greatest distance between supero-distal edges of proc. obl. anteriores	112.2
Longest diameter of (right) proc. obl. ant.	42.91
From supero-distal edge of (right) proc. obl. ant. to dorsal limit of facies costalis	26.45
Greatest width (measured parallel with longitudinal axis of body) of the articulation surface of (right) proc. obl. ant.	22.—
Vertical diameter of (right) facies costalis	26.97
Greatest horizontal diameter of same	10.06
Distance between most prominent points of facies costales	130.4
From middle region of posterior limit of (right) facies costalis to dorso-lateral edge of ball (measured along rounded lateral edge on limit of arch and centre)	57.77
From foremost edge of (right) proc. obl. ant. to hindmost point of postero-ventral edge of proc. obl. post.	78.01
Distance between most distal points of proc. obl. post. edges	111.5
Greatest diameter of articulation surface of (right) proc. obl. post.	44.1
Greatest breadth of same	25.45
Distance between proximal ends of proc. obl. post. articulation surfaces	41.62
From middle region of latero-basal sinuation of proc. spinosus to most distal point of proc. obl. post. (measured on right side)	43.5

From middle region of (right side) latero-basal sinuation of proc. spinosus to top of latter (severely damaged) ..... 39.—
From fore-most point of anterior crest of proc. spin. to top of the latter 98.23
From top of proc. spin. to median point of dorsal vault of spinal canal 83.25
Anterior thickness of proc. spinosus 3.3
Greatest thickness of same at basis 23.2
Greatest thickness of same at preserved part of top 11.68
Thickness of posterior edge in middle region of the process's height 7.9
Antero-posterior diameter of proc. spin., measured at base 37.89
Transverse diameter of pars tectiformis 37.08
Median thickness of same 5.9
Height of (right side) zygosphenal tubercle, measured form dorsal level of pars tectiformis 2.73
Anterior width of spinal canal 25.82
Antero-median height of same 8.89
Anterior width of sulcus canalis vertebralis pro vena spinali dextra 6.1
Anterior width of spinal cord recess of spinal canal 13.3
Posterior width of spinal canal just above the cristae laterales can. vert. 10.33
Posterior height of spinal canal 14.3
Posterior height of spinal cord recess of spinal canal 17.3

Chapter 4: *Varanians*

Before entering the field of special descriptions, there are several morphological details bearing upon the correct valuation of the whole family Varanidae, which, precisely on account of such general import, must be first considered in this place.

A) Eidonomical and Anatomical Notes on the Nario-Loreal Region.

It is a well known fact, also alluded to by Gustav Born,[65] that in many Varanian species, indeed in most of them, the nostril forms a postero-anteriorly oblique slit, the superior and posterior

[65] D. Nasenhöhlen u. d. Thränennasengang d. amnioten Wirbelthiere. I. Morphol. Jahrbuch, Fünfter Bd., 1879, p. 124.

corner of which lies quite near to the anterior corner of the eye. Such narial slit, i. e. the nostril, leads, in *V. griseus*, e. g., into a spacious cavity, extending rostrad, which is lined with a comparatively small-scaled, wrinkled skin, the lateral (exterior) wall of the cavity merely consisting of a large tegumental fold, and being, therefore, scutellated on both its exterior and interior surfaces, the exterior narial cavities thus formed being produced by the gradual caudad extension of the skin fold anteriorly bordering the nostril. The latter is, in this way, displaced in caudal sense, i. e. it has „migrated" in antero-posterior direction. When opening this exterior narial cavity — which, to a certain degree, reminds us of the exterior auditory meatus of many Mammalians, for it exemplifies principle of formation more or less paralleling the one obtaining in the case of the latter — we find, at the anterior end of the cavity, the real, original, narial opening, i.e. the actual nostril, the posterior border of which is still marked by a very prominent postero-medial fold of the tegument lining the cavity. The biomechanical cause and the ethological significance, or importance, of this structure's having developed in precisely the Varanians, is obscure to me. It is evident that such specialization serves the protection of the narial duct and cavity, but the way in which it was brought about, and the reason why it had developed just in the Varanians — not being, however, characteristic of all species in this group either — these are questions to which, at present, I am unable to find an answer which would really satisfy scientific curiosity. It is certainly due to a complete inversion of the inference concerned, when BORN[66] writes as follows: „Der Zweck dieser besonderen Complication des Eingangs in die Nasenhöhle wurde mir durch den öfteren Befund von Zecken in der auswärtigen Vorhöhle der Saurier etwas verständlicher." Such naive mode of visualizing the problem cannot stand its ground when aiming at the development of an argument that is meant for the furthering of the investigation into the causes of developmental phenomena, which are never to be focused from a teleological, i.e. finalistical, view-point.

This feature proves very interesting if the conditions referred to be examined with respect to the connection subsisting between them and the morphology of the upper jaw. Considering the general habit of the maxillary, the existence of two main types may be

[66] Op. cit. p. 125.

established within the Varanian group. The first type, which is the more ancestral one, is represented by *Varanus salvator* LAUR., *V. prasinus* (MÜLL.) SCHLEG., *V. indicus* DAUD., and *Placovaranus*, e.g., and may be called the hypsiprosopic one, whilst *V. griseus* DAUD., *V. Dumérili* (MÜLL.) SCHLEG., and the fossil species *V. dirus* DE VIS, ident. inc., e.g., belong to the second, modern, type, which I propose to designate as the platyprosopic one. These two main types are connected with each other by a third, intermediate, type, which should be designated as the mesoprosopic one, being exemplified by, e.g., *V. niloticus* L., *V. bengalensis* DAUD., and probably (?), the fossil *V. marathonensis* WEITH.

The hypsiprosopic type may be characterized as follows: excavatio nasalis ossis maxillaris (FEJÉRV., 1918) not exceeding, in caudal sense, the posterior limit of the intranasals (= turbinals), and generally ending with about the transversal median line of the latter skeletal element; processus praefrontalis ossis maxillaris (SIEBENR., 1893) gradually rising, and, therefore, apparently long; ala intranasalis ossis maxillaris (FEJÉRV., 1918, emend. FEJÉRV.;[67] = ala superior maxillae, FEJÉRV., 1918) not *(Palaeovaranus)* or but feebly differentiated; the dorsal surface of that part of the maxillary, which lies anterior to the rostrad border of the intranasals is, as a rule, more flattened, and in some cases, more hollowed also, than in the species belonging to the platyprosopic type; hypsiprosopy is generally connected with a comparatively more flattened and longer front part of the snout (platymacrorrhiny), comparatively narrow and long narial fenestrae on the skull, rather spacious nasal cavities, and a platycephalous formation of the cranium; the distance between the tip of the snout and the very posterior corner of the narial fenestra on the skull may, in some cases, be visibly longer than the distance measured from the antero-median point of the frontal bone to the postero-median edge of the parietal one.

The characteristics of the platyprosopic type may be resumed in the following: excavatio nasalis ossis maxillaris often less marked in the pre-intranasal recess of the maxillary, and proceeding in postero lateral direction so as to first border the intranasal and to terminate, caudad, at the very basis of the rather steeply ascending and short processus praefrontalis ossis maxillaris; ala intranasalis ossis maxillaris very markedly differentiated; dor-

[67] Cfr. p. 15. of the present paper.

sal surface of pre-intranasal part of maxillary in the average more or less convex, with the excavatio nasalis oss. maxill. shallower than in the former type, or even nearly absent; platyprosopy is generally connected with a rather convex, i.e. not flattened, and shorter front part of the snout (hypsi-brachyrrhiny), comparatively broad and short narial fenestrae on the skull, nasal cavities of a more limited space, and a pyramidocephalous formation of the cranium; the distance between the tip of the snout and the very posterior corner of the narial fenestra on the skull apparently always visibly shorter than the distance measured from the antero-median point of the frontal bone to the postero-median edge of the parietal one.

The third type, which is intermediate between the two main types as outlined here above, and which was designated as the mesoprosopic, is characterized by the comprehension of mixed characters, i. e. some of its features are hypsiprosopic, whilst others prove to belong to the platyprosopic set; according to the circumstance, which complex of the characters thus gathered prevails over the other one, the species pertaining to this mixed, or transition, type, may be said either hypsiprosopoid or platyprosopoid; the much specialized *V. niloticus,* and probably (?), the fossil *V. marathonensis,* e.g., may be looked upon as representing the former kind, whilst *V. bengalensis,* e.g. should be classed with the latter.

Let us see now the connection existing between the craniomorphological specializations here discussed and the eidonomic, i.e. outer morphological, characteristics of the loreal region, among which the shape, position and construction of the nostrils prove to play the decisive rôle.

The hypsiprosopic formation of the maxillary is consequently coupled with comparatively small, and rounded nostrils, rather terminal in position, whilst the platyprosopic formation of the upper jaw co-occurs with large slit-like outermost narial openings which are displaced caudad, being, thus, very posterior in position, lying rather closer to the eye than to the tip of the snout; the nostril of such species possesses a spacious exterior meatus, lying under the two-folded, small-scaled integument, whilst the medial wall of the cavity is lined with a simple, but also scaled, integumental tapestry. Finally, the nostrils of the forms with a mesoprosopic formation of the maxillary, are intermediate, both in construction and position, between the two afore-

named types, as exemplified by *V. niloticus* and *V. bengalensis*, for instance. Both of the latter species prove, in their eidonomic characters, to be of a platyprosopoid type, despite the fact of the Nile Monitor's being in craniological respect decidedly hypsiprosopoid, and only the Bengalee Monitor exhibiting also craniologically platyprosopoid features.

Slight eidonomical gradations exist, of course, even within the frame of the two main types. Whilst *V. salvator* and *V. varius* SHAW, e.g., are typically demonstrative of the rather „terminal" position of the nostrils, *V. indicus* shows, in spite of being, in fact, both eidonomically and craniologically also hypsiprosopic, a marked tendence towards the caudad displacement of the nostrils, representing thus the very first stage that leads from hypsiprosopy to mesoprosopy which, in turn, connects the former named type with the much specialized platyprosopic one.

The caudad „migration" of the outermost nares in Varanidae is made possible, and proves to be even greatly facilitated, by the considerable reduction of the nasal bones, such reduction, or atrophy, obtaining in two out of the three genera known at present as composing the family. These two genera are *Varanus* and *Plaeovaranus*, whilst the third genus — in which, as will be shown in the present paper, the nasals are still of normal size and development — is represented by *Palaeovaranus*.

Such considerations will enable the reader to reconstruct, quite easily, by means of simple logical inference, the evolutional history, i.e., in the present case, the phylogenetical morphogeny, of the skeletal and tegumental parts here dealt with, for he is offered all the material of evidence wanted for making, himself, the only possible logical inference by means of which the thread of the evolutional changes concerned may be both well understood and correctly valued.

The establishment of the fact that the three different types of formation obtaining in the anatomy of both the olfactory and the upper part of the masticatory apparatus, is of special importance to paleontological investigation, for a small fragment of the maxillary may thus enable the searcher to draw safe conclusions as to the development and shape of quite a series of features characterizing the osteology and soft anatomy of the maxillo-nasal complex of any fossil Varanian. And he who is interested in the paleontology of this Reptilian group may even go one step further: he

may safely reconstruct the eidonomy of the loreal and rostral region of a fossil of which he possesses but a comparatively small fragment of some latero-dorsal part of the maxillary.

From the bionomical view-point it would certainly be of highest importance to decide, which etiognostically established category of morphogenetical, or geneto-mechanical, linkage the several cooccurrences of the mentioned anatomical and eidonomical characters do enter? Are we, here, in the presence of a real correlation (in DÜRKEN's sense),[68] or does a relation subsist, or is it to a mere combination that a certain position and construction of the outermost narial openings goes hand in hand with certain anatomical peculiarities of the maxillar region? Where lies the starting point of these modifications, and which are the causes that brought them about, or prevented, or retarded their development while the species proceeded along the specially conditioned line of its evolution? These are the questions that stand out in bold relief, but to which I do not venture to give any answer — for I do not find any explanation which could really correspond to such scientific requirements as would prove to be of a satisfactory, i.e. positive, and not merely speculative, kind. So we are bound to let this question open to future investigation.

B) Notes on the Lacrimal Canaliculi, the Naso-Lacrimal Duct, and their Osteographical Relations.

The substance of these notes consists in the description of the very peculiar way in which the canaliculi lacrimales of the Varanians enter the skull. Such peculiarity of the Varanian anatomy also deserves to be considered, for, so far as I am informed, it escaped the attention of even those who made special studies on the anatomy of the orbit and the nasal region of the Lacertilians. Since the investigations of F. LEYDIG,[69] M. WEBER,[70] G. BORN,[71] B. HOFF-

[68] Cfr. BERNHARD DÜRKEN, Einführung in die Experimentalzoologie. Berlin, 1919, p. 129.

[69] Die in Deutschland lebenden Arten d. Saurier, Tübingen, 1872, p. 43—44.

[70] Ueber d. Nebenorgane d. Auges d. Reptilien, Erst. Art. D. Nebenorgane d. Auges d. einheim. Lacertidae, Arch. f. Naturgesch., Drei u. vierzigster Jahrg., Erster Bd., 1877, p. 332.

[71] Op. cit. p. 99, 100, 106, 117, 120.

MANN.[72] C. K. HOFFMANN[73] and F. SIEBENROCK[74] the belief is maintained in literature that the canaliculi lacrimales of the Lacertilians enter the skull through a single hole: the foramen lacrimale, and that this foramen may be delimited in the following ways: *a)* by the prefrontal, the lacrimal and the maxillary; *b)* by the prefrontal and the lacrimal, *c)* by the prefrontal and the maxillary, *d)* by the prefrontal, the maxillary and the jugal, — the two latter named modes of delimitation obtaining in those forms in which the lacrimal became totally suppressed. From these statements it was inferred that it is wrong to speak of a „perforated lacrimal" in the Lacertilians, for the lacrimal of these Reptiles is but jagged, and not really perforated, only participating, by the medially situated jag, in the delimitation of the lacrimal foramen, and not actually constituting it. In *Sphenodon* (Rhynchocephalians) the lacrimal bone is absent, and the single foramen lacrimale is apparently delimited by the prefrontal and the maxillary.[75] Also in the Snakes,[76] that have no lacrimal bone, the foramen lacrimale is represented by a single hole only, lying within the prefrontal, whilst in the Testudinata it seems to be altogether absent.[77] Thus, among the recent Orders of Reptiles, it is only the Crocodilians in which the lacrimal bone is known to be practically perforated by the lacrimal ducts (or duct?), so that the foramen lacrimale lies, in this Order, really within the lacrimal bone itself. This condition is, however, regarded by B. HOFFMANN[78] as a secondary acquisition, for he states: „Im Speciellen liegt der

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[72] Die Thraenenwege d. Voegel u. Rept., Zeitschr. f. Naturwissenschaften, LV, 1882, p. 22, 23, 24, 28 of the reprint.

[73] Op. cit. in BRONN's Klassen u. Ordnungen, p. 798.

[74] Different publications on the skull of Lacertilians, in : Ann. k. k. Naturhist. Hofmus., VII, 1892, & Sitzungsber. d. kais. Akad. d. Wiss., Mathem.-naturwiss. Cl., CII, CIII, Abth. I, 1893, 1894.

[75] Cfr. Fig. 2 on Pl. added to SIEBENROCK, Zur Osteol. d. Hatteria-Kopfes, Sitzungber. d. kais. Akad. &c. CII, Abth. I, 1893, p. 250—268.

[76] Cfr. B. HOFFMANN, op. cit., p. 26—28; the first notes on the lacrimal, and naso-lacrimal ducts in Snakes, are : J. CLOQUET, Des voies lacrymales des Serpens, Mém. Mus. d'Hist. Nat. de Paris, VII, 1821, & G. L. DUVERNOY, Fragments d'Anat. sur l'Organisation des Serpens, Ann. d. Sc. Nat., XXX, 1833, p. 27—28. (CLOQUET's mémoir is cited after DUVERNOY, p. 27, and B. HOFFMANN, p. 3).

[77] SIEBENROCK, Das Kopfskelett der Schildkröten, Sitzungsber. d. Kais. Akad. d. Wiss., Mathem.-naturwiss. Cl. Bd. 106, 1897, Heft I, Abth. 1, p. 243. Taf. 1—6.

[78] Op. cit. p. 23.

Thränenkanal, dessen Querschnitt eine horizontale Ellipse darstellt, in demjenigen Theil des Lacrymale, mit welchem sich dasselbe in das Praefrontal hineinerstreckt. Es scheint in Folge dessen, als hätte das Thränenbein allmählich das Praefrontale von der Begrenzung des Thränenkanals abgedrängt, indem es denselben nicht in sich hinein verlegte, sondern gleichsam auf Kost des Praefrontale umwuchs. Die Richtung des Thränenkanals ist ferner, nicht wie bei den Sauriern, eine von oben schräg nach vorn und unten gehende, der Tränenkanal verläuft vielmehr in einer fast horizontalen Ebene, etwas von außen nach innen zu. Doch bleibt das Praefrontale selbst an dem vorderen Ende des knöchernen Thränenkanals von der Begrenzung desselben ausgeschlossen, da das Thränenbein selbst nach vorn zu sich der Mittellinie des Schädels nähert, von der es schließlich nur durch das sehr schmale Nasenbein getrennt ist. Daher kommt das vordere Ende des Thränenkanals in die Mittellinie der freien Unterfläche des Lacrymale zu liegen und zwar nahe der Verwachsungsnaht desselben mit dem Maxillare." With respect to the conditions existing in the Crocodilians, and affording a parallel to those which are about to be here discussed in the Varanians, there is yet another detail worth of consideration, viz. the n u m b e r of the lacrimal foramina. Whilst in all other recent representatives of the Reptilian Class, hitherto dealt with in literature, the lacrimal foramina are stated to be simple, their number being confined to o n e on each side, — the Crocodilians exhibit conditions throwing much doubt upon the correctness of such view, as emitted by B. HOFFMANN,[79] according to which they too would possess but one punctum lacrimale, and, a fortiori, a single lacrimal foramen only. According to RATHKE[80] the Crocodilians exhibit, on the inner side of the l o w e r eyelid, 3 to 8 puncta lacrimalia, arranged, antero-posteriorly, in a single row, their number being specifically determined. No lacrimal points were found on the upper eyelid. The naso-lacrimal duct is said, by RATHKE, to widen after having entered the lacrimal bone, so as to form a rather spacious duct with a considerably thick wall, and functioning as a special secretory organ, being, therefore, called, by RATHKE, saccus nasolacrimalis, just as in the case of the Mammals. C. K. HOFFMANN found, however, in a young specimen of *Crocodilus porosus* SCHN.

[79] Op. cit. p. 26.

[80] Referred to by C. K. HOFFMANN, op. cit. in BRONN's Klass. u. Ordn., p. 802—803.

but one lacrimal point, lying in the lower eyelid. Nothing is said, however, about the number of the foramina lacrimalia of the lacrimal bone. In this respect I have to refer to the data contained in B. HOFFMANN's paper. This author mentions that according to C. GEGENBAUR the Crocodilians would possess at least 3 lacrimal canaliculi, such statement appearing, at first glance, to be corroborated, besides the foramen lacrimale, by the fact he found in the lacrimal bone of *Gavialis* 2, and in that of *Crocodilus* and *Alligator* 6 to 8 foramina which are smaller than the „principal lacrimal opening", and irregularly disposed. After having passed, however, a probe through the foramina in question, B. HOFFMANN came to the conclusion that „nur wenige, wie mir schien nur zwei derselben in kleine Kanälchen führten, die in den Thränenkanal ausmündeten, während die übrigen 5 bis 6 die Sonde durch kleine gebogenen Kanälchen auf der Oberfläche des Lacrymale zum Vorschein kommen ließen. Die letzteren waren sicherlich Leitungswege für Nerven, welche die Stirnhaut versorgten und wahrscheinlich vom Ramus ophthalmicus des Trigeminus stammten und so halte ich denn auch die in den eigentlichen Thränenkanal mündenden kleinen, seitlichen Kanälchen für Nervenwege. Abgesehen davon, daß ich nur einen einzigen Thränenpunkt gefunden habe, sprechen gegen die Möglichkeit, daß wir es mit Thränenkanälchen zu thun haben, noch die bei Alligator sehr kleinen Durchmesser der Kanälchen, ferner ihre Lage inmitten derjenigen, welche auf die Oberfläche des Lacrymale führen und die bedeutende Entfernung ihrer Anfangsöffnungen vom eigentlichen Foramen lacrymale. Bemerken will ich nur noch, daß sämmtliche Kanälchen allein vom Lacrymale gebildet wurden."[81] If such interpretation and identification of the foramina mentioned, is really agreeable to facts, that is a question which appears, in my estimation, to require proofs afforded by evidence ensuing from the dissection of the soft parts concerned, for, on the one hand, such foramina m i g h t, eventually, result in being blood vessel passages, and not the apertures of nerve canals only, whilst, on the other, those that lead into the naso-lacrimal duct m i g h t, in spite of their aberrant topography and narrow lumina, prove to be lacrimal canaliculi.

The glimpse we here caught of the conditions obtaining in the Crocodilians, may suffice for giving the reader a general view of

[81] Op. cit. p. 400.

the subject under discussion, sparing him instant personal consultation of the various data scattered in literature.

The conditions to be here described in the Varanians, will, after such preliminaries, appear clear enough without continual recurrence to those data that constitute our present knowledge of the matter, so that any comparison, parallelization and inference may safely be left to the reader's power of imagination.

After having examined a large series of skulls belonging to the most different species of Varanians, the writer of the present lines found that all of them agree in the presence of a perforated lacrimal bone, the foramen of the lacrimal lying between the small foramen palatinum pro introitu partis alveolaris superioris nervi infraorbitalis [the latter nerve being given off by the maxillary (i. e. the IInd) branch of the trigeminus] mihi,[82] and the very large, vertically oval hole formed by the opposite sinuses of the prefrontal bone's lamina ethmoidalis (SIEBENR., 1892) and of the lacrimal bone, and representing the osteological homologon of the foramen lacrimale of other Lacertilians. The foramen of the lacrimal bone leads into a short canal that goes through the lacrimal in following a somewhat dorso-ventrally and latero-medially inclined course, and opens on the modest anterior, i. e. rostrad, surface of the bone in question. The anterior foramen of this duct is somewhat smaller than the posterior one, and the bony duct itself is rather narrow. Postero-laterally of

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[82] = foramen pterygo-palatinum CUVIER = foramen palatinum WEBER, 1877; according to SIEBENROCK (D. Skelet. d. Lac. Simonyi &c., p. 253) the said foramen would represent the inlet for the nervus supraorbitalis which „setzt sich nach Weber l. c. hinter dem Foramen palatinum als Nervus dentalis seu alveolaris superior fort und dringt in den vor demselben beginnenden Canalis alveolaris superior des Maxillare ein". With respect to such statement it should be remarked that SIEBENROCK's text does not conform with WEBER's original text which is absolutely correct, two unpleasant slips of the pen occurring in SIEBENROCK's wording. For WEBER (op. cit. p. 319) states that the „N. infraorbitalis" ..... „dringt in das Foramen palatinum" ein. Von hier aus setzt er als N. dentalis (seu N. alveolaris sup.) seinen Weg im Knochenkanal des Oberkiefers weiter fort, von Stelle zu Stelle Aeste an die Zähne und die äussere Haut der Gesichtsfläche abgebend; diese letzteren treten durch die feinen Löcher oberhalb der Zähne durch die Knochenwand des Oberkiefers nach Aussen". Thus it is evident that it is n o t the supraorbital, but, indeed, the infraorbital nerve that gives off the superior alveolar „branch", and that the said nerve does n o t — and cannot — continue its way as superior alveolar nerve „hinter" the foramen palatinum, but only rostrad of the latter, for the infraorbital nerve's superior alveolar part begins at the palatinal foramen, and proceeds forward, viz. in a direction anterior, and not posterior, to the bony passage just mentioned.

the caudad foramen there is an U-shaped impression in the lateral wall of the lacrimal bone, the open part of the „U" looking caudad, and the sides oft it markedly converging rostrad, and meeting in the caudad foramen, referred to above, of the lacrimal. If a fine needle be passed through the duct going through the lacrimal bone, the point of the needle proves to come out in the lower division of that postero-anteriorly elongate, comparatively spacious and rostradly narrowed recess which is formed, laterally, by the interior surface of the maxillary, and, medially, by a membran, and into the upper division of which the wide hole formed by the lacrimal and prefrontal, and known as the foramen lacrimale, is leading. Such condition, established on the strength of the examination of skulls preserved as dry preparations, immediately struck me with the suggestion that the duct passing through the lacrimal bone may serve as passage for the lower canaliculus lacrimalis, having, thus, a bony duct independent of the much larger upper lacrimal canaliculus, the latter appearing to occupy, quite by itself, the large foramen lacrimale formed by the antagonistic peripherial sinuations of the lacrimal and prefrontal bones. In the performation of this inferential suggestion there is a detail of important moment to be considered, i. e. that the longitudinally bipartite, medially membraneous recess, alluded to here above, represents the „sheath" of the posterior tract of the naso-lacrimal duct. Concerning the conditions exhibited by the dry skulls, prepared by the excellent late skeletonizer of the Vienna Natural History Hofmuseum, Mr. PETER KOLAŘ, the following fact should still be stated as pleading in favour of the correctness of such interpretation of the lacrimal and praefrontalo-lacrimal foramina as suggested in the course of the present argumentation: Both of the latter foramina are bordered by an even-edged membraneous seam, centrally of which a single lumen was found by the writer, in every case in which the intact condition of the membran proved to be obvious. This circumstance seems rather to point at the evidence of but one soft-tissued duct having filled out each of the membran-seamed foramina in question, i. e. also the large, conventional foramen lacrimale, so that there is no good reason to be adduced in disfavour of the supposition that it was only the upper lacrimal canaliculus which passed through the praefontalo-lacrimal foramen, such condition necessarily inducing the searcher to look upon the perforation of the lacrimal bone as repre-

senting the inlet for the lower lacrimal canaliculus.

Not to be, however, confined to mere conjections, I made, aided by my wife, Baroness de FEJÉRVÁRY-LÁNGH, Ph, D., and my preparator in the Museum, Mr. J. BARTÓK, the dissection of the head of an adult male specimen of *V. griseus* DAUD., kindly presented, by the „Aquarium" of the Budapest Zoological and Botanical Garden, to the Herpetological Section of our Museum's Zoological Department. And this dissection corroborated, in every respect, the verity of those conclusions to which the inspection of the masterly prepared dry skulls had led. The results concerned may be resumed as follows:

In the antero-basal part of the lower eyelid a small but well marked punctum lacrimale inferius is to be found. If a fine probe be introduced into the canal beginning with the lower „tear point", the duct ist felt to widen, and it appears as if forming a cul-de-sac, or impasse, not having any outlet in rostral direction. After having carefully followed the course of the duct along its (exterior) peripherial wall, by freeing it from all the connective tissues adhering to it, we found it to reach the medio-basal part of the lacrimal bone's posterior surface. The very lateral part of the lacrimal bone was then cut off, so as to facilitate further operation. I cut into the duct, in longitudinal sense, opening a short tract of it from its very beginning, i. e. from the inferior tear point. The discovering of the luminal surface showed that the duct forms, immediately after the lower tear point, a widening, a sort of sack, the wall of which keeps rather straight on the dorsal side, whilst puffing out in its antero-ventrad part. The recess thus formed is, however, not an impasse at all, as might have been supposed when introducing the probe, but rather suddenly narrows into a duct of about the same lumen as exhibited at the very beginning of the portion contiguous to the lower tear point. The sacklike recess fits into the shallow, U-shaped excavation already mentioned as visible on the lateral wall of the lacrimal bone's inner, i. e. orbital, surface, whilst the narrow duct, forming the rostrad continuation of the recess, passes the bony canal leading through the lacrimal, to appose itself at its exit, to the ventral surface of the duct beginning with the punctum lacrimal superius — the latter being represented by the praefrontalo-lacrimal foramen, i. e. the conventional lacrimal foramen — the two, closely juxtaposed, apparently

common-sheated canals thus constituting the ductus naso-lacrimalis, the rostrad end of which seems to be, also in this instance, one-lumened, i. e. the two canals seem to be finally fusing to a single one.[83]

Such conditions obtaining in the soft anatomy of the parts under inspection, afford full evidence of the fact that the duct beginning with the lower tear point is identical with the canaliculus lacrimalis inferior whilst the duct opening by the upper tear „point" represents the canaliculus lacrimalis superior. — All the topographical difference existing, in this respect, between the Varanian type and the one known in other Lacertilians consists, therefore, in the fact that whilst the juxtaposition of the lacrimal canaliculi, and thus the formation of the origin of the naso-lacrimal duct, occurs, in the latter named forms, at the (anterior) limit of the orbit — the formation of the Varanian naso-lacrimal duct proves to be of pre-orbital occurrence, for it takes place in the nasal cavity only.

Examination of the membraneous parts preserved on the dry skulls, and probing of the tear canaliculi in the dissected head of *V. griseus,* showed that the lower tear canal is very much narrower than the upper one, and that its course is, if compared to the direction of the maxillary, more horizontal. The wide upper tear canal, after having passed the short, forward very slightly narrowed bony duct constituting the conventional foramen lacrimale, keeps to the direction originally conditioned by the course of the latter, which is slightly oblique, so that it meets the lower tear canal after having assumed the form of a dorso-ventrally slightly inclined funnel-shaped tube that follows a faintly latero-medial direction, closely paralelling the inner (medial) side of the maxillary. Hereafter both canals proceed, as mentioned above: tightly juxtaposed to one another and delimited by an apparently common membraneous wall,[84] rostrad, finally ending by a duct with, as stated above, an apparently single lumen only, i. e. the interiorly bi-luminal ductus naso-lacri-

[83] Cfr. C. K. Hoffmann's description of the Lacertilian naso-lacrimal duct, op. cit., p. 798, as well as the earlier data of M. Weber (op. cit. p. 330—332), G. Born (op. cit.) and B. Hoffmann (op. cit.).

[84] The medial part of this membraneous wall is very demonstratively exhibited by well prepared dry skulls.

malis seems to have become, in its end part, uni-luminal because of the total fusion of the two ducts beginning with the two canaliculi lacrimales. The naso-lacrimal duct opens in about the middle region of the large, much elongate choanae — as already described by G. BORN[85] and B. HOFFMANN.[86] The latter conditions are, of course, really well visible in those preparations only, in which the parts concerned are preserved in soft state — dry skulls with their membranes spared are rather unfit for the clarification of such intimate details.

These are the facts on which I wished to report as bearing upon our very imperfect knowledge of the lacrimal and naso-lacrimal ducts in the Varanians, and which are partly quite new to science.

With respect to the anatomy of the naso-lacrimal duct, its topographical relations and the anatomy of those parts — soft, cartilaginous and osseous, — that are adjacent to it, we find but very scarce data which are bearing precisely upon the conditions obtaining in Varanians. Such data are, so far as I am informed, footnote on p. 72 (lower cartilage-arch of chondrocranium on the maxillary's horizontal lamella), and text on pp. 124—126, accompanied by Fig. 5 on Pl. VI, in BORN's cited study, and B. HOFFMANN's note on p. 47 of the reprint of his paper mentioned — whilst of the histology of these parts nothing seems to have been published regarding specially the Varanidae. It appears, therefore, most desirable that a thorough study of the whole orbito-nasal region should be made, not only of the Varanidae, of which we know least, but, comparatively, of all Lacertilians, and even of the other Reptilian Orders that are accessible to such investigation, i. e. the fossil ones included so far as some details may be ascertained in them as well. For it seems rather odd that nothing substantially, technically and representationally modern has been carried out along this line. In this present paper which aims at the clarification of other problems, I am unable to deal more intimately with this special question.

The considerations regarding the naso-lacrimal apparatus and its supporting elements should now be concluded with the following s u m m a r y of the new statements:

1. The Varanidae possess, within the orbit, two foramina lacrimalia: the foramen lacrimale postero-superius (mihi), formed by the posterior (i. e. caudad) border of the incisura lacrimalis (SIEBENR.,

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[85] Op. cit. p. 126; cfr. also BORN's figure of the vertical longitudinal section of the head of *Varanus albogularis* GRAY, on his Pl. VI, Fig. 5.

[86] Op. cit. pp. 45—46. of the reprint.

1892) of both the prefrontal and the lacrimal, and the foramen lacrimale postero-inferius (mihi) which subhorizontalo-subcentrally perforates the lacrimal bone. Thus — literally and in our present conception — STANNIUS[87] may really prove to be right in stating that the lacrimal is perforated in Lizards, supposed that such statement should be applied to the Varanian skull. In fact, of course, he was not right at all, for he designated as lacrimal the bone that is attached to the „os frontale anterius", which means that his statement refers to the prefrontal which, in turn, is not „perforated" in Lizards, and not to the lacrimal. SIEBENROCK's[88] criticism concerned stands its ground, therefore, also at present.

2. The upper bony tear-canal (canalis lacrimalis osseus superior, mihi) of the Varanids is large and subvertically oval. The lower one (canalis lacrimalis osseus inferior, mihi) is about half the size of the upper one (e. g. in *V. salvator),* or even much narrower (e. g. in *V. Duméril).*

3. Either laterad (in *V. griseus,* e. g.) or ventrad (in *V. salvator,* e. g.) of the foramen lacrimale inferius, a small, U-shaped impression occurs on the caudad surface of the lacrimal bone, the arms, or sides, of the „U" being directed backwards, and the arch of it lying just at the lower lacrimal foramen; this impression is occupied by the lateral or ventral surface, respectively, of the belly-shaped entasis formed by the lower canaliculus lacrimalis just before entering the lower lacrimal foramen. This impression I designate as impressio ossis lacrimalis pro sacculo canaliculi lacrimalis inferioris (mihi).

4. Medialo-ventrad of the lower lacrimal foramen a large hole leads through the proc. transverso-maxillaris of the palatine bone, which is the foramen palatinum pro introitu partis alveolaris superioris nervi infraorbitalis (mihi).

5. The large, oval, upper tear „point" of the Lacertilia should be named, in soft anatomy, apertura lacrimalis (mihi), contrary to the lower tear point which, for its being effectively a „point", should keep the former denomination: punctum lacrimale.

6. The canaliculus lacrimalis superior originates with the apertura lacrimalis (which lies in the antero-lateral corner of the orbit), and meets the lower lacrimal canaliculus in the p r e -orbital region

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[87] Handbuch der Zootomie, Zweites Buch: Zootomie der Amphibien, 2. Aufl., 1856. (Cited after SIEBENROCK, Das Skelet d. Lac. Simonyi &c., p. 242, footnote 2.).

[88] Op. cit. p. 242—243.

— and not within the orbit — the Varanids notably differing herein from the other Lacertilia.

7. The canaliculus lacrimalis inferior originates with the small punctum lacrimale, appearing like the prick of a pin in the antero-basal part of the lower eyelid. Its course is a rostral one, it does not bend over into a supero-medial direction, but proceeds nearly straight towards the lacrimal bone. Its part lying caudad of the postero-inferior lacrimal foramen, is rather short, forming a belly-shaped entasis (sacculus canaliculi lacrimalis inferioris, mihi) which again constricts itself into a narrow duct on the spot where the foramen lacrimale postero-inferius is reached; the duct then enters the ductus lacrimalis osseus inferior; the two points serving as inlet and outlet to the sacculus canaliculi lacrimalis inferior do not lie — in *V. griseus* — straight opposite to one another, both occurring on the dorsal surface of the sacculus. — In this respect the Varanids differ from the conditions hitherto known in all other Lacertilians, and, probably, from all other Reptiles in general, with, p e r h a p s, the exception of some fossil forms in which this character has not yet been clarified.

8. After having passed the upper and lower osseous tear ducts, the canaliculi lacrimales form the naso-lacrimal duct which apparently shows the same scheme of morphological and histological construction as the one described in other Lacertilians, whilst with respect to some more intimate details BORN's cited paper should be considered.[89] The slit-like[90] opening of the naso-lacrimal duct lies in about the middle region of the large, longitudinally oval choanae.

9. Regarding the differentiation and specialization of the whole naso-lacrimal apparatus, the Varanians prove to be highly developed and, at the same time, physiologically much perfectioned, forms, most likely having attained to what may be said to represent, in this respect, the highest degree of evolutional development in the Reptilian stem. Comparing such specialization with what is found to obtain in other Lacertilia, the latter seem to be more primitive in this respect — for there is no evidence in favour of the supposition that their lacrimal apparatus should be looked upon as having descended from a type of the Varanian kind and thus being the product of a paracmic evolution of the respective region, i. e. as having arisen by means of a (regressive or degressive) simplification of a

[89] Op. cit. p. 72, footnote, & p. 124—126.

[90] Op. cit. p. 126, and B. HOFFMANN, referring to BORN, on p. 46 of the reprint.

previously more compound (acmic) organization. — By the statement of such fact one datum more is added to the set of those that prove that the Varanids, in spite of their possessing quite a series of ancestral, i. e. (primarily) primitive, or prototypical, characters, are, on the other hand, provided with peculiarities very decisively pointing at the most advanced phylogenetical standard of their owners. FÜRBINGER[91] writes: „Die graduelle Stellung der Varanidae ist im ganzen eine hohe, was einzelne ziemlich tiefe Züge nicht ausschließt. Manches tendiert in der Richtung nach den Crocodiliern zu; doch kann ich BEDDARD nicht folgen, der sie als eine den Lacertiliern und Rhynchocephaliern äquivalente Gruppe auffaßte und den Crocodiliern näher brachte als den Lacertiliern. Ueber ihre Zugehörigkeit zu den Lacertilien besteht für mich kein Zweifel." Each of the statements contained in these sentences due to the penetrating glance of the excellent German anatomist, are but gaining in prevalence if the details described here above be added to our preexisting material of evidence bearing upon the knowledge and phylogenetical valuation of the Varanidae. The Varanids thus result in being a heterepistatic group, the epistasis of the primitive characters being of the epacmic kind, whilst the epidotic characters may be looked upon as representing the phase of their acme. The epidosis as the result of which these acmic features were brought about, is most likely of the normally conditioned kind of it, for a halmatogenetic evolution should be, in this case, excluded, whilst there are no good reasons either to be adduced in favour of the supposition of a metakinetic development having set in.[92] — As to the bionomical — viz. aetiognostical and nomognostical — side of the problem, I must confess to be at a perfect loss of any reasonable suggestion, just as I have been in the case of the peculiar, and certainly very advanced, specialization of the nario-loreal region.

C. Monographical Notes on, and Description of, Varanian Genera and Species.

Owing to the courtesy of Prof. Dr. F. BROILI, of the Munich University and the Bavarian Palaeontological State Collections, I

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[91] Beitr. z. Syst. u. Genealog. d. Rept., Jenaische Ztschr. f. Naturwissenschaften, XXXIV, N. F. XXVII, 1900, p. 613—614.

[92] For the bionomical terminology see author's paper: On some Biological, especially Bionomical Terms, Xe Congr. Internat. de Zool., tenu à Budapest, du 4 au 10 Sept. 1927, Budapest, 1929, p. 466—483.

was permitted, during my 1923 stay in the Bavarian metropole, to take with me, on loan, a series of fossils belonging to some small-sized Lacertilians, for I intended to study them in view of preparing a paper on the subject.

The Fossils concerned were determined as, or conditionally referred to, respectively, *Palaeovaranus, Varanus* and *„Propseudopus"*. Due examination, and comparison with both fossil and living forms, brought out that a great part of this material effectually belongs to the two first named genera, entering thus the systematical compass of those forms that still have to be discussed in the present paper, whilst some specimens proved wrongly identified and will be, together with the Ophisaurian remains, separately dealt with in another publication of mine.

I am glad to express, in this place, my very best thanks to Prof. Dr. F. Broili and Prof. Dr. Baron E. Stromer, Munich, who kindly enabled me to study that part of the collections in care of theirs, which, at present, proved of importance to me. To Baron Stromer I am, moreover, much indebted for his interest with which he followed my present work, amiably affording information whenever I applied to him.

The Varanian fossils of the Munich Collection belong to two species, i.e. *Palaeovaranus Cayluxi* Filh., from Escamps near Lalbenque, Quercy, Dépt. Lot, France, and *Varanus Bolkayi*, mihi, from the Kendeng Beds of Trinil, Java. Both will be duly considered in the course of the subsequent descriptions.

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I. Genus: ***Palaeovaranus*** Filh., 1877.

This genus, established in 1877, by H. Filhol,[93] was declared by me, in my Monograph of 1918, to be identical with the genus *Varanus*, and I have thus ranged the name *Palaeovaranus* into the synonymy of *Varanus*. This standpoint was accepted by F. Broili, who, in the fourth edition (1923) of v. Zittel's „Grundzüge der Paläontologie (Paläozoologie)" refers (p. 258) to the Quercy species under the denomination *Varanus Cayluxi*.

The personal examination of the upper jaw to be described in the present paper convinced me, however, that the generic se-

[93] Rech. sur les Phosphorites du Quercy. Études des fossiles qu'on rencontre et spécialement des Mammifères, Ann. Sc. Géol., VIII, 1877, p. 268.

paration of the Caylus fossil species from *Varanus* is actually justified — an opinion in favour of the correctness I was unable to find support in 1918, when I was merely confined, in this respect, to literary data, i. e. to descriptions and figures.

Based upon the scanty material at my disposition, the diagnosis of the genus may be resumed in the following:

Agreeing with *Varanus*,[94] except for the presence of large, well developed nasal bones, which are supported, as in many Micromammalians, by a very strong and mediadly saillant crest extending along the anterodorsal edge of the prefrontal process of the maxillary.

In this respect the genus closely parallels the recent *Ameiva* Cuv., e. g., which belongs to the Family Tupinambidae Gray, 1825, part., sensu meo (= Teiidae Gray, 1827, sensu Blgr.), this family being, at the same time, the one which seems to bear, among all recent Lacertilians, the closest relations to the Varanians, apparently constistuting the offspring of that ancestral group of the „Eulacertilian" stock which, of yore, might have connected the sub-order Lacertilia vera Blgr., 1884, sensu Fürbr., 1900, with the prototypes of the sub-order Platynota D. & B. (fam.), 1836, emend. Fürbr., 1900, sensu meo.[95] Such suggestion of the existence of a more intimate relation between the Varanidae and Tupinambidae means a certain reversion to those conceptions of parentage, that are expressed by ancient authors, F. M. Daudin[96] or B. Merrem,[97] e. g., who, in their antiquated systems, either ranged Varanian species with the genus *Tupinambis*, or placed *Varanus* in the immediate vicinity of the latter.

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[94] Cfr. the diagnosis of *Varanus*, given on p. 365. (op. cit.). NB.: As to the conditions obtaining in the construction of the nasolacrimal apparatus (perforation of the lacrimal bone by the lower lacrimal canaliculus, and thus, presence of two bony lacrimal ducts), nothing can be said of an agreement of *Palaeovaranus* with, or disagreement from, the genus *Varanus*, for we are still ignorant of the bones concerned in the Caylus form. It appears, however, probable enough that *Palaeovaranus* should prove typically „Varanian" in this respect.

[95] Cfr. the classification of the Platynota as represented on p. 22 of the present paper.

[96] Hist. Nat., génér. et particul. des Reptiles, Tome troisième, Paris, An X (i. e. 1801—1802).

[97] Tent. Syst. Amphib., Marburgi, MDCCCXX, p. 58 & 60.

Generotype and, up to now,' sole representative of the Genus:

1. ***Palaeovaranus* Cayluxi*** FILH., ident. inc.[98]

Addition to the Synonymy published, in 1918, in my Monograph:

Varanus Cayluxi („Cayluxy" is one of the, unfortunately, numerous misprints occurring in that paper of mine) FILH., FEJÉRVÁRY, Contr. Monogr. on Foss. Varanidae and on Megalanidae, Ann. Mus. Nat. Hung., XVI, 1918, p. 367; BROILI, in: K. A. v. ZITTEL's Grundzüge d. Paläontologie (Paläozoologie), Dritte vermehr. u. verbess. Aufl., München, 1923, p. 258, Fig. 361; EINAR LÖNNBERG, Notes on Varanus Komodoensis OUWENS and its affinities, Arkiv för Zoologi, K. Svenska Vetenskapakademien, Bd. 19 A. No. 27, 1928, p. 10.

Varanus cf.? *Cayluxi* FILH., FEJÉRVÁRY, op. cit., 1918, p. 371.

Among the fossils of the Munich Collections, handed over to me and labelled *„Palaeovaranus cadurcensis"* (which apparently is but a „museum name"), the following proved to belong actually to this form:

3 remains of the maxillary (comprising an almost complete upper jaw and two fragments of it),

2 remains of the dentary (comprising an almost complete and a very fragmentary specimen),

6 humeri (2 of them being fragmentary),

1 radius,

4 femora,

2 tibiae,

1 fibula.

Find place: Escamps, near Lalbenque, (Dép. Lot), Quercy, Caylux (Dép. Tarn-et-Garonne,) France.

Local stratigraphy: Phosphorites of Quercy.

Geological Period: Oligocene, perhaps from Upper Eocene to Lower Miocene.

The antero-dorsal surface of the maxillary obviously proves the incorrectness of my opinion, emitted in 1918, according to which the genus *Palaeovaranus* FILH. would be identical with *Varanus* MERR. Some doubts are — again — rising, as to the correctness of my 1918 view regarding the generic distinctness of the Caylus Monitor from GERVAIS's *Placosaurus*,[99] for at present, knowing of the existence of Varanian forms with nuchal osteoderms *(V. varius* SHAW, *V. giganteus* GRAY, *V. Gouldi* GRAY) or even with a complete bony armour all over the head and body *(Placovaranus* FEJÉRV.), the presence of

[98] Cfr. p. 67. footnote 122 of the present paper.

[99] Cfr. the data concerned in my Monograph, p. 350—351.

secondary dermal bones does not entitle us to exclude, merely on such account, any dermal bone armour bearing form from the compass of the Varanidae, Unfortunately I do not know of any other cranial element than jaws having been found from *Palaeovaranus*, so that we cannot, in fact, pretend that the Caylus Monitor did not possess dermal ossifications — for these may be absent precisely on the jaws of even those species in which they occur in other regions of head and body, as proved by, e.g., certain Anguids and Scincids. If, however, the remain presented on Fig. 2 of Pl. X (II) in GIUSEPPE DE STEFANO's paper on the Quercy Lacertilians[100] as „*Placosaurus? rugosus* Gervais"[101] should really prove to belong to the form to which it is conditionally referred: the distinctness of *Placosaurus* from *Palaeovaranus* would appear to be almost granted, for the impressions marking the pilear scutellation in the parietal region and very clearly showing the outlines of the parietal and postfrontal scuta, as well as of the interparietal, are not at all of the conventional Varanian type, but decidedly point in the direction of either the Anguidae or the Scincidae. Of course, it must not be forgotten that we do not know anything about the pilear scutellation of primeval Varanians, which m i g h t have been different from the Varanian type we actually know of, and having eventually agreed with the type obtaining in the apparently closely related Tupinambidae — a question upon which it is impossible to decide on the strength of our present, very scanty knowledge, the more so as we cannot decide whether or not the pilear scutellation occurring in recent Varanians is, i n i t s L a c e r t i l i a n c o n d i t i o n, of a primary, i. e. ancestral kind, not having been submitted to any serious change in its developmental scheme. For we must not forget that the phylogenetical development of the lepidosis is a problem that has not yet been definitively cleared up, and besides, the ancient or prototypical scheme of scutellation may be, in general, a different one in the several Reptilian groups, varying according to the immediate ancestors from which the taxonomic units concerned take their origin. The problem results, thus, in being rather complex, especially on account of the fact that evolutional reversals (epistrephogenesis) have also to be reckoned with when

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[100] I Sauri del Quercy apparten. alla Collezione Rossignol, Atti Soc. Ital. Sc. Nat. e del Mus. Civ. Stor. Nat. Milano, XLII, 1903, p. 382—418.

[101] Op. cit. p. 416& 417.

aiming at the clarification of the biohistorical development of lepidosis.

At the beginning of the inference concerning the *Palaeovaranus* and *Placosaurus* question, I alluded to the possibility of G. DE STEFANO's „*Placosaurus? rugosus* Gervais" being identical with the fossil thus called by GERVAIS.[102] I must confess, however, that such identity, and be it even from the generic point of view only, appears to me as most problematic. For the pilear osteoderms figured by GERVAIS (Pl. 64. Fig. 2) appear to belong to a genus in which — contrarily to what obtains in the fragment described and figured by DE STEFANO — the pilear scutellation consists of more or less subequal, polygonal plates, and there appears to be no trace of morphologically more differentiated, taxonomically distinguishable lepidotic elements. Thus, the conditions exposed by the pilear lepidosis in any of the modern Varanians, are certainly more approached by the scheme expressed in the true *Placovaranus* of GERVAIS than by the one to be seen in the DE STEFANO compound plaque. And so we have to admit: ignoramus — what sounds rather strange if one considers, as one has to, that the *Placosaurus* and *Palaeovaranus* problem is now existing again, though we thought it no longer a problem, up to those recent investigations that showed us that also true Varanians may bear a more or less extended armour of dermal bone plates. It remains, therefore, open to future inquiry to decide whether it is FILHOL[103] — who himself suggested that his *Palaeovaranus* may possibly belong to GERVAIS's *Placosaurus* — and LYDEKKER,[104] who directly ranged the former genus with the latter, who were on the right path, or K. A. v. ZITTEL[105] and G. DE STEFANO,[106] both of whom acted, or pleaded and acted, respectively, in favour of the generic, and, of course, familiar, separation of the two forms now under inspection.

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[102] Zool. et Paléont. Françaises, &c., Deuxième édition, Paris, 1859, p. 457, & Atlas, Pl. 64, Fig. 2 (Figs. 1 & 3 are not regarded, by GERVAIS, as certainly belonging to this form).

[103] Rech. sur les Phosphorites du Quercy, Étude des foss. qu'on y rencontre et spéc. des Mammif., Ann. Sc. Géol., VIII, 1877, p. 268; see Figs. 434, 445, 446, on Pl. 26.

[104] Catal. Foss. Rept. and Amph. Brit. Mus., I, London, 1888, p. 279, 280, 281.

[105] Handbuch d. Paläont., I. Abth. Paläozool., III, München u. Leipzig, 1887—1890, p. 609.

[106] I Sauri del Quercy apparten. alla Collezione Rossignol, Atti Soc. Ital. Sc. Nat. e del Museo Civ. Stor. Nat. Milano, XLII, 1903, p. 403—406.

The Munich femora evidenced that the femur described and represented by FILHOL[107] as pertaining to *Palaeovaranus,* effectually belongs to that form, as correctly pointed out by the writer[108] of the present lines, though, after all that was just stated with respect to *Placosaurus,* it is not herewith implied that, on the other hand, LYDEKKER[109] might not, eventually, be also right when referring the rest now mentioned to the latter named, ambiguous, genus.

In one respect LYDEKKER's view of the subject must, however, necessarily prove to be wrong. For there is an alternative: Either GERVAIS's *Placosaurus* is, in fact, an Anguid,[110] and then it can, in no way, be identified with the undoubtedly Varanian *Palaeovaranus,* or: it is identical with *Palaeovaranus* (in which case priority would claim the use of the prior name, i.e. of *Placosaurus*), and then it can, by no means, be ranged with the Anguidae, but only with the Varanidae. Personally, I believe, and in spite of having given full acknowledgement to the motivatedness of the contrary standpoint, that further researches, based upon a rich material on either part, the two genera will prove to be distinct, *Palaeovaranus* belonging to the Varanians, whilst *Placosaurus* pertaining to the Anguids, or, may be, to the Scincids. This is, however, but a suggestion based on nothing else than on a sort of zoological routine ensuing from personal experience.

The rather small vertebrae, labelled, in the Munich Collections, as those of *„Palaeovaranus cadurcensis"*, proved to be n o n-Varanian, and shall therefore be dealt with in a separate paper.[111] — Among the vertebrae figured by DE STEFANO,[112] those represented on Figs. 8 and 6, Pl. X (II) of his paper cited, and reproduced, under a and c, Textfig. 3 (on p. 369), in my Monograph, are certainly belonging to the species under discussion. The originals of DE STEFANO's Figs. 9 and 10, Pl. X, however, which are visible on Textfig. 3 b and d of my Monograph, are, to-day, awakening some doubts in me as to their actually being Varanian. For, in spite of their e n s e m b l e very decidedly pleading in favour of such supposition, the spinous process appears, in both of the vertebrae concerned, too long for a Varanian. So strongly developed proc. spinosi

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[107] L. c., & Figs. 445—446 on Pl. 26 of the same work.

[108] Cfr. p. 350—351 of my Monograph published in 1918.

[109] Op. cit. p. 280.

[110] Cfr. LYDEKKER, op. cit. p. 281, sub: „Genus Varanus, Merrem".

[111] Cfr. p. 98 of the present paper.

[112] Op. cit.

are, in Varanians, only to be met with in cervical vertebrae, and not in dorsals which these two specimens are stated to be. It might, however, be supposed that the vertebrae in question belong to the set of the foremost dorsals, immediately following upon the hypapophysis-bearing cervicals, the more so as the side view specimen shows a slight, though well marked, convexity in the region concerned, such feature proving characteristic of exactly the directly post-cervical dorsals. Thus the systematical identification of the two vertebrae just referred to, proves, in my opinion, to require revision, and this by means of applying to an examination of the originals, for the figures we dispose of do not afford sufficient ground for really exact determination. By the statement of that fact I wish to complete and to correct, respectively, the data concerned of both DE STEFANO's and mine. — On p. 370, in footnote 1, of my Monograph I wrote that the drawings published by ZITTEL (op. cit. p. 603, Fig. 534, a—d), as possibly representing the vertebrae of the Varanian species we are now dealing with, and thus figuring as „? *Palaeovaranus Cayluxi* Filhol", seem not to belong to a Varanian at all, and should be considered quite problematical until renewed examination of the originals will afford due evidence. At present I can but confirm the correctness of such supposition, and I may even add that the remains concerned are surely not Varanian. — In this place I have, moreover, to record a Varanian epistropheus, from the Miocene deposits of La Grive St.Alban, Dépt. de l'Isère, France, described and figured in my monograph[113] as „*Varanus* cf.? *Cayluxi* FILH.". With the experience afforded by recent studies bearing upon the subject, I feel entitled, at present, to really specify the vertebra in question as belonging to *Palaeovaranus Cayluxi* FILH., and to omit, thus, its taxing with the designation „cf.?". The narrow range in which *P. Cayluxi* has up to now been found, is hereby considerably widened, its find places not being, anymore, limited to the Quercy, but extending to the East, the species being now known from the Département de l'Isère as well, from where it, or at least the genus had proceeded to gradually shove its limits of distribution in eastward direction. — As to DE STEFANO's[114] data concerning the vertebrae, I merely refer to the

[113] p. 371—375, Pl. I, Figs. 4—5.
[114] Op. cit. p. 409—411.

respective statements contained in my Monograph,[115] and there is hardly any necessity for completing these with the expressive remark that the vertebrae of *P. Cayluxi* are in no way intermediate between the types represented by *V. bengalensis* DAUD. on the one hand, and *Megalania* OW. on the other, as supposed by the Italian author when dealing with his „*Palaeovaranus Filholi*".

Allusion is made in my Monograph[116] to Figs. 7 and 11, Pl. X, published by DE STEFANO.[117] These figures are meant, by DE STEFANO, to represent tibiae of „*Palaeovaranus Cayluxi* Filhol" and „*Palaeovaranus Filholi* de Stefano", respectively.[118] In 1918 I could write only so much that „The photographs are indistinct and offer no characteristic views of the fossils, not giving thus any clue to an accurate determination of the bones...". „All that could be established is that inasmuch as the bones be really tibiae they c a n n o t b e l o n g to the same species [i.e. *V. Cayluxi* (= *V. Filholi*)].[119] Now, with the Munich femora and tibiae before my eyes, I am able to say even more. Briefly: Fig. 7 m i g h t represent a tibia, but c e r t a i n l y n o t a Varanian one, whilst the original of Fig. 11 m i g h t be Varanian, but if so, it can b y n o m e a n s be a tibia. The correctness of such statement is easily evidenced by comparison of DE STEFANO's Fig. 7 with Figs. 13 and 15 (tibiae of *P. Cayluxi*) on Pl. XI of the present paper, and of his Fig. 11 with the ventrally viewed femur of the same species, as here represented on Fig. 10 of Pl. XI. A definite clarification of the problem is, of course, possible only by means of the original remains' inspection. The non-sense arrived at by the late Dr. GIUSEPPE DE STEFANO when „identifying" the two rests just touched upon, affords one striking proof more of the delicious superficiality and glorious anatomical ignorance with which that geo-palaeontologist was carrying on his work, a fact I now and again feel compelled to point out, in spite of my adhering to the reverential principle „de mortuis nihil nisi bene". — For the rest of the data published on *Palaeovaranus Cayluxi*, I have simply to refer to what has been put down in my Monograph, taking, of course, into consideration those important morphological and systematical facts that are put

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[115] p. 352—353.
[116] p. 351.
[117] Op. cit.
[118] Op. cit. p. 417. [„Spiegazione della Tavola X (II).].
[119] FEJÉRVÁRY, l. c.

forward in the present paper, on account of which quite a series of my 1918 statements had to undergo a substantial modification.

Before proceeding to the examination of the Munich fossils, let us still throw a glance upon the size of the species. Regarding this question I wrote, in 1918,[120] as follows: „among the fossil Monitors of Europe" known up to now. „*P. Cayluxi* FILH. was one of the smaller sized forms, hardly exceeding the size of the recent *V. griseus* which approaches or slightly surpasses one metre in length. The femur represented by FILHOL (op. cit.) as that of *V. Cayluxi* (and referred by LYDEKKER to *Placosaurus*) seems to indicate however a somewhat larger size (Textfig. 1); unfortunately Mr. FILHOL did not even note whether this femur is represented in natural size or not; if this were the case, and if my supposition — not statement — according to which the mentioned femur was justly determined by FILHOL as that of *V. Cayluxi,* were to prove right, the size of this species would be equal to that of an at least full-grown specimen of *V. griseus*" ... „or a smaller individual of *V. salvator* LAUR.". These statements of mine require reconsideration in two different respects. (1). There is no longer any reason for doubting that the femur figured by FILHOL should not belong to *P. Cayluxi,* and I was obviously right in referring it, on p. 351 of my Monograph, to this species. (2). The average size of the species effectively equals that of old, full-grown specimens of *V. griseus* DAUD., but there are rests proving that their owners had been of larger dimensions, approaching, in bulk, the medium sized individuals of *V. salvator* LAUR., such having been the case with the specimen to which the femur represented by FILHOL had belonged, supposed, of course, that the figure concerned exhibits the natural size of the rest. The total length of *P. Cayluxi* might thus be estimated, in the average, at about 1.20 m, whilst the larger specimens might have grown to the length of 1.50 or so. Thus, among the fossil Varanians known to us, *P. Cayluxi* is, in fact, the smallest species, and it is only *V. Hofmanni* ROGER, a doubtful form as to its specific validity, from the Miocene „Dinotherium Sands" of Stätzling (Germany), which appears to have been of about the same dimensions. The fact of the oldest Varanian forms' exhibiting a smaller size than the geologically subsequent ones, is in full accordance with CH. DEPÉRET's „loi d'augmentation de taille dans les rameaux phylétiques". The small sized species of

[120] Op. cit. p. 368—369.

nowadays are, on the other hand, expressive of the paracmic phase of Varanian evolution.

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Description of the Munich material, with phylogenetical notes bearing upon Osteo-Morphology and Palaeovaranian kinship.

A) Skull. — 1. Maxillary: The three maxillaries — handed over to me in the form of 8 fragments — under inspection are considerably mineralized, showing, on their fractured surfaces, the rather compact structure characteristic of those fossils that have been submitted to considerable petrification. They are of a dirty yellowish white colour, with parts of the red earth matrix adhering to them. Cleaned specimens present, on the smooth surfaces, a feeble grassy shine. One of the specimens Pl. X, Figs. 3—4) is tinged reddish by means of ferric oxide absorbed by the fossilized bony tissue. Hardly perceptible traces of much scattered black dots are present in another specimen (Pl. X, Figs. 5—6), without, of course, approaching in this respect the piebald pattern met with in, and characteristic of, certain bone deposits belonging to younger zones, such as, e.g., the bone breccie of Pikermi (Greece) or Csarnóta (Hungary).

The rest figured on Text figs. 5—6 & Pl. X, Figs. 1—2, proves especially valuable, because, if its details be considered, it affords important grounds of evidence for the systematical, i.e. phylogenetical valuation of the genus, supporting, at the same instance, such inference as aims at the reconstruction of the general shape of the skull, of this Reptile, about which no data exist, up to now, in literature. — The Escamps (near Lalbenque, Quercy) fragment under discussion, which represents an almost complete left side upper jaw, at first glance strikes the specialist with the fact of its morphological agreement with the „Labenque Quercy" apparently right side upper jaw figured by ZITTEL,[121] in the 3rd volume of his famous textbook of Palaeontology, and which subsequently passed into the several editions of his „Grundzüge der Paläontologie"; and as a

[121] Handbuch d. Paläont., I. Abt. Paläozool., III, München u. Leipzig, 1887—1890, p. 609, Fig. 430. NB.: The find place's name is Lalbenque, „Labenque" being faultively spelt throughout all of the editions of ZITTEL's books referred to here above. Such incorrect spelling of the locality's name has passed on into my 1918 Monograph, p. 351.

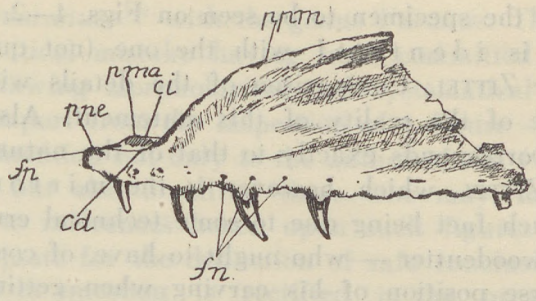

Fig. 5. *Palaeovaranus* Cayluxi* Filh., left maxillary, outside-view, magnified 1 ½ times. *ppe* = processus praemaxillaris exterior ossis maxillaris; *fp* = facies praemaxillaris processus praemaxillaris maxillae (mihi); *ppm* = processus praefrontalis ossis maxillaris; *fn* = foramina ossis maxillaris; *ci* = crista intranasalis ossis maxillaris; *pma* = protrusio medialis alae intranasalis ossis maxillaris; *cd* = carina delimitans excavationis nasalis ossis maxillaris (mihi).

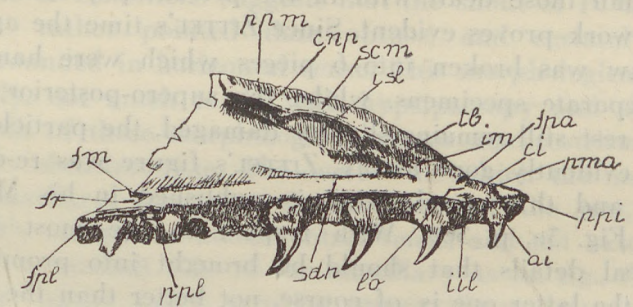

Fig. 6. *Palaeovaranus* Cayluxi* Filh., left maxillary, inside-view, magnified 1 ½ times. *cnp* = crista nasalis processus praefrontalis ossis maxillaris (mihi); *ppm* = processus praefrontalis ossis maxillaris; *scm* = sulcus pro crista maxillari ossis nasalis, cristae nasalis processus (nasalo-) praefrontalis ossis maxillaris (mihi); *tb* = torus basalis processus (nasalo-) praefrontalis ossis maxillaris (mihi); *im* = impressio pro margine laminae maxillaris posterioris (mihi); *isl* = impressio semilunaris, cristae nasalis processus praefrontalis maxillae, pro lamina maxillari ossis praefrontalis (mihi); *ci* = crista intranasalis ossis maxillaris; *pma* = protrusio medialis alae intranasalis ossis maxillaris; *iil* = impressio intranasalis laminae horizontalis maxillae; *fpa* = foramen maxillare pro exitu partis alveolaris superioris nervi infraorbitalis; *ai* = area intranasalis ossis maxillaris (mihi); *lo* = lamella obliqua intranasalis ossis maxillaris (mihi); *ppi* = processus praemaxillaris interior ossis maxillaris; *ppl* = processus palatinus laminae horizontalis ossis maxillaris; *fpl* = facies palatina processus palatini laminae horizontalis ossis maxillaris (mihi); *sdn* = sulcus maxillaris pro ductu naso-lacrimali (mihi); *fm* = foramen maxillare pro introitu nervi alveolaris superioris; *fr* = foramen maxillare pro introitu rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi).

matter of fact, the specimen to be seen on Figs. 1—2, Pl. X, of the present paper is identical with the one (not quite correctly) represented by ZITTEL. Comparison of the details will easily convince everyone of the reality of this statement. Also the size of the fragment corresponds exactly to that of the natural size figure published by ZITTEL, which, however, is the mirror image of the original, such fact being due to some technical error committed by either the woodcutter — who ought to have, of course, reckoned with the inverse position of his carving when getting printed — or, if it was a photo that served as model to his purpose, by the photographer who might have made the copy concerned from the wrong side of the plate. For, as stated above, and visible from the figure here reproduced, the maxillary in question belongs to the left side, whilst ZITTEL's figure appears as if representing a right side jaw. No other Varanian remains being preserved in the Munich collection than those dealt with in the present paper, the mistake in ZITTEL's work proves evident. Since ZITTEL's time the apparently complete jaw was broken into 6 pieces which were handed over to me as separate specimens, whilst the supero-posterior marginal part of the rest still remains slightly damaged, the particles broken off having evidently gone astray. ZITTEL's figure was re-drawn by the writer, and this pen-drawing is published in his Monograph concerned, Fig. 3e, p. 369. With respect to the most important morphological details that should be brought into prominence on the figure, the latter one is, of course, not better than the graphical model from which it has been copied.

Turning to the description of the original of these figures, I wish to observe at once that the most outstanding feature of the rest consists in the strong, moulding-like projection mediadly protruding from the dorsal edge of the part forming the processus praefrontalis ossis maxillaris (SIEBENR. 1893). This „moulding" that flanks the upper border of the prefrontal process is not really apparent in the figure published by ZITTEL, nor in the one given, in 1918, by the writer. It is precisely the lack of correct recognition and connectional identification bearing on the interpretation of this part that I did not notice, in 1918, the deep — generic — difference existing between the Lalbenque fossil and the representatives of the genus *Varanus*. For had I perceived it on ground of the Zittelian figure, I would never have doubted of the generic validity of *Palaeovaranus*, and so I would never have committed the, somehow impardonable, systematical error of synonymizing the

genus *Palaeovaranus**[122] with the genus *Varanus*. The fact of such grave systematical mistake having been committed by the writer by simply drawing morphological and systematical conclusions of remarkable import from the inspection of a figure — may serve as a serious admonition not only to the author of the 1918 and present Monographs, but also to all of those who may, in certain cases, be confined to inferences based upon such figures that are more or less inadequate for the deduction of safe conclusions. The systematical error in question is rectified in the present paper, so that now I may instantly proceed to the description of the rest under discussion.

The processus praemaxillaris exterior ossis maxillaris (FEJÉRV., 1918) is intact. The jaw is bent, from the third tooth (first preserved tooth on the maxillary, Pl. X, Figs. 1 & 2), inwards, more so than in, e.g., *V. griseus*, parallelling, in this respect too, *V. salvator*. Such state of conditions suggests that the snout of *P. Cayluxi* was, relatively, rather pointed than obtuse, and certainly not very broadly rounded in horizontal sense. This morphological detail has, apparently, not much to do with hypsiprosopy and platyprosopy, for in both of these morphological groups acutirostrism may occur as well as obtusirostrism. The surface in which the maxillary met the premaxillary, comprises the thickness of the jaw, thus being but slightly oblique in dorso-ventral sense, and not extending upon the interior (medial) side of the maxillary as in, e.g., *V. griseus* in which the upper jaw's exterior premaxillary process practically overlaps, i.e. laterally (alias exteriorly) partly rests upon, the maxillary process of the premaxillary, the mentioned surface of junction (facies praemaxillaris processus praemaxillaris maxillae, mihi) being, therefore, in *P. Cayluxi* comparatively narrower than in, e.g., *V. griseus*.

The conditions just summarized point towards the fact of *P. Cayluxi* having possessed a rather narrow than broad premaxillary. Owing to the conditions set forth by the crista nasalis processus praefrontalis ossis maxillaris (mihi) it appears evident that the processus nasalis of the premaxillary bone was by far not as long as in the representatives of the genus *Varanus*, in which, the nasals

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[122] The asterisc following the generic name is meant to be expressive of the uncertain validity of the genus (cfr. author's paper: Notes de nomenclature paléozoologique, Bull. Soc. Vaud. Sc. Nat., 52, 1919, p. 321, 2, Art. 2.), such uncertainty obtaining, in the present case, especially with respect to the actual relation existing between *Placosaurus* and *Palaeovaranus* (see above).

being much reduced, it had to grow pretty long to be able to keep up its contact with them, to thus suffice to one of its most important mechanical tasks which consists in the solidification of the dorsal front part of the rostral framework — being ventrally supported by the intranasal bones and caudadly being wedged in between the nasal ones. Also in this respect *Palaeovaranus* approaches the Tupinambid genus *Ameiva*, differing from *Varanus* by the morphological expression of bio-mechanically implied life-principles which are still adhered to by, and obtaining in, the overwhelming majority of even the modern Lacertilians — these having developed along other lines of evolution.

The processus praefrontalis maxillae rises abruptly, immediately from the excavatio nasalis ossis maxillaris (FEJÉRV., 1918), which, in the hypsiprosopoid type of *P. Cayluxi*, means: from the middle region of the space the lateral edge of the intranasal bone had occupied. The ascension angle of the prefrontal process, i.e. the angle enclosed by it and the crista intranasalis ossis maxillaris (mihi, see farther below), measures about 120°.

The dorsal edge of the prefrontal process bears the bulky crista nasalis processus praefrontalis ossis maxillaris, referred to here above. This crest protrudes in ventro-medial direction, i.e. its dorsal surface is slightly oblique, being inclined from the lateral side to the medial one. It practically comprises the whole antero-superior part of the maxillary. It is this crest that makes appear the prefrontal process to be unusually thick for a Varanian, and very long; though, in fact, the post-nasal part of it, which represents, in this case, the t r u e prefrontal portion of the maxillary's dorso-lateral limb, is wanting in the fossil, so that the dimensions concerned cannot be established, no grounds of comparative-topographical evidence being afforded to the benefit of such inference. The dorsal surface of the nasal crest of the prefrontal process is hollow, constituting a broad furrow throughout the whole of its length.

The shape of this furrow (sulcus) pro crista maxillari ossis nasalis,[123] cristae nasalis processus (nasalo-) praefrontalis ossis maxillaris, mihi) conforms to that of the wedge-shaped dorsal surface of the prefrontal's nasal crest, being pointed at its rostral end, and widely open at the caudal one. The very antero-basal part of the prefrontal process's nasal crest is, if viewed from the rostrad side, broad, rounded, and, thus, more or less torus-like. This torus basalis

[123] Cfr. p. 72.

processus (nasalo-) praefrontalis ossis maxillaris (mihi) is somewhat hollowed, or rather flattened impressio, pro margine laminae maxillaris posterioris (et processus maxillaris posterioris?) ossis intranasalis, tori basalis processus (nasalo-) praefrontalis ossis maxillaris[124] (mihi) at the very basis of its inner (medial) side, this flattening being indicative of the contact that subsisted, in the skull, with either the posterior maxillar process or the edge of the posterior maxillar lamina of the intranasal bone,[125] or, maybe, with both of the intranasal parts just mentioned. The small, longitudinal flattening in question is posteriorly delimited by the anterior end of the furrow for the naso-lacrimal duct (cfr. p. 83 of the present paper), whilst the whole medial side of the torus, on which it occurs, rises from, or rather stands upon, the maxillary's horizontal lamina. Immediately posterior to this flattening the medial side of the arcuately rising (nasalo-) prefrontal process's nasal crest presents a medium, but marked, and comparatively long, cylindrical swelling, actually forming the continuation of the torus referred to here above and feebly hollowed, or rather flattened, only in its basal part, just above the horizontal lamina of the maxillary, by the slight carving left by, and evidently due to the mechanical action (i.e. pressure) of the intranasal bone's posterolateral part. Caudad, a semilunar impression, with its arch turned downwards, puts an end to the cylindrical torus; it is precisely this impression, showing the shape of an elongate leaf, with its point looking caudad, that gives the medial or inner side of the prefrontal process's nasal crest the moulding-like appearance: the very basal line of the nasal crest lies in about the longitudinal middle region of the medial surface of the maxillary's ascending limb, i.e. that part of the maxillary, which lies superior to its lamina horizontalis, and from this line the median third of the nasal crest of the prefrontal process — which is represented by the leaf-shaped impression — rises, forming a medially gently inclined surface which ends, dorsally, in the sharply marked medialo-dorsal edge of the nasal crest, this edge constituting, at the same time, the medial delimitation of the dorsal furrow of the nasal crest, into

[124] The partial homologon of this impression in *Ophisaurus* was named, by Baroness A. M. DE FEJÉRVÁRY-LÁNGH (1923), impressio intranasalis ossis maxillaris which, however, is a „collective term" split, by the writer of the present lines, into two designations, the second of which is to be found on p. 78. of this paper.

[125] Processus maxillaris posterior ossis intranasalis. MÉHELY, 1910. emend. FEJÉRV., nunc; = proc. lateralis posterior, MÉHELY, 1910.

which dorsal furrow the cuneiform maxillary crest, or rather callosity, of the nasal bone had fitted in — very like the conditions obtaining in the recent *Ameiva*. The prefrontal process's nasal crest is, thus, on the whole, not a sort of lamellar protrusion, but a stout „moulding". The leaf-shaped impression now discussed, might very probably be identified with the area praefrontalis ossis maxillaris (F.—LGH., 1923), which should more correctly be designated as area ossis maxillaris pro lamina maxillari ossis praefrontalis (F.-LGH., 1923, emend., nunc, FEJÉRV.). In the present case, and with special regard to the nasal crest of the maxillary's prefrontal process, we may speak of an impressio semilunaris cristae nasalis processus praefrontalis maxillae pro lamina maxillari ossis praefrontalis, mihi. From the caudad limit of the impression just discussed, the prefrontal process's nasal crest loses its bulky aspect, and very soon becomes quite lamellar in structure, gradually gaining in horizontal protrusion, i.e. width, towards its posterior end which is the broadest, most horizontal — though still markedly oblique in latero-medial direction — and, thus, most saillant part of the strange „moulding" formed by it. The posterior end of this subhorizontal terminal and lamellar part of nasal crest of the maxillary's prefrontal process forms a subsemilunar indentation, with a very short but sharp point protruding from its free, medial side. — All the details here described are clearly to be discerned when applying to Fig. 2 on Pl. X, which should be recommended to facilitate understanding while following the thread of the description. Figs. 12 and 13 represent the parallel conditions put forward by *Ameiva surinamensis* LAUR., to which several allusions have been made in this paper. — There is, however, one detail that still should be recorded. As visible on Fig. 1, Pl. X, the jaw was broken, in vertical direction, between the second and third tooth preserved in the maxillary, i.e. and above the region where the 3th tooth had stood. The fracture occurred during the handling of the rest, after the photo to be seen on Fig. 2, Pl. X, was taken, so that the fracture line is still absent in the latter. The fracture exhibited the interior framework of the nasal crest of the maxillary's prefrontal process, and evidenced that the crest is not filled out with osseous tissue, but encloses two comparatively wide canals, superimposed to one another; the examination of these canals by means of a probe introduced into them, proved that they proceed, rostrad and caudad of the fracture, so far as the nasal crest itself does, i.e. throughout the whole length of the crest. The probe showed that the canals appear to have,

both anteriorly and posteriorly, blind ends. The canals are separated from each other by a latero-mediadly, i.e. extero-internadly, oblique, thin bone lamella which divides the lumen of the crest into a smaller lower part, exposing, in transverse section, a triangular shape, the point of the subequilateral triangle rising from the massive bony tissue of the basal torus of the (nasalo-) prefrontal process; this part of the torus has a columnar shape in transverse section, and under it the rostral end part of the canalis partis alveolaris superioris nervi infraorbitalis is to be found, also subtriangular in section, with the basis of the lumen formed by the lamina horizontalis maxillae (SIEBENR., 1893), whilst the dorsal vault of it being formed by the basal, i.e. ventral, limit of the (nasalo-) prefrontal torus's transverse section. The nerve canal just referred to is much smaller than, about half the size of, the rostral end portion of the nasal crest's lower lumen. The nasal crest's upper lumen, i.e. the one superior to the subtransversal lamella occurring in it, is almost twice as large as the inferior lumen, its shape being irregularly semilunar, with the string of the bow being basal in position and slightly concave dorsad, according to the slight dorsad bending of the lamella, whilst the dorsal outline of the lumen is constituted by the convex arch of the half moon. The description of the shape of the transverse section of the nasal crest's lumina refers only to the place in which the fracture occurred, the outlines here described not being, thus, indicative of the form of the respective lumina on any other spot of the canals' course. Not having had the opportunity to make the dissection of the head of an *Ameiva* in flesh, and thus to find out the rôle played by the nasal crest's canals in their relation to soft-anatomical conditions, the lower canal should, provisionally, be designated as canalis inferior cristae nasalis processus (nasalo-) praefrontalis ossis maxillaris (mihi), whilst for the upper one the name canalis superior cristae nas. proc. (nas.-) praefr. oss. max. (mihi) should, accordingly, be proposed. The lamella separating the lower canal from the upper, may be termed lamella interna obliqua cristae nasalis processus (nasalo-) praefrontalis ossis maxillaris (mihi).

From the topographical and metrical conditions evidenced by the nasal crest, the following facts may be inferred as bearing upon the nasal bones and the narial fenestrae of the skull in *Palaeovaranus:* this prototypical member of the family Varanidae possesses, as stated above, well developed nasal bones, much like those obtaining in the Tupinambid genus *Ameiva:* the nasals must

be pretty long, and — taking into consideration the morphological conditions displayed by the rostral portion of the maxillary, which will be dealt with in the course of the subsequent descriptions — rather narrow; the length of the nasal bones entails, in turn, the presence of short and, in comparison to the status exhibited by *Varanus*, very small narial fenestrae in the skull, such fact being mechanico-morphologically connected with the relative shortness of the nasal process of the premaxillary bone, which was already pointed out on p. 67—68 of the present paper.[1] The nasal bones of *Palaeovaranus* evidently possess a well developed crista maxillaris ossis nasalis (mihi), which fits into the sulcus, pro crista maxillari ossis nasalis, cristae nasalis processus (nasalo-) praefrontalis ossis maxillaris, described on p. 69 of this paper. — The whole configuration of both the maxillar crest of the nasals and the basal torus and nasal crest of the maxillary's (nasalo-) prefrontal process obtaining in *Palaeovaranus* are closely paralleled by the conditions exposed by the Tupinambid species *Ameiva surinamensis* LAUR. that affords, on the whole, a miniature „edition" of the respective complex of morphological peculiarities present in, and characteristic of, the Caylus Monitor. (For *Ameiva surinamensis* see Pl. X, Figs. 11—13.). Such instance points toward two, phylogenetically different, facts, both of which prove to be of equal import.

On the one hand, we see that the Oligocene Varanidae still possessed much developed nasal bones, and, herewith, small and (transversely) narrow narial fenestrae, the anterior border of the nasal bones having evidently reached to about the trabecular part of the intranasal (= turbinal) bones — which is a primeval feature preserved in most of the Lacertilian forms, either fossil or recent, among the latter even in the most modernized representatives, *Lacerta*, e.g. And so it becomes clear that in the prototypes of the Varanidae the reduction of the nasals, already obtaining in, and characteristic of, the Lower Cretaceous (Neocome) Platynota: Dolichosauridae GORJ.-KRAMB., sensu NOPCSA and Aigialosauridae NOPCSA, took place at a much later period of time than in the latter ones. The Dolichosauridae and Aigialosauridae prove thus to have got both specialized and extinct in much earlier times than such typically Platynote specializations were brought about in the most ancestral members of the family Varanidae, its typical genus, *Varanus*, thus resulting in being but of a comparatively young age — most likely remounting to the Miocene, since the first well known and g e n e r i c a l l y safely identifiable Varanian remains

are those of *Varanus marathonensis* WEITH. from the Lower Pliocene bone breccie of Pikermi.

On the other hand, the agreement of *Palaeovaranus*, in the respect put forward here above, with *Ameiva* suggests that — as mentioned on p. 56 of the present paper — a rather close connection may be supposed to exist between the Varanidae and Tupinambidae, the two families probably drawing their origin from some common Paleocene or Eocene — or, may be, even Cretaceous — group of ancestry. Such supposition offers a new material of discussion, for it raises the question w h e r e the cradle of the Provaranian (Varano-Tupinambid?) stock had stood? Is it the territory of the present Old World or that of the present New World which had been its lieu d'origine? How is it possible that the chorological distribution — i.e. that which comprises both the temporal and spacial spread — of the Varanians shows a range from W to E,[126] the most ancient Varanoid forms being known from the Wyoming Eocene (North America), whilst the youngest fossil Monitors had to turn up in the far East of the Eurasian continent, i.e. in the Pliocene (Siwalik Hills) and Pleistocene (Karnul District of Madras) of India, and in the Pleistocene of Australia (Kings Creek and Chinchilla, Darling Downs; Wellington Valley, New S. Wales)?[127] And now we see that a close connection seems to establish itself between the New World Tupinambidae and the Oligocene *Palaeovaranus* from France. If such connection should prove to really exist, i.e. if it should prove to be of a more intimate kind than to which some parallel drawing its origin from a remote homoeoplasy remounting to the Prolacertilian stem in general would be due — a late Mesozoic or early Palaeogene connection by land would necessarily have to be accepted as uniting the E part of America — presumably of North America — with the W lands of Europe or, may be, of Eurafrica. For only in this way the kinship and the geological and geographical spread of the Varanian group may be understood. Personally, I dare say that I am convinced of the subsistence of such land at the date mentioned here above, for I appreciate the common characteristics of *Palaeovaranus* and the Tupinambidae as very probably pointing at a direct phylogenetical linkage of these two groups, such linkage involving, in turn, the subsistence of an Americo-European land-

[126] Cfr. pp. 421—433 of my 1918 Monograph.
[127] Cfr. the synoptical table on p. 445 of my 1918 Monograph.

connection at the geological epoch concerned. If such paleogeographical connection might be visualized in the form of a subsequently submerged land bridge, or, on the contrary, if it might be explained by applying to WEGENER's famous theory of the continents' drifting — that is a question in which I do not feel entitled to hold up any opinion, thus not joining any stand point, either pro or con. No doubt, the distribution of the Varanidae and Tupinambidae might easily be adduced as offering one biogeographical proof more in favour of the drifting theory which certainly is very suggestive if only the biological, geodetical, tectonical and geomorphological side of the problem be concerned, but which does not seem to stand very well its ground against especially those of the petrographical protests that arise when considering the contradiction existing between the evidence due to volcanic record on the one hand and the Wegenerian supposition of the distribution of the Sima and Sial on the other, though it is precisely the latter thesis which proves to be fundamental of the whole of WEGENER's argument.

From the shape of the maxillary's premaxillary process, as well as from the ascendence angle of the proc. (nasalo-) praefrontalis and from the inferences bearing upon the morphology of the premaxillary and the nasals,[128] we may conclude to the Caylus Monitor having possessed a rather pointed, short and high snout, the latter construction necessarily involving a pyramidocephalous type of skull, not unlike, on the whole, that obtaining in the Tupinambid genus *Ameiva*, from which the facial skeleton of *Palaeovaranus* appears to differ very markedly only in the scheme of the teeth, the dentition of the Caylus Monitor being typically Varanian, whilst *Ameiva* presents quite another type of dentition, more akin to the Lacertian one, its teeth being, in about the two posterior thirds of the maxillary, bifid, presenting two well defined cusps.

As to the morphology and dimensions of the prefrontal bone, the details concerned exhibited by the maxillary afford hardly any ground of real evidence. To begin with the sole positive statement, there is a topographical fact which may be safely infered as a negative. We know that in Varanians each of the two narial fenestrae is delimited by the intranasal, the maxillary, the premaxillary's nasal process, the nasals, the nario-marginal edge of the prefrontal's maxillary lamina, and, as a rule, the lateral nasal process occurring on either side of the frontal processus nasales

[128] Cfr. p. 67. & 71—72.

laterales ossis frontalis (mihi). It is evident that in *Palaeovaranus* the prefrontal did not participate in the formation of the narial fenestrae, the latter having been enclosed by the intranasal, the maxillary, the nasal process of the premaxillary and the nasals only — as is the rule with all those Lacertilians that possess normally developed nasal bones, such state of conditions excluding both the prefrontal and frontal from the delimitation of the narial fenestrae. (The same conditions obtain also in *Ameiva*, cfr. Pl. X. Fig. 11). — As to the size and form of the prefrontal and its relations, practically nothing can be established. Manifold differences are obtaining, in this respect, within the group of the Varanians, such differences being of specific import. The same fact may be stated also regarding the intranasal bone, the size and form of which is often determinative of the topographical relations of the prefrontal. The intranasal of the Varanians forms, in its posterior part, a wide, sack-like cavity looking dorsad and protruding caudad, the postero-lateral portion of this bone, which is the lamina posterior (MÉHELY, 1910)[129] and which should more correctly be called lamina maxillaris posterior ossis intranasalis (MÉHELY, 1910, emend, nunc, FEJÉRV.), being — in *V. niloticus* L., e.g. — laterally addressed to the medial surface of the prefrontal's maxillary plate which is, thus, medially, i.e. internally, flanked by the intranasal and laterally, i.e. to the exterior, by the maxillary, so that it results in being intercalated between the two latter named bones. The prefrontal's lamina maxillaris leaves thus a visible impression on the medial surface of the maxillary's prefrontal process, as shown by Fig. 1 of Pl. X. In such case it is not difficult to calculate, from its trace left on the medial surface of the maxillary, the length of the prefrontal, or, rather, the forward protrusion, length, and even shape, of its maxillary plate. But in the maxillary of *Palaeovaranus** under inspection no reliable traces are to be found as safely indicating any of the conditions dealt with here above. If the leaf-shaped impression provisionally and conditionally identified, on p. 70, with the area ossis maxillaris pro lamina maxillari ossis praefrontalis should really prove to respond to such supposed homology, the maxillary process of the prefrontal would result in having protruded very far forward, paralleling, in this respect, the recent *V. niloticus*, whilst the presence of a rather deep dorso-marginal furrow ought to be supposed to have occurred on it, into

[129] Cfr. L. v. MÉHELY, ll. cc.

which the caudad, most saillant portion of the moulding-like nasal crest of the maxillary's (nasalo-) prefrontal process — i.e. that part of the latter, which lies posterior to the leaf-shaped impression — might have fitted in. Such reflection is, however, of a purely conjectural and hypothetical value, the correctness of the interpretation thus given not being, in any way, granted by actuality.

The loreo-preorbital part of the maxillary, as shown by Fig. 1 on Pl. X, that represents the rest after its single parts were adapted to one another, proves widely different from the type exemplified by *V. griseus* and, e.g., *V. Dumérili* [MÜLL.] SCHLEG., and is, in this respect, intermediate between *V. salvator* LAUR. or *V. bengalensis* DAUD. on the one hand, and *V. niloticus* L. on the other: for the part in question presents a large and slightly deepened surface, with its posterior border describing an apparently wide concave arch, quite gradually going over into both the zygomatic process of the maxillary and the posterior end of the (nasalo-) prefrontal one, these processes not being, thus, so sharply marked off as in, e.g., *V. griseus* in which they appear in bold outline because of the deep rostral sinuation of the intermediate (posterodorsal) part of the upper jaw. Also in this respect *Palaeovaranus** seems to approach the respective conditions obtaining in *Ameiva surinamensis* LAUR. (cfr. Pl. X, Fig. 12).

The full number of the foramina maxillaria pro exitu ramorum gingivalium et cutaneorum partis alveolaris superioris nervi infraorbitalis is about 10.

The processus zygomaticus maxillae — to which, in Varanians, the jugal, the transverse, and the transverse process of the pterygoid are adhering — is broken off in all specimens at my disposal.

An ala intranasalis maxillae (FEJÉRV.)[130] which, in the short-snouted Varanians,[131] medially o v e r l a p s the outer edge of the intranasal and, by means of the protrusio medialis alae intranasalis ossis maxillaris (FEJÉRV., 1918, emend. FEJÉRV., nunc).[132] more or less sharply forms the incisura intranasalis ossis maxillaris (FEJÉRV., 1918, emend. FEJÉRV., nunc),[133] is apparently wanting in the Caylus

[130] Cfr. p. 11 of the present paper.

[131] Cfr., e. g., † *Varanus dirus* DE VIS (ident. inc.?) from the Pleistocene of Darling Downs, Queensland, Australia, Fig. 16, on p. 414 of my 1918 Monograph.

[132] Named processus turbinalis alae superioris maxillae in my Monograph, l. c.

[133] Named incisura turbinalis in my Monograph, l. c.

Monitor. It is, of course, not impossible that the feebly developed, short and very low — for there is no room left for a bone crest exhibiting another shape — ala intranasalis m i g h t, though, have been present in the Caylus Monitor, but rather only in the form of a stronger developed crista intranasalis ossis maxillaris (FEJÉRV., 1918, emend. FEJÉRV., nunc = crista nasalis FEJÉRV., 1918, l. c. & p. 385) somewhat extending caudad and immediately losing itself in the bulky and steeply ascending processus (nasalo-) praefrontalis maxillae which rises immediately behind the excavatio nasalis ossis maxillaris (FEJÉRV., 1918, ll. cc.).[134] Such supposition would, however, prove to rely on purely hypothetical grounds of idea, for the specimen represented on Figs. 1 and 2, Pl. X, does not exhibit the trace of any wearing, and so it could hardly be surmised that the surface of some fracture — even if but a faint crest be concerned[135] — should have got obliterate in the fossil. But, presumed that such conditions should have obtained in *Palaeovaranus*,* this would but quantitatively, and by no means qualitatively, alter the status we actually have before our eyes in the fossil maxillary from Lalbenque, Caylus.

As shown by the fossil under inspection, *Palaeovaranus Cayluxi* presents a hypsiprosopoid type of skull, evidenced by the shape and topographical occurrence of its excavatio nasalis ossis maxillaris. In these details the Caylus Monitor is much the same as the Kabaragoya *(V. salvator)*. The nasal excavation is, however, in *P. Cayluxi*, comparatively deeper, and its postero-medially delimiting crest: the crista intranasalis oss. maxillaris, which stands v e r t i c a l l y, proves to be decidedly stronger than in *V. salvator*. Moreover, there is a well defined, semilunar edge, with the bow of the half moon turned outward, that marks the antero-lateral and lateral limit of the nasal excavation of the maxillary. This carina delimitans excavationis nasalis ossis maxillaris (mihi) I found but very faintly indicated in *V. salvator*. The crista intranasalis which runs subparallel to the rostrad bending of the maxillary, i.e. to the part from which the processus praemaxillares are emitted, appears as a sharp and low crest in its antero-medial part, whilst the postero-lateral portion constitutes a small torus-like evanescence,

[134] For the identification of the parts referred to here above see Text figs. 5 & 6, and Figs. 1 & 2 on Pl. X.

[135] Cfr. the following statements concerning the shape of the intranasal crest of the maxillary, and the conditions evidenced by Figs. 1 & 2 on Pl. X.

the dorsally cylindrical body of which goes over into the very medio-basal part of the torus basalis processus (nasalo-) praefrontalis ossis maxillaris.

In *P. Cayluxi* ident. inc. the topographical relations of the intranasal seem to have been much the same as in *V. salvator*. The intranasal obviously rested, in its rostral portion i.e. with its lamina maxillaris anterior (MÉHELY, 1910, emend. FEJÉRV., nunc; = lam. anterior, MÉHELY, 1910) and the trabeculum (MÉHELY, 1910) ossis intranasalis, upon the crista intranasalis ossis maxillaris, whilst its lateral edge was supported by the lamina horizontalis ossis maxillaris (SIEBENR. 1893) which, on its dorsal surface posterior to the intranasal crest of the maxillary, presents, in longitudinal direction, a well marked impressio intranasalis laminae horizontalis maxillae (F.—LGH., 1923, emend. FEJÉRV., nunc),[136] similar to that observable in other species, and obtaining in both the hypsiprosopic and platyprosopic types.

At the anterior basis of the maxillary's processus (nasalo-) praefrontalis, quite close to the posterior end of the nasal excavation, a small foramen opens into a canal that leads, in latero-caudal direction, into the canalis partis alveolaris superioris nervi infraorbitalis, which fact could safely be established when the fracture between the second and the third tooth preserved in the maxillary, i.e. in and above the region where the 5th tooth had stood,[137] occurred. It represents, obviously, the outlet for the main branch of the upper alveolar and gingivo-cutaneal plexus, i.e. for the end part of the infraorbital nerve's upper alveolar part, and should, therefore, be called: foramen maxillare pro exitu partis alveolaris superioris nervi infraorbitalis (mihi). The same foramen is present in other Varanians as well, always occurring within the area intranasalis ossis maxillaris (mihi) which might, or might not, be clearly delimited by an impressio intranasalis, which, in turn, may occur either in the basal part on the inner (medial) side, of the prefrontal process (in the hypsiprosopic forms) or on the inner surface of the ala intranasalis (in the platyprosopic forms) of the maxillary (cfr. Pl. IX, Figs. 1, 2 & 6). The area intranasalis is formed, in its ventrad, i.e. „basal", part, by the dorsal surface of the maxillary's lamina horizontalis, ventradly sinuate in this region, and bearing the longitudinal impressio intranasalis laminae hori-

[136] Cfr. footnote 124 on p. 69 of the present paper.

[137] Cfr. p. 70 of the present paper.

zontalis ossis maxillaris, whilst the antero-lateral und lateral wall, or dorsal vault, respectively, of the intranasal area are constituted by either the inner (medial) surface of the maxillary's intranasal crest and the inner surface of the intranasal wing (ala intranasalis) of the maxillary, or, in case of the absence of the latter, by the former and the very medio-basal part of the maxillary's prefrontal process — the latter condition obtaining, as stated above, in hypsiprosopic species. — In the Caylux Monitor the foramen here discussed lies in about the middle of the maxillary's intranasal area, and latero-dorsally just at the end of the intranasal crest; a minute, bilaterally compressed, lamelliform outgrowth, ending with a straight outline, protrudes, forward and somewhat dorsad, from the inner (medial) and posterior (caudad) border of the foramen; the antero-basal part of this small, lamelliform „exostose" goes over into the very postero-lateral part of the evanescence in which the small, dorsally cylindrical, torus-like lateral portion of the as stated above: medially sharp-keeled, intranasal crest meets the basal torus of the (nasalo-) prefrontal process of the maxillary (cfr. Pl. X, Fig. 2). The outlet foramen in question lies above, and somewhat caudad of, the second of the foramina that served as outlets to the respective rami gingivales et cutanei given off by the superior alveolar part of the infraorbital nerve. The canal which opens by this foramen, leads back, in caudal direction, into the alveolar canal of the maxillary, which it appears to meet at a point approximately paralleling the 3rd of the gingival and cutaneous nerve-foramina of the maxillary. The alveolar part of the infraorbital nerve thus seems to have formed, at its rostral end, a ramification, the main branch having left the canal by the foramen now dealt with, whilst other branches surveyed the anterior end of the maxillary, viz. that part of it which is immediately adjacent to the premaxillary, and the premaxillary itself. — The same foramen and canal is also present in *Megalania*, the foramen lying, in this case too, at the base of the prefrontal process of the maxillary (cfr. Pl. I, Fig. 2). — The position of the foramen discussed varies with the different species, such variation existing, however, only if its relative place within the area intranasalis ossis maxillaris be concerned, i.e. the variation seems to be but an apparent one, brought about by the specifically different shape and extension of the area intranasalis, and above all, by the different place of occurrence of the processus intranasalis laminae horizontalis ossis maxillaris (mihi) which, in Varanians and *Ophi-*

saurus, e.g., cannot be termed, as in many other Lacertilians, proc. vomerinus laminae horizontalis oss. max., though it is homologous with the latter.[138] Contrarily to the great positional variation occurring in such relation, the spot of occurrence of the nerve foramen under inspection seems to be of a certain topographical constance, viz. more invariable in its „absolute" anatomical position which is determined by its positional relation to the ordinal number of the front teeth — for I always found it in the region above the 4th or 5th maxillary tooth, regardless of the metrical proportion existing between the very anterior part, thus characterized, of the maxillary and the rest part of its length's fractions. In *Palaeovaranus* Cayluxi* Filh. ident. inc. the portion of the maxillary being posterior to the foramen at the lateral end of the intranasal crest is about 4 times and ½ as long as the part anterior to it, whilst in *V. griseus* the posterior part does not reach quite the double of the anterior's length; in *V. niloticus* I found the posterior portion of the maxillary to measure about 2 times and ½ the length of the anterior one, and in a specifically undetermined upper jaw of a recent Varanian the length of the part posterior to the foramen contained about 3 times that of the part anterior to it (cfr. Pl. X, Fig. 2, & Pl. IX, Figs. 1, 2 & 6). These data suggest that the position of the outlet foramen of the superior alveolar part of the infraorbital nerve merely depends upon the mode of innervation of the anterior maxillary teeth and adjacent parts, the osteological likeness obtaining in this respect being entailed by a like principle of innervation. On such grounds, the occurrence of the foramen, together with the evidence concerned delivered by the size of the teeth, may, in certain cases, afford a valuable indicant as to the topographical identification of very fragmentarily preserved jaws of fossil Varanians.

In *V. griseus*, and in platyprosopic Varanians in general (cfr. Pl. IX, Figs. 2 & 6), there is a short, antero-posteriorly inclined bone lamella that connects the lamina horizontalis oss. max. with the (caudal) end part of the ala intranasalis oss. max., about at that point at which the latter goes over into the base of the maxillary's prefrontal process. This lamella, which is very characteristic of the platyprosopic Varanians, and the traces of which are also to be found in the hypsiprosopic Tupinambid *Ameiva surinamensis* Laur. (Pl. X, Fig. 12), may be termed lamella obliqua

[138] Cfr. the statements concerned on p. 82 of the present paper.

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intranasalis ossis maxillaris (mihi). (Cfr. Textfig. 6). In *V. griseus* the foramen dealt with here above lies at the dorsal front basis of the maxillary's oblique intranasal lamella, whilst in the undetermined Varanian maxillary visible on Fig. 2 of Pl. IX, it is situated far in front of the latter; this difference is very striking, especially because of the different shape and occurrence of the horizontal lamella's intranasal process, the latter condition being rather determinative of the shape of those surfaces that constitute the maxillary's intranasal area; and if, to this difference, we add the fact that in *V. griseus* the said foramen occurs in the region above the 5th tooth, whilst in the undetermined Varanian jaw it lies above the 4th — we find plenty of evidence to account for the great morphological disagreement existing, in this respect, between the two jaws here compared. — Both in *Palaeovaranus* and *V. niloticus* the oblique intranasal lamella of the maxillary is absent. Thus, the area intranasalis lacks, in these forms, its valve-shaped appearance, so characteristic of the platyprosopic forms. In the rather mesoprosopic Nile Monitor the conditions obtaining in this respect are of the hypsiprosopic type. The foramen serving as outlet for the end branch of the infraorbital nerve's superior alveolar part, occupies a pretty advanced position, lying at the base of, and interior to (i.e. mediad of) the very strongly developed crista intranasalis oss. max., which continuously passes into the well developed, but rather vertical than subhorizontal (which fact marks a comparatively primitive condition) ala intranasalis ossis maxillaris. Very characteristic, of the Nile Monitor jaw under inspection, is the deep furrow that leads to the foramen mentioned, and runs close and sub-parallel to the margin of the maxillary's intranasal wing, strikingly reminding of the conditions obtaining in *Megalania* (Pl. I, Fig. 2), in which, however, the position of the foramen and the course of the furrow leading to it, are caudad, instead of rostrad as in the Nile Monitor. Indication of the same furrow is to be found in *V. griseus* (Pl. IX, Fig. 6)[1] and in the *Varanus* sp. the jaw of which is represented on Pl. IX, Fig. 2; in the former species the furrow runs on the lateral, i.e., in situ, dorsal, surface of the mediadly much bent ala intranasalis, and proceeds forward to meet the foramen, whilst in the latter species it occurs on the inner, i.e. medial, side of the more vertically standing, viz. mediadly much less inclined, intranasal wing of the maxillary, is but very short — and runs backward, as in *Megalania*, to join the nerve hole. Not having clarified the anatomical

rôle, and, herewith, the identity, of the furrow under inspection, I abstain from designating it by a name, the question remaining to be settled at earliest convenience.

The lamina horizontalis ossis maxillaris (SIEBENROCK, 1893) is, in the nearly complete maxillary of the Caylus Monitor, represented on Pl. X, Fig. 2, but slightly injured, its edge being defective in the anterior part only. It does not seem to have been much broader than in its present state of preservation. It follows a rather straight course, exhibiting but a feeble sinuation in the part bearing the impressio intranasalis laminae horizontalis ossis maxillaris, which lies between the severely damaged processus praemaxillaris interior ossis maxillaris and the processus intranasalis laminae horizontalis ossis maxillaris,[139] the latter one being completely broken off. The horizontal lamina is comparatively thin in its anterior part, until about the 9th tooth, in which place it begins to thicken considerably, assuming the form of rather a torus, or much elongated callus, than of a real lamina, emitting, above the 13th and the 14th tooth, the massive, relatively thick and broad processus palatinus laminae horizontalis ossis maxillaris (SIEBENR., 1894),[140] presenting an excavated facies palatina processus palatini laminae horizontalis ossis maxillaris (mihi), into which the evidently convex facies maxillaris ossis palatini (mihi) was fitting in. The palatine „process" of the maxillary is, however, in *Palaeovaranus** — just as in other Varanians, the Komodo *Placovaranus* FEJÉRV. included

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[139] I wish to remark that the denomination processus vomerinus laminae horizontalis ossis maxillaris (FEJÉRV., 1918) = crista intranasalis (emend. FEJÉRV., nunc) must be changed, in the case of the Varanians, as well as in that of, e. g., *Ophisaurus*, into processus intranasalis laminae horiz. oss. maxill., for the process does not meet, in the forms just referred to, the vomerine bone, but the intranasal bone which, in Varanians, joins the mentioned process of the horizontal lamina by means of the lateral side of the strong, callous crest (crista vomero-maxillaris ossis intranasalis, mihi), that forms, in this family, the lateral limit of the comparatively mediumsized, but deep, fossa ossis intranasalis pro organo Jacobsoniano (mihi), and intrudes into the pre-choanal space left between the vomerine bone and the maxillary's horizontal lamina — whilst in *Ophisaurus* the horizontal lamina's above named process supports the processus maxillaris posterior of the intranasal bone, without being met, on its ventral side, by the vomerine bone as well.

[140] With respect to the osteological identification, two heavy mistakes have crept into the terminology used, by the author of the present lines, on p. 414 of his 1918 Monograph, in the explanation of Fig. 16a which represents the medial view of the maxillary of † *Varanus dirus* DE VIS ident. inc. The rectification is to be found on p. 85 of the present paper.

— not a real process, but merely a somewhat protruding part of the maxillary's horizontal lamina (cfr. Pl. X, Figs. 2, 4 & 6). In the construction of this part the Caylus Monitor closely resembles *V. salvator*, not being unlike *Ameiva surinamensis* either (Pl. X, Fig. 12).

From the point lying above the posterior end of the 6th tooth's basis, a rather deep, broadly hollowed furrow occurs, on the medial, or inner, surface of the maxillary, and runs along the dorsal level of the horizontal lamina; this furrow is „carved" into the very basis of that part of the maxillary which forms its (nasalo-) prefrontal process, and is sharply marked off from the surface superior to it (Pl. X, Figs. 2, 4 & 6). The furrow in question appears to constitute, at least in the major part of its course, the bony bed of the ductus naso-lacrimalis which, as stated on pp. 50 and 53 of the present publication, opens, in Varanians, in about the middle region of the choanae; what the very deep and most strongly marked off rostral part of the furrow may represent in its relation to the soft parts, is a question that the writer of the present lines is compelled to leave open to further investigation, for it appears improbable to his mind that precisely the end part of the naso-lacrimal duct, and precisely in its end part, should have left such pregnant trace in the bone. There is no parallel known to the writer, which might serve as a hint in the elucidation of the anatomical significance of this very peculiar osteological feature. Maybe that the furrow had been recipient of some cartilaginous rod that occurred in the very lateral region of the chondrocranium's olfactory portion, or maybe, that it is expressive of some special relation having obtained in the osseous part of the nasal skeleton, of which we are still ignorant. The posterior, evanescent part of the furrow, i.e. that part of it which runs along the posterior, torus-like portion of the maxillary's horizontal lamina, may, on account of comparative osteological record, effectively be identified with the sulcus maxillaris pro ductu naso-lacrimali (mihi), whilst the rostrad end part of the furrow has to remain of problematical identity. The shape of the furrow seems to be of generic importance, thus representing a useful character bearing upon the identification of fossil rests, for it differs, in *Palaeovaranus*,* very markedly from the conditions obtaining in other members of the family Varanidae. Such fact will be elucent from the comparative inspection of Pl. X, Fig. 2, and Pl. IX, Figs. 1, 2 and 6. Most instructive proves also the comparison of the Varanian conditions with

those exposed by the Tupinambid *Ameiva surinamensis*, visible on Fig. 12, Pl. X.

The following parallels should be put down as probably bearing upon the inferential clarification of the phyletical morphogeny and anatomical homologization of the several parts entering the field of our present inspection: The rostrad end of the furrow in *Palaeovaranus** lies at the point where the lamella obliqua intranasalis of the maxillary meets, in the platyprosopic Varanians (Pl. IX, Figs. 2 and 6), and in the hypsiprosopic *Ameiva*, the maxillary's horizontal lamina. Both the furrow in the Caylus Monitor and the angle enclosed by the oblique lamella and the horizontal lamina in the platyprosopic Varanians are ending blind. The lateral end of the maxillary's intranasal crest goes over, in the Caylus Monitor, into the medial part of the basal torus of the (nasalo-) prefrontal process of the maxillary, and the same principle obtains in other Varanians and in *Ameiva*. Whilst, however, the maxillary of *Ameiva* and the hypsiprosopic Varanians does not differentiate any intranasal wing, the dorsal margin of the prefrontal process of the maxillary of the latter species thus corresponding to the whole of the surface that, in *Palaeovaranus** and *Ameiva* exhibits the nasal crest (cfr. Pl. X, Figs. 1, 2, 12, & Pl. X, Figs. 3, 5) — the intranasal wing present in the mesoprosopic (Pl. VIII, Figs. 6, 7 & Pl. IX, Fig. 1), and platyprosopic (Pl. IX, Figs. 2, 4, 6) Varanians may be looked upon as having evolved from the inner, or medial, side of the prefrontal process' nasal crest, whereas the outer side of the latter seems to correspond to the strong crest (*V. niloticus:* Pl. VIII, Fig. 7) into which the carina delimitans excavationis nasalis ossis maxillaris is protruding in dorso-caudal direction, or, in the platyprosopic forms, to the (lateral) limit of the nasal excavation, marked, in this type, by a modest furrow laterad of which the body of the maxillary stands out in a more or less marked, slightly vaulted relief (cfr. Textfig. 6.) that bends over to meet the anterior edge of the abruptly rising prefrontal process. I do not pretend, of course, that the morphological details referred to here above and characteristic of the three types concerned occurring in genus *Varanus*, may be, phylogenetically, exactly deduced from, and thus, anatomically, absolutely homologized with, the topographically corresponding parts of the Palaeovaranian skull — but I wished to point at the striking appearance that suggests the idea that the meso- and platyprosopic features may well be derived from the Palaeovaranian hypsiprosopic prototype by the nasal

crest's having — from step to step with the gradual reduction of the nasal bones — bent itself inward, i.e. mediad, finally producing the ala intranasalis connected, in the platyprosopic type, with the horizontal lamina by means of the oblique intranasal lamella,[141] whilst those forms that evolved into hypsiprosopic species, retained, in this respect, more primitive, i.e. less specialized conditions, the nasal crest having, in such case, simply degenerated in consequence of an atrophia inactivitatis, and not having undergone modification, saving its existence, by means of functional change, as appears to have obtained with the inset of those bio-mechanical — or, to express ourselves more cautiously: bio-dynamical — stimuli which led to the production of the meso- and platyprosopic types. With respect to the causal origin of the latter, it should be remarked that the process by which they were brought about is certainly largely dependent on those, presumably exogenous, factors to which the antero-posterior migration of the outer nares is due. Unfortunately, these factors remained obscure before the writer's eyes, and so he is confined to simply refer to his statements concerned, set forth in division A) of Chapter 4 (p. 38—43) of the present publication, with the substance of which the above conjectural suggestions may be harmonized, such harmonization perhaps affording those grounds of argument from which future investigations may start in trying to find out the real thread to be picked up when aiming at the bionomical — viz. both etiognostical and nomognostical — clarification of this complex problem.

These are the details of a more general import, which may be established by comparatively considering the topographical relations of the anterior continuation of the furrow for the naso-lacrimal duct in *Palaeovaranus*. Comparison of the respective Palaeovaranian conditions with those obtaining in other fossil Monitors, does not store our mind with new knowledge. *V. marathonensis* Weith. and *V. dirus* De Vis ident. inc., the maxillaries of which are more or less well known, apparently belong to the platyprosopic type, so that, on the whole, the same conditions seem to have existed in them as in those recent platyprosopic Varani which have already

[141] Though very characteristic of the latter type, and theoretically easily derivable from the strong inward bending of that part of the maxillary, which forms the intranasal wing — the presence or absence of the oblique lamella seems, in fact, to be evolutionally independent of hypsi-, meso- and platyprosopy, for it is present in the hypsiprosopic *Ameiva*, but absent in the Caylus Monitor, as well as in the mesoprosopic Nile Monitor.

entered our consideration. And for the establishment of more intimate details, the material of evidence at my disposition[142] does not prove to be sufficient. Considering the osteological indices, which are less than scarce, it cannot be established whether the naso-lacrimal duct of the Caylus Monitor had been less developed or not than in the phylogenetically younger representatives of the family. The distance between the foramen maxillare pro exitu partis alveolaris superioris nervi infraorbitalis and the rostrad end of the furrow above the horizontal lamina is greater in *Palaeovaranus** than in, e.g., *V. griseus* in which the two points concerned are separated from one another by the thin oblique intranasal lamella only. The topographical relation of the furrow to the intranasal bone is, however, about the same in both instances, for the area intranasalis ends, in the lamella obliqua-bearing forms, precisely with this lamella, whilst in the Caylus Monitor, in which the said lamella is absent, it extends to the anterior end of the furrow — the topographical result thus being, on account of the comparative topographical statements contained in the preceding paragraph, principally the same in both instances.

The sulcus maxillaris pro ductu naso-lacrimali is but faintly marked in its caudal portion, gaining both in depth and width when proceeding rostrad and going over into its anterior prolongation of problematic anatomical identity. The very beginning of the maxillary's furrow for the naso-lacrimal duct, which is the less pregnantly marked portion of it, lies just above the foramen maxillare pro introitu partis alveolaris superioris nervi infraorbitalis F.—Lgh. (1923, emend. Fejérv., nunc, cfr. Pl. IX, Figs. 2 & 6). — The strong keel that draws the antero-superior limit of the furrows rostral prolongation at the anterior basal part of the (nasalo-) prefrontal process, disappears in the region above the 9th an the 10th tooth.

Beneath the level and somewhat caudad of the large, longitudinal slit-like foramen constituting the inlet of the superior alveolar part of the infraorbital nerve, there is, in the Caylus Monitor, just as in, e. g., *V. griseus* and *V. niloticus*, &c., a second, smaller, foramen that leads into a narrow canal running under the alveolar canal of the maxillary debouching in the one or two last of the foramina which served as outlets to the gingival and cutaneous nerve branches perforating (from within) the maxillary. Such condition proves

[142] Cfr. the parts concerned in my 1918 Monograph.

that, in Varanians, the superior alveolar part of the infraorbital nerve[143] may bifurcate before entering the maxillary, the lower and thinner branch: the ramus zygomaticus partis alveolaris superioris nervi infraorbitalis (mihi), being given off, subvertically, to provide the upper jaw at, as well as just anterior to, the very origin of its zygomatic process, whilst the upper and thicker branch: the well known pars alveolaris superior nervi infraorbitalis, goes, horizontally, into the alveolar canal of the maxillary. The zygomatic branch enters the maxillary, at the point indicated here above, through the foramen maxillare pro introitu rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi); then it either directly perforates the maxillary laterad, emerging, through the last one of the gingival and cutaneous foramina — which, in such case, should be termed foramen maxillare pro exitu partis gingivalis et cutaneae rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi) —, as pars gingivalis et cutanea rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi), or it bifurcates (in the zygomatic canal) in giving off two branches: the rami gingivales et cutanei rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi), which perforate the maxillary in passing through the two foramina pro exitu ramorum gingivalium et cutaneorum rami zygomatici partis alveolaris superioris nervi infraorbitalis (mihi).

Accidentally, I whish to remark in this place that the number of the branches given off by the infraorbital nerve's alveolar part, and entering the maxillary, as well as the relative position of their entrance foramina, are very different in the various Lacertilian forms. I found a single entrance foramen in, e. g., *Ophisaurus apus* PALL.[144] *Ameiva surinamensis* LAUR. and *Lacerta Simonyi* STEIND., whilst two foramina — a somewhat lower posterior, and a superior anterior one — occur in *Zonurus giganteus* SMITH. Conditions seem to be rather complex, in this respect, in *Iguana tuberculata* LAUR., for a more or less extensive part of the alveolar canal of the maxillary lies uncovered, thus forming but a furrow which

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[143] The alveolar part of the infraorbital nerve counts from the latter's entrance into the foramen palatinum pro introitu partis alveolaris superioris nervi infraorbitalis; cfr. M. WEBER's identification to wich the author of the present publication is adhering (see footnote 82 on p. 47).

[144] Cfr. also Baroness DE FEJÉRVÁRY—LANGH's data concerned, in: Beitr. z. einer Monogr. d. foss. Ophisaurier, Fig. 11, on p. 150, and, for *O. pannonicus* KORM., p. 182, and tab. VI, Fig. 2a.

exposes a series of foramina leading, through minute canals, to the foramina constituting the outlets of the gingival and cutaneous nerve branches, whilst short horizontal canaliculi may, moreover, connect some of the contiguous entrance foramina which lead, also in such instance, to those of the gingival and cutaneous foramina that lie, rostrad, next to them. Thus, in *Iguana*, an anastomosing frame work of minute alveolar canaliculi may be formed in the posterior part of the maxillary. In *Ophisaurus*, *Zonurus* and *Iguana* the superior alveolar part of the infraorbital nerve enters the (closed) alveolar canal of the maxillary in about the middle region of the upper jaw's length, whilst in *Lacerta* and *Ameiva* the nerve hole concerned lies more caudad, though by far not so near the (posterior) end of the maxillary as in Varanians.

About 15 teeth might have been present in the maxillary of *Palaeovaranus* Cayluxi* FILH. ident. inc., for the first tooth appears to have occurred on the limit between upper jaw and premaxillary (cfr. Pl. X, Fig. 2), so that two teeth appear to be wanting anterior to the first tooth actually present, i. e. preserved, in the remain under inspection. The dentition of *Palaeovaranus** is very typically Varanian, its scheme thus deeply differing with that exposed by the Tupinambid Ameiva. The teeth are, in shape, intermediate between those of *V. griseus* and *V. salvator*, more approaching, however, the former than the latter species. They are not unlike those of † *V. marathonensis*, though markedly less robust, i. e. anteroposteriorly much slimmer, than in this species which also in general is larger and, in comparison to the Caylus Monitor, rather heavy built. The tooth bases, or socles, are, in the latter form, unusually large, broad and thick, extending to about the half of the total length of each tooth concerned. A slight swelling is present, on the lingual side, at the limit between the shiny enamel distal portion and the dull, vertically strongly furrowed proximal, i. e. basal or socle, portion of the teeth. The exterior (lateral or labial) surface of the teeth visibly less convex than the interior (medial or lingual) one. The rostral edge of the teeth is convex, with a sometimes strongly marked medial keel. A rather strongly marked keel occurs on the labial edge of the posterior i. e. caudal, surface. All teeth are slender, curved backwards, and sharply pointed. A narrow, semicircular swelling, marking the limit of socle and crown, occurs also on the labial side of the teeth, this part appearing as the product of the ankylosis that took place between the rather sharp, but low, crista dentalis ossis maxillaris (SIEBENR., 1892) and the

teeth. The tooth basis or socle is furrowed also on the labial side, some of the furrows extending, on both the lingual and labial sides, upon the proximal circle of the crown part. The crista dentalis is, in consequence of the ankylotic swellings just mentioned, more or less serrated. The place of each wanting tooth is marked by such impressions as is often left by pleurodont teeth, the impressions concerned being delimited by the crista dentalis on the labial, and the lamina horizontalis oss. maxill. on the lingual, side. The lingual side of the socle extends in the 9th to 12th teeth to the free, i. e. inner or medial, edge of the horizontal lamina, whilst in the teeth anterior and posterior to the mentioned ones, the margin of the horizontal lamina protrudes linguad, beyond the tooth bases, and is most saillant at the bases of the smallest and latero-medially most compressed, foremost teeth, i. e. from the posterior end of the socle of 2nd to the anterior end of the socle of the 5th tooth, where the intranasal area of the horizontal lamina occurs, which fact mechanically causes the lamina to be broadest in this region — the 1st and the 2nd tooth growing on the maxillary's broad exterior premaxillary process, thus not being roofed over by the horizontal lamina. The presence of a sulcus dentalis (SIEBENR., 1892) might be signalized in the anterior and posterior part of the maxillary only, not being, however, really typical in these places either: the middle portion rather forms a slope gently decliving laterad. Also in this respect *Palaeovaranus** proves to be typically Varanian, and not Tupinambid at all.

The total length of the rest represented, magnified, on Pl. X, Figs. 1 and 2, measures 38.38 mm; greatest length of nasal excavation: 5.92 mm; length of processus (nasalo-) praefrontalis, measured from its basis (i. e. from the posterior limit of nasal excavation): 22.42 mm; ascension angle of proc. (nasalo-) praefrontalis: 120°; maximal height of jaw, measured vertically from the (posterior) end of (nasalo-) prefrontal process: 13.73 mm; from anterior end of jaw to anterior end of the furrow the caudal continuation of which forms the sulcus ossis maxillaris pro ductu naso-lacrimali: 10.01 mm; from anterior end of jaw to anterior margin of foramen pro introitu partis alveolaris superioris nervi infraorbitalis: 30.99 mm; greatest width of surface comprising the common basal section of the two premaxillary processes of the jaw: 3.88 mm; greatest width of jaw in posterior part, the processus palatinus laminae horizontalis oss. max. comprised: 2.9 mm; greatest width, or thickness, of the (nasalo-) prefrontal process's nasal crest at upper (posterior)

end: 3.77 mm; total length of nasal crest: 16.65 mm; length of 9th tooth: 6.85 mm; antero-posterior basal, or socle, width of same 3.71 mm.

Apart from the fragment described, there are, in the Munich collection under inspection, 2 other maxillary remains belonging to the same species, and represented, (somewhat) magnified, on Pl. X. Figs. 3 to 6. These fragments belong to the posterior two thirds of the maxillary.

From all the morphological and topographical details bearing upon the reconstruction of the skull's, and, thus, the head's, shape in *Palaeovaranus* Cayluxi* Filh. ident. inc., it becomes evident that — if in the valuation and standardization of the cranial characters it be precisely the Varanian conditions that are considered — there is a marked contradiction existing, on the one hand, between the typically hypsiprosopic formation of the anterior part of the maxillary, in which respect the Caylus jaw rather approaches the scheme exemplified by *V. salvator*, the particulars bearing upon the relation to the nasal bones excepted, and, on the other, the set of characteristics pointing at a non-platycephalous, but, on the contrary, pyramidocephalous, skull with an altogether short and pointed snout, and comparatively short narial fenestrae. In this respect the Caylus genus proves to bear a rather Tupinamboid than Varanoid stamp, such circumstance necessarily being implied by the Tupinamboid, and not Varanoid, conditions dependent on the morphology of the nasal bones. So far as may be gathered from the most instructive upper jaw here analysed, it is, when keeping to the Varanian standard, the hypsiprosopic characters that preponderate in the Caylus Monitor, whilst the platyprosopic (being, in this case, represented by the shortness of the snout, the small narial fenestrae and cavities only) remain in effectual minority. From such point of view, considering the typological „mixedness" of the characters, the jaw in question may be said to be, to some extent, rather mesoprosopic with preponderant hypsiprosopic characters, or, briefly, hypsiprosopoid, than typically hypsiprosopic. Among the Varanian species accessible to the writer, the maxillary of *V. bengalensis* appears to show the greatest resemblance to that of the Caylus form, but in the Bengalee Monitor the platyprosopic features are decidedly more pronounced than in the Caylus genus, for *V. bengalensis* is a mesoprosopic form with, in opposition to *Palaeovaranus**, rather platyprosopic than hypsi-

prosopic characters, thus being, on the whole, platyprosopoid. On account of those characteristics, however, in the presence of which the fossil Varanid genus from Caylus joins the Tupinambidae, especially *Ameiva*, such standardization of its craniological characters on purely Varanian grounds of comparison cannot be admitted, and, thus, one is not entitled to say — as one would to be in case of a typical *Varanus* — that *Palaeovaranus** represents, from the view point of the typology of its upper jaw, a real „collective type" uniting the yet not sharply defined and specialized characteristics of both the less differentiated hypsiprosopic and much specialized platyprosopic Varanians. For those characters upon which such typological distinction of the Varanians is based, are not yet brought into prominence in the fossil Varanian from Quercy, which, therefore, is but a prototype expressive of undefined morphological potentiality, and not advanced in the specialization concerned so far as to really exemplify, in this very respect, a true „collective type". It is evidently in a later phase of Varanian evolution that such a collective type had developed — conformably to the gradually advancing reduction of the nasals — in which the relational differentiation of the characters forming two antagonistic complexes and thus framing the two main types of the Varanian skull, had not yet been brought about.

A collective type, in the above sense of the conception, is still unknown to us, for our knowledge of the fossil Varanians is but very scanty, whilst such far-reaching collectiveness will hardly be met with in any of the recent representatives of the family. Slight encroachments upon the limits of the very type to which a species craniologically belongs, do not seem, however, to be unfrequent in them, as shown, e. g., by *V. bengalensis* and *V. niloticus*. The prefrontal process, e. g., of the latter species ascends in the shape of a broadly convex sinus (Pl. VIII, Fig. 7), exaggerating, in this respect, the conditions concerned obtaining in the Kabaragoya (*V. salvator*), and being, thus, more hypsiprosopic in t h i s respect than the craniological type itself of Varanian hypsiprosopy. It is not without interest to remark, in this place, that such broadly vaulted (nasalo-) prefrontal process of the maxillary as occurs in the Caylus genus, is unknown to me in other Varanians, *Placovaranus komodoënsis* Ouw. excepted (Pl. V., Figs. 1 & 3)' which, herein, approaches, to some extent, the fossil genus from France. Comparison with that archaic form from Komodo and Sumbawa is especially interesting, for also the maxillary of *Placovaranus* proves to exhibit

some dash of platyprosopy, despite of its being a curiously specialized hypsiprosopic jaw.

Resuming the characteristics of the skull of *Palaeovaranus* Cayluxi*, we may quite briefly state that it is hypsiprosopoid, and, most likely, acutirostric, the latter character being linked, in the present case, to a hypsi-brachyrrhine formation of the rostral portion, which points at a pyramidocephalous construction of the skull, such construction co-occurring with prevailing hypsiprosopy — contrarily to the rule typically exemplified by *V. salvator*, according to which Varanian hypsiprosopy is generally connected with platy-macrorrhiny, the latter feature necessarily involving platycephaly.

Inferential craniological considerations enable us to reconstruct, on absolutely safe grounds of evidence, the primitive type of the Varanian skull: shape rather pyramidocephalous: snout short and rather high than flat; canthus rostralis comparatively short and high; comparatively short intranasal bones, with their lamina maxillaris anterior (MÉHELY, 1910, emend. FEJÉRV., nunc) lying upon the intranasal crest of the maxillary; well developed nasals, with a well developed maxillary crest which fits into the sulcus cristae nasalis of the maxillary's (nasalo-) prefrontal process; narial fenestrae comparatively short, nasal cavities of moderate spaciousness; intranasal wing of maxillary not present, the mode of development of the maxillary portion concerned excluding such specialisation; (exterior nares quite rostrad in position, as in, e. g., *V. varius* SHAW: cfr. Pl. VII, Fig. 1); naso-lacrimal duct apparently of average development.

In all of these details — those enumerated in the two last sentences excepted — *P.* Cayluxi*, which for us represents the ancestral Varanian type, very markedly differs from any of the fossil Varanian species of which cranial fragments are, up to now, known in literature, *V. marathonensis* constituting the next member of the file that follows, in biohistorical sequence, upon the Caylus Monitor. Such ancestral type of the Varanian skull seems closely to join that which obtains in the family Dolichosauridae GORJ.-KRAMB., sensu NOPCSA (1903).[145] From out such type, the skull of modern

[145] Cfr. the skull of *Pontosaurus lesinensis* KORNH. Pl. XXI, Fig. B, in A. KORNHUBER, Über einen neuen foss. Saurier aus Lesina, Abh. d. k. k. Geol. Reichsanst., V, 1873. — Even the vertebrae of *Palaeovaranus* recall those of the Dolichosaurian form just referred to (cfr. l. c. & Fig. 3c in my 1918 Monograph, p. 369), also such fact pleading in favour of the existence of the close relationship

Varanians seems to have evolved along two different lines, and this very probably conformably and in response to the two different sets of mechanical stimuli that affected the jaw apparatus: Thus the longsnouted, platycephalous forms, with a rather high canthus rostralis, large narial fenestrae, spacious nasal cavities and rather terminal nares, arose on the one hand, and the more short snouted, pyramidocephalous species, with a comparatively low canthus rostralis, smaller narial fenestrae moderate nasal cavities and caudad deplaced nares on the other. These two opposite evolutionary directions of skull specialization are, on the whole, running parallel to one another, intercrossing but rarely and slightly, for they are, so to speak on principle, exclusive of each other. But the species contained in either of these two morphologically distinguishable groups do not, at the same time, constitute two phylogenetically opposable systematical complexes — i. e. the single members belonging to either of these two, genetomechanically conditioned, morphological groups may prove to be less closely allied to each other than to some species of the antagonistic group.

The facts summarized here above throw also some light upon the question how pyramidocephaly and platycephaly should be phylogenetically valued in Lacertilians. First of all it should be stated that these two types of skull formation have scarcely more than nothing to do with the degree of intelligence, i. e. the physiological perfection — rooted in histo-physiological, and not in rough morphological and dimensional, peculiarities — of the brain, as very erroneously presumed by authors adhering to antiquated conceptions in neurophysiology. The conditions obtaining in Varanians afford evidence in proof of the fact that platycephaly must not necessarily be primeval to pyramidocephaly, and that ancestral representatives of the Lacertilian group may be, on the contrary, pyramidocephalous, later on evolving into platycephalous types — just as put forward by Mr. G. A. Boulenger with respect to the pyramidocephalous forms of the genus *Lacerta*, which present a strongly ossified skull, in opposition to the platycephalous species exhibiting a light built skeleton and, with it, a more or less „membraneous" skull. So

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between Dolichosauridae and Varanidae diagrammed, by the author of the present publication, on the basis of the combined phylogenetical results arrived at by H. F. Osborn, M. Fürbringer and himself, on p. 442 of his cited Monograph, which visualisation of the problem deeply differs from that set out by the respective diagram published by Baron Nopcsa, on p. 144 of his paper: Eidolosaurus und Pachyophis, Zwei neue Neocom-Reptilien, Palaeontographica, LXV, 1923.

far as my experience reaches, platycephaly and pyramidocephaly are, in Lizards, by no means either expressive nor indicative of a phylogenetically higher or lower development: these different skeletal types do merely represent different, and often parallel, lines of evolution, such evolutional differentiation being due to either mechanical, i. e. exogenously conditioned, causes dependent on the various ways in which the masticatory apparatus has to function, or to the effect of endogenous (alias monentophysical) factors, resulting in an actually orthogenetical[146] thread of evolution. Besides, the general shape of the skull and the relative proportions of its parts if dimensionally compared with each other, will prove to be different in the several ontogenetical stages of one and the same species, this phenomenon of individual growth, the embryonic included, being peculiar to all Craniote Vertebrates. It means, therefore, a basic misinterpretation in the analysis of developmental phenomena, both ontogenetic and phylogenetic, if characters belonging to some other complex of organismic specialization, be evolutionarily valued from the view point of their co-occurrence with either platycephaly or pyramidocephaly, respectively. So, many specialists — e. g. EIMER, BOULENGER, MÉHELY — have followed an absolutely wrong thread of argument when discussing on s u c h grounds of visualization the evolutionary significance of the various Lacertilian types of skull and livery.[147] Neither must we forget that numerous characters that have figured in some previous phase of euthygenetical,[148] i. e. lineage development may, in certain cases, reappear in the course of evolution, making it often difficult to decide whether a character is really ancestral, i. e. both p r i m i t i v e and p r i m a r y, or if it had been secondarily, or perhaps even i t e r a t i v e l y, brought about.[149]

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[146] Cfr., on Orthogenesis, p. 471—475 of my paper: On some Biological, especially Bionomical Terms, Xe Congr. Internat. de Zool., tenu à Budapest, du 4 au 10 Sept. 1927, Budapest, 1929.

[147] Cfr. G. J. v. FEJÉRVÁRY, Üb. d. Entwicklung d. Farbenkleides b. d. Lacerten, Gedanken zu einer phylog.-ontogenet. Studie, Zool. Anz., XLIII, Leipzig u. Berlin, 1914, p. 533—537.

[148] With respect to this term see Footnote 1 on p. 331 of my paper: Quelques obs. s. la loi de Dollo et l'épistréphogén. en consid. spéc. de la loi biogén. de Haeckel, Bull. Soc. Vaud. Sc. Nat., 53, 1920. & p. 475 of op. cit. in Xe Congr. Internat. de Zool. &c.

[149] With respect to the literature on Reversibility and Irreversibility in Evolution, see the bibliographical lists on p. 106—107, added to my paper: Remarks on Baron Nopcsa's Paper on „Reversible and Irreversible Evolution", Arch. f. Naturgesch., 90, A, 12. Heft, 1925, p. 103—108.

2. Mandible: Of the lower jaw an almost complete dentary and a fragment representing about the second third of the same mandibular element are before the writer's eyes. The nearly complete

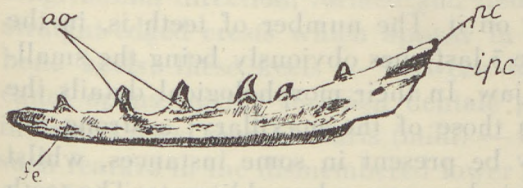

Fig. 7. *Palaeovaranus* Cayluxi* Filh., left dentary, outside-view, magnified 1 ½ times. *ao* = ankylotic ostosis; *fe* = foramina ossis dentalis pro exitu ramorum gingivalium et cutaneorum partis alveolaris inferioris nervi mandibularis (mihi); *pc* = processus coronoideus ossis dentalis (mihi); *ipc* = impressio processus coronoidei ossis dentalis (mihi).



Fig. 8. *Palaeovaranus* Cayluxi* Filh., left dentary, inside-view, magnified 1 ½ times. *fd* = foramen dentale pro introitu partis alveolaris inferioris nervi mandibularis (mihi); *asp* = area splenialis subdentalis ossis dentalis (mihi); *pc* = processus coronoideus ossis dentalis (mihi).

dentary (Text figs. 7 & 8 and Pl. X. Figs. 7 & 8) belongs to a specimen that is rather halfgrown than full-sized, whilst the small fragment (Pl. X, Figs. 9 & 10) evidently belongs to an adult, corresponding in size to the almost undamaged maxillary described here above. The dentary is moderately robust and reminds one of that of a large specimen of *V. griseus*, or, among the fossil forms, that of *V. marathonensis* — the fragmentary specimen of the rests under inspection much resembling the piece of dentary of the latter species, represented on Pl. II, Figs. 3 and 4, of my 1918 Monograph, which, however, obviously belongs to a semiadult individual. The symphysial part of the well preserved rest is slightly damaged, the probably (?) unciform symphysial process (processus symphysicus ossis dentalis, mihi) having been broken off in it. The post-symphysial part forming the mentum follows a subhorizontal direction, being apparently less curved upward than in *V. griseus*, and gradually, but not considerably, tapering toward the anterior end which forms an obtuse point, so that the chin was not strongly marked nor saillant, and but moderately pointed, not forming a sharp curve in neither the horizontal nor the

vertical direction. 7 horizontal, slit-like foramina ossis dentalis pro exitu ramorum gingivalium et cutaneorum partis alveolaris inferioris nervi mandibularis[150] (mihi); the first lies quite rostrad, on the mental portion, whilst the last is to be found in the region below the 12th tooth. The posterior border of even the well preserved specimen is so fractured that its outline cannot be established, and also the several processes are wanting on it. The number of teeth is, in the well preserved specimen, 9, the 3 last ones obviously being the smallest among those of the lower jaw. In their morphological details the mandibulary teeth agree with those of the maxillary; a strong anterior and posterior keel may be present in some instances, whilst in others this character proves to be more or less obliterate. The teeth of the almost complete dentary are, with the exception of the fifth and the two last ones preserved in it, more or less damaged. The sulcus dentalis (SIEBENR., 1892) is practically absent, though a slight trace of it may be detected on account of the faintly marked keel occurring along the very basal part of the socles, constituting the (medial) edge of the sloping surface to which the pleurodont teeth are attached. The crista dentalis (SIEBENR., 1892) is seriously injured in both of the rests, it is evident however, that it shows the same characteristics as in the maxillary, not forming an even edge, but a rather serrated one, which is due to the ankylotic ostoses occurring at the lateral (labial) surface of each tooth. As in the maxillary, also in the mandible the diastemata between the single teeth are considerable, the Caylus Monitor paralleling, in this respect, the rest of oxyodont Varanians, in opposition to the more or less closely set teeth rows of the amblyodont representatives of the family. The sulcus ossis dentalis pro cartilagine Meckeli (SIEBENR., 1893) exhibits the shape usually met with in Varanians, its anterior end reaching the symphysis; from about the 5th mandibulary tooth it considerably gains both in breadth and depth. It is about in this place that the anterior point of the splenial bone might have lain. The canalis ossis dentalis pro parte alveolari inferiori nervi mandibularis (mihi), which opens in the region below the 7th and 8th tooth, approximately, is narrow, not only comparatively, but also absolutely narrower than in *V. griseus*, e. g., in spite of the Quercy jaw under inspection being larger than the *griseus* jaw with which it has been compared. In-

[150] The nervus mandibularis is the third branch given off by the trigeminous nerve (cfr. „Ramus inframaxillaris" & „Nervus alveolaris inferior", C. K. HOFFMANN, op. cit. p. 737 & 739).

ferior to this alveolar nerve canal, and separated from it by a bony wall, we find the furrow for the Meckelian cartilage which was protected, ventrally and in its posterior portion to about the 8th tooth, by the splenial bone. This bony septum shows, as visible on Pl. X, Figs. 8 and 10, a sort of short median furrow proceeding in longitudinal direction, formed and delimited by two short, low and straight-edged crests which appear in the form of strongly marked bone keels; these keels — between which the mandible's alveolar canal opens by the foramen dentale pro introitu partis alveolaris inferioris nervi mandibularis (mihi) — extend rostrad. I did not find such feature in the dismembered lower jaw of *V. griseus*, and cannot establish the anatomical rôle it had played in the Caylus Monitor. The keels here mentioned may, in certain cases, be indicative of the topographical division to which some lower jaw fragment belongs, as well as of the ordinal number of the teeth occurring above them. In both of the fossil jaws there is, in the much posterior part of them, on the keel-like mediad edge pointing toward a vestigial sulcus dentalis previously delimited by it — which in *Palaeovaranus* evidently is an ancestral character not yet reduced to nothing — some faint indication of the adherence to the splenial bone (area splenialis subdentalis ossis dentalis, mihi), whilst the uppermost dorsal end, posterior to the last tooth, of the almost complete specimen, presents on its inner or medial surface, a hardly perceptible trace of its union with the inner one of the two rostral processes of the coronoid bone (processus dentalis exterior et interior ossis coronoidei, mihi), between which the processus coronoideus ossis dentalis (mihi) is wedged in Varanians; such impressio processus coronoidei ossis dentalis (mihi) is met with in other Varanians as well, *V. griseus*, e. g., whilst the exterior dental process of the coronoid left, in the Caylus fossil under inspection, hardly any perceptible trace on the dentary, just as is the case with *V. griseus*. A carina coronoidea ossis dentalis (F.-Lgh., 1923), as figured in Baroness de Fejérváry-Lángh's Monograph of the Fossil Ophisaurs,[151] is absent in Varanians, the process concerned of the coronoid not being, in this family, of such extent as in *Ophisaurus*, the respective region of the dentary being covered, in the former, by the anterior edge of the splenial's ascending posterior process, and not by the antero-interior dental process of the coronoid. The coronoid process itself — as well as the splenial one inferior to it, and the large angular process — are, as stated

[151] Op. cit., Fig. 25, on p. 168.

above, wanting in even the well preserved specimen of the Munich Collection's Palaeovaranian dentaries. More details and inferences are, therefore, unavailable in this case.

It is very probable that the splenial showed the same form, and bore the same relations to the dentary, in the Caylus Monitor, as it does in other Varanians. For the morphological conditions exhibited by the dentary are throughout Varanian, and in no way Ameivoid — or, in general, Tupinambid — which fact harmonizes with the dentition and some other particulars dependent on it, and set forth by the maxillary as well, whilst it is not comformable with some very Tupinambid characters obtaining in, and elucent from, the construction of the upper jaw. With respect to such characteristics *Palaeovaranus* proves to be a real Collective Type, uniting the characters of two rather nearly related families. If this collectiveness of the Caylus form is, itself, really ancestral to the characters exposed by the two families just mentioned, or if the Eocene Monitor from Quercy maintained only such ancestral, collective characters, being indeed but the member of an extinct side branch sprung from the prototypical Varanian stock — that is a question to which the writer is unable to answer, for the scantiness of the material concerned does, by no means, grant the emission of an opinion safely founded.

The greatest length of the almost complete lower jaw represented, magnified, on Pl. X, Figs. 7 and 8, measures 36.71 mm; greatest height, vertically, in the region of the last of the gingival and cutaneous foramina: 3.98 mm; greatest height in immediately post-symphysial region: 2.61 mm; from very anterior end (foremost symphysial point) to present foremost point of inlet foramen of mandibular nerve's lower alveolar part, on dentary: 30.41 mm. (this part of the septum concerned may be somewhat jagged). Greatest length of fragment represented on Pl. X, Figs. 9 and 10: 17.8 mm; height of preserved tooth, with socle: 3.92 mm; height of tooth crown of same: 3.3 mm.

B) Vertebral Column. Of the five vertebrae labelled, in the Munich Collections, as *„Palaeovaranus cadurcensis"*, not one is, in fact, Varanian.[152]

There are, moreover, two ribs in this collection, bearing the label *„Palaeovaranus?"*. These are, however, by no means, Varan-

[152] Cfr. author's paper cited on p. 60 of the present study.

ian, and, very probably, not even Lacertilian (of which order only some Anguinid form could possess ribs schemed on such grounds of construction), but decidedly show an Ophidian plan of configuration. They will not, therefore, be dealt with in this place.[153] (Cfr. Pl. X, Figs. 14—19).

The Munich material under description does not afford, thus, any contribution to the benefit of the knowledge of the vertebral column and its appendages in *Palaeovaranus*.

C) Fore limb. — 1. Humerus: Habit typically Varanian; size that of the humerus of a full grown, „capital" *V. griseus*, to which it bears, among the Varanian species examined by the author, the greatest resemblance also with respect to its morphological details. The material consists of a nearly perfect right humerus of a full grown specimen, two right humeri of half grown specimens, with the epiphysial parts more or less damaged, two left humeri of full grown individuals, with more or less injured epiphysial parts, and a well preserved distal portion of the humerus of a full grown specimen. The first and the last of the remains here enumerated are visible on Pl. XI, Figs. 1—4.

The processus medialis (C. K. Hoffmann, 1890) is strongly developed, the angle of its mediad bending at the collum chirurgicum measuring about 140°. The process in question is rather elongate, more so than in, e. g., *V. griseus* or *V. salvator*, approaching, in this respect, the more subtle conditions exhibited by *V. Duméril*. Its length, measured from the collum chirurgicum, equals about two thirds of its greatest width, the width of the portion bearing the tuberculum processus medialis ossis humeri, pro insertione musculi latissimi dorsi (mihi)[154] included. The mesial, i. e.

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[153] Cfr. the paper referred to in the precedent footnote.

[154] Cfr. C. K. Hoffmann, op. cit., p. 523. — The author of the present lines is of the opinion that osteological, and, in general, anatomical, terms should always be created in a way to be expressive not only of merely formal and orientational moments, but, so far as possible, of characteristics that point at the relational rôle played by the morphological differentiations to be designated. For only such terminology is indicative of physiological, say functional, conditions too, thus sufficing to both the morphological and functional requirements implied by the modern visualization of anatomical investigation. In certain cases, of course, the writer was not able to proceed in the effectuation of his proposition concerned, along such lines of idea, and the old style denominations of detail characters, created by him in disharmony with the principle exposed here above, should, at earliest convenience, be substituted by adequate, new, terms.

middle part of the medial process is occupied, as usual, by the caput humeri proper, the much solidified cartilage constituting the „head" being separated from the tuberculum internum processus medialis ossis humeri (mihi) by a very strongly marked, broadly (about 2½ mm in the adult) excavated, but shallow furrow on the dorsal side, still showing some trace after having turned down to the ventral one; this furrow (sulcus, dorsalis et ventralis, processus medialis ossis humeri, mihi) serves the adhesion of a strong ligament attaching the humerus to the glenoid part of the scapula, and is present in modern Varanians as well, though in none of the species examined by the writer does it prove of such marked development, so as even to interrupt the cartilaginous tissue by the emergence to the surface of the bony one, as in *Palaeovaranus*. The caput humeri proper is the most prominent part within this tractus; it shows a rather rounded outline, and is more saillant on the dorsal than on the ventral surface, the same fact obtaining with the tuberculum internum processus medialis ossis humeri as well, i. e. with the part lying mediad, or proximad, of the furrow for the insertion of the aforenamed scapular ligament. The tubercle lying on the other side, i.e. laterad or distad, of the caput humeri, viz. the tubercle for the insertion of the latissimus dorsi muscle, is also very strongly developed, and protrudes, medio-distally, on both the dorsal and ventral sides, into a semi-cylindrical callus formed within the bony part of the proximal epiphysial portion of the humerus; the dorsal callus is stronger than, though not sharply keeled as, the ventral one; the originally cartilaginous „cap", i.e. the tuberculum proper which protrudes into this callus, dorsalis et ventralis, tuberculi pro insertione musculi latissimi dorsi, processus medialis ossis humeri (mihi), is confluent with the solidified cartilaginous tissue of the caput humeri, and not separated from it by the emergence to the surface of the underlying bony tissue, as it obtains in the case of the differentiation of the caput humeri from the tuberculum internum of the upper arm's medial process. Proximad of the callus, i.e. between it and the caput humeri, a rather deep, furrow-like impression occurs on both the dorsal and ventral surface: the sulcus, inter capite humeri et callo, dorsali sive ventrali, tuberculi pro insertione musculi latissimi dorsi (mihi) — the present denomination of which should be changed later on into a name indicating the insertion of the respective fascia (or fasciae) of the muscle (or muscles) concerned; of the furrows just mentioned the ventral one is deeper than the dorsal. Distally of the sulcus

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dorsalis processus medialis ossis humeri there occurs, in the collum chirurgicum, a strongly marked, medium-sized foramen which I have found just as markedly developed in the adult *V. salvator* LAUR. It is present, though comparatively much smaller, in the other Varanians as well, its size and position varying with the different species. The presence of this foramen is not a specially Varanian character, for I found it in other Lacertilians too, e.g. in *Tiliqua* and *Egernia* (Scincidae). Among the Varanians examined by the author, it is *V. griseus* DAUD. in which the position of the foramen in question most agrees with that obtaining in *Palaeovaranus,* though individual variation occurs in this respect, as proved also by the fossils under inspection. There are cases in which more than one foramen is to be found, as, e.g., in *V. griseus,* in which, however, the foramina concerned (in a left humerus of this species I have found 3 of them) are considerably smaller than in *Palaeovaranus.* In the latter genus I have never found more than one foramen, in one case the foramen being apparently absent. I believe that the foramen — or foramina, respectively — in question may be looked upon as belonging to the set of the „foramina nutritiva" and, may be, also „evehentes" (mihi), constituting the opening — or openings — of some blood vessel canal, or canals, supplying the bony tissue and securing the process of metabolism brought about in it. Which arteries and which veins may be concerned in this respect, that is a question I am unable to answer, for even textbooks of human anatomy are lacking of the designation of such details, though their establishment should not be neglected, because it closely pertains to the clarification of anatomical knowledge. On account of such state of conditions I abstain from giving any name to the foramen now discussed. I wish to remark finally that the foramen under inspection lies in *V. Duméril* (MÜLL.) SCHLEG. — the humerus of which was said, here above, to most resemble, on the whole, that of *Palaeovaranus* — quite on the medial edge of the humerus (just in the bending of the collum chirurgicum), the specimen examined by the writer markedly differing, in this respect, from the Munich Collection humeri of *Palaeovaranus.* (The same position of the largest of the proximo-medial foramina of the humerus was found, by the writer, in the arboricolous *V. prasinus* (MÜLL.) SCHLEG., the humerus of which is remarkable for its slender construction, involving greater relative length and an „un-Varanian" narrowness of the proximal epiphysial part). Quite adjacent to, and distally of, the foramen in

the collum chirurgicum, there is, in the almost perfect specimen of the *Palaeovaranus* humeri here described, a small, but well marked tubercle extending parallel to the medial edge of the humerus, and still lying within the range of the collum chirurgicum. This small exostose evidently served the adhesion of some muscle fascia, or perhaps, it may be looked upon as the very basis of some ossified tendon.

From the substance of the preceding paragraph it may be infered that the medial process of the humerus is characterized, in *Palaeovaranus,* by its strongly tripartite formation, a feature that was not observed, by the writer, in any of the other Varanians examined by him. All these details point at a more powerful muscular strain having obtained in the humero-scapular mechanism of the Caylus Monitor than is to be found in the other Varanian forms examined by the author. The argument of the above description may be best followed by applying to Figs. 1 and 2 on Pl. XI of the present publication.

The processus lateralis ossis humeri (RUDINGER, emend. C. K. HOFFMANN, 1890) is very strongly developed, forming, antero-ventrad, a sharply projecting point somewhat rounded. The angle formed, at the tuberculum processus medial. oss. humeri pro insertione musculi latissimi dorsi, by the medial and the lateral process of the upper arm bone, measures about 134°. The angle formed by the antero-ventral point of the lateral process, measures about 79°. The (in situ) medial outline of the lateral process is slightly concave, whilst the lateral one proves to be rather straight. The dorsal surface of the antero-ventral point is smooth, the ventral being, on the contrary, produced into a keenly projecting tuberosity, with a sharp postero-proximal point, and some rough sculpture lines convergently meeting, like the sections of a fig-like body, in the rounded, rather smooth antero-distal end of the tuberosity. This tuberosity I propose to name tuberositas processus lateralis ossis humeri. (mihi). The tuberosity in question is present in other Varanians as well, being, in the species examined by the writer, most developed — though comparatively less than in the Caylus Monitor — in *V. salvator*, and the less pronounced in the arboricolous *V. prasinus.* The lateral edge of the lateral process bears a pretty sharp keel. The medial side of the lateral process is outlined, in recent Varanians, by a cartilaginous epiphysis which presents its greatest bulk on the tuberositas processus lateralis oss. humeri, generally ending with the antero-laterad end of the tuberosity

mentioned, which is capped over by the cartilaginous tissue. The epiphysial cartilage of the lateral process, which is more or less visibly connected with the cartilaginous epiphysis of the medial process, was found, by the writer, to be most developed in *V. salvator* and *V. griseus;* in the former species it extends even much beyond the antero-lateral end of the lateral process's terminal tuberosity, ending in a wedge-like point at about the middle region of the process's lateral edge. Conditions more or less like the latter ones appear to have prevailed in the Caylus Monitor as well, though even the well preserved humerus under inspection does not afford much evidence in favour of an exact establishment of the bulk its lateral cartilaginous epiphysis originally had set out. — About halfway between the foremost end of the lateral process's terminal tuberosity and the medial process's tubercle for the insertion of the latissimus dorsi muscle, a sharply projecting splash-like exostose is present, elongate and narrow in form, with the broader end distad, and the evanescent point proximad; this excrescence, which occurs on the dorsal side, runs subparallel to the lateral edge of the lateral process, and is the homologon of the rather sharp, keel-like line which is to be seen in *V. griseus*, just marking the limit of the ventrad bending in that part of the humerus which represents the basal line of ventro-rostrad looking lateral process; the same rugosity occurs in *V. Duméril*, whilst it is but very obliterately expressed in the skeleton, examined by the writer, of the adult *V. salvator*. The excrescence in question has no ventral parallel. It obviously served the insertion of some muscle or tendon, and might even be presumed to have arisen by means of tendon ossification, as, possibly, was the case with the small exostose adjacent to the (nutritive?) foramen occurring in the posterior dorsal surface of the collum chirurgicum, and referred to on p. 102 of the present study. Not having clarified, in either case, the myological connection of these ostoses, I abstain from denoting them with names. — Immediately behind the splash-like exostose, i.e. in the direction of the foramen previously mentioned, but far off from it, two minute exostotic lines, meeting distad in a point, are visible in the same humerus from which the two other, aforenamed, exostoses were described. All of these are well visible on Pl. XI, Fig. 2. Their alternating or total absence in other humeri of *Palaeovaranus*, in one of which the splash-like ostose is even substituted by a sharp impression into the bone, proves that these features are of no particular biomechanical, genetical and, with that, systematical, import.

The diaphysis is comparatively much longer and more slender than in the other Varanians examined by the author, *V. prasinus* excepted, which, however, is, as repeatedly stated in this work, an aberrantly specialized form, affording no real parallel to the Caylus Monitor, in this case either the slender humerus representing, in the latter, if standardizing the conditions by applying to the Varanian scheme, a status marking primary and primitive, i.e. non-specialized, conditions within the evolution of precisely this group, such fact being evidently contrary to what obtains in *V. prasinus*. The greatest expansion measured in the proximal part of the humerus (between the extreme ends of the medial and lateral processes) is contained, in, e.g., *V. griseus*, which presents average proportions within the Varanian scale, about 2 and ½ times in the greatest length of the bone, whilst in *Palaeovaranus Cayluxi* Filh. ident. inc. the former distance is about 3 and ¼ times exceeded by the latter. Comparing the direction followed by the distal surface of articulation with the one obtaining in the proximal epiphysis (the latter being determined by the imaginary line connecting the ventrally most saillant point of the tuberositas processus later. oss. humeri with the margino-ventral surface of the tuberculum internum processus medialis oss. hum.), the distal epiphysis proves to be so to speak „torted" proximo-caudad, the angle thus formed by the two surfaces mentioned measuring about 60°. The middle portion of the diaphysis is sub-cylindrical; the apparent „torsion" of the humerus in proximo-caudal direction seems to begin somewhat distad of the middle point of the entire bone's greatest length, in which place the diaphysis presents, in situ, a slight dorsad curve thus being, on the whole, faintly vaulted dorsad in this region. No keels are perceptible on the diaphysis which rather gradually goes over, in both the proximal and distal directions, into the much widened epiphyses. (Cfr. Pl. XI, Figs. 1—4).

The distal epiphysis — the greatest width of which slightly, but visibly, exceeds that of the proximal part's medial process — is especially remarkable for the very strongly developed, broad, bulky and projecting epicondylus ulnaris, the ulnar profile of which shows two longitudinal rugosities meeting, proximad, valve-like, the space between the „valves" having probably been filled out by the epiphysial cartilage terminating, in this place, wedge-like. It is also remarkable for the very strongly developed and much projecting, but comparatively narrow eminentia capitata which is sharply set off from the considerably smaller and not half so pro-

jecting trochlea which is narrower and more rounded, i. e. standing out in bolder outline, than in, e. g., *V. griseus, Dumérili* or *salvator*. So far as may be gathered from a drawing published by LYDEKKER, *V. sivalensis* FALC.[155] seems to most approach, in this respect, the Caylus Monitor. Though very different in shape, both from one another and the Caylus Monitor, the figures published of the humeri of *V. emeritus* DE VIS ident. inc. and of the problematical *V. ? Lemoinei* NOP.[156] prove that these agree with the upper armbone of the Caylus Monitor in one respect, i. e. the saillance and differentiation of the trochlea and eminentia capitata, which are, especially in *V. emeritus,* just as sharply marked off from one another as in the Caylus form. The fossa supratrochlearis anterior (FEJÉRV., 1918) is deep and sharply outlined, more so than in the recent species examined by the writer, which fact is especially due to the sharpness of the proximal limit of the fossa: in this demarcation line there is, facing the proximal end of the eminentia capitata, a strongly marked foramen (cfr. Pl. XI, Figs. 1 and 3) with its slightly longer diameter directed transversely to the longitudinal axis of the bone. The same foramen is to be found in other Varanians as well, in which, however, it is more apparent because it is quite exposed, the demarcation line of the anterior supratrochlear fossa not being, in this region of their humeri, strongly indicated, but gradually evanescent. The crista epicondyloidea radialis = crista epicondyloidea lateralis, is sharp, low, and extends, proximad, somewhat farther than the point corresponding to the mesial length of the supratrochlear fossa; its edge is but very faintly arcuate, the proximal end of the crest being more or less evanescent; the crest is strongly marked off from the small epicondylus radialis which bears, on the radial side, one conventional fossula; this fossula is subrotund, and similarly developed as in, e. g., *V. griseus,* though apparently more rounded and somewhat deeper. In the sole specimen (Pl. XI, Figs. 3 and 4), of the Caylus material under inspection, in which the radial epicondyle is fully preserved, it does not seem to have been capped over by cartilage, the latter tissue apparently ending with the eminentia capitata — contrarily to what I have found to obtain in other Varanians, in which the cartilage of the eminentia capitata is continuous with the cap of the radial epicondyle, and even the fossula present in, e. g.,

[155] Op. cit. p. 283.

[156] Cfr. my monograph, p. 417, Fig. 17, and p. 419, Fig. 18.

V. griseus, on the radial side of the epicondyle in question, is formed by the cartilage and not by the bony tissue, as in *Palaeovaranus,* in which the bony tissue protrudes, distad, to the same level as the distal radial surface of the eminentia capitata, such case not having been observed, by the author, in none of the other Varani examined by him, with, perhaps, the exception of the problematical humerus known as *V. ? Lemoinei* Nop.[157] The apertura anterior canalis nervi radialis ossis humeri lies at the very basis of the crista epicondyloidea radialis, in one line with the proximal end of the eminentia capitata, distally of the sharp keel (carina supratrochlearis radialis, mihi) constituting the radiad limit of the supratrochlear pit and separating it from the very basis of the radial epicondyle's crest. On the proximo-caudad rotated dorsal, or anterior, surface of the distal epiphysis one finds the well marked fossa supratrochlearis posterior which is practically absent in all the Varanians known to the writer, the problematical *V. ? Lemoinei* Nop. excepted, in which it appears to be faintly indicated; this posterior supratrochlear fossa, very clearly visible on Pl. XI, Fig. 4, is subtriangular in shape, the distally directed limbs of the subtriangle enclosing the trochlea, the proximal outline of which runs, in this place, subparallel to these two limbs that meet in a rather rounded, proximad looking point. This feature appears to be very characteristic of the humerus of the Caylus Monitor. The apertura posterior canalis nervi radialis ossis humeri lies about 1 mm and ½ proximad of the same canal's anterior aperture, and nearer to the edge of the radial epicondyle's crest; this aperture is not rounded as the anterior one, but appears rather slit-like, a furrow leading from it to the proximal end of the crest, which furrow represents the uncovered part of the radial nerve's canal, which marks off the radial epicondylear crest from the „body" of the humerus; distally of the posterior aperture of the radial nerve's canal, the radial epicondylear crest does not set off itself from the (d o r s a l) surface of the humeral „body", so that it remains practically indiscernible in this part of the bone. (Cfr. Pl. XI, Fig. 4).

The above data prove, together with the figures, that the upper arm bone of *Palaeovaranus* proves, on the whole, typically Varanian, so that, on account of this element too, there would be no reason to separate the Caylus species from the genus *Varanus,*

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[157] Nopcsa, Beitr. z. Kenntn. foss. Eid., Beitr. z. Pal. u. Geol. Öst.-Ung., Bd. XXI, 1908, p. 48.

if the maxillary would not bid to do so. The mandibles prove, on the other hand, to pertain to the same species as the maxillary, so that it is owing to their mediation that it could be safely infered that the rest of the throughout Varanian bones are, in fact, also belonging to *Palaeovaranus.*

The details bearing upon the construction of the distal end of the humerus are also pointing at a more powerful muscular mechanism having subsisted in the Caylus Monitor than in its recent allies — such fact being agreeable to what has been stated with respect to the evidence drawn from the inspection of the proximal epiphysis.

Measurement of the specimen figured, somewhat magnified, on Pl. XI, Figs. 1 and 2: length from most prominent point of caput humeri to very end of ulnar epicondyle: 46.79 mm; greatest distance between edges of medial process's tuberculum internum and terminal tuberosity of lateral process: 14.22 mm; width of ball forming caput humeri, transversely to longitudinal axis of bone: 5.38 mm; greatest thickness of caput humeri: 4.82 mm; greatest thickness of collum chirurgicum, in the region of the foramen: 8.8 mm; dorsoventral thickness of diaphysis in middle of the bone's length: 3.62 mm. Measurements of specimen figured, somewhat magnified, on Pl. XI, Figs. 3 and 4: greatest length of the fragment (from distal top of ulnar epicondyle to point of fractured surface): 25.3 mm; greatest width of distal epiphysis: 12.37 mm; length of ulnar epicondyle, from its proximal projection on ulnar side: 6.71 mm; greatest thickness, on ulnar side, of same: 3.92 mm; anterior, or ventral, length of trochlea: 5.3 mm; greatest width of same on ventral side: 2.61 mm; anterior, or ventral, length of eminentia capitata: 5.8 mm; greatest width of same on ventral side: 3.1 mm; greatest width of anterior supratrochlear fossa: 5.9 mm; greatest rectilinear length of same, from eminentia capitata to foramen 2.39 mm; from distal end of radial epicondyle to very end of radial epicondyloid crest: 2.23 mm; median height of latter crest, on ventral side, from carina supratrochlearis radialis: 2.32 mm; length of radial epicondyle's fossula: 2.3 mm; from topmost distal surface of eminentia capitata to most proximal point of posterior supratrochlear fossa: 5.9 mm.

2. Radius: A left side radius, quite perfectly preserved, handed over to the writer as a „fibula", and marked *„Palaeovaranus?"* very probably belongs to this species. I must confess, however, that some doubts arose in me with respect to its

systematical identity, for it is, as visible on Pl. XI, Figs. 5 and 6, of a comparatively stouter habit than it is usual with Varanians. In its habit it markedly differs from the type exhibited by the comparatively long and slim radius of *V. griseus*, more approaching the one obtaining in *V. Dumérili*, and being most like the radius of *V. salvator*. Comparing its length to that of the humerus, it equals the distance between the distal surface of the radial epicondyle and the antero-lateral middle region of the tuberosity-bearing, projecting angle of the processus lateralis -- in which respect the fossil under inspection corresponds to the respective conditions obtaining in *V. salvator*, contrarily to those present in *V. griseus* in which the length of the radius nearly equals that of the radial side of the humerus, whilst in *V. Dumérili* the radius proves to be, comparatively, even shorter than in the Caylus fossil, being, however, more slender than in this species, the greatest distal width of the radius being contained, in *V. Dumérili*, nearly 6 times in its greatest length, whilst in the radius identified as Palaeovaranian, it is hardly contained 5 times, such being the case with *V. salvator* as well. As may be seen, the characteristic of the fossil consists, on the whole, in its massive appearance, due not only to the width of the epiphyses, but also to the relative bulkiness of the diaphysis, especially striking by the want of getting much more slender in the mesial portion of its length. In spite of the peculiarities thus coming into prominence in the habitus of the bone, it appears to belong, in fact, to *Palaeovaranus Cayluxi* FILH. ident. inc., for the analysis of its single details proves to point at its Varanian pertainance.

The proximal cartilaginous epiphysis may be said to be practically undamaged; it is somewhat broader on the, in situ, lateral than on the medial end; the articulation surface is transversely expanded, smooth, slightly sinuate in its mesial part, being, therefore, slightly saddle-shaped, but not hollowed, much like the conditions obtaining in *V. salvator;* the two ends of the cartilage are projecting in lateral and medial direction. The diaphysis is but very faintly and gradually narrowed distad of the proximal epiphysis, rather subrotund than suboval in tranverse section, until about the middle region of the bone's length; in this part the diaphysis is very slightly curved laterad, becoming more flattened and gradually enlarging toward the distal end of it, the oval shape of its transverse section more and more gaining in prevalence. In the distal portion the lateral and medial outlines become much divergent, this being the broadest part of the radius. The distal epiphysis presents a carti-

laginous cap — absolutely preserved in the fossil — with a rounded surface of articulation, which is not hollowed, in this case broader at the medial than at the lateral end, slightly curved, with both its ends, latero-caudad, and presenting, in the middle region of its postero-lateral surface, a concave sinuation which gives the articulation surface an irregular bean-like aspect; the articulation surface is most projecting distad in the vicinity of its medial end; the medial and lateral ends are much less projecting here than in the proximal epiphysis. From somewhat proximad of the middle region of the bone's length, there is, on the posterior, or ventral, surface of it, a narrow furrow, beginning with a point, and proceeding distad, gradually gaining in width and losing in depth, delimited, on both sides, by a very faintly marked keel which becomes most apparent in the pre-epiphysial part, where the „furrow" ceases to really exist, for it is no more concave, after which point it again becomes deepened, acquiring its greatest depth in this place, and ending in the broad sinuation described by the (in situ) posterior limit of the distal epiphysis, referred to here above.

All these details are very well discernible on Figs. 5 and 6, reproduced on Pl. XI.

The want of concavity on the articulation surfaces of both cartilaginous epiphyses is a striking fact, such being disagreeable to what I have observed in *Varanus*. On the proximal epiphysis the saddle-like sinuation might be looked upon as expressive of such concave, „glenoid" surface, whilst on the distal one an eventual obliteration might be, eventually, presumed. The ventral furrow and its delimiting keels are absent in *V. salvator* in which but a strongly marked postero-lateral keel is present — but the very clearly pronounced traces of the same feature where observed, en miniature, in the pre-epiphysial (distal) part of the radius of a half grown specimen of *V. griseus*.

The fossil radius here described may be said, on account of the alternating agreements with, and differences from, the modern Varanians, to represent a sort of „collective type", for the several differentiations obtaining in recent species may be easily retraced to such plan of construction upon which the fossil rest in question is built up. The forearm of the owner of the fossil radius in question was evidently comparatively short and stout, the advanced specializations brought about in the modern Varanians, by means of their kineto-mechanical adaptation to great speed in locomotion, not yet having prevailed in it. The ventral furrow seems to suggest

the insertion of some muscle, or rather tendon, which, in the distal portion, must have adhered to the os radiale, thus having played an important rôle in the powerful, evidently terrestrial, and comparatively not very fast locomotion of the animal.

Measurements of the bone: greatest length (between most saillant points of epiphyses): 35.64 mm; greatest width of proximal epiphysis (in middle region): 6.58 mm; greatest thickness of same: 4.05 mm; breadth of lateral end of articulation surface of same: 3.5 mm; breadth of medial end of same: 1.6 mm; width of diaphysis in proximal neck region, distally of proximal epiphysial cartilage: 3.58 mm; dorso-ventral, or antero-posterior, thickness in same place: 3.09 mm; width (bilaterally measured) in middle region of the bone's length: 3.31 mm; dorso-ventral, or antero-posterior, thickness in same place: 2.48 mm; greatest width of distal epiphysis: 6.51 mm; breadth of lateral end of same: 1.1 mm; breadth of medial end of same: 1.56 mm; greatest breadth, or thickness, of same (in mediad half of the surface of articulation): 3.5 mm; width of distal end of diaphysis, in middle of neck region, before epiphysial cartilage: 3.6 mm; greatest dorso-ventral, or antero-posterior, thickness of bone in same region: 3.38 mm.

Two pretty well preserved Lacertilian u l n a e — figuring on the loan list as radii —and labelled as *„Palaeovaranus?"* are so aberrant from the Varanian scheme that I do not venture to describe them in this place. It is not impossible, of course, that they should belong, in spite of such peculiar construction, to *Palaeovaranus*, but I do not find it adequate to deal, in this monographic work, with problematica of that kind, the — at present unfounded — hypothesis of their being Palaeovaranian, necessarily giving rise to far reaching and purely theoretical combinations and inferences that are of no good at all in a paper claiming to stand on the positive grounds of exact scientific evidence. — There appears to be no doubt as to the Quercy origin of the bones, the colour of which is rather dull, dirty whitish, with a faint yellow dash, and with some traces of the red earth matrix. Colour, consistence and comparatively low degree of „mineralization" correspond to what obtains in the large maxillary rest and the almost complete dentary, described here above, of the p. 64.

D) H i n d l i m b. — 1. F e m u r: the 4 femora handed over to me were correctly determined as those of *„Palaeovaranus cadurcensis"*. Two left side specimens belong to full grown individuals, whilst a right side and a left side specimen pertain to two somewhat

younger, though about adult, individuals. They are figured on Pl. XI, Figs. 7 to 10. The original of Fig. 7 and 10 appear to be less „mineralized" than those of Figs. 8 and 9, the latter one appearing to be the most „petrified". Coloration rather dull, dirty whitish, with rests of the red earth matrix, and obliterate violet brownish spots (Fig. 7), or dirty yellowish white, with grey infiltrations and rosty black incrustation (Fig. 10), or more or less uniform violet brownish, with a locally more or less pronounced dash of indian red (Fig. 9), or piebald, yellowish-whitish and chestnutbrown, with faint traces of black incrustations (Fig. 8), the two latter specimens being rather shiny than dull. — Habit typically Varanian, intermediate, in shape, between *V. salvator* and *V. griseus*, on the whole more like the latter than the former. The size exceeds visibly, though not considerably, that of the femur of a full grown *V. griseus*. The caput femoris is bilaterally rounded, of medium width, the anterior and posterior trochanteres marked only by broad keels, ending in the cartilaginous cap forming the proximal epiphysis. The sinuation formed in the proximal neck region of the diaphysis in that part which forms the keel of the anterior trochanter, is less marked than in *V. salvator* and *griseus*, forming but a comparatively moderate concavity, being, in this respect, not unlike *V. Duméril*, such fact being due to the moderate rostrad protrusion of the anterior trochanter's proximal end (cfr. Pl. XI, Figs. 7 to 10, especially 9). The anterior is the broadest of the three trochanters, the posterior being the narrowest, less marked and less projecting of them; the latter one shows no trace of the caudad projection occurring, on the distalo-basal part of its keel, in, e. g., *V. griseus* and *V. salvator*, this being replaced, in the two large specimens, by a small, though well visible, rounded tubercle on the ventral side, just below the keel (Figs. 7 and 9). The trochanter medius is directed, as with Varanians, ventrad, strongly projecting, with a separate, large cartilaginous cap, the margin of which is point-like protruding upward and distally (if viewed in situ) on the posterior surface, and separated from the caput femoris by a well-marked, saddle-shaped isthmus which is, however, much shorter than in the modern species examined by the writer (leaving, in this place, the specialized conditions obtaining in *V. prasinus* out of consideration), so that its length does not exceed, in the full grown, that of a half grown *V. griseus*, though the femur of the latter measures but about three thirds that of the Caylus Monitor's. In ventral aspect the median trochanter of the Caylus form proves to be much broader and

stouter than in the recent species referred to here above, bulkily going over into, and, therefore, less set off from, the pro-median part of the diaphysis' length. The diaphysis is rounded in transverse section, with a very sharp ventral keel taking its origin on the tibial side of the lower surface of the bone, somewhat proximad of the limit of the tibial epicondyle's cartilaginous cap, and proceeding, proximad, in mesial direction, ending, with a slightly prominent, obliterate, proximad bifurcating and evanescent elevation, in the middle line of the ventral surface at about half way of the femur's length (Pl. XI, Figs. 7 & 10). I did not find this keel in *V. salvator* and *Duméril*, whilst traces of a ventral keel were observed in two specimens of *V. griseus*, in a full grown in the mesial line, whilst in a half grown two keels are present, one beginning on the fibular side and proceeding mesiad, and the other beginning at about the limit between the two distal thirds of the bone's length, in the mesial line, and proceeding in proximo-caudad direction, going over into the keel of the posterior trochanter. These keels are, however, by far less pronounced than in the Caylus Monitor. Tibial and fibular epicondyles of the usual Varanian type, with a continuous cartilaginous cap which, on the dorsal side of the fibular epicondyle's mesial limit, just before the facies patellaris, protrudes, proximad, into an elongate and prominent callus of cartilage, similarly to the one obtaining in other species, fossa intercondyloidea, distad of the linea intercondyloidea, very faintly marked in the cartilage, whilst the fossa poplitea, occurring on the osseous epiphysial part of the bone, immediately proximad of the limit of the cartilaginous epiphysial cap, is well marked, showing conditions like those obtaining in *V. griseus*. No foramina were found in these fossils. Slight callosities of no import — because of no constance — are present in the two large thigh bones.

Measurements of the specimen figured, somewhat magnified, on Pl. XI, Fig. 7: from top of caput femoris to most outstanding distal point of tibial epicondyle: 58.25 mm; greatest width of caput femoris, between keels of anterior and posterior trochanters: 10.12 mm; dorso-ventral thickness of caput femoris: 5.21 mm; from ventrally most projecting point of cap of trochanter medius to basis of latter, at limit of cap of caput femoris (thus comprising proximal height of median trochanter): 7.28 mm; width of cap of median trochanter: 4.48 mm; dorso-ventral thickness of diaphysis, about half-way the length of bone: 5.22 mm; greatest width of distal epiphysis: 11.12 mm. — Length of specimen figured on Pl. XI, Fig. 8: 46.6 mm. —

Length of original of Pl. XI, Fig. 9: 32.23 mm; approximative terminal height of trochanter anterior 5.8 mm approximative terminal height of trochanter posterior: 3.62 mm. — Length of specimen represented on Pl. XI, Fig. 45.81 mm.

2. T i b i a. — A left tibia of a not quite full sized, though adult, and a right tibia of a half grown specimen. Larger specimen pretty mineralized, shiny; coloration dark ivory, with obliterate ochraceous and violet brownish involution and some traces of red earth matrix; smaller one less infiltrated, shiny; coloration of a somewhat lighter ivory, with some traces of red earth matrix. — Habit typically Varanian, similar to that of the tibia of *V. griseus*, but especially in the adult, stouter, for thicker in the diaphysial part; the comparative shortness of the bone reminds one of the conditions set forth by *V. Duméril*. The cartilaginous epiphysial caps are wanting in both of the specimens, of which the larger is perfectly preserved, the smaller but nearly so (Pl. XI, Figs. 13 to 16). The proximal bony epiphysis differs with all of the modern Varanians examined by the author, in the almost total absence of an incisura intercondyloidea (mihi) occurring on the, in situ, antero-medial side of the bone (cfr. Pl. XI, Figs. 14 & 15), the incision concerned being even in *V. prasinus* more marked than in the Caylus form. The proximal surface, which bore the cartilaginous cap, is subtriangular in shape, producing a prominent, rather edge-like processus fibularis epiphyseos osseae proximalis ossis tibiae (mihi) which lies below the respective part of the cartilaginous condylus medialis proximalis ossis tibiae (mihi) wanting in the fossil, and presents a rounded point looking downward, as in other Varanians. The tuberositas proximo-medialis ossis tibiae (emend., nunc, Fejérv.), present on the medial, or „anterior" upper margin of the bone, is very strongly developed, forming, especially in its proximal part, a strongly projecting and rather thick callus (cfr. Pl. XI, Figs. 13 to 15). This callus I found to be less developed in modern species, and thicker in the distal instead of in the proximal part of it. The proximal part of the bone is very broad, becoming gradually, but moderately, narrowed in the diaphysis, the difference between proximal width and diaphysial width being comparatively less marked than in *V. griseus* in which the diaphysis is getting relatively more narrowed, and the same fact may be stated with respect to *V. salvator* as well, in which, in turn, the proximal epiphysial part of the bone is comparatively much wider than in the Caylus Monitor, so that the diaphysial constriction appears to be very considerable in spite of the effectual width of this portion. The diaphysis of the Escamps tibiae

is more rounded in transverse section than in the full grown specimens of the modern species examined, whilst in young skeletons of the same the tibia does not appear to be so subtriangular in transverse section as in the adults. The Escamps tibiae are, moreover, much straighter than those of recent Varanians, not showing the strong mediad, or „forward" bent arch obtaining in the latter. Toward the distal end, the diaphysis again widens quite gradually, but not considerably, in the adult more so than in the half grown specimen. The distal bony epiphysis ends in an almost straight line, the very perceptible mediad curve existing, with recent Varanians, in that end part of the bone being but very faintly marked in the Escamps fossils, especially in the half grown specimen. A small nutritive foramen occurs somewhat distad of the middle region of the bone, on the lateral side of the medial, or „posterior" surface of it (Pl. XI, Fig. 15). The distal osseous epiphysis is suboval in transverse section, such being the shape of its distal surface too, covered, in perfect condition, by the cartilaginous cap; the, in situ, lateral end of this surface is somewhat broader than the medial one; a very feeble mediad bending on the medial side forms an analogon to the processus fibularis of the proximal epiphysis, without, however, forming a real protrusion that could be designated as a process. In accordance to this slight medial concavity of the distal epiphysis, one finds the outer, or lateral, side of it to be faintly convex (cfr. Pl. XI, Figs. 14 & 16). The low, comparatively short but well marked tuberositas distalo-lateralis ossis tibiae (mihi) is a topographical antagonist to the callosity referred to in literature as „tuberositas tibiae" and re-named, here above, by the writer tuberositas proximo-medialis tibiae (cfr. Pl. XI, Figs. 13, 15, 16). The comparative anatomical clarification of the muscular relation and functional rôle of these tuberosities is much required, simultaneously entailing a new re-naming of them, effected on myological grounds. The distalo-lateral tuberosity of the tibia is present in recent Varanians as well, appearing, however, to be less prominent in them than in the Escamps tibiae in which the callosity in question is sharply set off from the „body" of the bone, whilst such fact does not obtain in the other forms alluded to in this place.

Greatest length of the specimen figured, in natural size, on Pl. XI, Figs. 13 and 14: 44.15 mm; greatest proximal width: 10.55 mm; proximal thickness, from point of fibular process to opposed surface: 8.46 mm; greatest height of proximo-medial tuberosity, measured on medial, inner or „posterior", surface: 1.1 mm; width of

diaphysis, in middle region of its length: 4.61 mm; thickness of same (measured in profile) in same region: 4.41 mm; greatest height of distalo-lateral tuberosity, measured on medial surface: 0.5 mm; distal width: 7.4 mm; greatest, meso-laterad, distal thickness: 5.6 mm. Length of specimen represented on Pl. XI, Figs. 15 and 16: 40 mm.

3. Fibula. — A typically Varanian fibula of the right side occurs among the Escamps fossils under inspection. There can be no doubt of its being Palaeovaranian. Not highly mineralized, moderately shiny; coloration of a yellowish dirty white, obliterately prinkled with pale grey, with adherent particles of the red earth matrix. Preservation perfect, inclusively of the epiphysial cartilages. — Habit very slender, size very large, exceeding that of the largest femur here described. This points at the fact that it may have belonged to a very big specimen, for the fibula is, in Varanians, always visibly shorter than the femur. General shape strikingly corresponding to that obtaining in the fibula of *V. griseus*, and widely differing with that exposed by the other species here considered. At first sight it appeared rather paradoxical that such fibula should have been coupled with the stout tibia described here above, the more so as the radius described on p. 107, and looked upon as very probably being that of *Palaeovaranus*, also points at a stout habit and, thus, an apparent shortness of the mesial portion of the limbs — a fact contradicted by the long and slender fibula which cannot be linked, in the present case, on account of kineto-mechanical considerations adapted to what we know about the thread of evolution that casted Varanian morphology, to an unusually short forearm, nor, of course, to a very short and too stout tibia. A thorough comparative examination bearing upon the identification of the fossils and upon the interpretation of their characteristics, lead, however, to the conclusion that the tibiae and the fibula effectually belonged to the same species, i. e. to the Caylus Monitor, and that the differences in size are merely due to the different stages attained, in ontogenetic development, by the of yore owners of the rests concerned, such proportional differences finding full analoga in those observed by the author in *V. griseus*. Also the radius must have belonged to a not yet full sized individual, this bone proving, in fact, even comparatively, stouter than in the recent species examined by the writer, such stoutness not being, however, indicative of a really short fore limb. The morphological details of the bone under discussion are well displayed by the natural size Figs. 11 and 12 on

Pl. XI. The proximal epiphysis shows the characteristic, pointed end known, in human anatomy, as apex capituli fibulae; the proximal articulation surface shows, on a larger scale, the very same features that occur in *V. griseus;* the inner, or medial, side of the bony epiphysis bears, inferior to the cartilaginous one, a strong callosity, vaguely connected with the crista anterior ossis fibulae, the connecting part of this callosity (crista medialis ossis fibulae) being, in reduced condition, present in *V. griseus* as well (cfr. Pl. XI, Fig. 12). The crista anterior ossis fibulae is very strongly marked, more so than in any of the Varanians examined by the writer, but of the same shape as in *V. griseus,* the respective crest of the latter species appearing as though being a miniature „edition" of the one obtaining in the Caylus Monitor. The fibula's anterior crest continues, in the form of a sharp keel, downward, to the malleolus tibialis ossis fibulae (mihi), and forms, before losing itself in the point of the latter, a small, but well marked protuberance (Pl. XI, Figs. 11 and 12). The bone shows the same bending as in *V. griseus,* the S-like curve being, however, stronger and somehow smoother in the distal part of it than in the case of the recent species mentioned. The relative bulk of the diaphysis is much the same as in the Grey Varan, being, however, more rounded in transverse section, because of the crista posterior ossis fibulae (mihi) being present, in the Caylus Monitor, only on the distal osseous epiphysis, where it begins with the protuberantia posterior epiphyseos distalis ossis fibulae (mihi), (Pl. XI, Fig. 12), whilst in the Grey Monitor it extends upward, to the proximal bony epiphysis, being most pronounced in the middle region of the bone's length, by which fact the fibula assumes an angular outline in transverse section. The crista lateralis ossis fibulae is more marked, on the contrary, than in *V. griseus,* proceeding upward, i. e. dorsad, so far as to about the middle region of the diaphysis' length; it begins with the point of the malleolus lateralis ossis fibulae, in the form of a well marked keel, becoming evanescent toward the limit between the third and second lower thirds of the bone. The malleolus tibialis of the fibula is capped with cartilage, and shorter than the malleolus lateralis; it forms an edge sharply projecting mediad, whilst the medial side of the lateral malleolus, which is devoid of cartilage, proves less outstanding (Pl. XI, Fig. 12). A well marked keel connects, on the antero-lateral side, the projection formed by the anterior crest before its reaching the fibula's tibial malleolus, with the point of the

lateral malleolus, such keel being absent in the recent forms here considered.

Greatest length of the bone: 34.26 mm; proximal epiphysial width: 7.45 mm; greatest proximal epiphysial thickness: 5 mm; diaphysial width in middle region of bone's length: 3.22 mm; thickness (medio-laterally measured) in same region: 3.08 mm; width between end points of (distal) malleoli of fibulare: 8.4 mm; greatest thickness of distal epiphysis: 4.35 mm.

4. Metatarsals. — The 7 metatarsals of this species were designated as „large phalanges", and labelled as *„Palaeovaranus?"*. One of them represents the II. metatarsal of the left foot (Pl. XI, Figs. 17 to 19), whilst 3 of the rest are III. metatarsals of the right side (Pl. XII, Figs. 1 to 3) and 3 prove to be IV. metatarsals of the right side (Pl. XII, Figs. 6 to 10). They belong to adult specimens, of various size, the specimen visible on Figs. 7, 9 and 10 being the largest of the whole set. Mineralization of various degree, being most pronounced in the II.mt. which is shiny, slightly translucent, reddish brown, with a faint violet dash, in the diaphysial part, dark ivory in the epiphysial ones; the rest are but little shiny, or dull, not translucent, greyish, dirty whitish with grey, dirty yellowish, or medium ivory, with more or less of the red earth matrix adhering to them.

IInd metatarsal much like that of the adult *V. griseus;* of about the same proportions, approximately 4 mm longer only. On the side facing the IIIrd toe, a well marked, light yellow coloured callosity occurs (Pl. XI, Figs. 18 & 19), some faint trace of which may be present in the recent Grey Monitor as well. The several morphological differentiations of the bone's surface correspond to those obtaining in the latter named species, but, conformably to the size of the fossil, bulkier. Fig. 17 represents the dorsal, Fig. 18 the profile facing the IIIrd toe, and Fig. 19 the ventral surface of the perfectly preserved rest. The figures are magnified, the greatest length of the original measuring 24.99 mm.

IIIrd metatarsal also like that of *V. griseus*, but larger and bulkier. Figs. 2, 4 and 5 represent the same specimen. The meso-lateral part of the proximal epiphysis shows on the ventral surface, in the two stouter specimens, a rounded callosity (Pl. XII, Fig. 2) which is absent in the more slender specimen visible on Fig. 3, in spite of its being a bit larger than that represented by Fig. 1. It is not impossible, therefore, that such difference might be supposed to belong to the set of sexual dimorphisms. Fig. 1 shows the dor-

sal surface, Fig. 2 the ventral; Fig. 3 exhibits the medial, Fig. 4 the lateral side, and Fig. 5 the proximal epiphysis, bearing the cartilaginous cap. All specimens are perfect.

Greatest length of the specimen represented on Fig. 1: 26.8 mm; that of specimen to be seen on Figs. 2, 4 and 5: 29.72 mm; greatest diameter of articulation surface of same visible on Fig. 5: 6.88 mm; greatest length of specimen (♀?) shown by Fig. 3: 27.08 mm.

IVth metatarsal also agreeing, in its scheme, with that of *V. griseus*, but larger and, accordingly, robuster. Diaphysis comparatively less narrowed than in the Grey Monitor. Proximal epiphysis of the originals of Figs. 6 and 7, 9—10 (the latter ones representing the same specimen) showing, on its ventral surface, in the mesial region, a well marked tuberosity, very strongly developed and broad in the largest of the rests (Pl. XII, Fig. 7), and but comparatively slightly developed in the specimen exhibited by Fig. 8, which, on the whole, proves to be more slender, though scarcely smaller, than the original of Fig. 8; in this case too one might be inclined to think of facing a sexual difference. In the semiadult specimen of *V. griseus* under inspection I found the ventral side of the proximal osseous epiphysis to be practically smooth, showing the tubercle only on the cartilaginous cap, whilst in an adult skeleton of the same species some trace of the tubercle is to be found also on the osseous part concerned. A strong longitudinal callosity, proceeding and very soon ending ventrad, is to be seen on the medial side of the proximal bony epiphysis (Pl. XII, Fig. 7, &, especially, 9 & 10), i. e. on the side facing the IIIrd toe, which is very faintly indicated in the adult *V. griseus* as well. In the slender fossil mt. IV. (♀?) referred to here above (Pl. XII, Fig. 8), there is practically no trace of this callosity, the latter being but faintly marked in the younger (♂?) rest visible on Fig. 6. The lateral portion of the proximal articulation surface exhibits, in all of the specimens, the articular cavity characteristic of the IVth metatarsal.

Greatest length of the specimen represented on Fig. 6: 27.32 mm; same of specimen visible on Figs. 7 and 9—10: 31.88 mm; latero-medial (in situ) diameter of articulation surface visible on Fig. 10: 8 mm; dorso-ventral (in situ) diameter of same, the tuberculum included: 5.63 mm; greatest length of specimen (♀?) shown on Fig. 8: 26.52 mm.

With respect to those characteristics that are not separately referred to in this description, the metatarsals of the Caylus Monitor proportionally and substantially agree with the conditions set forth

by the Grey Monitor. Thus, the metatarsus of *Palaeovaranus* is less bulky than that of *V. salvator*, but of a robuster construction than that of, e. g., *V. Dumérili*.

5. Phalanges of the foot. — Of the „6 small phalanges" handed over to me by Prof. Broili, and labelled, as „*Palaeovaranus?*", 5 proved to be effectually Palaeovaranian, whilst one phalanx is certainly not Varanian, and seems to belong to *Agama Galliae* Filh. Preservation in all of these phalanges perfect. Mineralization various, moderate on the whole; surface more or less shiny; coloration uniform or mottled, brownish, dark ivory, dirty yellowish white, with (Figs. 11—14, 31 & 23—26, 34) or without (the rest) obsolete greyish sprinkling; adherent parts of the red earth matrix are present; the original of Figs. 19—22, 33, with slight traces of blackish incrustation. — Habit agreeing with that obtaining in *V. griseus*, the several Palaeovaranian phalanges, which are those of adult specimens, being somewhat larger in size and robuster than those of the Grey Monitor, such fact proving conformable to the rest of proportional differences signalized in the course of the precedent descriptions.

The single phalanges under inspection were positionally homologized as follows: Figs. 11—14, 31: cfr. 1st, i. e. basal, phalanx of IInd toe, left side; the figures cited show the bone in dorsal, ventral, lateral, medial and proximal-articular views; Figs. 15—18, 32: cfr. 3rd phalanx of IIIrd toe, left side; views the same, in same order; with respect to this phalanx it should be remarked that it might, eventually, be identified also as the 2nd phalanx of the IInd toe, or the 4th phalanx of the IVth toe, left side; Figs. 19—22, 33: cfr. last phalanx of IVth toe, left side; views and order of the idem; Figs. 23—26, 34: cfr. last phalanx of IVth toe, right side; order of views the same; Figs 27—30, 35: 1st phalanx of Vth toe, right side; same view, same order.

The topographical identification of phalanges presents, in many cases, great difficulties. The writer of the present lines believes to have made no serious mistakes herein, frankly having put, however, the designation „cfr." in all instances in which the skeletal homologization seemed to admit some doubt as to its absolute correctness.

Greatest length of the phalanx represented on Pl. XII, Fig. 11: 12.61 mm; same of original of Fig. 15: 9.99 mm; same of specimen visible on Fig. 19: 13.45 mm; same of rest exhibited by Fig. 23: 11.59

mm.; and of Fig. 27: 10.11 mm. — All figures concerned are magnified, the proximal end views more than the rest.

The material in question does not claim, in this place, a more detailed treatment of the subject, for the parallel drawn between the Caylus Monitor's phalanges and those of the recent Grey Monitor may satisfy the reader, the more so as the figures are most fit for affording full evidence in case of even a close inspection, accounting, at the same time, for the correctness and sufficiency of the data resumed here above.

The facts elucent from the present publication prove that the foot, and, more than presumably, the hand too, of *Palaeovaranus** represents the same type, or scheme, that obtains in *V. griseus*. Such simple statement may contain the germ of quite a series of interesting phylogenetical, ethological and ecological inferences. For the author of these lines was strikken, while making his comparative osteological studies on Varanians, with the fact that, with respect to their phalangial length, the Varanians divide into two — evidently functionally conditioned — morphological (I do not say genetical!) groups: One group with long terminal phalanges, and another in which the proterminal phalanges are short and, in opposition to the precedent forms, stout. This difference in the length and volume of the proterminal phalanges in hand and foot entails the prevalence of the same conditions in the phalanges proximally of them. Of the recent species examined by the writer, *V. salvator, indicus, bengalensis, Dumérili* and *prasinus* belong to the long phalanged group, whilst *V. griseus* and the fossil *V. marathonensis* enter the compass of the short phalanged ones. The group containing forms with long and more or less slender phalanges may be termed the macrophalangial, whilst the other may be named the brachyphalangial. Macrophalangy is connected with a more or less pronounced stenophalangy, whilst a certain degree of pachyphalangy characterizes the brachyphalangial forms. The extreme macro-stenophalangy is set out by the much specialized, arboricolous, *V. prasinus*. The brachy-pachyphalangial scheme seems to represent the archetype within the Varanian complex of evolution. *Palaeovaranus** belongs to the type of limb evolution, representing, also in this respect, an ancestral Varanian form.

It is a task incumbent upon future investigators, to clarify, both etio- and nomognostically, the origin of the two antagonistic features just referred to, and to search after an eventual connection that may exist between this character and other specializations, pointed at in the preceding discussions, of the Varanian organism.

On the whole, we may safely state that the locomotory conditions of the Caylus Monitor may be pretty well visualized by comparing them to those obtaining in our Grey Monitor, with the locomotor apparatus of which the Palaeovaranian one shows a great affinity.

*

On page 90 I referred to the reconstruction of the skull of *Palaeovaranus,** which is, in my opinion, of hypsiprosopoid type; according to the structure of the limb, it belongs to the brachyphalangial type. *Palaeovaranus** proved, in course of the detailed anatomical investigations, in many respects similar to *V. griseus*, therefore the results of the reconstruction are drawn up in comparison with *V. griseus*.

Length of	head:	10.5 cm
„ „	neck:	12 „
„ „	trunk:	30 „
„ „	tail:	70 „
„ „	maxillary:	4 „
„ „	humerus:	5 „
„ „	radius:	3.5 „
„ „	femur:	6 „
„ „	tibia:	4.5 „
„ „	II. metatarsal:	2.5 „
„ „	III. „	2.9 „
„ „	IV. „	3.2 „

On strength of these data it is evident that the total length of *Palaeovaranus** was about 122.5 cm. The reconstructed model (Pl. XIII) has been made, on basis of the above considerations, and after directions of the author, by his pupil, Dr. J. Szunyoghy.[158]

[158] The data concerning the reconstruction are taken from the author's personal notes.

Varanus Bolkayi n. sp.

The two dorsal vertebrae from Kendeng Beds of Trinil, Java, belong to a new species, the description of which I am giving below. The age of the rests found at Trinil is about, according to BLANCKENHORN, the end of the Pliocene or the beginning of the Diluvium. In the Munich Collection it is labelled „Alt-Diluvium".

Vertebra dorsalis, cfr. XVIII.: Centre of the usual Varanian type, elongate, slender, resembling the conditions exhibited by *V. marathonensis*, and sharply differing from the stout type exhibited by the figure published by LYDEKKER[159] of the dorsal vertebra of *V. sivalensis*, though agreeing in length with the centre of the latter species, thus being considerably larger than in *V. marathonensis*.

Shaft comparatively shallow, subelliptic; edge not sharp, rather rounded, not protruding, laterally somewhat torous, which characters may be due to the specimen's having been worn during fossilization. Shaft about 1.6 times as broad as long. Depth of shaft, measured from the middle of its upper margin to deepest point of concavity, about 2.9 times contained in its width. Dorsal and ventral margin of shaft meeting in an angle of about 78°. Several parts of, and adjacent to, the shaft's margin are injured (cfr. Pl. XIV, Fig. 2), showing a pretty high degree of mineralization, which accounts for the comparatively remarkable weight (about 13 g) of the specimen. The bony tissue is so highly petrified as to appear compact, not affording any detail with respect to the architecture of the spongiosa.

The ventral surface of the centre is rather convex, with two slight keels, proceeding caudad, beginning at the posterior, or ventral, margin of the shaft, not far from, and at both sides of, the median line of the centre (Pl. XIV, Fig. 2); laterad of each of these sculpture lines, the centre is somewhat hollowed, whilst the space enclosed by the two „keels" that are evanescent towards the middle of the centre's length, appears rather plane than deepened. No margo inferior centri vertebrae (FEJÉRV., 1918), and no sulcus medianus centri vertebrae (FEJÉRV., 1918, emend., nunc p. 27, FEJÉRV.). Some sub-longitudinal structure lines present. No openings for vascular canals (foramina nutritiva ventralia) are to be seen on the fossil. Ventral surface of centre strongly wedge-shaped on the whole, bilaterally delimited by the occurrence of a sharp, but rounded, edge

[159] Op. cit. p. 283.

on each side, delimiting the ventral surface of the centre from the lateral ones; the angle thus formed measures, in the middle region between ball and transverse process, about 109°. The lateral sides of the ball are strongly projecting, the angle thus formed by the ventro-lateral edge of the centre measuring about 113°. The ventral margin of the ball is visibly, though not strongly, projecting, the sulcus pericondyloideus centri vertebrae thus being but moderately marked.

The dorsal surface of the ball is very long, pretty broad, comparatively much flattened, sub-elliptic in caudal view (Pl. XIV, Fig. 4), smooth, somewhat shiny and almost intactly preserved. The pericondylear furrow is not sharply marked on the dorsal surface either.

The dorso-lateral part of the centre ascends, immediately anterior to the pericondylear furrow, in forming an angle of about 101°, unperceptibly going over into the neural arch. Superior to the ventro-marginal edge of the centrum, referred to here above, there is a marked, broad furrow, flanking the edge dorsad, and above it the lateral surface of the neural arch presents a moderate, but well pronounced, hollowness (cfr. Pl. XIV, Fig. 3).

The vertebral (or neural) canal is narrow — as usual with all fossil Lacertilians if compared to their nearest recent relatives —, comparatively much narrower than in any of our recent Varanians, and narrower even than in the dorsal vertebra of *V. marathonensis* figured in my Monograph, though the vertebra under inspection of *V. Bolkayi* is decidedly larger than the one mentioned of the Marathon Monitor. This fact is certainly strange and surprising, for *V. marathonensis* is a Pliocene and Preglacial form, showing a western range of distribution, whilst *V. Bolkayi* originates from the Pleistocene of the far East — both of the latter circumstances giving place to the suggestion that it is precisely *V. Bolkayi* that should prove more modernized than the Marathon Monitor which is a biohistorically elder species that lived nearer to the phylogenetical cradle of the Varanian stock than *V. Bolkayi* with its biohistorically more advanced range of geographical spread. — The neural canal being much filled out with the hard, crystallized ash-grey matrix, the development of the sulci canalis vertebralis pro venis spinalibus lateralibus and of the proëminentia triangularis anterior and posterior canalis vertebralis (the latter ones forming the inter-venal spaces in the neural canal) cannot be clearly established in this specimen; it is evident, however, that these parts

are in normal Varanian proportion to the size of the vertebral canal.

The neural arch is, just as the centrum, most like that of *V. salvator*, being quasi a gigantic fac simile of the latter. The whole impression it gives is that of a steady, but comparatively slender vertebra, more graceful than the dorsal type of the Marathon Monitor, and essentially differing from the stout, broad and bulky scheme characteristic of the Siwalik Monitor vertebrae. The right proc. obliquus posterior and the spinous process are wanting in this specimen.

Processus obliqui anteriores long, with broad articulation surface which is rather smooth and even; lateral edges massive, rounded. Distance between lateral edges visibly, but not considerably, longer than distance between anterior edge and posterior one of proc. obl. posterior. Angle enclosed by lateral surface of anterior oblique process and imaginary line connecting mediobasal (interior basal) points of articulation surfaces, measuring about 97 to 98°. Facies subrhomboideae large, convex, the process somewhat flattening laterad, above the transverse process. Sulci connectentes arcus vertebrae strong but narrow and short. Articulation surface and lateral surface of anterior oblique processes enclosing an angle of about 55°. Foveae paraglenoideae but faintly marked and small, to be seen between ventral end of facies costales and lateral part of shaft's edge. Antero-lateral surface of oblique processes flattened, as mentioned above; it meets the postero-lateral one which is faintly convex, in an oblique line proceeding in ventrocaudad direction and marked by the presence of some tuberosities (Pl. XIV, Fig. 3). Posterior to that modest saillance a shallow impression occurs on the arch.

Ventrad the oblique process goes over into the knob-like, vertically sub-ovoid transverse process, practically consisting of the costal facies. The ventral end of the costal surface is connected, by a modest torus-like protrusion, with the lateral „point" of the shaft. Superior to this „torus" one finds the widened and evanescent prolongation of the sulcus connectens. Tubercula faciei costalis not discernible in the fossil. No fovea pro insertione ligamenti tuberculi medialis capitis costae, the shallow hollowness mentioned at the end of the preceding paragraph being too large, and too caudad in position, to be identifiable with the ligamental pit in question.

Incisura lateralis arcus vertebrae of the same shape as in *V. salvator*.

Processus obliquus posterior narrow, shape and direction similar to what obtains in *V. salvator*. Articulation surface smooth, of proportionally normal size. The process under inspection is damaged on both its dorsal and ventral surfaces. Posterior surface large, presenting a large facies rhomboidea latero-ventrally delimited by a sharp keel. Dorsal surface smooth, medio-posterior one worn. No structure lines visible. Angle enclosed by imaginary horizontal plane of neural arch and upper surface of proc. obl. post. directed ventrad, about 71°. Angle formed by articulation surface of posterior oblique process and outer surface of neural canal's basi-lateral wall that is continuous with it, about 120°. Angle formed by dorsal and articulation surface of same process, about 65°.

Processus spinosus broken off. The basal part of it, which begins with the median crest on the pars tectiformis, points at a strong development (Pl. XIV, Fig. 1).

Pars tectiformis very strongly marked, its lateral surface enclosing an angle of about 118° with the articulation surface of the anterior oblique process. Its surface is made rough by the presence of a couple of exostoses that evidently served the adhesion of the intervertebral muscles of this powerful animal. The dorsal keel of the tectiform part which, as stated above, forms the very beginning of the spinous process, is bulky, rather torus-like. (All these details are evidenced by Pl. XIV, Figs. 1 & 3). The two sides of the tectiform part, meeting in the median torus-like crest, enclose an angle of about 92°. In the concave sinuation occurring between the tectiform part and the articulation surface of the anterior oblique processes, there is, on each side, an exostosis, belonging to those just mentioned; these two exostoses are asymmetrical in shape and position, the right side one forming a sort of torus, whilst the left side one appears as a short, but sharp, keel (Pl. XIV, Figs. 1 & 3). They remind one of very primitive zygosphenes, having, however, in fact, very probably nothing to do, neither genetically, nor functionally, with such product of differentiation in the neural arch.

The dorsal surface of the neural arch is smooth on the whole, showing, however, structure lines more or less converging mediad.

The posterior basal ends of the arch, i.e. that part of the neural arch, which constitutes the wall of the neural canal at both sides of its exit from the vertebra, are very thick,

measuring about 3.5 mm in the middle region of the vertebral canal's posterior height.

Vertebra dorsalis cfr. XXVI, agreeing in substance with the precedent, differing from it only in those characters that are implied by its topographical, i.e. positional, occurrence in the vertebral column. Such are: smaller size, shorter centrum, narrower cup (or shaft) and smaller ball, larger vertebral canal, and some slight — divisional — differences in the neural arch (shape of processus transversi which are preserved without the cartilaginous surface of articulation for the ribs, &c). All these differences being very clearly accessible to the reader, even if metrical conditions (angles, proportions) be concerned, when applying to Figs. 6 to 10 on Pl. XIV. — I will spare him, and myself, the rather useless trouble of enumerating them in detail. I only wish, in this place, to draw attention to the very bulky, torus-like pars tectiformis, well visible on Figs. 6 and 10, as well as to the processus spinosus which, however, is so seriously injured in its peripherial parts that it is not possible to reconstruct, on such grounds of evidence, its actual outline. Linea medialis marked only in its very basal part. The vertebral canal being free in this specimen from the matrix that filled it out when I received the bone, the furrows, crests (cristae laterales can. vertebr.) and inter-venal spaces occurring in it are well discernible on Figs. 9 and 10. The special postero-basilateral crests described in *Megalania* are not present in this Varanian.

Measurements of the two specimens:	Vert. cfr. XVIII.	Vert. cfr. XXVI.
Total length of centre (from anterior margin of cup to postero-ventral edge of ball, in median line)	27·15	22·3 (appr.)
Length of cup (longitudinally)	9·37	9·3 (appr.)
Width of cup (transversely)	15·66	13·5
From deepest point of cup to medio-anterior margin of it	5·5	4·6 (appr.)
Length of ball (dorsally, in median line)	10·11	—
Width of ball	13·45	11·15
Height of ball (thickness, vertically, in median line)	6·7	6·3
Median length of neural arch	20·3 (very defective)	19·35

From antero-median point of arch to anterior supero-proximal basis of (left) proc. obl. anterior	6·	5·34
Greatest distance between supero-distal edges of proc. obl. anteriores	29·01	26·83
Longest diameter of articulation surface of (left) proc. obl. anterior	9·8	9·1 (appr.)
From supero-distal edge of (left) proc. obl. anterior to dorsal limit of facies costalis	6·6	4·4
Greatest width (measured in median region, at right angles to greatest diameter) of articulation surface of (left) proc. obl. ant.	8·95	9·17
Vertical diameter of (left) facies costalis	5·74	7·14
Greatest horizontal diameter of same	4·2	2·5
Distance between most prominent points of facies costales	29·74	26·75 (cartilage wanting)
From middle region of posterior limit of (left) facies costalis to dorso-lateral edge of ball	12·5	12·97
From foremost edge of (left) proc. obl. ant. to hindmost point of postero-ventral edge of proc. obl. posterior	26·05	24·3
Distance between most distal points of proc. obl. posteriores edges	—	22·9
Greatest diameter of articulation surface of (left) proc. obl. posterior	8·83 (defective)	9·2
Greatest breadth of same	6·78	5·58
Distance between proximo-basal ends of articulation surfaces of proc. obl. posteriores	—	10·6
From middle region of posterior latero-basal sinuation of proc. spinosus to most distal point of proc. obl. posterior (on left side)	—	10·2
From middle region of (left side) latero-basal sinuation of proc. spinosus to top of latter (defective)	—	—
From anterior end of tectiform part to top of proc. spinosus	—	20·8 (very defective)
From top of proc. spinosus to median point of dorsal vault of spinal canal	—	12·— (very defective)
Anterior basal thickness (transversely measured) of proc. spinosus	3·4	2·6

Greatest thickness of same (anterior border)	—	2·1
Posterior basal thickness of same		4·33
From posterior end of pars tectiformis to top of proc. spinosus	—	15·9
Transverse diameter of tectiform part (between proximal ends of proc. obl. ant.)	9·58	8·9 (very defective)
Median thickness of same	3·45	3·5
Anterior width of spinal canal	4·82	6·88
Antero-median height of same	3·6	4·01
Posterior width of spinal canal just above cristae laterales	4·7	4·68
Posterior height of spinal canal	4·6	5·0

Explanation of the plates.

PLATE I.

Fig. 1. *Megalania prisca,* OWEN. Exterior view of right dentary.
Fig. 2. Interior view of the same.

PLATE II.

Fig. 1. Dorsal vertebra of *Megalania prisca,* OWEN. — Darling Downs, Queensland, Australia. — Mus. Hung. Rept. No 2778. Dorsal view.
Fig. 2. Same dorsal vertebra, ventral view.
Fig. 3. Same dorsal vertebra, posterior view.

PLATE III.

Fig. 1. Same dorsal vertebra, anterior view.
Fig. 2. Same dorsal vertebra, lateral view.

PLATE IV.

Fig. 1. *Placovaranus komodoënsis* OUW. Photo by F. BOND. Zool. Soc. of London.

PLATE V.

Fig. 1. Skull of *Placovaranus komodoënsis* OUW., dorsal view.
Fig. 2. Same skull, ventral view.
Fig. 3. Same skull, lateral view.
Phot. Dr. FOESTER, Cambridge, Zoological Laboratory.

PLATE VI.

Fig. 1. Same skull, posterior view.
Fig. 2. Dermal ossification of *Placovaranus komodoënsis* OUW. dorsal view.

Fig. 3. Same ossification, ventral view.
Phot. Dr. FOESTER, Cambridge, Zoological Laboratory.

PLATE VII.

Fig. 1. Head of *Varanus varius* SHAW.
Fig. 2. Head of *Varanus salvator* LAUR., young specimen from Java, in the Collection of Reptiles, Mus. Hung. Nat. 1856—M404dl.
Fig. 3. Skull of *Varanus salvator* LAUR. ♀ iuv., South-India, legit DUKA.
Fig. 4. *Varanus salvator* LAUR. Propriety of the Natural History Museum Vienna.
Fig. 5. Same skull, nario-loreal region.

PLATE VIII.

Fig. 1. Head of *Varanus indicus* DAUD.; Simbang, 1898; legit BIRÓ. Mus Rept. No. 2423/11.
Fig. 2. Skull of *Varanus indicus* DAUD.: ♀ legit BIRÓ. New-Guinea. 1897. Mus. Rept. No. 2126/18.
Fig. 3. Head of *Varanus prasinus* SCHLEG.; New-Guinea, Sattelberg; legit BIRÓ. Mus. Rept. No. 2423/13.
Fig. 4. Skull of *Varanus prasinus* SCHLEG.; Stephansort, New-Guinea, 1897. IV. 28; legit BIRÓ. No. 2126B/19d.
Fig. 5. Head of *Varanus bengalensis* DAUD., India; legit KAUFMANN. Mus. Rept. No. 1881/12.
Fig. 6. Skull of *Varanus bengalensis* DAUD. Ceylon, 1870, legit XANTUS. Mus. Rept. No. 1100/67.
Fig. 7. Skull of *Varanus niloticus* L.

PLATE IX.

Fig. 1. *Varanus niloticus* L. left maxillary, the same old specimen figured on Pl. VIII, Fig. 7.
Fig. 2. Upper jaw of an undetermined recent Varanian.
Fig. 3. Head of *Varanus griseus* DAUD.
Fig. 4. Skull of *Varanus Duméril* (MÜLL.) SCHLEG. Singapore, 1870; legit XANTUS.
Fig. 5. Naso-loreal region of an adult male specimen of *Varanus griseus* DAUD.
Fig. 6. *Varanus griseus* DAUD., left maxillary. Egypt, (?) Mus. Rept. No. 2584.

PLATE X.

Fig. 1. *Palaeovaranus* Cayluxi* FILH., left maxillary, view of the outside.
Fig. 2. Same, view of the inside.
Fig. 3—6. Two maxillary-fragments.
Fig. 7—8. Left dentary, view of the out- and inside.
Fig. 9—10. Fragment of a dentary.
Fig. 11. Skull of *Ameiva surinamensis* LAUR. South America, 1911.
Fig. 12. Left maxillary of *Ameiva surinamensis* LAUR. from the inside.
Fig. 13. Nasal bone of *Ameiva surinamensis* LAUR.
Fig. 14—19. Two ribs from the Munich Collection.

PLATE XI.

Palaeovaranus Cayluxi* FILH.

Fig. 1. Right humerus from the ventral side.
Fig. 2. Idem, from the dorsal side.
Fig. 3. Distal portion of the left humerus, from the ventral side.
Fig. 4. Idem, from the dorsal side.
Fig. 5. Left radius, from the dorsal side.
Fig. 6. Idem, from the ventral side.
Fig. 7. Left femur, from the ventral side.
Fig. 8. Right femur, from dorsal side.
Fig. 9. Left femur, from the lateral side.
Fig. 10. Left femur, from the medial side.
Fig. 11. Right fibula, from the caudal side.
Fig. 12. Idem, from the cranial side.
Fig. 13. Left tibia, from the lateral side.
Fig. 14. Idem, from the ventral side.
Fig. 15. Right tibia, fibular side.
Fig. 16. Idem, caudad side.
Fig. 17. II. metatarsal of the left foot, dorsal view.
Fig. 18. Idem, medial view.
Fig. 19. Idem, ventral view.

PLATE XII.

Palaeovaranus Cayluxi* FILH.

The numbers of figures connected by a dash show the same bone in dorsal, ventral, lateral, medial and proximal-articular views.
Figs. 1—5. III. metatarsal of the right side (2, 4, 5, represent same specimen).
Figs. 6—10. IV. metatarsal of the right side. (7, 9, 10, represent same specimen).
Figs. 11—14 & 31 cfr. 1st phalanx of the II. toe, left side.
Figs. 15—18 & 32. cfr. 3rd. phalanx of the III. toe, left side.
Figs. 19—22 & 33. cfr. 1st phalanx of IV. toe, left side.
Figs. 23—26 & 34. cfr. 1st phalanx of IV. toe, rigth side.
Figs. 27—30 & 35. 1st phalanx of V. toe, rigth side.

PLATE XIII.

Reconstruction of *Palaeovaranus* Cayluxi.* FILH. Drawing by DR A. PONGRÁCZ.

PLATE XIV.

Figs. 1—5. *Varanus Bolkay nov. sp.* dorsal vertebra c f r. XVIII.
Figs. 6—10. *Varanus Bolkay nov. sp.* dorsal vertebra XXVI.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS ZOOLOGICA.

THE REDESCRIPTION OF CERTAIN TRYPETIDAE (DIPTERA) PUBLISHED BY BEZZI IN 1924, WITH THE DESCRIPTIONS OF A NEW GENUS AND SPECIES.

(With 30 text figures).

By H. K. Munro.

When in 1924 the late Prof. M. Bezzi published, in the Bulletin of Entomological Research, his summary of the Trypetidae of the Ethiopian Region, he included in the tables numerous species of which he stated the complete descriptions would appear later. This he did in many cases but there remained some thirty species of which he did not complete the descriptions prior to his death. The majority of the types of the species concerned proved to belong to the collection of the Hungarian National Museum in Budapest and I am greatly indebted to Dr. Szilády for his kindness and courtesy in sending me the material for study.

There are still four species of which I have not been able to locate the types; these are — *Carpophthoromyia angusticeps* Bez., *Pardalaspis Roubaudi* Bez., *Pardalaspis cyanescens* Bez. and *Themara Speiseriana* Bez. I should be glad if any museum possessing these types would communicate with me.

All the types received from Dr. Szilády are redescribed here, an undertaking that seemed essential in view of the generally incomplete data available from the tables for the determination of the genera and species. The position was unsatisfactory especially as it was often impossible to say for certain if apparently new species were really different from Bezzi's or not. Bezzi himself redescribed one species as new, and I redescribed one of the genera on a closely allied species.

Further, it seemed possible there might be some lack of agreement as to the status accorded to Bezzi's names. It would appear, however, that all except two of the species are sufficiently characterised to be valid under the rules of nomenclature. In this opinion Dr. Karl Jordan has kindly told me he agrees. It is necessary, however, to consider another question, namely that the two species referred to above are not described at all and so must be considered

nomina nuda, and they have been described here as new. Both names are quoted as genotypes of new genera, *Brachyaciura* and *Brachiopterna*. The genera themselves may be regarded as valid. Some authors, however, consider that genera should date from the time of the publication of the description of the genotype. That the question cannot yet be considered settled is evidenced by the revival of the controversy in regard to MEIGEN's 1800 names. If the latter are eventually rejected, names of many genera of various authors will be affected. In the case of the two under discussion, I would reluctantly have to claim *Brachyaciura* and my *Cyanodesmops* would replace *Brachiopterna*. In this paper I have credited all names previously published by BEZZI to him, only describing as new the two where this appeared necessary to make them valid.

While I am not generally in favour of the use of contractions in descriptions, I have followed BEZZI in using his for the bristles. That a few may be used to advantage is evident, but excessive use of contractions is apt to lead to confusion, especially as there seems to be no general agreement as to what should be employed.

It has been considered advisable to describe the species under the genera in which BEZZI placed them; also, unfortunately, most of the species are represented by unique specimens. That it may be necessary to locate some in other genera is very probable. To some extent I have indicated what may be necessary changes, but to go into the subject thoroughly would require a revision of many related species which is beyond the needs of the present paper.

A few words in regard to the illustrations of the wings given here may not be out of place. They were made with the aid of a camera lucida and should be regarded more as diagrams than as photographic reproductions. As regards the pattern, dark markings have generally been made lighter in order that the venation might be apparent, and light markings made darker, especially in the case of *Euribia xiphias* and *Ensina evanida*, in both of which the markings are almost invisible.

Dacus hyalobasis BEZ.

BEZZI, Bull. Ent. Res., XV, 87, 90 (1924).

This species belongs to a series placed by BEZZI in *Dacus* and which have the following characters in common: face unspotted, a rather narrow costal border on the wing and no anal stripe, third segment of male not ciliated, a single hypopleural spot and yellow

humeri. Of the species given by BEZZI in his tables (l. c. p. 87) *D. annulatus* BECK., *D. hyalobasis* BEZ., *D. xanthopus* BEZ., *D. Maynei* BEZ., *D Mochii* BEZ., *D. Woodi* BEZ. and *D. macer* BEZ. as well as *D. Chapini* CURR. all appear very closely allied. A large series of specimens of this group should be studied as unfortunately most are based on solitary or very few specimens.

D. hyalobasis itself seems most closely related to *D. xanthopus* (a variety of *D. Woodi*). On comparison with a series of specimens of *D. xanthopus* from South Africa, the single specimen of *D. hyalobasis* is seen to be much blacker; on the abdomen the dorsal ferruginous ('reddish') markings are much more extended in the former, in which they form a broad median stripe, widening to a large, rather paler, triangular fascia on the second segment.

Type, a male, Arusha-Ju, Africa Or., X, 1905, KATONA.

♂. Length of body 5.5 mm, of wing 4.5 mm. Head as long as high and rather less than one-third wider, yellow, with large irregularly rounded, dark brown, lateral areas on occiput, each prolonged to meet below neck and above at corner of eye touching a dark, broad bar across vertex, the latter is rather indistinctly produced laterally and medially to join a paler brown, trapezoidal area between the hinder of the i.or; frons flat with slight yellow pile, parallel sided, barely twice as long as wide, the front pair of i.or well-developed and of normal size, the hinder, on small brown spots, very short and inconspicuous, as are the pair s.or and the oc; lunule short, brownish; face unspotted; a slight brownish spot below eye; palpi broad, flattened, yellow; proboscis short, antennae brownish, paler on inner side of third joint; arista bare, brown, basal joints paler. Thorax very dark reddish brown on dorsum with very faint indication of broad, greydusted, sub-median stripes extending anteriorly barely past the suture, vestiture pale blackish, appearing silvery obliquely, pubescence yellow on yellow areas; pleura paler anteriorly; yellow spots well-developed, i. e humeri, a single hypopleural spot and a very broad mesopleural fascia which reaches on to the sternopleura below and the notopleura above; there is also a pale yellowish spot on the widened portion of the suture on each side of the dorsum. Bristles normal, outer cervicals strong, the middle weak, a latero-median pair seems also present but may be only strongly developed hairs; a.sa absent. Wing (fig. 1) hyaline, veins brownish, stigma dark brown, costal stripe slight, no anal stripe nor brown 'cloud' below end of sixth vein; scutellum yellow, the two bristles about as far from each other as from base. Abdomen

oval, segments fused, third segment not ciliated, concolorous with thorax, a broad, reddish median stripe a quarter width of abdomen, just past middle of sixth segment the stripe widens to cover the whole of the width of segment. Venter and genitalia reddish.

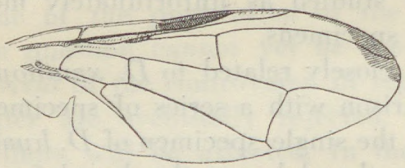


Fig. 1. Dacus hyalobasis Bez.

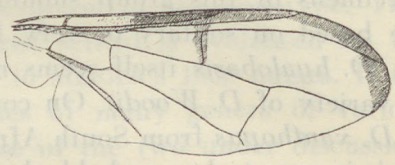


Fig. 2. Dacus Katonai Bez.

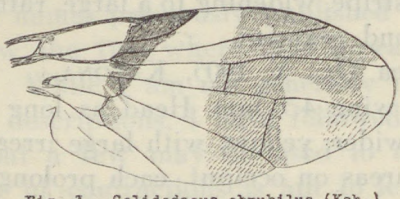


Fig. 3. Celidodacus obnubilus (Ksh.) var. ornatus Bez.

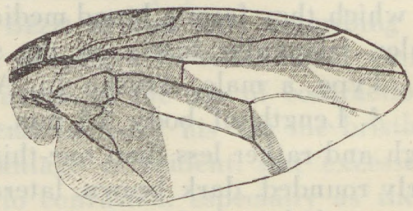


Fig. 4. Trirhithrum homogeneum Bez.

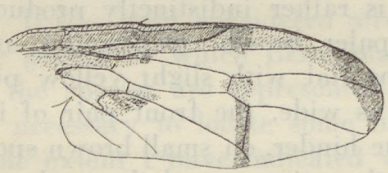


Fig. 5. Hermannloewia dissoluta Bez.

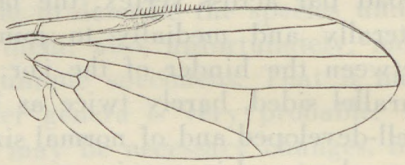


Fig. 6. Urophora cilipennis Bez.

Dacus Katonai BEZ. emend.

BEZZI, l. c., 86, 90. *Dacus katonae.*

This species agrees with *Dacus hyalobasis* and the others previously mentioned in the series of characters noted with two exceptions: there is a very faint indication of an anal stripe and the humeri are ferruginous; in addition it may be separated by the infuscation over the upper cross-vein. This latter character, however, it has in common with *D. Maynei* BEZ.

Type, Mto-ja-Kifaru, Africa Or., 1905, KATONA.

♂ (?). Length of body 5.9 mm, of wing 5.0 mm. Head a little higher than long, and not quite one-third wider, straw yellow with only a black ocellar dot. Frons not quite twice as long as wide, parallel sided, about one-third narrower than an eye, i.or, inner and outer vt strong, the single s.or and oc minute, very slight black pubescence anteriorly. Antennae, third joint of both missing; face

with a flat, median tubercle; palpi flattened, parallel sided. Thorax shining blackish ferruginous, paler and more reddish on anterior parts of pleura and on humeri, on dorsum a welldefined median white pollinose stripe from just behind cervical bristles to half way between suture and scutellum, its hind two-thirds narrowly divided by a shining black streak, a broad mesopleural fascia and single hypopleural spot yellow, inner and outer cervicals strong (but in type the right inner is weak), a.sa absent. Scutellum flattened, yellow with very slight darkened base, sides somewhat concave, posterior margin straight and three-quarters length of scutellum. Halteres yellow. Legs straw yellow, except light brown stripes on inner and outer surfaces of anterior tibiae, a brownish illdefined streak towards apex of outer surface of front femora, on middle legs distal half of femora and proximal half of tibiae and hind coxae and tibiae ferruginous. Wing (fig. 2) with normal venation, stigma dark, a narrow costal stripe, a very faint suggestion of an anal stripe but no distinct cloud below sixth vein, although the microtrichiae are rather more closely-set there. Abdomen rather long oval, concolorous but with a slightly more reddish tinge than thorax, fascia on hind margin of second segment represented by rather small, oval, pale yellowish areas irregularly developed on either side, a small median pale spot on hind margin of fourth segment, segments fused with well-defined sutures, venter and genitalia eaten away, but specimen is probably a male.

Celidodacus obnubilus (KSH.) var. ***ornatus*** BEZ.

BEZZI, l. c., 94.

Type, a female, Ukami, Africa Or.

♀. This variety agrees with typical specimens of *C. obnubilus* from the Congo in all respects except a slight variation in the wing pattern (fig. 3). There is a small hyaline spot on the second vein near the outer end of the marginal cell and the hyaline indentation in the second posterior cell is much wider and reaches half way across the first posterior cell; further, the outer end of the second posterior cell is rather more faintly infuscated.

Trirhithrum homogeneum BEZ

BEZZI, l. c., 105, 108.

Type, a rather damaged male, „Deutsch O. Afrika".

♂. A black species of the same size and appearance as *Trirhi-*

thrum occipitale BEZ. There are slight differences in the coloration of the head: the occiput is brown, the frons yellow and there is a broad bar across the upper third of the face; in *T. occipitale* the first two are yellowish brown and orange respectively and there is on the face only a slight brown mark below the roots of the antennae. As far as can be judged, the rest of the body is as in *T. occipitale,* but the silvery dusted, submedian fasciae on the second, third and fourth segments of the abdomen are not evident in the present specimen. The main difference is in the wing pattern (fig. 4) the basal third of the wing being very dark and opaque; the veins above and below the discal cell are practically parallel, and the lower angle of the cell is acute.

Hermannloewia dissoluta BEZ.

BEZZI, l. c., 115.

Type, a female, Pretoria, Transvaal, 8. XI. 12.

A rather small, greenish-yellow species that I have so far failed to discover myself.

♀. Length of body and of wing 4.2 mm. Head yellow, length six-ninths, height eight-ninths of width; occiput with some slight dark marks above neck, flat, not very prominent below, the bristles black, thin; frons, width at vertex twice, and length nearly three times, width of an eye, somewhat narrowed anteriorly, bristles black, two s.or, four i.or, the hindmost of the latter small and thin, oc medium, ocellar dot black, some thin brownish pubescence on frons, longer on orbits; lunule short, arcuate, yellow; antennae two-thirds length of face, rounded at end, yellow at apex and below, on inner and outer sides with greenish markings; arista brown, bare; face flat, epistome barely visible in profile, cheeks as, and genae twice as wide as third antennal joint; oral opening short and wide, palpi yellow, proboscis darker yellow, short, drawn up into oral cavity in specimen. Thorax straw-yellow on about the anterior four-fifths, with slight silvery dust and black pubescence, also a median and a pair of sub-lateral stripes, these are blackish and somewhat irregular, ending just behind the dc in outward hooks, and where they cross the suture are large dark brown spots; the posterior two-fifths and the scutellum are waxy yellow with practically no pubescence; the dc are far back at the hind quarter of the dorsum; laterally there is a brown spot above the root of the wings; apex of scutellum with a green spot; it has four bristles, the apicals the

shorter; on the thorax the bristles are black, the inner cervicals apparently absent; two mpl; mesophragma darker yellow and a pair of large dark brown spots on the postscutellum; halteres with green stem and yellow knob; legs yellow with touches of green on coxae and faintly on ends of femora; squamae large, yellow, more or less edged with green; wing (fig. 5), stigma large, as long as outer costal cell, upper cross-vein about one and a half times its length from lower (not less as indicated by BEZZI), lower cross-vein straight, third vein with two setae at extreme base, veins brown, paler and greenish towards base, from the base of the wing there is a broad greenish-brown costal margin, with a large darker spot at end of stigma and at the apex of wing darker, a small dark brown spot below junction of second and third veins, stigma and costal cells distinctly greenish, a pale cloud at base of third posterior cell extending into discal cell, and slightly into anal and second basal cells, a bar from base of first posterior cell where it is pale, extending, darker, over lower cross-vein to wing margin. Abdomen straw yellow, somewhat discoloured in specimen, with rather long black pubescence, which develops into setae on hind margins of segments and is longest on the last, fifth and sixth of about equal length; base of ovipositor straw yellow, black at apex and with black pubescence, very short and broad, about as long as last segment; venter yellow.

Urophora cilipennis BEZ.

BEZZI, l. c., 116.

Type, a male, Mujenje, Uganda, VII, 1913, KATONA.

A small black species, with yellow head and notopleural stripe and hyaline wings, at once distinguished from known related species by the row of long setae along the costa at stigma.

♂. Length of body 2.4 mm, of wing 2.6 mm. Head a little higher than long and half as much again wider; occiput flat, not prominent below, shining black with a yellow stripe on lower margins of eye broadening to yellow genae; occipital bristles thin, black; frons one and two-thirds width of eye, a little wider at vertex than long, rather narrowed anteriorly, dark yellow, bare with some orbital pubescence, ocellar dot black, one s.or, two i.or, oc well-developed; lunule arcuate, pale yellow; antennae as long as face, dark yellow, third joint blackened, arista brown with rather short pubescence; face narrow, yellow, epistome a little prominent;

cheeks linear, genae as wide as third antennal joint; oral opening rounded; palpi brownish; proboscis not very elongate, labellae about as long as median portion which is a little shorter than oral opening. Thorax shining black, with slight dust and brown pubescence, yellow lateral stripes from humeri to base of wing inclusive, dc on line of a.sa; halteres yellow; scutellum flat, clothed as thorax, with four bristles, the apicals slightly the longer; squamae yellow, upper large, lower more or less linear; wing (fig. 6) hyaline with brownish veins and yellowish stigma, which is elongate with costa and vein below it somewhat thickened, along costa above stigma and for about an equal distance further a row of strong setae, grading outwardly into usual costal setulae; legs black, tibiae brownish and tarsi paler. Abdomen shining black, pubescence and bristles black, the latter laterally and round margin of last segment, tergites rather narrow and lateral membranes prominent, venter and genitalia black.

Brachyaciura Bez.

Bezzi, l. c., 121.

In regard to this genus Bezzi states: — „in the form of the head this genus is allied to the *Acidia-Pseudospheniscus* group but is distinguished by the very short antennae, by the bare third vein, by the dc being placed on the line of the a.sa, by the peculiar coloration of the head, and by the wing pattern of the *Aciura*-type." From the tables for the determination of the genera (l. c. p. 78) additional characters to be noted are: — „head in front view higher than broad, well developed lower occipital swellings, the very short antennae inserted above middle of eye." From an examination of the type of the genotype, the following remarks may be made: — the third vein is not bare, but has a few, three or four, setae at the base, and a few, four or five, beyond the upper cross-vein; the dc are slightly before the line of the a.sa; the head is actually about eight per cent wider than high; the ocp are whitish and somewhat flattened. The genus seems most closely related to *Acidia* Rob.-Desv., and has also a row of bristles on the propleura below the humeri, but the st is present and the occiput much less prominent, especially above.

Genotype, the following new species.

Brachyaciura Kovácsi n. sp.

Bezzi, l. c., 121, nomen nudum.

Type, a male, Ulamo, Abyssinia, III, 1921, Kovács.

The affinities of the species have been indicated under the genus.

♂. Length of body 4.7 mm. of wing 4.2 mm. Head of rather large proportions compared with the body, a little wider than high and about four-fifths width in length: occiput blackish, concave above, prominent below, the bristles whitish and somewhat flattened; frons flat, parallel sided, one-third longer than wide, and slightly wider than an eye, orbits broadly yellow with pale pu-

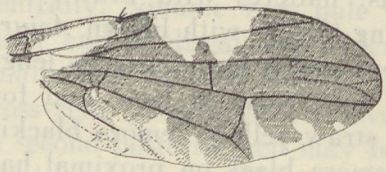


Fig. 7. Brachyaciura Kovácsi Mro.

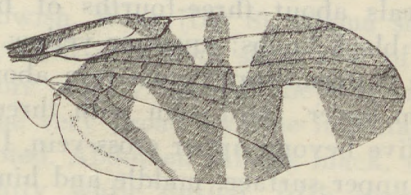


Fig. 8. Aciura latincisa Bez.

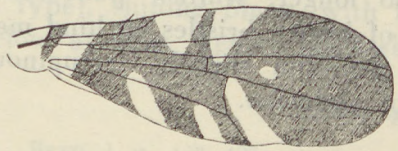


Fig. 9. Aciura sphenoptera Bez.

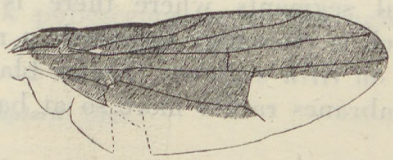


Fig. 10. Katonaia aruehae Mro.

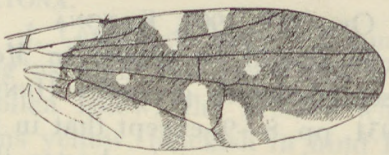


Fig. 11. Spheniscomyia senaria Bez.

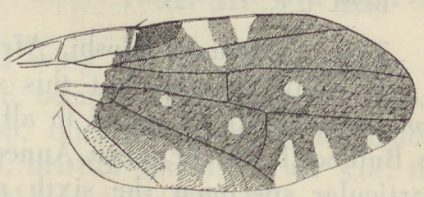


Fig. 12. Tephrella Katonai Bez.

bescence, centre broadly brown with a faint median streak which widens to surround the black ocellar dot; only the merest suggestion of pubescence anteriorly, bristles brown, two s.or, three i.or, oc strong; lunule wide U-shaped, nearly twice as wide as long, darker brown than frons, but with paler lateral and hind margins; antennae close together, opposite middle of eye, short, less than half length of face, second joint prominent, black, bristly above, third joint rather small, about twice as long as wide, brown, rounded at end, arista twice as long as antenna, brown, short pubescent; cheeks

and genae yellow as sides of frons, cheeks less than, genae twice, width of third antennal joint; face elongate, flat, velvety black, epistome not at all prominent, oral opening slightly elongate oval; proboscis short, black, palpi blackish ferruginous. Thorax shining black, with whitish pubescence and grey dust on dorsum where along whole length are a median and two dorsocentral blacker streaks, pleura with a slight ferruginous tinge, stronger along notopleura and distinct on humeri; postscutellum whitish; bristles brown, dc slightly before line of a.sa, a row of four bristles on propleura below humeri, st present. Scutellum flat, somewhat triangular, shining black, with slight dust and pale pubescence, four bristles, the apicals about three-fourths of basals; halteres with brown base and black knobs; squamae yellow. Wing (fig. 7) with brown *Aciura*-like pattern, upper cross-vein about one and a half times its length from lower, third vein with three or four setae at base, and four or five beyond upper cross-vein. Legs straw yellow, femora blackish on upper surface, middle and hind femora black on proximal half. Abdomen short, shining black, apparently without dust except on basal segments where there is also longer, whitish pubescence, which is elsewhere brownish, a row of brown bristles on hind margin on fifth segment. Venter black, genitalia slightly ferruginous, membranes rather more so at base of abdomen.

Aciura latincisa BEZ.

BEZZI, l. c., 122, 123.

Type, a female, Moshi, Africa Or., VII, 1905, KATONA.

It would appear that this species should be placed in *Metasphenisca* HEND. It agrees in all essential details given by HENDEL in Bull.Soc.R.Ent.d'Égypte, Année 1931, pp. 8—9, except that in this particular specimen the sixth abdominal segment is shorter than the fifth and this does not seem to be due to the fact that the one overlaps the other more than is usual. In the females of both *Metasphenisca tetrapoda* BEZ. and *M. haematopoda* BEZ. examined by me, the lengths of the segments in question are practically equal. The present species, however, could not be placed in *Aciura* nor any of the related genera as the third vein is bristly.

♀. Length of body 5.3 mm, of wing 4.5 mm. Head nearly as high as wide and about two fifths height in length, blackish ferruginous, face and lunule somewhat silvery pollinose; frons two-thirds as wide as long, a little narrowed anteriorly, three i.or (four

on left in type), two s.or; lunule semicircular; antennae missing except first and second joints on left; face reddish yellow, silvery on upper half with shallow grooves, epistome only slightly prominent; cheeks narrow, genae wider; ocp. posterior and outer vt whitish, others brown to blackish; proboscis short. Thorax black, with ferruginous tinge on pleura, white dust and sparse white pubescence; bristles brownish, cervicals absent, dc on line of a.sa; scutellum more shining black and less white dusted than thorax; legs ferruginous like head, middle femora slightly, hind tibiae and femora more blackened, front coxae with two strong bristles outwardly, front femora with a row of three strong spines latero-ventrally. Squame very pale yellowish. Wing (fig. 8), stigma short, outer end of discal cell widened, third vein with short row of six small setae at base and five, more widely spaced, beyond small cross-vein, pattern dark brown, the very broad hyaline indentation in second posterior cell may be noted. Abdomen shining black, with black pubescence but very slightly white dusted, fifth segment half as long again as sixth; base of ovipositor conical (flattened in type), shining black, with black pubescence, more ferruginous below at base. Venter blackish.

Aciura sphenoptera BEZ.

BEZZI, l. c., 122, 123.

Type, a rather damaged male, Arusha-Ju, Africa Or., XI, 1905, KATONA.

♂. Length of body 3.2 mm, of wing 3.4 mm. Head about as long as high and two-fifths wider, occiput black, concave above, swollen below, the bristles whitish, thickened, ocellar dot black; frons yellow, blackish in hind half, bristles blackish, two s.or, the hinder rather small as are the oc, three i.or, width at vertex about one-fifth wider both of width at antennae and of width of an eye and three-quarters of length; lunule sunken in specimen, yellow, short and small; antennae yellow, about as long as face, third joint somewhat tapered to a blunt point, arista elongate, brownish, paler at base, with sparse but rather long pubescence; face as wide as lower part of frons, yellow, cheeks very narrow, genae wider, epistome somewhat projecting, broadly excavated medially, oral opening rounded oval; proboscis and palpi yellow, the former short. Thorax rather shining black, with a slight ferruginous tinge and slight whitish dust, otherwise bare or the pubescence has been ab-

raded, bristles blackish, one mpl, dc on line of a.sa. Scutellum as thorax, with only a basal pair of bristles, halteres yellow, squamae short, yellow; legs blackish, rather paler than thorax but front coxae and distal ends of front femora more yellowish, all tibiae and tarsi yellow, except hind tarsi slightly blackened. Wing (fig. 9) narrow, lanceolate, no bristles could be observed on the third vein. Abdomen shining black, apparently bare, with very slight trace of dust, venter blackish, genitalia more ferruginous.

Katonaia n. g.

In considering the position of this genus, the first point to be remarked is that the fifth and sixth abdominal segments of the female are of approximately equal length. In spite of this, however, it does not appear to belong to the Tephritinae sensu HENDEL. The bristles of the head are all (apparently) thin and black, and there is only one s.or. Further, as the third vein is bare and there are two scutellar bristles, it runs to *Placaciura* HENDEL (Pal. Dipt. 49. Tryp. p. 20). From this it differs, among other points, in the shape of the head, the narrower frons and in wing venation and pattern. The latter is dimidiate while the venation is crowded towards the costa, the fourth vein ending at the tip of the wing as in species of *Spheniscomyia*. The basal half of the wing appears wider than is usual.

Genotype, the following new species.

Katonaia arushae n. sp.

Type, a female, in poor condition, Arusha-Ju, Africa Or., XI, 1905, KATONA.

When received the specimen was thickly covered with a mat of apparently fungus mycelia, only one wing being partly visible, the other mostly broken off. It bore a label in BEZZI's writing „indet. n. sp." After soaking the specimen in water it was possible to remove most of the thick mat, and after slight treatment in dilute potash and gentle teasing with needles, most of the strands of mycelia were removed. Many of the bristles were unfortunately broken off, but sufficient remained for examination and description, others could be noted from the position of their alveoli. The one wing that was fairly complete was also found to be damaged and in danger of falling to pieces; a mount was accordingly made of this and is pinned to the rest of the specimen.

♀. A shining black species, with only front portions of head, extremities of legs and halteres yellow; wing with a striking dimidiate pattern. Length of body 3.4 mm, of wing 2.9 mm. Head, proportions of width, height and length, 9, 8 and 6; occiput shining black, slightly concave above, prominent below, the bristles thin and black; frons broad, one and a half times width of eye, and a little more than one-third longer than wide, strongly sloping and prominent anteriorly in profile, vertical plates ferruginous, ocellar dot black, a few black hairs on front portion of orbits, one s.or, two i.or, oc apparently present and small; lunule short, lunate, yellow; antennae straw yellow, second joint rather more than half length of third, which is about twice as long as wide and rounded at apex, arista brown, with slight pubescence; face slightly concave, yellow, cheeks about half, and genae about as wide as third antennal joint; genal bristle absent or abraded; eye elongate oval in profile, sloping backwards, anterior facets enlarged, oral opening rounded; proboscis short, yellow, palpi yellow, but scarcely visible in specimen. Thorax swollen, shining black, on dorsum very slight trace of dust and slight black pubescence; dc on line of a.sa. Scutellum shining black, two strong basal bristles and apparently a pair of microscopic apicals. Halteres yellow. Legs, coxae and femora black, except apices of femora and al tibiae and tarsi yellow. Wing (fig. 10), venation more or less crowded towards costa, fourth vein ending at tip of wing, stigma elongate, third vein bare, discal cell large, a uniformly brown, dimidiate pattern. Abdomen and base of ovipositor shining black with black pubescence, fifth and sixth segments of equal length; base of ovipositor elongate legging-shaped, rather longer than pre-abdomen, width at base half, and at apex one-eight, of its length; second joint blackish, third, brown; venter black.

Spheniscomyia senaria BEZ.

BEZZI, l. c., 124, 125.
MUNRO, Ann. S. A. Mus., XXIX. 14 (1929).

Of the specimens from South West Africa in the collection of the South African Museum determined by me as this species in 1929, a female retained in my collection agrees closely with the type. There are however slight differences in the proportions of the head: while in the type the head is slightly higher than long, in my specimen it is slightly longer than high, which gives its head

a somewhat depressed appearance. The fronto-facial angle is also rather less in the type, and the eye rather more rounded in profile.

Type, a female, Mujenje, Uganda, IX, 1913, KATONA.

♀. Length of body 4.2 mm, of wing 2.8 mm. Head, proportions of width, height and length, 4.3 and 2.5, in profile flattened in appearance, the fronto-facial angle obtuse, the eye large in profile, its long axis sloping backwards; occiput black, flattened, only slightly prominent below, the bristles rather thin and blackish; frons at antennae about as wide as eye, about one-third wider at vertex and not quite twice as long as wide, opaque yellow anteriorly, sub-translucent blackish on sides and behind, ocellar dot black, one s.or, three i.or, the anterior one smaller, oc small; lunule yellow, broadly rounded U-shape, as long as wide; antennae deep yellow nearly as long as face, third joint twice as long as wide, with an upper, terminal blunted point; face yellow, narrower than frons, concave, grooves distinct; cheeks linear, genae about as wide as third antennal joint, epistome hardly prominent, broadly rectangularly excavated, oral opening slightly elogante oval; palpi yellow, proboscis short, yellow. Thorax shining black with slight dust and sparse brownish pubescence on dorsum, dc twice as far from line of a.sa as from suture; scutellum shining black, with slight dust and two long basal bristles; legs with all coxae and femora black, also proximal ends of hind and middle tibiae blackened, otherwise straw yellow; halteres yellow; squamae yellow, rather large. Wing (fig. 11) rather elongate, somewhat parallel sided, with brownish pattern and hyaline spots and indentations. Abdomen shining black, with black pubescence but no dust; sixth segment a little longer than fifth; base of ovipositor shining black, with black pubescence, 0.6 mm long, about two-thirds length of pre-abdomen, legging-shaped, rather flat below, and flattened at apex, second joint black, brownish on distal half, third brownish; venter black.

Tephrella Katonai BEZ. emend.

BEZZI, l. c., 126.

Type, a female, Arusha-Ju, Africa Or., XI, 1905, KATONA. The specimen is in poor condition, having been attacked by mould.

It is somewhat difficult to indicate the affinities of this species. It seems, however, that it is very closely allied to *Trypeta ternaria* LW. (Berl.Ent.Zeit., V, 273, 1860). The latter species was placed by BEZZI in *Spheniscomyia* (l. c., p. 124) but it does not seem to have

been recorded since the original description. I have in my collection a female (from Bualwayo, 14.6.25, R.H.R. STEVENSON) which I have no doubt is LOEW's species. It agrees almost word for word with the description, but the wing pattern differs slightly from that figured by LOEW, as the outer indentation in the second posterior cell is wider outwardly, and it appears almost as if a marginal spot has become confluent with the indentation. However, apart from the fact that in the Bulawayo specimen the hyaline markings are larger, there is no sign of a hyaline spot at the outer end of the second posterior cell. *Tephrella Katonai* differs also in the proportions of the head and frons: in the Bulawayo specimen the frons is, if anything slightly shorter than wide, while in *T. Katonai* it is almost a quarter longer than wide. Further in *T. Katonai* the base of the ovipositor is shorter and more broadly truncate apically.

The generic position of both seems to offer further difficulties. In both the sixth segment is distinctly shorter than the fifth, but the third vein is bare. Hence it does not seem that they should be placed in *Metasphenisca* HEND., to which genus they seem to belong, nor can they be placed in the *Aciura-Spheniscomyia* group of the Trypetini, owing to the bare third vein. Both species run down to *Spheniscomyia* in HENDEL's tables except that *T. Katonai* has three i.or and the Bulawayo specimen three on one side and two on the other. It is interesting to remark here that in *Spheniscomyia sexmaculata* MACQ. the third vein is bristly while HENDEL (in LINDNER, Die Fliegen, 49, Tryp. p. 105) states that it is not bristly. At any rate, in the absence of more material for comparative study, I do not propose to discuss the matter further here, except that perhaps the South African specimens recorded as *Spheniscomyia sexmaculata* may prove to be another species.

♀. Length of body and of wing 3.3 mm. Head, proportions of length, height and width about 3, 4 and 5; occiput black, the bristles whitish, thickened; frons dark yellow, blackened behind, ocellar dot black, bare, slightly narrower than an eye, at vertex three-quarters length and somewhat narrowed anteriorly, bristles brownish, two s.or, the hind one smaller, three i.or; lunule rather short semi-circular, blackened; antennae yellow, about three-fourths length of face, third joint a little darkened, twice as long as wide, rounded at end, arista brown, paler at base with slight pubescence; face rather dark yellow, cheeks narrow, oral opening circular, palpi and proboscis yellow, the latter short. Thorax black (dull in

type) with grey dust and brownish pubescence, dc only slightly before line of a.sa; scutellum as thorax, with four bristles of about equal length; halteres yellow; legs, femora and coxae black, tibiae and tarsi dark yellow; wing (fig. 12) brown with hyaline base and small indentations and spots. Abdomen and base of ovipositor shining black, pubescence black but scarcely any dust; the latter short and broad, broadly truncate at end, flattened in type, probably not quite conical in life, as long as last two segments together; fifth segment about one-fifth longer than sixth; venter black.

Tephrella limbata BEZ.

BEZZI, l. c., 126.

Type, a female, Mujenje, Uganda, VIII, 1913, KATONA.

This species seems to be a true *Metasphenisca* HEND.

♀. Length of body 4.7 mm, of wing 4.2 mm. Head, proportions of width, height and length, 9, 7 and 6, yellow, only upper part of occiput and ocellar dot black; ocp light brownish, flattened;

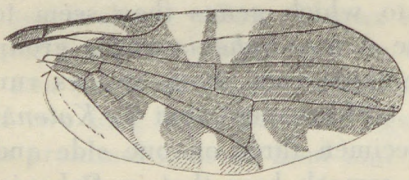


Fig. 13. Tephrella limbata Bez.

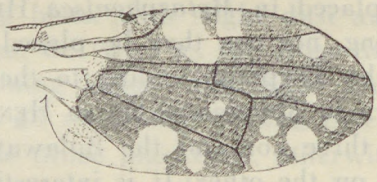


Fig. 14. Tephrella polyspila Bez.

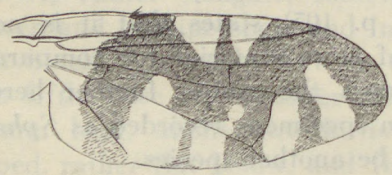


Fig. 15. Tephrella erosa Bez.

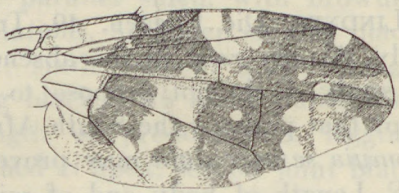


Fig. 16. Pliomelaena xyphosiina Bez.

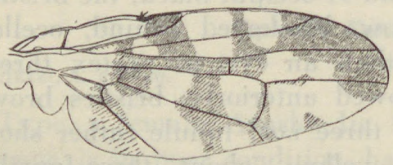


Fig. 17. Spathulina abyssinica Bez.

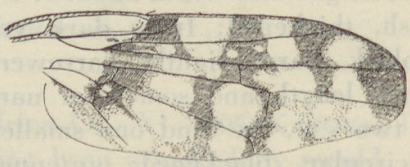


Fig. 18. Spathulina euryomma Bez.

frons with blackish tinge, flat, bare, slight orbital pubescence anteriorly, parallel sided, as wide as an eye, three-quarters as wide as long, two s.or, three i.or, oc well-developed; lunule semicircular;

antennae about two-thirds length of face, third joint rounded at end, about one and a half times as long as wide; arista with slight pubescence; face flat, epistome hardly projecting, cheeks narrow, genae about as wide as third antennal joint, (it should be noted that in the specimen the face and epistome seem to have been pushed in, and the antennae, also, are flattened against the face). Mouth opening rounded; proboscis and palpi much retracted, the former apparently short. Thorax shining black with ferruginous tinge on sides, very slight dust and yellow pubescence on dorsum; bristles brown, dc half way between suture and line of a.sa, one mpl. Scutellum flat, shining black, with ferruginous tinge marginally, slight grey dust and pubescence laterally at base only, four brown bristles, apicals only a little more than half length of basals; halteres yellow, knob blackish; squamae short, yellow, in specimen appressed against thorax; legs straw yellow; wing (fig. 13) with brown *Aciura*-like pattern, third vein with two small setae at extreme base on upper side. Abdomen shining black, with slight indication of dust and rather long pubescence whitish on first two segments, brownish elsewhere; sixth segment a little longer than fifth; base of ovipositor shining blackish ferruginous above, blacker at base and ferruginous below, with brownish pubescence, nearly as long as pre-abdomen, flattened in specimen; venter more or less blackish ferruginous.

Tephrella polyspila BEZ.

BEZZI, l. c., 126.

Type, a female, Mto-ja-Kifaru, Africa Or., KATONA.

A careful review of related species would be required before this species could be placed in its correct genus with certainty. It might be placed in *Acinia*, but there are several points of difference between it and the diagnosis of the genus.

♀. Length of body 5.1 mm, of wing 3.6 mm. Head, proportions of length, width and height, 3, 5 and 4; occiput yellow with strong black suffusion, the bristles white, thickened; frons as long as wide, a little narrowed anteriorly somewhat less than twice width of an eye, pale translucent blackish yellow, largely deep yellow anteriorly, where there is slight pubescence centrally and on orbits, bristles brownish, inner vt long, two s.or, three i.or; lunule arcuate, yellow; antennae yellow, third joint rounded at end, arista blackish, brown at base, with short pubescence; face narrower than

frons, translucent blackish; cheeks and genae narrow; mouth opening ovoid, wider behind; epistome slightly projecting; proboscis short, palpi yellow. Thorax black, humeri and notopleura yellowish, prosterna yellow, dorsum thickly grey dusted, with whitish pubescence, mostly abraded in specimen; bristles brownish, dc a little behind line of a.sa, two mpl. Scutellum as thorax, yellowish marginally, four bristles of equal length; legs straw yellow; halteres and squamae yellow. Wing (fig. 14) with brown pattern and hyaline spots and indentations, stigma dark with slight pale spot, third vein with two setae at extreme base on right wing, and one on left wing on upper side. Abdomen reddish, appearing more or less blackish mottled through discoloration, but black basally and laterally, pubescence pale brownish, fifth and sixth segments of equal length; base of ovipositor shining black with black pubescence, about as long as pre-abdomen, rather pointed, flattened in specimen; venter, lateral membranes blackish, sternites blackish yellow, with distinct broad, paler hind margins, narrow on last segment, pubescence white.

Tephrella erosa BEZ.

BEZZI, l. c., 126.

Type, a male, Moshi, Africa Or., VII, 1905.

♂. Length of body 3.6 mm, of wing 3.8 mm. Head, length about one-third less, and width as much more, than height; occiput black, dark straw yellow below, the bristles pale brownish or dirty white, thickened; frons flat, bare, width slightly more than an eye, and three-quarters of length, yellow anteriorly, blackish behind, ocellar dot black, bristle brown, inner vt. very long, two s.or, three i.or; lunule yellow with whitish bloom, nearly semicircular; antennae dark straw yellow, third joint twice as long as wide, rounded at end, arista brown with short pubescence; face rather narrow, dark straw yellow, cheeks and genae narrow, epistome slightly projecting, oral opening rounded; proboscis short, and with palpi straw yellow. Thorax and scutellum shining black, with rather thin grey dust and white pubescence (slight on scutellum); bristles blackish, dc. about half way between line of a.sa and suture, four scutellars, apicals one-third length of basals; legs dark straw yellow, only coxae blackened; halteres straw yellow; squamae white. Wing (fig. 15) brown with hyaline indentations. Abdomen shining black, with black pubescence but no apparent dust; venter and genitalia shining black with grey dust.

Pliomelaena xyphosiina BEZ.

BEZZI, l. c., 129, 130.

Type, a male, Dire-Daua, Abyssinia, 19.XI.1911, KOVÁCS.

This would appear to be a species of *Acinia* ROB.-DESV.

♂. Length of body and of wing 5.3 mm. Head about as wide as high and one-third shorter; occiput dark yellow, flat above, prominent below, the bristles yellow, thickened; frons at vertex a little less than length, which is twice width of eye, width at antennae two-thirds length, flat, with slight pubescence anteriorly, where it is yellow, elsewhere subtranslucent blackish yellow, ocellar dot black, vertical plates nearly half length of frons, two s.or, three i.or, oc strong; lunule yellow, arcuate; antennae straw yellow, about three-quarters length of face, third joint tinged with blackish, blacker along upper edge and at rounded apex, second joint setiferous, arista brown, pubescent; face rather narrow, slightly concave, yellow, epistome only slightly projecting, cheeks and genae yellow, the former narrow, latter not as wide as third antennal joint, genal bristle strong; oral opening rather elongate oval, palpi whitish, spatulate, proboscis yellow, labellae short. Thorax somewhat amber brown, with blackish tinge stronger on dorsum, with fine brown pubescence; bristles brown, dc just behind suture; scutellum as thorax, but hardly blackened, four bristles, the apicals the shorter; halteres yellow; squamae medium; mesophragma black with white dust. Legs somewhat more yellow than thorax, with slight touches of blackening on femora. Wing (fig. 16) pattern anchor-like, third vein setiferous to beyond upper cross-vein. Abdomen concolorous with thorax with similar pubescence and bristles, the blackening more defined forming a spot in middle of second segment, a band on anterior portion of third half width and length of segment, on anterior three-fourths of fourth segment reaching nearly to edges, and on anterior half of fifth segment from side to side; genitalia more ferruginous narrow sternites like legs and wide membranes black.

Spathulina Monroi BEZ. var. *majuscula* BEZ.

BEZZI, l. c., 132, 134.

BEZZI, Ann. S. A. Mus., XIX, 536, pl. XIV, f. 84(wing) (1924).

Type, a female, Rustenburg, Transvaal, S.Afr. 2.VII.10. (not from East Africa as stated by BEZZI).

The specimen agrees closely with the description of *Spathulina Munroi* Bez. (Ann. S. A. Mus. XIX, 535, 1924). It may be noted that the frons in both is a little longer than wide, not more than one-tenth, and is certainly not one and a half times as long as wide; it is somewhat narrowed anteriorly, where there is some yellow pubescence; two s.or and three i.or; lunule short. In *majuscula* the humeri and pleural sutures are yellowish, and there are two mpl, the lower rather smaller. The only difference in the wing pattern is than while in *Munroi* there are five distinct spots in the second posterior cell, in *majuscula* the four inner are fused in pairs to form two elongated indentations reaching nearly to the fourt vein, and the outer spot, on the wing margin, is larger. In one of the paratypes of *Munroi* the inner pair of spots is practically fused. In both forms the spots in the third posterior cell are similarly fused, but in *Munroi* they tend to be more separated.

Spathulina abyssinica Bez.

Bezzi, l. c., 133, 134.

Type, a male, Hamaraja, Abyssinia, V, 1911, Kovács.

This is undoubtedly a species of *Tephrella*.

♂. Length of body 2.4 mm, of wing 2.7 mm. Head, proportions of height, length and width 5, 4 and 6; occiput blackish ferruginous, flattened, rather concave above, convex below, the bristles whitish, rather thin; frons twice width of an eye, a little shorter than wide, more or less parallel sided, but rather sharply narrowed at antennae, flat, only a little prominent anteriorly, bare, yellow; lunule and sides of frons a little paler, ocellar dot ferruginous, bristles pale brownish, two s.or, two i.or (three on one side); antennae a little shorter than face, second joint blackish, third yellow, rounded at end, about twice as long as wide, arista brownish with slight pubescence; face yellow, rather narrow and concave, epistome projecting; cheeks narrow, genae a little wider than third antennal joint; proboscis dark yellow, labellae broad, as long as haustellum, palpi short, yellow. Thorax shining black with a ferruginous tinge, grey dusted, less on pleura, and rather sparse pale pubescence; bristles brown, dc just behind suture; scutellum as thorax, two long basal bristles; post-scutellum white; squamae yellow, lower short, upper longer; halteres dark yellow. Legs, all coxae and femora except ends of front four, as thorax, otherwise straw yellow. Wing (fig. 17) with a rather reduced, broadly reticulate, light

brown pattern; third vein bare, upper cross-vein short, twice its length from lower, costal spine double. Abdomen black, with very slight suggestion of dust, with very long, rather sparse, brownish pubescence except at base where it is shorter. Genitalia black.

Spathulina euryomma BEZ.

BEZZI, l. c., 133, 134.

Type, a male, Dire-Daua, Abyssinia, 19.XI.1911, KOVÁCS.

A greyish species with a reticulate wing pattern with some resemblance to species of *Paroxyna* HEND. (*Ensina* sensu BEZZI). It may perhaps be placed in *Tephrella* on account of the shining black abdomen, the two scutellar bristles and the short labellae, although there are three i.or.

♂. Length of body 3.1 mm, of wing 3.6 mm. Head a little longer than high and half again as wide; occiput slightly concave above, prominent below, black with grey dust, the bristles thickened, whitish; frons a little narrowed anteriorly, a little narrower at vertex than long, and about one-sixth wider than an eye, flat, bare, with some lateral pubescence, opaque yellow but translucent blackish yellow on sides and behind, ocellar dot black, vertical plates prominent bristles brownish, two s.or (both hind ones abraded in specimen), three i.or, the anterior one small; lunule semicircular, pale yellow; antennae dark yellow, three-fourts length of face, arista brown, yellow at base, slightly pubescent. Front portions of head yellow. Face shallowly concave with shallow grooves, cheeks narrow, genae about as wide as third antennal joint; palpi and proboscis dark yellow, latter short, genal bristle long; eye in profile large, rounded oval. Thorax shining black with rather thick grey dust and yellowish pubescence on dorsum, whitish on hind portions of pleura; bristles brown, dc one third of distance from suture to a.sa behind former. Scutellum as thorax; two long sub-apical bristles; upper part of mesophragma brown; halteres yellow, squamae pale yellow, the upper large, circular the lower short, linear. Legs: all coxae and femora, except extremities of latter, black, otherwise straw yellow. Wing (fig. 18) with reticulate sub-banded pattern; on the fore half of the wing the markings are darker, becoming paler in the second posterior cell and in the anal region; their margins are not sharply defined as they grade more or less gradually into hyaline; third vein bare; anal cell ending in a blunt point. Abdomen shining black with

slight grey dust, pubescence brown on tergites, paler on sternites, middle sternites with narrow brownish posterior margins.

Ensina evanida BEZ.

BEZZI, l. c. 136.

Type, a female, Marako, Abyssinia, III, 1912, KOVÁCS.

♀. Length of body 2.5 mm, of wing 2.6 mm. Head, proportions of height, length and width 7, 6 and 9; occiput black, concave above, fairly swollen below, the bristles thickened, yellow, with some short thin, black setae. Frons about two and a half times width of eye, a little wider than long, and a quarter narrower at antennae, yellow, blackish on posterior half, ocellar dot black, orbits white pollinose, bristles brown, two s.or, the upper white, two i.or, oc strong; lunule arcuate, yellow; antennae darker yellow,

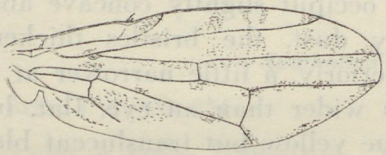


Fig. 19. Ensina evanida Bez.

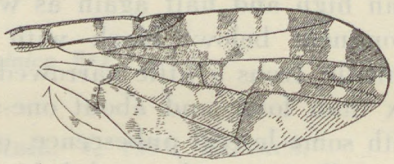


Fig. 20. Euribia oxynoides Bez.

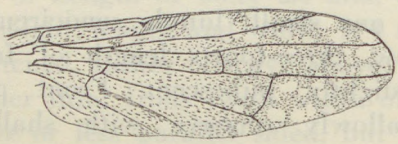


Fig. 21. Euribia xiphias Bez.

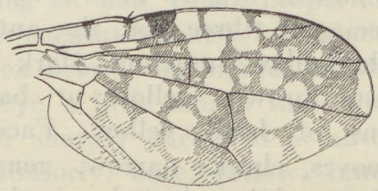


Fig. 22. Euribia albina Bez.

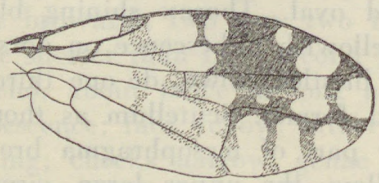


Fig. 23. Trypaena Kovácsi Bez.

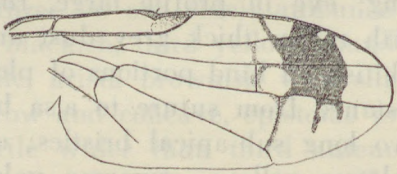


Fig. 24. Trypanea bistellata Bez.

third joint nearly as wide as long, broadly rounded below at apex and the upper corner a right angle; cheeks and genae yellow slightly white pollinose, the former narrow, barely one quarter width, and latter as wide as, third antennal joint; face slightly white pollinose, with shallow grooves, epistome slightly projecting, oral opening elongate oval, palpi elongate, yellow, proboscis rather long,

base as long as oral opening, labellae a little shorter, hook-like. Thorax black, grey pollinose, white pubescence, dc just behind suture, bristles dark brown, except pt pale; halteres yellow; legs: coxae and femora and proximal two-thirds of hind tibiae black, otherwise, including distal ends of femora, yellow; upper squama large, lower linear. Wing (fig. 19) with an extremely faint, only just perceptible, sub-reticulate pattern, stigma pale yellow, lower angle of anal cell a right angle. Abdomen black, less grey pollinose than thorax and with longer white pubescence, some black setae at end of sixth segment, fifth as long as sixth; base of ovipositor 0.5 mm long, shining black, with black pubescence, a little shorter than pre-abdomen; venter black.

Euribia oxynoides BEZ.

BEZZI, l. c., 137, 138.

Type, a male, Arusha-Ju, Africa Or., X, 1905, KATONA.

This is a species of *Paroxyna* HEND.

♂. Length of body 2.9 mm, of wing 3.4 mm. Head, proportions of width, length and height 7, 5 and 6, entirely yellow except upper portion of occiput blackish; occiput flattened above, swollen below, the bristles thickened, yellow, with a row of short, black setae; frons twice width of an eye, a little longer than wide, narrowed to antennae with convex margins, mostly opaque yellow, slightly translucent blackish behind, very slight yellow pubescence anteriorly in middle and less on orbits, bristles black, two s.or (the hind one thickened, yellow), two i.or, oc strong; lunule darker yellow, rather short and wide; antennae dark yellow, third joint less than twice as long as wide, with short, blunt apical point, arista brown with short pubescence; face, cheeks and genae paler yellow; face flattened, cheeks rather narrow, genae as wide as third antennal joint, epistome slightly projecting, oral opening rounded; proboscis yellow with rather long labellae, palpi yellow. Thorax black, with thick brown dust and white pubescence, bristles black, except pt pale, dc a little behind suture; scutellum blackish with brown dust, yellow on apical half, two strong basal and two thin short apical bristles; halteres light brownish; legs straw yellow, femora broadly blackened medially, squamae whitish, the upper the larger. Wing (fig. 20) with a more or less reticulate pattern, stigma brown, with a basal light spot, third vein with two or three small setae at base. Abdomen thickly shining brown dusted, with

a pair of sub-median, broad, rounded, dark brown spots on each segment from second backwards, pubescence yellow; venter black, genitalia brownish.

Euribia xiphias BEZ.

BEZZI, l. c., 137, 138.

Type, a female, Tshertsher, Abyssinia, X, 1911, KOVÁCS.

A large elongate greyish species with narrow wings having a very faint reticulate pattern and the basal joint of ovipositor very long. It is certainly a species of *Acanthiophilus* BECK. (sub-genus *Tephritomyia* HEND.) and seems to have some resemblance to *A. (T.) lautus* LW. but differs in its much larger size, the longer base of the ovipositor and the shape of the third antennal joint.

♀. Length of body 10.8 mm, of wing 6.0 mm. Head, proportions of width, length and height 13, 8 and 11, yellow except two darkish spots on occiput and brown ocellar dot; ocp thickened whitish; frons flat, parallel sided, about one-sixth narrower than long, and about one-third wider than an eye, slight central pubescence anteriorly and some on orbits, bristles brown, two s. or (the hinder thickened, white), three i.or, oc well-developed; lunule large, semicircular, quarter length of frons; antennae rather short, about three quarters length of face, second joint with black setulae and blackish above and along front edge, third joint flattened short oval from side (i. e. about as wide as long), somewhat rounded at end, darker yellow, arista brown, yellow at base, slightly pubescent; face short, flattened, with shallow grooves, epistome somewhat projecting, cheeks narrow, genae about one-third as wide as third antennal joint, oral opening rounded, palpi spatulate, with some strong brown setae at end, proboscis short, labellae not very long. Thorax black, yellowish from humeri to and including margin of scutellum; thickly golden dusted, with a more or less distinct median and sub-lateral stripes, pubescence pale yellow, rather dense, dc just behind suture. Scutellum flattened, clothed as thorax, two long basal and two shorter, decussate, apical brown bristles; halteres yellow; legs dark straw yellow; squamae large, yellowish. Wing (fig. 21) long, narrow, third vein bare, very faintly greyish with a faintly developed, barely perceptible, reticulation on outer half, stigma yellowish. Abdomen black, clothed as thorax, but dust more greyish, fifth and sixth segments about equal, the sixth slightly longer if anything, base of ovipositor very elon-

gate and narrow, length 3.4 mm, about half of total length of body, white pubescence on anterior half, and brown on apical half.

Euribia albina BEZ.

BEZZI, l. c., 138.

Type, a female, Shiraki, Africa Or., II, 1908, KATONA.

♀. A pale yellowish species with reticulate wingpattern. Length of body 3.4 mm, of wing 3.2 mm. Head about one-third as high and about one half as long as wide, entirely pale yellow with only a pair of medium, brownish spots on occiput and brownish ocellar dot; occiput shallowly concave above, not very prominent below; bristles thickened, rather paler than others on head; frons slightly shorter than long and one-third wider than an eye, a little narrowed anteriorly, bare, with slight orbital pubescence; two s.or, three i.or; oc long; antennae missing; face slightly concave with shallow grooves, epistome slightly projecting, cheeks almost linear, genae narrow, oral opening rounded, proboscis too retracted for examination, labellae apparently moderately long. Thorax black on dorsum, otherwise yellow with more or less black tinge, stronger on sternites with dense dust and white pubescence, bristles pale, dc a short distance behind suture; scutellum yellow with faint blackish tinge on flat disc, two basal and two shorter, decussate apical bristles, only slight pubescence on margins; upper half of postscutellum yellow, lower portions black with silvery dust, lowest portion of mesophragma shining black; halteres, legs and squamae yellow. Wing (fig. 22) with broadly reticulate, pale brownish pattern, stigma darker but hyaline on basal two-fifths, third vein with a single seta at extreme base. Abdomen mainly yellow, with yellow pubescence, a black band, separated in median line, on anterior two-thirds of third, fourth and fifth segments; fifth and sixth of about equal length; base of ovipositor short, broad and flattened in specimen, length 0.6 mm, reddish yellow with black apex, as wide as last segment at base, but barely as long as last two segments together; venter yellow.

Trypanea Kovácsi BEZ.

BEZZI, l. c., 140, 143.

Types, a male, Tshertsher, Abyssinia, X, 1911, KOVÁCS, and a female, Haramaja, Abyssinia, V. 1911, KOVÁCS.

♂♀. This species agrees with the common *Trypanea peregrina*

ADAMS (1908) closely in body coloration, shape of head, chaetotaxy and wing pattern (fig. 23). *T. peregrina* ADAMS and *T. mundella* BEZ. (1924) appear to be the two species most closely related to *T. Kovácsi*, which may be distinguished by the entirely black femora. Further, the third joint of the antenna appears broadly spatulate, being widened from base to apex, and only slightly longer than broad. The base of the ovipositor is about as long as the preabdomen, while in peregrina it is a quarter of its length longer. A further study of this species in relation to those most closely allied is being made.

Trypanea goliath BEZ.

BEZZI, l. c., 141, 144.

Tyrpanea haemorrhoa BEZZI, Bol. Lab. Zool. Portici, XVIII, 114 (1926); MUNRO, Union of S. Afr., Dept. Agric., Entomology Memior V, 33 (1926) — biology.

Type, a female, Haenertzberg, Zoutpansberg, Transvaal, S.Afr. (The specimen is not from Arabia as stated by BEZZI).

There is no doubt as to the above synonymy as I have the type (male) of *T. haemorrhoa* as well as a series of specimens of both sexes.

As far as *Trypanea dentiens* BEZ. is concerned, although it may be closely allied to *T. goliath* and both may be placed in *Acanthiophilus* BECK., there are characters by which they may be separated. As regards size, *T. goliath* is a much larger species (male body length 5.5 mm) while *T. dentiens* is smaller (only 3.5 mm). The difference in size is, however, of little importance as the size of *T. goliath* seems to depend on the size of the flower of the particular hostplant. The type of *T. haemorrhoa* is only slightly larger than the average size of *T. dentiens*, and I have specimens even smaller. Differences between the species, apart from those given by BEZZI in the description of *T. haemorrhoa* may be noted as follows: — in *T. goliath* there is always a well-developed third i.or, white in colour, opposite the base of the antennae; in *T. dentiens* this bristle is more often than not absent, if present usually quite small, rarely well-developed. In *T. goliath* the elongate indentation along the costa, beyond the stigma, is not hyaline, but yellow; another character in the wing which serves to distinguish the two without fail and not noted by BEZZI is the position of the dark spot in the apical fuscous area. In *T. goliath* this spot is small and restricted to the sub-marginal cell, just beyond the end of the second vein.

between the costa and the third vein; in *T. dentiens* it extends upwards into the end of the marginal cell, and below half way across the first posterior cell, where there is even a slight suggestion of the formation of a „bulla" as occurs in *T. bulligera* Bez. On the abdomen of *T. goliath* the hind margins of the segments are distinctly edged with yellow which is visible to the naked eye, and the apical segments of each sex half yellow.

The undescribed female resembles the male. The ovipositor is as long as the pre-abdomen, orange in colour with a black tip, pubescence white on anterior half, brown on posterior half; (in *T. dentiens* the base of the ovipositor is only half the length of the pre-abdomen).

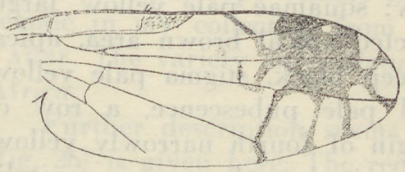


Fig. 25. Trypanea furcifera Bez.

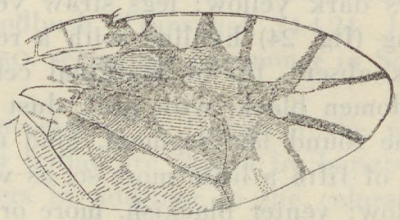


Fig. 26. Rhabdochaeta nigra Bez.

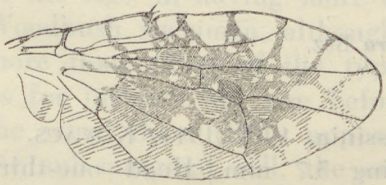


Fig. 27. Rhabdochaeta subspinosa Bez.

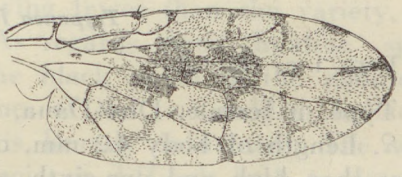


Fig. 28. Rhabdochaeta obsoleta Bez.

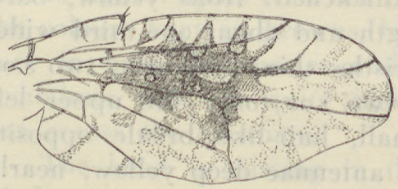


Fig. 29. Rhochmopterum lutescens Bez.

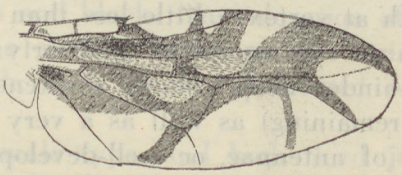


Fig. 30. Brachiopterna Katonai Mro.

Trypanea bistellata Bez.

Bezzi, Bull.Ent.Res., XV, 142, 147 (1924).

Type, a male, Moshi, Africa Or., VII, 1905, Katona.

♂. Length of body 3.2 mm, of wing 3.2 mm. Head twice as wide as long and one-third higher; occiput yellow, blackened centrally above neck, the bristles yellow, thickened; frons as long as wide at vertex and one-fifth wider than an eye, a little narrowed

anteriorly, yellow, blackened on sides and behind, bristles brown, two s.or, upper thickened, whitish, three i.or, the lowest small, whitish, oc strong; slight yellow pubescence before lunule; ocellar dot black; lunule short, half rounded oval; antennae deep yellow, nearly as long as face, third joint somewhat pointed to end; face yellow, flat, narrow, epistome very slightly prominent; cheeks narrow, almost linear, yellow, genae barely wider than third antennal joint, yellow; oral opening circular, palpi yellow, proboscis yellow, labellae rather elongate. Thorax black, with thick grey dust and white pubescence; humeri to wing base yellowish; bristles brown, npl thickened yellow, dc just behind suture; scutellum as thorax, with two long basal and two short, decussate, apical bristles; halteres dark yellow; legs straw yellow; squamae pale yellow, large; wing (fig. 24) hyaline with a restricted apical brown area, apical fork absent, tip of marginal cell deep black, stigma pale yellow. Abdomen black, with grey dust and pale pubescence, a row of setae round last segment, hind margin of fourth narrowly yellowish, of fifth a little more so, as well as its lateral margins; genitalia yellow; venter blackish, more or less yellowish.

Trypanea furcifera BEZ.

BEZZI, l. c., 142, 147.

Type, a female, Dire-Daua, Abyssinia, 19.XI.1911, KOVÁCS.

♀. Length of body 4.2 mm, of wing 3.7 mm. Head one-third wider than high and one-sixth shorter; occiput yellow, blackish centrally, the bristles deep yellow, thickened; frons yellow, bare, width at vertex a little less than length and about one-third wider than an eye, narrowed anteriorly; bristles thin, brownish, two s.or, the hinder deep yellow, thickened, two i.or (only the upper left one remaining) as well as a very small, hair-like bristle opposite base of antennae, oc well-developed; antennae deep yellow, nearly as long as face, third joint with apex bluntly up-turned, arista broken off except deep yellow base; face yellow, narrow, with shallow grooves; cheeks yellow, almost linear, genae yellow, narrower than third antennal joint, genal bristle weak; eye in profile large, rounded oval, perpendicular, oral opening rounded oval, palpi and proboscis yellow, labellae fairly elongate. Thorax black, thickly grey dusted, pubescence white, bristles pale brownish, yellow on pleura, dc on suture, two mpl; scutellum with two bristles; halteres yellow; legs straw yellow;

squamae yellow; wing (fig. 25) hyaline with well-developed apical spot and rays, stigma slightly brownish, tip of marginal and top corner of sub-marginal cells blacker, double costal spine. Abdomen black, rather less grey dusted than thorax, pubescence white, fifth and sixth segments of about equal length; base of ovipositor shining black, pubescence white on anterior half, brown on distal half, about as long as pre-abdomen; venter as dorsum.

Rhabdochaeta nigra BEZ.

BEZZI, l. c., 151.

Types, male and female, Mujenje, Uganda, IX, 1913, KATONA. There is a paratype female in the British Museum and I have a female in my collection from Woodbush, Transvaal, 14.4.24, J. C. FAURE. The variety *anteroflava* MRO. seems the commoner in South Africa.

Further description seems unnecessary. A figure of the wing (fig. 26) is given here. The reddish bullae are shown by horizontal lines. The variety mentioned differs in addition to the coloration of the legs, in having more of the small hyaline spots, but the Woodbush specimen, although having fewer than the variety, has more than either of the types. As regards these „hyaline" spots, as for instance the one before the black patch in the middle of the wing, these really appear blue; of the two reddish bullae in the sub-marginal cell, the outer is heavily infuscated. The wing pattern of this and of related species is difficult both to describe and to figure: apart from the reddish, almost shellac coloured bullae, the colours vary in browns, blues and black. The coloration of the face in both the species and the variety seems rather variable, sometimes pale, or quite blackish, or with a well-defined white bar across the epistome.

The head is missing in the male type, and both third joints of the antennae in the female; in the Woodbush specimen the antennae are rather dark brown than black; the arista is brownish with yellow base and is slightly pubescent.

Rhabdochaeta subspinosa BEZ.

BEZZI, l. c., 151, 152.

Type, a male, Mujenje, Uganda, VII, 1913, KATONA.

The specimen differs from *Rhabdochaeta nigra* BEZ. in its much paler coloration and in details of the wing pattern. The black spots

between the base of the antennae and the eye are rather small and not markedly developed; the antennae are yellow; the face yellowish with apparently a blackish bar across. The thorax is thickly dusted, mainly greyish, and appears less mottled than in *nigra*. There are faint blackish spots on the four hind femora. The wing pattern (fig. 27) is very similar. The bullae and spots are in more or less the same positions, but the bullae are fewer and the small blue „hyaline" spots more numerous than in either *nigra* or *anteroflava*. The most conspicuous difference is in the appearance of the apical rays: in *nigra* they are longer and better defined, in *subspinosa* shorter and paler.

Rhabdochaeta obsoleta BEZ.

BEZZI, l. c., 151.

Type, a male, Dire-Daua, Abyssinia, 19.11.1911, KOVÁCS.

♂. Length of body 2.6 mm, of wing 3.2 mm. Head, proportions of length, height and width 4, 5 and 6.5; occiput black, grey dusted, yellow laterally along orbits and below, the bristles mostly denuded, yellow, flattened with some black setae along orbits; frons a little wider at vertex than long, and more than twice as wide as an eye, slightly narrowed anteriorly, flat, bare, yellow, blackish laterally and behind, ocellar dot black, bristles yellow, two s.or, three i.or (the lowest smaller), oc small, poc small, far forward; a deep black spot at sides of antennae; lunule arcuate, blackened; antennae, second joint yellow, third brown, pointed, arista yellow; face flat, brown on upper two-thirds, white pollinose on lower third, epistome projecting, cheeks linear, genae about as wide as third antennal joint, yellow with brown spot below eye, oral opening round, palpi deep yellow, proboscis short; eye in profile more or less rounded, more rounded and less oblique than in *R. nigra*. Thorax black, thickly brownish dusted, pubescence white, but too rubbed in specimen to state details of pattern; humeri and a line to apical half of scutellum yellowish; bristles pale brown, dc just behind suture; scutellum with four bristles, basals denuded, apicals short, yellowish, only black and dusted on disc; halteres yellow; legs straw yellow, only hind tibiae with small blackish spot on upper surface near proximal end. Wing (fig. 28) covered with a rather undefined, very faint, reticulate pattern, with a darker, more or less blackish, central area. The reticulation of the peripheral portions is caused by blackish microtrichiae, which, on the

hyaline spots, are colourless; besides, on certain irregular spots, especially along the costa, is a brownish infuscation of the membrane, and where these occur adjacent veins are also darker; on the central dark area, near the base of the first posterior cell and above the lower cross-vein, is an elongate, shining reddish brown bulla. The third vein is bristly from its base to the upper cross-vein and for an equal distance beyond. Abdomen greasy in specimen, black with yellow pubescence, dust not evident; some ferruginous tinge on hind margins of segments; venter black, genitalia mostly ferruginous.

Rhochmopterum lutescens BEZ.

BEZZI, l. c., 153.

Type, a male, Tshertsher, Abyssinia, X, 1911, KOVÁCS, a female, Moshi, Africa Or., VII, 1905 Katona.

♂♀. Length of body 2.9 mm, of wing, male, 2.9 mm, female, 2.8 mm. Head as high as wide and one-fifth shorter; occiput flat above, not very prominent below, blackened centrally above neck, about a quarter wider than long, and more than twice width of an ocp mostly denuded, yellow, with some short black setae; frons eye, a little narrowed anteriorly, flat, bare, yellow, ocellar dot black, bristles black, two s.or, the upper white, three i.or, the lowest white, the hindmost thickened and long, inner vt white; lunule arcuate, inconspicuous; no spot at sides of antennae; antennae yellow, third joint sharply pointed, arista yellow, pubescent; face yellow, with upper median keel, epistome large and prominent, cheeks linear, yellow, genae narrow, yellow, genal bristle black, oral opening widely rounded, palpi yellow with black setae, proboscis yellow, short. (Note: the head of the female is much discoloured, but all the bristles are present). Thorax black with thick grey dust, badly denuded, but probably much as in *Rhochmopterum Munroi* BEZ. — discoloured in female. Humeri to wing base broadly yellow; dc a little behind suture. Halteres and legs yellow, front femora with a broad spot near distal end on outer side, middle and hind femora with a larger brown spot on proximal end on inner side and another at outer third. Squamae yellow. The wing pattern (fig. 29) is somewhat difficult to describe. In transmitted light there is to be seen a central dark area around the

upper cross-vein; there may be noted in the marginal cell three short triangular rays not quite reaching the costa, these are light slate blue (dotted in diagram) with dark margins; similar light blue spots occur in the first basal and first posterior cells; the three reddish bullae, one at base of sub-marginal, one in upper part of first posterior cell, and one near upper corner of discal cell. The broad apical and posterior areas appear practically hyaline. In oblique incident light, however, a faint reticulate pattern is evident, and also all the dark rays are seen to be faintly connected with the costa, and where any ray meets the costa, it is darkened as well. The light slate blue spots appear enamel white; third vein with two or three setae at extreme base and one close to base. Scutellum yellow, a pair of long, brown, basal bristles and a pair of short, straight, white bristles one-third length of basals. Abdomen, male, pale reddish yellow, with slight dust and white pubescence, second, third and fourth segments with hind margins yellow, last segment shining black with grey dust on anterior half; genitalia yellow, venter reddish. Abdomen, female, more yellow than in male, with hind margins of segments yellow margined, fifth and sixth segments about equal; base of ovipositor barely as long as last two segments, reddish with brown tip and very short pale pubescence. Venter yellow.

Brachiopterna Bez.

Bezzi, l. c., 81 and 124.
Cyanodesmops Munro, Bull.Ent.Res., XXII, 124 (1931).

When the species *Cyanodesmops ornithomorpha* Mro. was described, it was only through an oversight that it was not placed in *Brachiopterna* Bez., with which *Cyanodesmops* is identical. Further, as *Brachiopterna* is sufficiently described to be valid under the rules of nomenclature, it must take precedence. I, however, designate *Cyanodesmops ornithomorpha* Mro. as the genotype, and in so doing may state that Bezzi's name *Katonae* must be regarded as a nomen nudum as no specific characters are mentioned in the diagnosis of the genus. It is thus not valid, and in this Dr. Karl Jordan agrees. Therefore, in terms of Article 30, section III, n, *Brachiopterna ornithomorpha* Mro. (described under *Cyanodesmops)* may be accepted as the genotype.

Brachiopterna Katonai n. sp.

BEZZI, l. c., 153. *Brachiopterna katonae,* nomen nudum.

Type, a female, Arusha-Ju, Africa Or., X, 1905, KATONA.

The specimen is in a poor state of preservation, all the bristles on the head being denuded. As far as the state of the specimen allows, it agrees with the description of *Cyanodesmops ornithomorpha* MRO. There is, however, a striking difference in the wing pattern, for which reason two species may be recognised, at least until more material shows a range of intergraded variation, when the one may be regarded as a variety. While the pattern in both species is very similar, in the wing of *ornithomorpha* (MUNRO, l. c. fig. 5) at the end of the third vein a broad ray breaks up into two fairly widely separated short rays on the costa, in *Katonai* (fig. 30) there is a single broad ray meeting the costa beyond the end of the first vein and extending over the end of the second vein, while at the same time the hyaline indentation just beyond the stigma is much narrower and has straight margins. Further, in *Katonai,* there is no reticulation in the anal area from the axillary cell a broad hyaline indentation extends obliquely upwards and outwards across the third posterior cell, just entering the discal cell, leaving, a fairly broad ray across the outer end of the third posterior cell. It may be noted that none of the large series of *ornithomorpha* I have examined show any variation in the pattern — but they all came from one locality. The anal cross-vein, as well as a short section of the fifth at the lower outer corner of the second basal cell is apparently quite absent. It is not possible to make a more definite statement from the dried specimen, only by making a mount of a wing could more precise details be obtained. In *ornithomorpha* both are distinct, but rather weak.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1935.
PARS ZOOLOGICA.

PROMECOTHECA PAPUANA CSIKI (ANTIQUA WS.) UND AB. BIRÓI CSIKI.

50. Beitrag zur Kenntnis der Hispinen (Col. Chrys.).

Von E. UHMANN (Stollberg — Erzgebirge).

Durch das liebenswürdige Entgegenkommen der Direktion der Zoologischen Abteilung des Ungarischen National-Museums ist es mir möglich gewesen, die Typen von *P. papuana* und *Birói* zu studieren. Dabei hat sich ergeben, daß *Birói* eine belanglose Farb-Aberration von *papuana* ist. Die braune Färbung unserer Art auf Halsschild, an Beinen und Unterseite ist sehr veränderlich, z. B. ist manchmal der Halsschild mehr braun als schwarz, vergl. weiter unten unter *antiqua*. Unter meinen Stücken von *papuana* stimmt keines in der Färbung der genannten Körperteile mit dem andern überein. Die von CSIKI angegebene Querrunzelung und stärkere Punktierung der Decken bei BIRÓI ist nur graduell, *papuana* ist auch deutlich quergerunzelt. Der Halsschild ist keineswegs „punktiert", sondern glatt. Allerdings befinden sich hinter seiner Mitte beiderseits der Mittellinie einige unbestimmte, punktartige Eindrücke, die auch bei den anderen untersuchten Stücken mehr oder weniger deutlich vorhanden sind. Auf diese Eindrücke bezieht sich sicher CSIKI's Bezeichnung „punctato". Eine äußerst feine Punktierung besitzen alle Stücke auf dem ganzen Halsschild.

P. antiqua Ws. ist mit *papuana* synonym. Ich konnte 4 typische Stücke und 18 andere Exemplare aus der Sammlung WEISE im Berliner Museum einsehen. Das vorliegende Material stimmt ganz mit dem WEISE'schen überein. WEISE ist durch die Angabe CSIKI's, der Halsschild sei punktiert, veranlaßt worden, eine neue Art zu beschreiben. Er stellt sie als sehr nahe stehend zu *papuana* (Arch. Natg. 1905. p. 97 und Philipp. Journ. Science, 21. 1922. p. 71). Im Archiv, l. c. beschreibt er unter var. a) eine Aberration, die der *Birói* ähnlich ist. Zu dieser Aberration a) gehört sein Typus. In Philipp. Sc. l. c. p. 70 weist er auf die veränderliche Farbe der Beine hin. Der Größenunterschied ist belanglos, da er bei vielen *Promecotheca*-Arten ziemlich stark ist. Charakteristische Merkmale: ♂ Decken an der Spitze gemeinsam abgerundet. Hinterrand des letz-

ten Sternites breit ausgeschnitten. Hierher der Typus und ein Cotypus von *antiqua* (Mus. Berl. 105933). ♀: Decken an der Spitze gemeinsam schwach zugespitzt. Hierher die beiden Typen von *papuana. Birói* und 2 Cotypen von *antiqua* 105933, ebenso die Abbildung in Gen. Ins. t. 4. Hinterrand des letzten Sternites in der Mitte gerade, davor quer niedergedrückt. — Untersuchtes Material: Typus von *papuana, Birói* und *antiqua* nebst 3 Cotypen. 1 ♂, 4 ♀, Neu Pommern. Wahnes (coll. Fr. MÜLLER, jetzt in der meinigen). 1 ♀, Admiralitätsinseln: Ponam (HELLER don.) 18 ♂, ♀; Neu-Guinea (Mus. Berl.).

Für ausführlichere Beschreibung der *papuana:* s. Természetrajzi Füzetek, XXIII, 1900. p. 80, der *Birói* l. c. p. 196.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1935.
PARS ZOOLOGICA.

ON A PREPARED SPECIMEN RESEMBLING EQUUS ZEBRA FREDERICI TROUESS. FROM THE COLLECTION OF THE STUTTGART „NATURALIENSAMMLUNG".

(With 1 text figure).

By Cs. G. ANGHI
Inspector of Mammals, Zoological Garden (Budapest).

The *Equus zebra* L. is known, besides the typeform (*Equus zebra zebra* L.), in two subspecies, viz. *Equus zebra Hartmannae* MTSCH. (1898), and *Equus zebra Frederici* TROUESS. (1904). ZUKOWSKY's *Equus Hartmannae Matschiei* is only a variety of *Equus zebra (E. z. Hartmannae* var. *Matschiei). Equus Penricei* THOS. (1900) is in GRIFFINI's, LYDEKKER's, RZASNICKI's, TROUESSART's, and the present author's opinion a synonym of the Hartmann zebra, but ZUKOWSKY regard it as a different form.

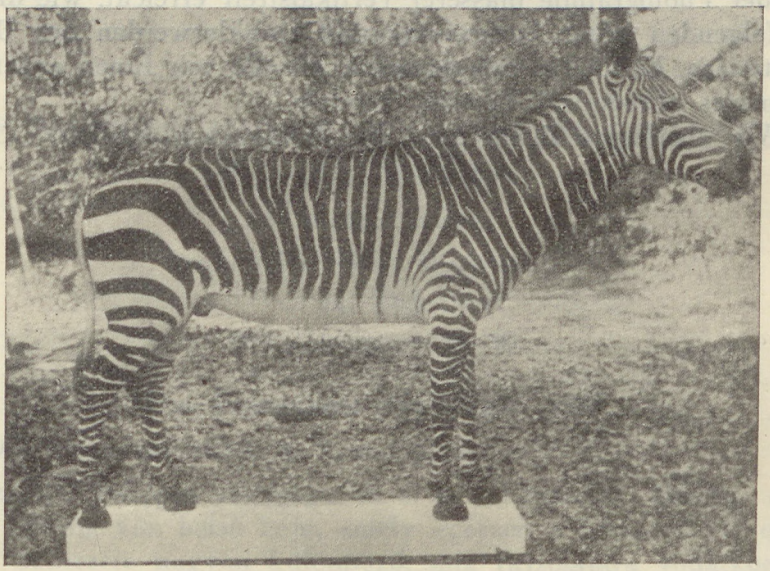
We know of RZASNICKY's and SCHWARTZ's works that *E. z. Frederici* is known in two prepared specimens only: one being preserved in the Zoological Museum of the Berlin University, and the other in the Zoological Museum of Warsaw.

The best characteristics of the *E. z. Frederici* are the vertical stripes on the regio thoracalis. I studied many living and prepared tigerhorses (incl. zebras), skins, numerous photos of specimens preserved in Austrian, English, French, German, Hungarian, Italian, Polish, etc. collections, and also studied cca. 120 literary works of the tigerhorses, and so I am daring to say, that most of the characters are not so important in respect of the system, as some authors are asserting.

The chief characters of the mountain zebra are: the size of the body, the asinin habit, the plica laryngealis, and the vertical main stripes (taeniae verticales) not reaching the longitudinal ventral stripe. The dark main stripes (taeniae diagonales) of the hindquarter (regio femoralis, and bicipitis) are much broader, than in the northern, or in the south Burchell groupes; the legs are striped (tt. horizontales) as far as the hoof, gridiron pattern (cribrum sacrale) present, while intermediate stripes (tt. intermediatae or interpositae) are always absent. The ground colour varying between

light and dark yellow, or between light and dark cream — possesses some systematical importance only in the case of the Burchell-tigerhorses. As of no systematical importance is to be valued — in the case of the mountain zebra — the colour of the nostril patch, the number of the vertical stripes, the black or brownish colour of the dark stripes, the number of the frontal stripes, etc.

The *Equus zebra Hartmannae* differs from *E. z. zebra* in having thinner diagonal and vertical stripes.



Equus zebra Frederici TROUESS.

Thus *E. z. Frederici* differs, really, from *Equus z. zebra,* and *E. z. Hartmannae* only in having several thoracal main stripes reaching as far as the ventral longitudinal middle line. The number of these stripes is four both on the specimen of the Warsaw museum and CUVIER's figure. The number four is not to be regarded, however, as a fixed character of the Frederici zebra. Not the number of the stripes is characteristic of this form, but the circumstance that the vertical stripes of the mountain zebra *(E. z. zebra)* never reach the ventral middle line. Since this form of the vertical stripes is to be looked upon as an absolut character of the Frederici zebra, the specimen of the Stuttgart museum which I had the opportunity to study on the very spot, and labelled: „Equus zebra ♂ ad. von Transvaal. Südafrica. Präpariert von F. Kerz 1887." is to be regarded as a representative of *E. z. Frederici.*

This opinion was accepted also by Prof. VÖGEL the keeper of the zoological collections of that museum as shown by his letter to the present writer: „Den von F. Kerz 1887 präparierten Equus zebra ♂ habe ich mir mit Bezug auf die von Ihnen angegebenen Merkmale gesehen. Die beiden von Ihnen angegebenen Vertikalstreifen am Thorax vereinigen sich in der Tat mit dem schwarzen medianen Bauchstreifen und zwar unter starker Verbreiterung und Annahme intensiverer schwarzer Färbung. Auch der davor gelegene (auf der Photographie blassere) Vertikalstreif erreicht, wie die beiden folgenden unter Verbreitung und Dunklerwerden den Bauchlängstreifen. Es dürfte sich demnach um die von Ihnen angeführte Subspecies „Frederici" Trouess. handeln.

Wir überlassen Ihnen gern die Publikation darüber, ..."

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS ZOOLOGICA.

MAGYARORSZÁG, HORVÁTORSZÁG ÉS DALMÁCIA HÁZATLAN CSIGÁI.

(40 szövegrajzzal).

Irta dr. WAGNER JÁNOS.

II. rész.

(16—36. szövegrajzzal).

DIE NACKTSCHNECKEN UNGARNS, CROATIENS UND DALMATIENS.

(Mit 40 Abbildungen).

Von Dr. HANS WAGNER.

II. Teil.

(Mit Abbildungen 16—36).

Nem: **Lehmannia** HEYNEMANN, 1862.

Lehmannia HEYNEMANN, Malak. Bl. X, 1862, p. 211.

Az állat közepes nagyságot ér el és rendszerint karcsú, megnyúlt; mindig van belső héja, amely egészen a *Limax*-okéra emlékeztet. Színezete nagyon különböző, míg rajzolatára vonatkozólag jellemző sajátságként emelhetjük ki, hogy pajzsa jobb és baloldalán igen gyakran egy-egy sötét sávot hord, amelyek igen sokszor az úgynevezett lyraalakú ábrává olvadnak egybe. Külsőleg főleg ez a fölötte különleges rajzolat és a test puhasága különbözteti meg a *Limax*-októl. Utóbbi sajátossága különösen esős időben tűnik fel, amikor is rendkívül lágynak tetsző teste szokatlanul sok vizet vehet magába és ezzel egészen áttetszővé válik. Talpának középső pásztája elül aránylag széles, hátrafelé elég észrevehetően megkeskenyedik, úgy hogy a szélső pászták szélességben felülmúlják.

Állkapcsa olyan mint a *Limax*-é. Radulájának középső foga, valamint az oldalsó fogak gyakran egyhegyűek, a csökevényes mellékhegyek néha éppen csak hogy észrevehetők. Más fajok középfoga háromhegyű, az oldalsó fogak pedig kéthegyűek. A szélső fogak nincsenek annyira kihegyezve, mint a *Limax*-ok és *Agriolimax*-okéi; legkülső fogaik csökevényes mellékhegyeket hordanak.

Bélcsatornájuk 6 kanyarulatot ír le, közülük a két utolsó feltűnően rövid. A végbélen hosszú, tömlőalakú vakbél foglal helyet. A nyálkamirigyek kicsinyek, háromszögalakúak, fehér vagy sárga színűek.

Ivarszervek. A penis és a jobboldali tapogató visszahúzó izma keresztezi egymást. A penis meglehetősen rövid és vastag, csak elülső vége felé vékonyodik meg egy kissé. Hátsó végén egy hosszúkás vagy gömbded, vakon végződő csövet találunk. A bursa copulatrix véghólyagja gömbölyű vagy tojásdad alakú; a mérsékelten hosszú és vékony kivezető csatorna a penis mellett nyílik. A prostata és az oviductus el nem választva fekszik egymás mellett.

Előfordulás: Európa és Előázsia.

Magyarország területéről egyetlen egy alnemét ismerjük, ez a *Lehmannia* s. str., amely különösen a párosodószervek alkotásában különbözik az *Ambigolimax* nevű, csak nyugaton elterjedt alnemtől.

Alnem: *Lehmannia* Heynem. s. str.

Subgenus *Lehmannia* s. str. (P. Hesse, 1926).

Radulája két typusú lehet: 1. a középső és oldalsó fogak egyhegyüek, de hegyük letompított *(L. marginata)*, vagy 2. a középső fog háromhegyű, az oldalsó fogak pedig kéthegyűek és élesen kihegyezettek *(L. melitensis)*. A penisen karcsú, hosszúkás, olykor meggörbült, flagellumszerű függelék foglal helyet.

Hazánkban előforduló egyetlen faja, a *Lehmannia (L.) marginata* Müll. Sziklákon és fákon él; esős időben magasan felmászik a fák törzsére s ott a zuzmókat legeli le. Ilyenkor gyüjthetjük a legkönnyebben a félig áttetsző testű állatokat, amelyek sokáig *Limax arborum* Bouch.-Chant. néven szerepeltek az irodalomban. Vannak zoologusok, akik még ma sem ismerik el a *Lehmannia* nem jogosultságát, mert szerintük a közte és a *Limax* között lévő különbségek nem annyira mélyrehatók, hogy ezen az alapon a két csoport élesen elhatárolható volna. Szerény véleményem szerint — és ez a vélemény megegyezik a legtöbb modern kutató nézetével — feltétlenül meg kell hagynunk a *Lehmannia* nemzetséget, mert sajátos, már előbb kiemelt bélyegei annyira elütnek a többi Limacidákétól, hogy önálló helyet biztosítanak neki a rendszerben.

1. Lehmannia (Lehmannia) marginata Müll. (16. rajz.)

Limax marginatus Müller (non Drap.). Verm. Hist. II, p. 10, 1774.

A puha, nyúlékony testű állat közepes nagyságot ér el; hosszúsága kinyúlt állapotban 60-80 mm között váltakozik, színe kékes-

szürke, szürke okkersárga, drapszínű, olajbarna, olykor piros, sőt néha egészen fekete; háta közepén rendesen egy világosabb sáv húzódik végig, amelyet két oldalról sötétebb csíkok határolnak. A pajzs mérsékelt nagyságot ér el, elül lekerített, hátul pedig néha kihegyezett; felületén koncentrikus irányú sávozottság figyelhető meg, színeződésére pedig jellemző a már említett két, oldalt húzódó sötét színű vonal, amely gyakran lyraalakú rajzolatot hoz rajta létre. Feje sokszor világosabb színű, mint a test többi része, míg a három részre osztott talp egészen világos, gyakran fehér. A tojásdad



17



16

16. rajz. *Lehmannia marginata*. 17. r. *L. marginata* var. *zebrina*.

alakú és fehér színű héj 4—5 mm hosszúságot és 2—3 mm szélességet ér el. A nyálka színtelen.

A bélcsatorna hat kanyarulatot ír le. A rectumon jól fejlett coecum foglal helyet. Az állkapocs sárga színű vagy szarubarna. A radula középfoga legtöbbnyire háromhegyű, az oldalsó fogak kéthegyűek, a szélsők egy vagy kéthegyűek. Képlete:

$$\frac{c}{3}\ \frac{a}{2}\ \frac{b}{2\text{-}1}$$

Ivarszervek. A kicsi hímnősmirigy számos sötétbarna lebenyből áll; vezetékének a kezdeti része keskeny, azonban a hatalmas, sárga színű, nyelvalakú fehérjemirigy felé közeledve mindinkább megvastagodik; a spermoviductus sárgásfehér színű és mérsékelten hosszú; nagyon rövid a vas deferens, a penis pedig vastag és izmos; utóbbi egy szarvalakú, fehér színű, váltakozó hosszúságú függeléket hord, amelyet egyes malakologusok flagellumnak hívnak; az oviductus szabad része hengeres, kékes-fehér színű, alsó kétharmadában pirosas-sárga, redőzött mirigyekkel ellátott cső; az oviductus mirigyei egészen az atriumig terjednek le. A párzótáska végtartálya nagyjából körtealakú, kivezetőcsatornája az atriumba nyílik.

Életmód. A *Lehmannia marginata* — mint azt régebbi neve *(arborum)* is mutatja — igazi „fákat kedvelő" faj. Magyarország egész területén elterjedt, Budapest környékén a Hűvösvölgyben, a Hárshegyen és a Jánoshegyen mindenütt megtalálható. Legtöbbnyire csak kiadós esőzések után bukkanunk reá, amikor is az állatok a nedves fatörzseken mászkálnak és a főtáplálékukat alkotó zuzmót eszik. Leginkább az erdős helyeket kedvelik. Az Alpesekben 8000 lábnyi magasságban, sőt még azon felül is megtalálták. Nedves időben nagyon mozgékony; a vizet rendkívül nagy mértékben veheti fel testébe, amely ilyenkor egészen áttetszővé válik. Az élő állapotban egészen átlátszó, termetes külsejű állat alkoholban a felényire vagy még kisebbre is összezsugorodhatik. A konzerváló folyadékban, a többi Limacidákhoz hasonlóan, sötétebbé válik, mert pigmentcsoportjai összébb szorulnak és így jobban előtünnek.

Külföldi elterjedése: Anglia, Németország, Belgium, Hollandia, Franciaország, Svájc, Olaszország, Ausztria, Magyarország, Spanyolország, Portugália. Görögország, Norvégia, Svédország, Dánia, Oroszország.

Magyarország egész területén el van terjedve; eddig ismert termőhelyei a következők: Budapest (Gellérthegy, Hűvösvölgy, Nagyhárshegy, Jánoshegy, Zugliget), Piliscsaba, Leányfalu, Dunabogdány, Nagykároly, Nyirbátor, Sárospatak, Mecsekhegység (Mélyvölgy, Jakabhegy), Kaposvár, a Nádasdi erdő Kaposvár mellett, Szentbalázs Kaposvár közelében, Kakonya Múrakeresztur mellett, a Hódosér völgye és a Cuha patak völgye Zirc közelében, Vidámvár a Vértesben, Borostyánkő, Óház Kőszeg mellett, Csákánypuszta (Komárom m.), Nagysalló, Körmöcbánya, Hermánd, Magas-Tátra, Fehérviz völgye, Tátraszéplak, Barlangliget, Jászó, Murányalja, a Murányvárba vezető út, Pelsőc, Szádelői völgy, a Kékes a Mátrában, Brassó, Kereszténvhavas, Cenk, Bucses, Retyezát, Zenoga, Vulkán Abrudbánya mellett, Nadrág, Domogled, Moldova.

Horvátországi termőhelyek: a Kik hegy, Crna Rieka és Devciče-vac a Plitvicai tavak mentén, Biela Lasica, Biela Stiene, Jasenak, Apatisan környéke a Nagy Kapelában (Ogulintól délnyugatra), továbbá Ostarija, a Metla csúcs Ostarija közelében, Brušane, a Qinici erdő Krasnótól nyugatra, Gračac, Sv. Brdo, Mali Halan és Crnopać a Velebitben.

A példányok gyüjtői Adensamer, Dudich, Éhik, Forstner, Horváth, Jekelius, Kleiner, Kormos, Méhely, Oberwimmer, Soós Á. és L., Sturany, Szabó, Szilády, Ujhelyi, Visnya és Wagner voltak.

A faunakatalógus még a Felvidék és Erdély következő helyeiről sorolja fel: Pozsony Szt. György, Trencsén-Teplic, Igló, Kassa, Ránk, Királynép, Jászó, Radna (Ünőkő), Balánbánya, Kéroly, Ojtoz, Keresztényhavas, Felső Porumbák, M. Felekenses, Fenyőfalva, Nagyszeben, Czód, Riuszádului, Sebeshely (Bisztra), Nagy-Baár, Merisor, Vulkán (M. Zenoga).

A *Lehmannia marginata* fajváltozatai közül Magyarország területéről eddig 6-ot ismerünk; ezek a következők:

1. var. **Bettonii** Sord. Atti Soc. Ital. di Sci. Nat. 1871, p. 251.

Borvörös színű, egybeolvadt hosszanti csíkokkal, amelyeket azonban itt-ott szabálytalan alakú, világos foltok szakítanak meg; néha a rajzolat a *Limax flavus*-éra emlékeztető; a hát középvonala világos színű, a pajzs jobb- és balszélén egy-egy sötét hosszanti sávot visel. — Földrajzi elterjedés: Anglia, Olaszország, Norvégia, Magyarország. Egyetlen ismert hazai termőhelye a Zlata tanya a Retyezátban, ahol Horváth Géza gyűjtötte.

2. var. **carpathica** Haz. Jahrb. Deutsch. Mal. Ges. Feb. 1885, XII, p. 23.

Hazay a következő diagnózist adta róla: „Animal gracile, marmoratum, vel obscure maculatum; carina alta et pallida, utrinque fusco-fasciata at annulis sparsa; solea albescenti". A Kárpátokban (Magas Tátra, stb.) fordul elő. Ismert termőhelyei a következők: Kralován (Czebrat és Vichnana hegy), Tátra, Tátrafüred, Zólyomi hegyek, Szliács, Igló.

3. var. **dianae** Kim. Beitr. Moll. Siebenb. 1884, p. 120—121.

Háta ritkán fekete, rendesen élénk világos-barna szinű, szétszórt pontokkal; talpa fehér, azonban az oldalsó pászták olykor sötétebbek, sőt néha feketék! Az egyszínű állatok taraja fekete, a tarkáké ellenben világos. Magyarországi termőhelyek: Fogarasi havasok (Negoj, Vale Serbotye), Rareul, Kuliman, Nagy-Hagymás hg., Zenoga. Külföldi előfordulás: Németország, Itália, Anglia, Portugália.

4. var. **Heynemanni** E. A. Bielz, Fauna Siebend. 1897, p. 32.

A törzsalaknál nagyobb, fehéres, világos színű, pajzsa sötét foltokkal tarkázott; háta egész hosszában apró fekete pontokat hord, kiemelkedő szemölcsei durva alkotásuak, taraja erős. Földrajzi elterjedés: Magyarország, Németország, Anglia, Svájc, Görögország. Hazai termőhelyek: Nagysalló (Dudich), Nagyszeben.

5. var. **subrufa** Le Comte. Bull. Soc. Mal. Belg. 1871, p. 65.

Színe sárgás, okkersárga vagy borpiros; az alapszínnél kissé halványabb tarajvonalat jobbról és balról egy-egy sötétebb sáv határolja; ugyancsak egy-egy sötét színü sávot hord a pajzs is jobb és baloldali szélén. Magyarországról ismert egyetlen termőhelye Gombaszög (Méhely). Ismerjük még Angliából, Franciaországból, Belgiumból és Itáliából.

6. var. **zebrina** Tayl. Mon. Land & Freshw. Moll. of the Brit. Isl. 1903. p. 96, pl. 10, f. 17. (17. rajz).

Ezt a fajváltozatot rajzolata kétségen kívül a legszebb házatlan csigák egyikévé teszi. A test alapszíne szürkés, a háton hosszanti sötét sávok húzódnak, oldalt pedig ferdén haladó sötétebb csíkok alkotnak rajta nagyon érdekes hálózatos rajzolatot; a pajzs az ismert sötét sávokat hordja. Eddig ismert egyetlen biztos hazai termőhelye: Nagyenyed (Szilády). Külföldi előfordulás: Anglia, Németország, Ausztria és Portugália.

Subfamilia: **Agriolimacinae** H. Wagner, nov. subfam.

Közepes nagyságú vagy kicsiny termetű állatok. Bőrük aránylag vékony és síma. Egyszínűek vagy tarkák, utóbbi esetben rendszerint hálózatos rajzolatúak. Jól fejlett, néha hatalmas köpenyük van, amely az alatta fekvő mészlemezkét mindig teljesen elfedi. Rövid tarajuk sohasem ér el a köpenyig. Nyálkájuk víztiszta vagy fehér. A radula középsőfoga háromhegyű, a bélcsatorna 4 kanyarulatot ír le. Némely csoport fajain vakbél fejlődött ki. Penisükön igen gyakran járulékos szerveket: függeléket és ingerlőtestet találunk. A penis és a jobboldali tapogató visszahúzó izma párhuzamosan fekszik egymás mellett. Hazánk területéről az alcsaládnak egyetlen nemét ismerjük.

Nem: **Agriolimax** Mörch, 1865.

Agriolimax Mörch, Journ. de Conch. XIII, 1865, p. 378. (Subg. Limacis)

Az állat közepes nagyságú vagy kicsiny, karcsú, mozgékony; háta végén tarajt hord, amelynek azonban soha sincsen különleges színeződése; a köpeny vagy pajzs concentrikusan barázdált, centruma oldalt található, a pneumostoma a pajzs középvonala mögött fekszik; a héj nucleusa ugyancsak szélső helyzetet foglal el; az állaton soha sem találunk tarajos ráncokat vagy kiemelkedő bőrszemölcsö-

ket, mert síma bőre csak keskeny barázdák által tagolódik kisebb pásztákra; rajzolata sohasem fejlődik ki határozott hosszanti sávokba; bőre általában vékony; nyálkája tiszta vagy mésztől zavaros, tejfehér színű.

Állkapcsa olyan mint a *Limax*-oké, radulájának középsőfoga háromhegyű, az oldalsó fogak kéthegyűek, a szélsők tövisalakúak, azonban gyakran csökevényes oldalsó, külső mellékhegyet viselnek. A bélcsatorna 4 kanyarulatot ír le, amelyek közül a két első a legrövidebb; a rectumon gyakran egy jól fejlett, rövidebb, vagy csökevényes vakbél alakult ki.

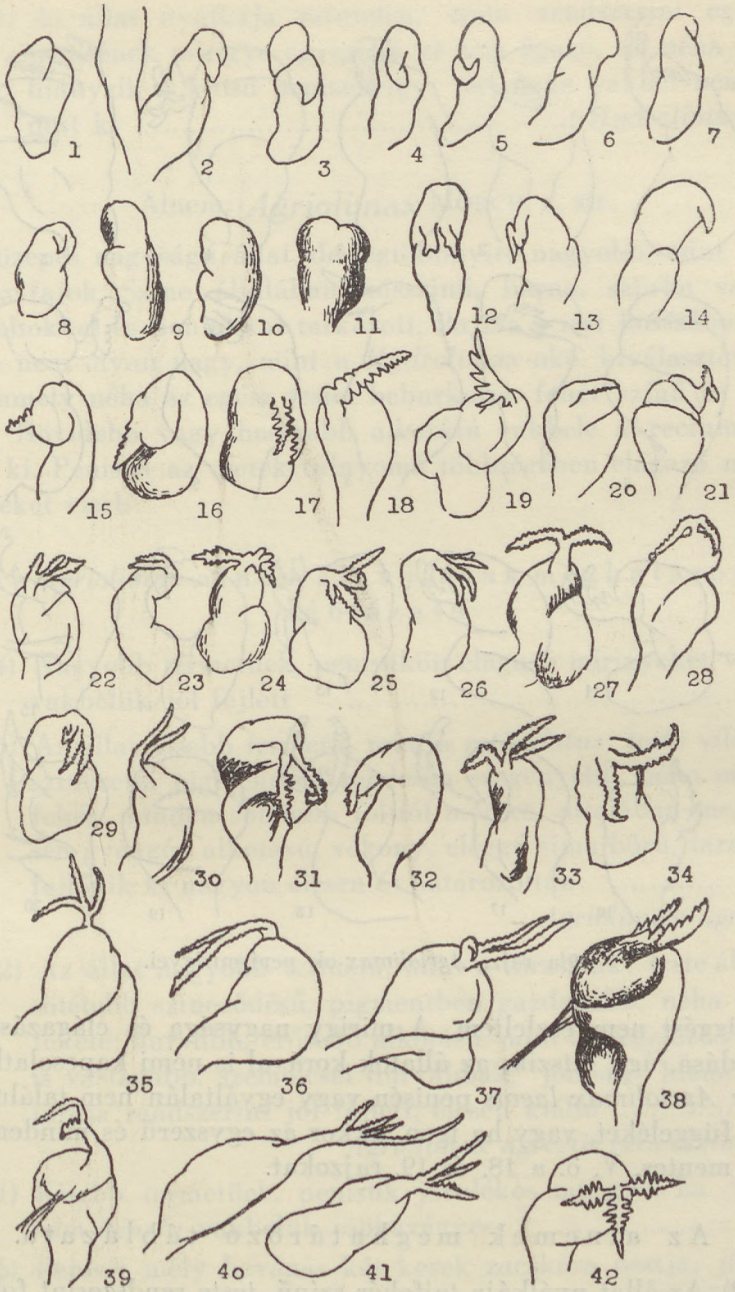
I v a r s z e r v e k. A jobboldali tapogató visszahúzó izma szabadon fekszik a penis mellett; ez a jellemző sajátság könnyen megkülönböztethetővé teszi az *Agriolimax*-okat a *Limax*-októl, amely utóbbi genus fajaiban, mint tudjuk, a penis és a tapogató retraktora keresztezi egymást. Az ivarnyílás közvetlenül a tapogatók mögött fekszik; a penisen igen gyakran járulékos mirigyeket és úgynevezett „ingerlőtestet" találunk, azonban ismerünk alakokat, amelyekben ezek a szervek hiányzanak. A sperma laza nyálkatokban jut át a megtermékenyítendő állatba. A petéik gömbölyűek, üvegszerűen átlátszóak, az állat 20—50 darabból álló rakásokba rakja le őket. Előfordul egész Európában és Előázsiában.

É l e t m ó d. Az *Agriolimax*-ok valamennyien növényevők; nedves, árnyas helyeken tartózkodnak, levelek alatt, kövek között, árkok oldalán, veteményes kertek zúgaiban. Egyik fajuk, az *Agriolimax laevis* annyira kedveli a nedvességet, hogy a megfigyelések szerint önként is bemegy a vízbe. Ez az alak némelyek szerint egyik képviselője azoknak a *Limax*-féléknek, amelyek a szárazföldön való életet a vízivel kezdik fölcserélni, és amely másokhoz hasonlatosan eredetileg vízi állat is volt; úgy látszik, hogy néha a legkevésbbé sem zavarja ha a vízben alámerül. Számos megfigyelő találta már a vízben, ahova önként mászott be, önként kereste fel azt; ha magunk merítjük őket a víz alá, csakhamar nagyon kellemetlenül érzik ott magukat és bizonyos idő elteltével éppen úgy elpusztulnak, mint a többi, víz alá került és ottfulladt házatlan csiga. Hogy mennyi ideig bírják ki a víz alatt, az sok egyéb körülménytől eltekintve, főleg a víz hőmérsékletétől is függ. Effajta kísérleteket magam is végeztem mind *Agriolimax laevis*-szel, mind *A. agrestis*-és *A. agrestis reticulatus* példányokkal. Az eredmény minden esetben ugyanaz volt, mert a *laevis* csakúgy kimult a víz alatt, mint a többi fajok egyénei. Ha levegőtől teljesen elzárt, vízzel telt üvegbe helyezzük őket, akkor a csigák gyorsan mászni kezdenek és csakhamar feljönnek az üveget

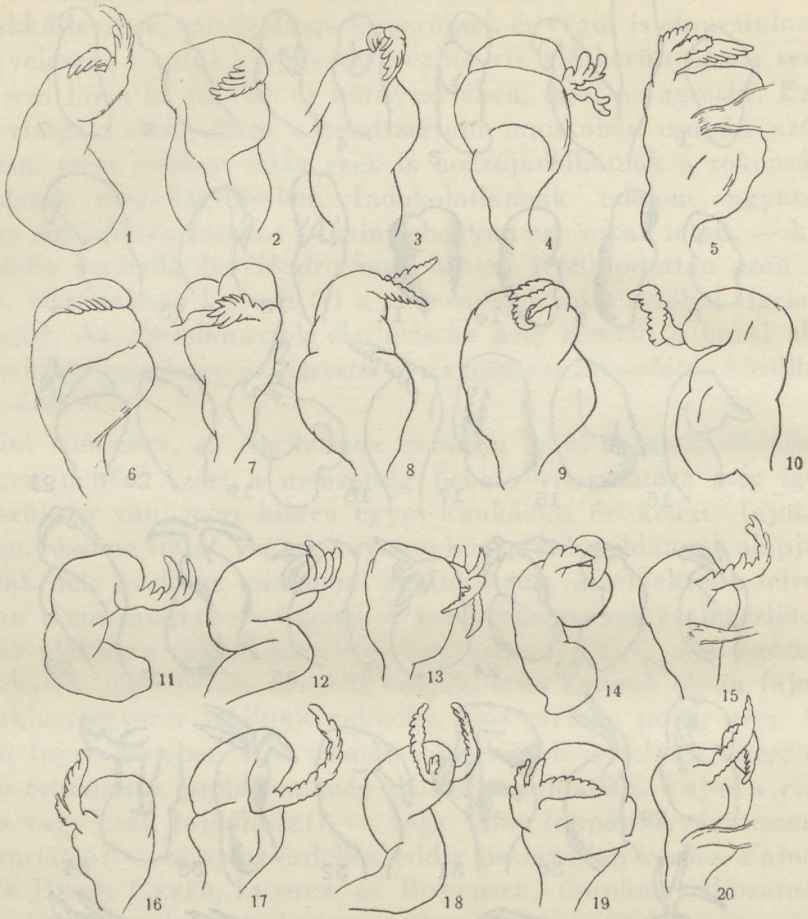
elzáró fedőlapra; pár órai ide-oda mászkálás után mozdulataik bágyadtakká lesznek, mindjobban kimerülnek és végül is elpusztulnak. Megfigyeléseim szerint a kényszerűségből víz alá került *laevis* semmivel sem bírja ki tovább új környezetében, mint az *agrestis*. Ezeket a vizsgálatokat ebben a rendszertani munkában csupán azért közöltem, mert részben talán ezek is hozzájárulhatnak a rokonsági kapcsolatok megvilágításához. Indokolatlannak találom ugyanis, hogy az *Agriolimax laevis*-t — mint ahogyan ezt sokan teszik — külön nembe sorozzák be (*Hydrolimax* MALM, 1868) pusztán azon az alapon, mert jobban kedveli (?) a nedvességet, mint a többi *Agriolimax*-fajok. Az *Agriolimax*-ok élettartama nem hosszú; a hazai alakok közül tudjuk, hogy az *agrestis* és az *agrestis reticulatus* körülbelül egy évig él.

Mint ismeretes, az *Agriolimax* genuson belül a fajok elhatárolása igen nehéz. Azért a nemzetség beható vizsgálatára még igen nagy szükség van, mert hiszen egyes kaukázusi és keleti fajokat egyetlen, részben fiatal, vagy hiányosan konzervált példányok alapján állítottak fel; azok az anatomiai sajátosságok, amelyekre a leírók gyakran támaszkodtak — ilyenek a penis mirigyének és ingerlőtestének az alakja, a vakbél jelenléte vagy hiánya, stb. — nem egészen megbízhatók, mert hiszen ma már tudjuk, hogy vannak olyan fajok, amelyekben egyszer találunk vakbelet, más esetben pedig nem. Az európai fajok esetében sem valami sokkal jobb a helyzet, mert az *agrestis-reticulatus* probléma még ma is megoldatlan. Faj-e a *reticulatus* vagy csak fajváltozat? — vagy talán csupán egyéni szomatikus variáció? — ez az az érdekes, eddig tisztázatlan kérdés. Fajnak tekintik HESSE, GEYER, LUTHER és BOETTGER, csupán változatnak tartotta SIMROTH, TAYLOR, LESSONA, POLLONERA és SOÓS!

Saját vizsgálataim alapján e tárgyra vonatkozó véleményemet a következőkben foglalhatom össze: A két alak elválasztására állítólag legjobban felhasználható penismirigy formája olyannyira ingadozik, hogy semmi biztos támpontot sem nyújt a fajok elhatárolására nézve. Az *Agriolimax agrestis* typikusnak mondható alakjai éppúgy viselnek elágazó mirigyeket, mint a legsötétebben retikulált „*reticulatus*" egyének, amiért is szerintem nem lehetséges őket külön fajoknak tartani. Éppen ezért a *reticulatus* csak mint kisebb rendszertani egység (subspecies, varietas) szerepelhet. A színezetben mindenféle átmenet megvan a majdnem világos fehértől az egészen feketéig, azonban a mirigy kialakulását ettől teljesen függetlennek találtam. A mirigy alakja és a pigmentáció foka között korrelativ



18. rajz. Különböző lelőhelyekről származó Agriolimax-ok penismirigyei.



19/a rajz. *Agriolimax*-ok penismirigyei.

összefüggést nem észleltem. A mirigy nagysága és elágazásának a fokozódása, úgy látszik, az állatok korával is némi kapcsolatban áll.

Az *Agriolimax laevis* penisén vagy egyáltalán nem találunk mirigyes függeléket, vagy ha igen, akkor az egyszerű és minden elágazástól mentes. V. ö. a 18. és 19. rajzokat.

Az alnemek meghatározó táblázata.

1 (2) Az állat nyálkája tejfehér színű, teste rendszerint foltokkal, pontokkal tarkázott; penisén rendszerint elágazó nyúlványokkal ellátott mirigyet hord, rectumán vakbél fejlődött ki ..... *Agriolimax* MÖRCH

2 (1) Az állat nyálkája színtelen, teste rendszerint egyszínű; penisének mirigye egyszerű, el nem ágazó, sőt néha teljesen hiányzik a külső penismirigy; rectumán vakbél nem fejlődött ki ..... *Hydrolimax* MALM

Alnem: *Agriolimax* MÖRCH, s. str.

Közepes nagyságú állat, de legtöbbnyire nagyobb, mint a *Hydrolimax*-fajok. Színe általában hússzínű, barna, szürke vagy fekete foltokkal és pontokkal tarkázott. Pajzsa a test hosszához viszonyítva nem olyan nagy, mint a *Hydrolimax*-oké, kiválasztott nyálkája, amely néha az egész testet beburkolja, fehér színű és át nem látszó. Rövidebb vagy hosszabb alkotású vakbele a rectumon fejlődött ki. Penisén az esetek túlnyomó többségében elágazó mirigyes függeléket visel.

Az *Agriolimax* alnem alakjainak meghatározó táblázata.

1 (4) Nagyobb termetüek, penisükön elágazó mirigyeket viselnek, vakbelük jól fejlett 2

2 (3) Az állat kisebb termetű, mint a *reticulatus;* teste világosabb színezetű, pigmentben rendesen szegényebb, néha majdnem fehér, minden sötétebb folttól mentes; általában meglehetősen gyengéd alkotású, vékony, eléggé síma bőrű, taraja nem fejlődik ki nagyon élesen és határozottan .....
Agriolimax agrestis L.

3 (2) Az állat nagyobb termetű, mint a törzsalak; teste általában sötétebb színeződésű, pigmentben gazdagabb, néha egészen fekete; durvább, erősebb alkotású, mint a megelőző faj, bőre is vastagabb, szemölcsei durvábbak, jobban kiemelkedők; taraja rendszerint jól fejlett, élesen kiálló .....
Agriolimax agrestis reticulatus MÜLL.

4 (1) Kisebb termetüek, penisük járulékos mirigye, ha van, el nem ágazó; vakbelük csökevényes 5

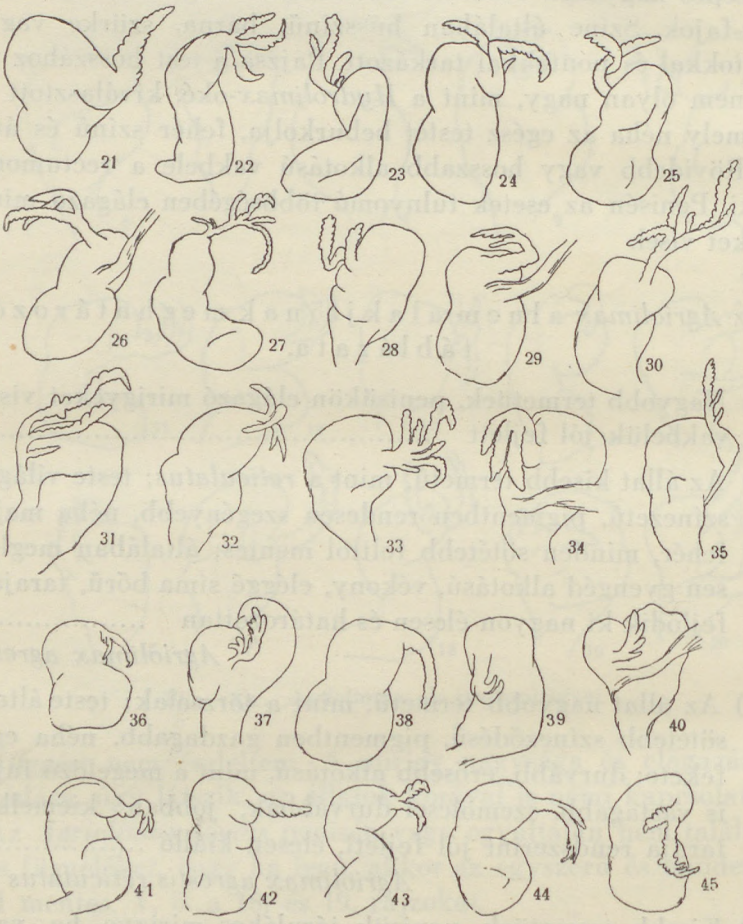
5 (6) Penisét mély bevágás két kerek zacskóra osztja; járulékos ivarmirigyei nincsenek ..... *Agriolimax Absoloni* SIMR.

6 (5) Penisén osztatlan járulékos mirigy van .....
Agriolimax subagrestis SIMR.

1. **Agriolimax (Agriolimax) agrestis** L. (20. rajz).

Limax agrestis LINNÉ, Syst. nat. X, 1758. p. 652.

Az állat kb. 30-35 mm hosszúra nő meg, karcsú és mozgékony; alapszíne sárgás-fehér, halvány okkersárga vagy hússzínű, gyakran szürke, barna vagy fekete pettyekkel, foltokkal behintve; ezek olykor hálózatos rajzolatot alkotnak rajta; a hát vége gyakran tarajos,



19/b rajz. *Agriolimax*-ok penismirigyei.

de a taraj néha alig emelkedik ki; a tapogatók rendszerint sötéten színezettek, a pajzs a test hosszának körülbelül harmadát éri el, de némely esetben még hosszabb; felületén koncentrikusan haladó, gyűrűalakú ráncokat találunk, amelyek azonban sohasem mélyek, míg

a nucleust a jobboldalán viseli. A halvány színű talp, a *Limax*-okéhoz hasonlóan, hosszanti irányban három részre osztott, a középső pászta olykor világosabb, mint a szélsők. A nyálka tejfehér. A hosszúkás-tojásalakú és fehér színű héj meglehetősen vékony, felületén koncentrikus irányban haladó növekedési vonalakkal ellátott; nucleusa a baloldalán helyezkedik el, hossza 3—5 mm, szélessége 2—2.5 mm között váltakozik.

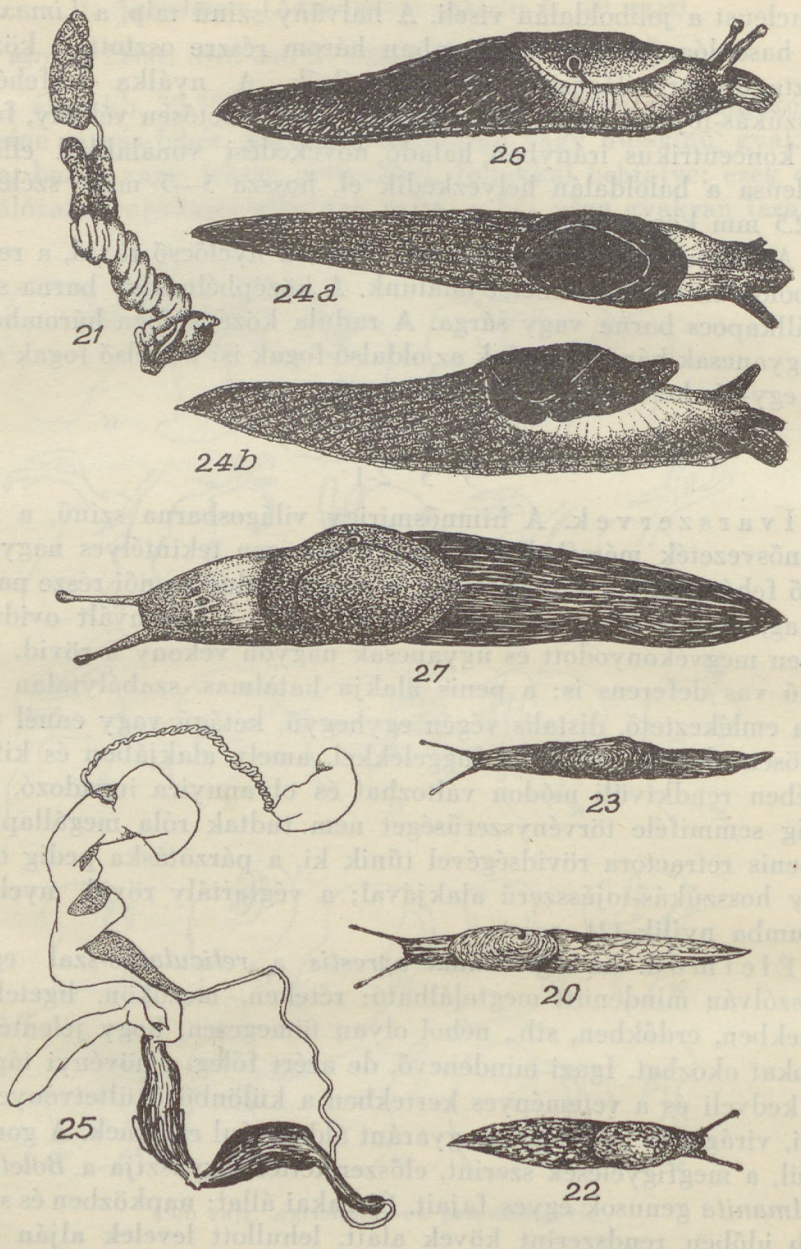
A bélcsatorna 4 kanyarulatot ír le; a nyelőcső rövid, a rectum jobboldalán rövid vakbelet találunk. A középbélmirigy barna színű, az állkapocs barna vagy sárga. A radula középsőfoga háromhegyű, és ugyancsak háromhegyűek az oldalsó fogak is; a szélső fogak ellenben egy- és kéthegyűek. Képlete:

$$\frac{c}{3}\ \frac{a}{3}\ \frac{b}{2\text{-}1}$$

Ivarszervek. A hímnősmirigy világosbarna színű, a fehér hímnősvezeték mérsékelt hosszúságú; az igen tekintélyes nagyságot elérő fehérjemirigy sárgás-barna, a spermoviductus női része nagyon vastag, a hím rész vékonyabb és sötétebb; a különvált oviductus erősen megvékonyodott és ugyancsak nagyon vékony a rövid, fehér színű vas deferens is; a penis alakja hatalmas, szabálytalan zacskóra emlékeztető, distalis végén egyhegyű, kétágú vagy ennél többszörösen elágazó mirigyes függelékkel, amely alakjában és kifejlődésében rendkívüli módon változhat és olyannyira ingadozó, hogy eddig semmiféle törvényszerűséget nem tudtak róla megállapítani. A penis retractora rövidségével tűnik ki, a párzótáska pedig ovális vagy hosszúkás-tojásszerű alakjával; a végtartály rövid nyele az atriumba nyílik (21. rajz).

Életmód. Az *Agriolimax agrestis* a *reticulatus*-szal együtt úgyszólván mindenütt megtalálható: réteken, mezőkön, ligetekben, kertekben, erdőkben, stb., néhol olyan tömegesen, hogy jelentékeny károkat okozhat. Igazi mindenevő, de azért főleg a növényi táplálékot kedveli és a veteményes kertekben a különböző ültetvények levelei, virágai és gyümölcsei egyaránt áldozatául eshetnek. A gombák közül, a megfigyelések szerint, előszeretettel fogyasztja a *Boletus* és az *Amanita* genusok egyes fajait. Éjszakai állat; napközben és szárazabb időben rendszerint kövek alatt, lehullott levelek alján vagy a földben tartózkodik. Petéit is kövek alá, levelek közé rakja. A fiatal állatok igen falánkak és gyorsan fejlődnek.

Földrajzi elterjedés: Norvégia, Svédország, Dánia, Finnország, Anglia, Németország, Belgium, Hollandia, Franciaország, Svájc,



20. rajz. *Agriolimax agrestis* L. 21 r. *A. agrestis*, ivarkészülék. 22. r. *A. agrestis reticulatus*. 23. r. *A. laevis*. 24. r. (a, b.) *Milax Fejérváryi*. 25. *Milax Fejérváryi*, ivarkészülék. 26. r. *Milax croaticus*. 27. r. *Milax Adensameri*.

Olaszország, Ausztria, Magyarország, Spanyolország, Portugália, Balkán-félsziget, Oroszország, Ázsia, Afrika, Észak- és Délamerika, Ausztrália.

Magyarország és Horvátország területén úgyszólván mindenütt el van terjedve; ismert lelőhelyei a következők: Budapest (Zugliget, Hárshegy, Hüvösvölgy, Mátyáshegy, Kertészeti Tanintézet), Budafok, Leányfalu, Dobogókő, Tápiósáp, Kecskemét, Szeged, Dorozsma, Ujverbász, Kaposvár, Mecsek hegység (Márévári völgy), Nagykanizsa, Ormánd, Komárváros, Gyenes-Diás, a Cuhapatak völgye és a Hódosér völgye a Bakonyban, a Tihanyi félsziget, Kőszeg környéke, Sopron (Tatschi-árok és a Kecske-patak völgye), Királyhída, Szokolya a Börzsönyben, Nagysalló, Szklenófürdő, Garamkovácsi, Körmöcbánya, Lőcse, a Kékes és a Gallya a Mátrában, Kolozsvár, Nadrág, Petrozsény (Csetáte Boli). Babor a következő helyekről sorolja fel: Brassó, Bucsecs, Barcarozsnyó, Retyezát, Zenoga. Horvátországi termőhelyek: Devcicevac a Plitvicai tavak mellett, Zrmanja és Crnopać. Dalmáciában Metković és Castelnuovo mellett találták meg, valamint Brazza szigetén és Lussinon.

Gyűjtők: Dudich, Éhik, Gaál, Gebhardt, Holdhaus, Horváth, Méhely, Oberwimmer, Plöbst, Rotarides, Soós, Sturany, Vasvári, Visnya, Wagner.

A faunakatalógus *„agrestis"* adatai nyilvánvalóan részben a *reticulatus*-ra is vonatkoznak; teljesség kedvéért ezeket is felsoroljuk: Budapest, Bihar, Sümeg, Kőszeg, Pozsony, Trencsén-Teplic, Rájec-Teplic, Vrátna völgy, Rózsahegy, Tátra (Bélai fürdő), Igló, Királynép, Kassa, Ránk, Nádaska, Varannó, Szobránc, V. Frequens, VII. Croatiam et Slavoniam secundum Möllendorf inhabitat.

Agriolimax (Agriolimax) agrestis reticulatus Müll. (22. rajz).

Limax reticulatus Müller, Verm. Hist. II, 1774, p. 10.

A törzsalaktól főleg nagyobb és durvább alkata által tér el; mindig sötéten pontozott és foltokkal díszitett; a barna vagy sötét-szürke, néha majdnem fekete színű pigment nem ritkán egészen sötétté teszi az alapszínt. Testének szemölcsei kiemelkedők, taraja élesen kiálló. Ivarszervein mindig megtaláljuk a penis járulékos mirigyét; ez rendszerint többszörösen elágazó, ágas-bogas, alakjában és fejlettségében rendkívül változatos szerv.

Földrajzi elterjedése körülbelül ugyanaz, mint a törzsalaké: Anglia, Németország, Franciaország, Olaszország, Finnország, Észtország, Svédország, Norvégia, Ausztria, Magyarország, stb.

Hazánkból eddig a következő termőhelyekről ismerjük: Budapest (Mátyáshegy, Hárshegy, Hűvösvölgy, Zugliget, Farkasvölgy), Pomáz, Piliscsaba, Kaposvár, a Ropolyerdő Kaposvár mellett, Nagykanizsa, Tihany, Kőszeg, Gönyü, Trencsén, Pöstyén, Nagysalló, Garamkovácsi, Körmöcbánya, Hermánd, Magas Tátra, Javorina, Tátraszéplak, Jászó, Lőcse, Mátra (Kékes és Gallya), Brassó: Cenk, Tömösi szoros, Kereszténvhavas, Herkulesfürdő, Oravica. Horvátországi termőhelyek: Plasi Saborski Ogulin közelében és a Crnopać Gračac mellett. Azonkívül megtalálták még Lussinon is, valamint Palazzuoli szigetén Lussin közelében.

A példányokat gyüjtötték: Bartók, Csiki, Dudich, Éhik, Galvagni, Gerger, Kleiner, Kormos, Méhely, Plöbst, Soós, Sturany, Szabó, Vasvári, Visnya, Wagner.

Magyarország területéről a törzsalaknak eddig három színváltozatát ismerjük, ezek a következők:

1. var. **pallida** Schrenk, Land u. Süssw. Moll. Livlands, 1848, p. 11.

Halovány színű, pigment nélküli, de pajzsa olykor sárgás. Földrajzi elterjedés: Anglia, Franciaország, Németország, Ausztria, Magyarország, Livland. Hazai termőhelyei: Budakeszi (Bartók). Maglód (Soós).

2. var. **brunnea** Taylor, Mon. Land & Freshw. Moll., 1904, p. 114, Pl. 15, f. 2.

Egész teste egyszínű barna. Földrajzi elterjedés: Anglia, Olaszország, Norvégia, Magyarország. Csak egyetlen egy hazai termőhelyét ismerjük: Budapest, Kőbánya, ahol Vasvári Miklós virágcserepek alól gyűjtötte.

3. var. **nigra** Morelet, Moll. Port. 1845, p. 34.

Teljesen vagy majdnem egészen fekete, a fekete szín néha a talp szélső pásztáira is kiterjed, a *Limax cinereo-niger*/színeződéséhez hasonlóan. Földrajzi elterjedés: Anglia, Belgium, Spanyolország, Portugália, Olaszország, Görögország, Magyarország. Egyetlen eddig ismert hazai termőhelye Nagysalló (Dudich), azonban Dalmáciában, Meleda szigetén is előfordul (Rogenhofer).

2. Agriolimax (Agriolimax) Absoloni Simroth.

Agriolimax Absoloni Simroth, Nachrbl. D. Mal. Ges. 48, 1916, p. 13—14, f. 3.

Az állat teste 1.8 cm, rövid köpenye 0.65 cm hosszú; csak hátulsó része tarajos. Szinezete sárgás-szürke, felső testrészein, valamint

a talpán erősebben okkersárga; elülső vége különösen élénk, majdnem narancssárga. A köpeny fekete vagy barna pigmentáció nyomaival.

A teljesen ivarérett állat hatalmas nagyságú hímnősmirígye feketés-barnán pigmentezett. Penisét egy mély bevágás két kerek zacskóra osztja. Végbelén kis vakbél fejlődött ki, járulékos ivarmirigyei nincsenek.

Erről a fajról, amelyről tulajdonképpen még máig sem tudjuk bizonyosan, előfordul-e hazánk területén vagy sem, talán alkalmasabb lett volna a pontosan ismert hazai formák után, egy függelékben megemlékeznem. Ugyanis e barlangokban, sötét helyeken élő állat termőhelyeit közelebbről nem ismerjük, de lehetséges, hogy a typust, amelyről a leírás készült, Dalmáciából hozta gyűjtőjük Absolon, az ismert barlangkutató. Bár hiteles bizonyító példánya azóta sem került elő, a teljesség kedvéért közöltem a faj leírását.

3. Agriolimax (Agriolimax) subagrestis Simroth.

Agriolimax subagrestis Simroth, Sitzber. Kön. Böhm. Ges. Wiss. 45, 1893, p. 13.

Egyszínű, kicsike, sárgás-barna vagy szürke állat; itt-ott sötéten vonalkázott és így azt a benyomást keltheti, mintha retikuláltság kezdődne el rajta. Nyálkája tejfehér színű.

Anatomiájára jellemző, hogy végbele csak egészen rövid vakbelet, vagy mindössze egy térdalakú kiöblösödést visel. Penisén osztatlan járulékos ivarmirigy fejlődött ki, a penis belsejében pedig lapos, kissé kihegyezett ingerlőtestet találunk.

Az *Agriolimax subagrestis*t Babor az *agrestis* egyik fajváltozatának tartja, míg mások különálló fajnak tekintik. A magam részéről nem tudok a dologhoz hozzászólni, mivel a kérdéses alaknak csupán egyetlen példányát láttam a bécsi muzeumban, mivel azonban a malakologusok nagyobb része „jó faj"-nak tekinti, így például Hesse is külön csoportot alakított a számára, ahol vele együtt a hozzá legközelebb álló kaukázusi és krimi fajok alkotnak természetes formakört, én is a fajok között sorolom fel.

Eddig mindössze egyetlen egy, minket is érdeklő példányát ismerjük Dalmáciából, termőhelye: Curzola szigete, gyűjtője ismeretlen. Ezen példányon kívül csak a Kaukázusból és Csehországból jegyezték fel az előfordulását. (A fajról bővebb tájékoztatót találunk Simroth: „Die Nacktschnecken des russischen Reiches" c. művében. Petersburg, 1901, p. 158, T. 15, F. 17-28).

Alnem: *Hydrolimax* Malm, 1868.

Az ide tartozó állatok közepes nagyságúak vagy kicsinyek, legtöbbnyire kisebbek, mint az *Agriolimax* s. str. alnem tagjai; színük rendesen különböző árnyalatú barna vagy szürke, azonban sohasem foltosak, sem nem pettyezettek; pajzsuk feltűnően nagy, egyes alakokon olyan hosszú, mint a test fele. Nyálkájuk átlátszó vagy csak egészen gyengén fehérrel színezett. Rectumukon vakbél nem alakult ki, penisükön a járulékos ivarmirigy, ha egyáltalában van, egyszerű alkotású és el nem ágazó.

A *Hydrolimax* alnem fajainak meghatározó táblázata.

1 (2) Az állat háta egyenletesen sötét szürkésbarna, az oldalak világosak; penisén semmiféle külső mirigyet sem találunk, azonban a penis belsejében számos mirigysejt alakult ki; hossza 20 mm-t nem haladja meg .....
Agriolimax huculorum Babor & Frankenberger.

2 (1) Az állat színe barna, vörösesbarna, sötétbarna vagy ritkán szürke; penisén rendszerint jól fejlett mirigyet találunk, amely egyszerű alkotású, sohasem elágazó, sőt olykor hiányozhat is; testhosszuk rendesen jóval több mint 20 mm
Agriolimax laevis Müll.

4. Agriolimax (Hydrolimax) laevis Müll. (23. rajz).

Limax laevis Müller, Verm. hist. II, 1774, p. 1.

Az állat kb. 30 mm hosszúra nő meg, karcsú, puha bőrű; teste barna, vörösbarna, szürkésbarna vagy sötétbarna színű; csak a háta vége tarajos, pajzsa hatalmas nagyságot ér el, elül és hátul lekerített és számos koncentrikus, a nucleus körül futó barázdával ellátott; a tapogatók igen nagyok, sötétek, a talp barna vagy világos barna és hosszában három részre osztott; a láb barázdái közül olykor a szélsők a halványabbak; a talp nyálkája mindig átlátszó; a fehérszínű héj hosszúkás-tojásalakú; növekedési vonalai jól láthatók; hossza 3 mm, szélessége körülbelül 1.5 mm.

A rectumon vakbelet nem találunk, az állkapocs barna színével tűnik ki. A radula középsőfoga háromhegyű, az oldalsó fogak három- vagy kéthegyűek, a szélsők kéthegyűek vagy csupán csak egyetlen egy csúcsuk van. A radula képlete:

$$\frac{c}{3}\ \frac{a}{3\text{-}2}\ \frac{b}{2\text{-}1}$$

Ivarszervek. A hímnősmirigy sötétbarna vagy gesztenyeszínű, kivezető csatornája sötét, a vesicula seminalis kicsi és halvány; a fehérje-mirigy sárgás színű, a spermoviductus hosszú, az oviductus szabad része ellenben igen rövid. Ugyancsak rövid a keskeny és fehér színű vas deferens is. A párzótáska véghólyagja hosszúkás tojásalakú, vékony vezetéke sárgás vagy hússzínű. A penis mirigye egyszerű alkotású, megnyúlt, néha kalapácshoz hasonló, néha azonban egészen kicsike és rövid, olykor teljesen hiányozhat; feltünően rövid a penis visszahúzó izma.

Életmód. Az *Agriolimax laevis* az *Agriolimax agrestis*-hez és *A. agrestis reticulatus*-hoz hasonlóan növényevő állat, azonban seholsem válik olyan károssá, mint nagyobb testű és nagyobb tömegekben előforduló rokonai. Kertekben, emberi ültetvények közelében nem is olyan gyakori, inkább nedves réteken, vizes árkok partján, tavak, mocsarak környékén heverő kövek alatt található meg. Nedvességet kedvelő természete közismert és a megfigyelések szerint néha még a saját jószántából is felkeresi a vizet, amelyben olykor huzamosabb időt tölthet el. Élete folyamán rendkívül érdekes ivari változásokon megy át, ezekről azonban ezen a helyen nem emlékezhetünk meg. Petéinek átmérője 1 és 3 mm között váltakozik, a petéből kikelő fiatal állatok 3—4 mm hosszúak. Fiatal korukban vöröses színezetűek, a fejlődés folyamán azonban mindinkább barnássá változnak.

Földrajzi elterjedés: Norvégia, Svédország, Dánia, Anglia, Franciaország, Németország, Belgium, Hollandia, Svájc, Olaszország, Ausztria, Magyarország, Spanyolország, Portugália, Oroszország. Magyarország területén szétszórtan valószínűleg mindenütt előfordul; hogy eddig aránylag kevés termőhelyét ismerjük, az annak tudható be, hogy gyűjtésére nem fordítottak elég figyelmet. Budapestről is csak a legújabb időben vált ismeretessé.

Eddig a következő hazai termőhelyekről ismerjük: Budapest (Zugliget, kertből, a Disznófő melletti mocsárból, Kőbányáról, Római-fürdőből), Cinkota, Csepelsziget, Hódmezővásárhely, Szeged, Tárnok (Fejér m.), Kaposvár, Mecsek hegység: Abaligeti pocsolyákból, Sümeg, Pozsony, Nagysalló, Körmöcbánya, Liptószentmiklós, Hradek (Liptó), Rozsnyó, Aggtelek (Jósvapatak mellékágának forrása, Farkaslyuk forrás), Szin (forrás), Petri (forrás), Diósgyőr (forrás), Erdélyi adatok: Derezsnye, Geje forrás, Hargita, Árkos, Gyepüpatak. Horvátországban Vrana mellett Sturany gyűjtötte. Gyűjtők: Bartók, Bokor, Dudich, Rotarides, Soós, Sturany, Szabó, Ujhelyi, Vasvári, Wagner.

Magyarország területéről csak egy fajváltozata ismeretes:

var. **grisea** Tayl. Mon. Land & Freshw. Moll. p. 126. Pl. 15, f. 6.

Halványszürke színével tér el a törzsalaktól; talpának középső pásztája szürke, az oldalsó pászták világosak. Külföldi előfordulások: Anglia, Németország, Finnország. Az újabb vizsgálatok szerint nálunk, úgy látszik, számos helyen előfordul. Ismert termőhelyei a következők: Nyirbakta, vizes árok, Füzérpatak Füzérkomlósnál, Abaligeti barlang mellett, Kőszeg, Körmöcbánya, Mátra (Kőrismocsár, kb. ½ mély vizből), forrás Szin határában. Gyűjtők: Dudich, Gebhardt, Soós Á., Visnya, Wagner.

5. **Agriolimax (Hydrolimax) huculorum** Babor & Frankenberger.

Agriolimax huculorum Babor & Frankenberger, Verh. zool.-bot. Ges. Wien, 1914, p. 110—114.

Az állat keskeny, karcsú, hosszúkás, háta egyszínű sötét szürkésbarna, oldalai világosabbak; hátsó vége kihegyesedő s végén rövid taraj alakult ki; talpa egyszínű, pajzsa tojásdadalakú, síma, a test hosszának ½-ét vagy $^2/_5$-ét is eléri; a lélekzőnyílás igen közel fekszik a pajzs hátulsó végéhez és meglehetősen nagy; az ivarnyílás nagyon előre tolódott, úgy hogy egészen a rövid, vékony, sötétszínű, de nem fekete tapogatók közelébe jutott. A legnagyobb megmért példány hosszúsága 20, szélessége 5, magassága pedig 7.5 mm volt.

Az állkapocs síma, a radula középsőfoga háromhegyű, a peremfogak jól fejlett középső, és kicsi, éles oldalsó hegyekkel ellátottak.

Ivarszervei az *A. laevis*-éihez hasonlók; az atrium genitale hosszú és karcsú, a mérsékelten hosszú vagina vékony, a bursa copulatrix véghólyagja hatalmas fejlettségű, de nyele egészen rövid. Nagyon rövid a vas deferens is, ellenben a penis nagy, vastag, majdnem hengeres, de alul kissé kiszélesedő. Külső járulékos mirigyet nem találunk rajta, azonban a belsejében szövettani vizsgálattal kimutathatjuk a mirigysejteket. Ezt a fajt tehát a *laevis* endemikus modifikációjának kell tartanunk, amelyben a külső, makroszkópikusan is észrevehető mirigy eltünt, és már csak a penis belsejében van jelen, megfelelő mirigysejtek alakjában.

Az *Agriolimax huculorum*-ot Babor és Frankenberger a Kárpátokból írta le. Azóta is csak egy pár új termőhelyét jegyezték fel, úgy hogy a földrajzi elterjedéséről ma még nem tudunk tiszta képet alkotni. A leírók Worochta és Howerla környékén találták meg.

Familia: **Milacidae** H. WAGN., nov. fam.

Hosszúkás, meglehetősen vastag bőrű házatlan csigák. Köpenyük szemcsézett, néha igen nagy és majdnem minden esetben patkóalakú, a pneumostomába hajló köpenycsatornát találunk rajta; a lélekző-nyílás postmedián helyzetű. A mindig központi fekvésű nucleusszal ellátott héjat a köpeny valamennyi faj esetében teljes egészében elfedi. A hát rendszerint egész hosszában, de egyes fajokon csupán a test hátulsó vége tarajos.

A félholdalakú állkapocs majdnem mindig egy középső, fogszerű kiugrást visel. A radula középsőfoga, valamint az oldalsó fogak háromhegyűek, a szélsők ellenben egyhegyűek, áralakúak. Bélcsatornájuk 4 (ritka esetekben 6) kanyarulatot ír le, vakbelük nincsen.

Ivarszervükre jellemző, hogy a jobboldali tapogató visszahúzó izma szabadon fekszik a penis mellett. Az ivarnyílás a nyak jobboldalán található. A penis előtt jól fejlett epiphallus alakult ki; az ondót mindig spermatophor alakjában kapja a megtermékenyülő állat. Az atriumon és a női vezeték végső részein igen gyakran mirigyes függelékek fejlődtek ki, ellenben a penisen sohasem találunk járulékos mirigyeket. A párzótáska nyele vagy az atriumba, vagy a vaginába torkollik.

Elterjedés. A Földközi-tenger országai és Előázsia; Középeurópában csak néhány fajuk él.

A nemek meghatározó táblázata.

1 (2) Bélcsatornája 4 kanyarulatot ír le; nyálkája fehér színű vagy sárgás, de nem színtelen; köpenyén a lélekzőnyíláson kívül más nyílást nem találunk; az atriumon vagy a vaginán gyakran járulékos mirigyek vannak ..... *Milax* GRAY.

2 (1) Bélcsatornája 6 kanyarulatot ír le; nyálkája színtelen; köpenyén a lélekző-nyíláson kívül még egy hosszúkás nyílás fejlődött ki; az atriumon járulékos mirigyek nincsenek *Aspidoporus* FITZ.

Nem: **Milax** GRAY, 1855.

Milax GRAY, Cat. Pulm. Brit. Mus. 1 Mai 1855, p. 174.
Amalia, MOQUIN-TANDON, 10. Sept. 1855, Hist. Moll. France, II, p. 19. (sect. gen. Limax.).

Jellemző rá az erősen fejlett taraj, amely legtöbbnyire a hát egész hosszában végigvonul, néha azonban annak csak a végső ré-

szén jelenik meg. A lélekzőnyílás a jobboldalon, a köpeny közepe mögött fekszik. A pajzs finoman szemcsézett, felületén a jellemző, patkóalakú csatorna-bemélyedéssel. A belső héj hosszúkás és lekerekített; a nucleus a középvonalban fekszik. A radula középsőfoga háromhegyű, és ugyancsak háromhegyűek a mellékfogak is, míg a szélsők egy- és kéthegyűek. Az ivarnyílás a lélekzőnyílás és a jobboldali tapogató alsó része között található. A talp középső pásztája mindig jóval szélesebb, mint egy-egy mellékpászta. A középső pásztán a keresztben haladó barázdák a pászta közepe táján szög alatt találkoznak. A nyálka legtöbbnyire fehér színű, ritkább esetekben azonban sárga, sőt színtelen, víztiszta is lehet. A bélcsatorna négy kanyarulatot ír le. A jobboldali tapogató visszahúzó izma szabadon fekszik a penis mellett. Utóbbin sohasem találunk járulékos mirigyeket. Ilyen mirigyek ebben a csoportban főleg az atriumon és a női vezeték végső szakaszán (vagina) fordulnak elő. Ezek a mirigyek rendszerint számos kivezető csővel nyílnak az ivarszervek valamelyik alsó szakaszába. A penis visszahúzó izma oldalsó helyzetű; a penis folytatásaként mindig megtaláljuk a tőle jól elkülöníthető epiphallust, amelynek másik végébe a vas deferens nyílik.

Elterjedés. A *Milax*-fajok főleg a Földközi-tenger környékén élnek; néhány fajuk Középeurópában is előfordul, egy alakjukat pedig a Kaukázusban találták meg.

A *Milax* nem alnemeinek meghatározó táblázata.

1 (2) A hát egész terjedelmében tarajos 3
2 (1) Csak a hát vége tarajos ..... *Subamalia* Poll.
3 (4) A párzótáskája nyele rendkívül hosszú. a spermoviductusnál is hosszabb; az állat színe majdnem fekete, rendszerint sötétszürke, oldalain lefelé haladva fokozatosan halványodó; talpa halványsárga ..... *Macrothylacus* H. Wagn.
4 (3) A párzótáskája nyele sokkalta rövidebb; az állat rendszerint világosabban színezett, soha sem egészen fekete; a párzótáska nyele az atriumba vagy a vaginába nyílik .....
Milax Gray.

Alnem: *Macrothylacus* H. Wagner, 1930.

Az állat háta egész hosszában tarajos; a hüvely kicsiny, csőalakú járulékos mirigyei alsó részébe nyílnak. Nagyon jellemző az alnemre a párzótáska alakja; ennek végtartálya ugyanis a fehérje-

mirigyen jóval túl ér és vezetékével együtt majdnem kétszer olyan hosszú, mint a spermoviductus. Az atrium hosszú és karcsú.

Az alnemet eddig mindössze az alábbi faj képviseli:

1. Milax (Macrothylacus) jablanacensis H. WAGN.

Milax (Macrothylacus) jablanacensis H. WAGNER, Zool. Anz. 88, 1930, p. 46—48, Abb. 1—3.

A karcsú, hosszú állat testének felső része sötétszürke, majdnem fekete, de az oldalsó testrészek alsó felén, a talp mellett a színezet kevéssé halványabbá válik, mivel itt okkersárga árnyalatok is vegyülnek az alaptónusba. A talp halványsárga színű, az oldalsó pászták külső széle kissé szürkéssárga. A pajzs felül egészen sötét és egyszínű, alsó része sárga, oldalai szürkéssárgák. A pajzs alatti testrész okkersárga.

A hosszúkás-ovalis alakú pajzs elül a legszélesebb, hátrafelé mindinkább keskenyebbé válik; patkóalakú csatornája jól látható. A csatorna elülső, majdnem hegyben végződő része a pajzsnak körülbelül az első harmadában fekszik. A lélekzőnyílás hátrafelé tolódott el. A taraj a hát egész hosszában végighúzódik, azonban nem fejlődött ki nagyon erősen és seholsem élesen kiemelkedő. A test apró mezőit mérsékelt mélységű barázdák választják el egymástól; a mezők a háton a leghosszabbak. A talp középső pásztája szélesebb, mint az oldalsó pászták bármelyike. A pajzs alatt fekvő fehér színű mészlemezke hosszúkás tojásalakú.

Ivarszervek. A hímnősmirigy igen hosszú és keskeny; feltűnően hosszú a hímnősvezeték és ugyancsak megnyúlt a fehérjemirigy is. A sárgásfehér spermoviductus a kivezetőnyílás felé lassanként keskenyedik. Feltünő és nagyon jellemző a párzótáska alakja. A végtartály és nyele ugyanis együttvéve majdnem kétszer olyan hosszú, és valamivel keskenyebb is, mint a spermoviductus. A nagyjából tojásalakú végtartály meglehetősen hirtelenül megy át a nyélbe, amely az egyesülés után a legvastagabb. A hüvely a többi fajokéhoz viszonyítva meglehetősen hosszú, alsó részébe apró, csőalakú mirigyek nyílnak. A vas deferens nem éppen hosszú, de meglehetősen vékony; az epiphallus hosszabb ugyan, mint a tulajdonképpeni penishüvely, de csak mintegy felényi vastagságú. A penishüvely azon a ponton, ahol a vaginával egyesül, kissé megvékonyodik. A pitvar igen hosszú és karcsú.

Egyetlen ismert termőhelye Jablanac: Živi bunari.

Alnem: *Subamalia* POLLONERA, 1887.

Az állat vagy egészen fekete, vagy majdnem fekete, de mindig egészen sötét, sohasem világos színű; taraja az esetek legnagyobb többségében csupán csak a hát végső részén fejlődött ki, ámbár olykor a pajzs felé is megtaláljuk a nyomát. A párzótáska nyele a legtöbb esetben az oviductusba nyílik.

A fajok meghatározó táblázata.

1 (2) Az állat hatalmas nagyságot ér el; a körülbelül 6 cm hosszú állatokban még nem találunk kifejlett ivarszerveket, ill. még csak ezeknek a nyomai vannak meg; barna színe felül sötétebb, alul világosabb; taraja a pajzs közelében ellaposodik, de azért csaknem a pajzsig ér .....
Milax hellenicus SIMR.

2 (1) Az állat sokkal kisebb a megelőzőnél, 4 cm hosszú példányaiban már teljesen kifejlődött ivarszerveket találunk; színe felül fekete vagy vöröses-szürke, talpa világosabb, taraja rendszerint csak a farka végén található, illetőleg mindig csak ott fejlődik ki élesen, határozottan 3

3 (4) A párzótáska tartálya és nyele élesen elhatárolódott egymástól; a hüvely függelékes mirigyei közvetlenül a párzótáska nyelének betorkolási helye alatt nyílnak .....
Milax Robici SIMR.

4 (3) A párzótáska nagyon hosszú cső; a hüvely függelékes mirigyei a párzótáska nyelének betorkolási helyétől távol, egészen az atrium közelében nyílnak be a női ivarjárat végső szakaszába ..... *Milax Fejérváryi* H. WAGN.

2. **Milax (Subamalia) Fejérváryi** H. WAGN. (24. rajz).

Milax (Subamalia) Fejérváryi H. WAGNER, Ann. Mus. Nat. Hung. 26, 1929, p. 331, 333, fig. 1—3.

Az állat hátoldala egészen fekete; oldalsó részei kissé halványabbak, azonban főleg csak elül, a köpeny alatt. A fiatal példányok kissé világosabban színezettek (sötét szürkéskékek); az elliptikus alakú köpeny egyszínű fekete és a jólismert patkóalakú bemélyedést viseli a felületén. A hát színével megegyező színű taraj csak a hát végső részén fejlődött ki. A test a köpeny alatt okkersárga és ugyanilyen színű a talp is; a talp pásztáit mély bevágások különítik el egymástól, a szélső pászták lateralis része sötétzöldbe megy

át. A hosszúkás-elliptikus héj sárgásfehér és meglehetősen kemény; nucleusa medialis helyzetű.

Ivarszervek. A hímnősvezeték feltűnően hosszú. A dorsoventralis irányban kissé összelapított fehérjemirigy félköralakúan hajlik. Az oviductus felső, fehér része hengeres, a hím vezeték sárga színű. Az oviductus ott, ahol a vas deferenstől különválik, aránylag vékony. Különösen jellemző a párzótáska alakja: a nyél és a tartály határa nem állapítható meg jól, ez a két rész tehát nem is választható el pontosan egymástól; a tartály egyébként nagyon hosszú tömlőre emlékeztet, amelynek végső szakasza alig észrevehető módon megvastagodott. A női vezeték végső szakasza, a vagina, feltűnően hosszú és tág; a járulékos mirigyek, amelyeknek a tartalma itt ömlik be, kicsi, hosszúkás csövek. A vas deferens vékony és hosszú; az epiphallus és a penis már külsőleg is könnyen megkülönböztethető egymástól. A penis valamivel rövidebb és tetemesen vastagabb az epiphallusnál. A karcsú epiphallus egyenletesen hengeres, a végén egy kissé meghajlott (25. rajz). A *Milax Fejérváryi* eddig csak Horvátországból ismeretes. Termőhelyei a következők: Carlopago, Mali Halan és a Basača csúcs Carlopago fölött. Mind három helyen Soós Lajos gyűjtötte.

3. Milax (Subamalia) hellenicus Simroth.

Amalia hellenica Simroth, Jahrb. Deutsch. Mal. Ges. 13, 1886, p. 321, T. 10, f. IX.

Az állat barnássárga színű, felül sötétebb, alul világos. Simroth barnának írja le, a bécsi múzeum példányának a színezete okkersárga és világosbarna között van, de lehetséges, hogy az alkoholban már erősen kifakult; talpa világos okkersárga. A taraj csak a farkán fejlődött ki élesen, de azért egészen a köpenyig követhető. A 2.3 cm hosszú köpeny színezete a testétől nem tér el.

A héj 8.5 mm hosszú és 4.5 mm széles. Az állat nagyjából megegyezik a Simroth által adott rajzzal és leírással. Annak dacára, hogy hatalmas nagyságú, még mindig nem ivarérett. Az ivarszervek járulékos mirigyei gombostűfejhez hasonló apró nyúlványok alakjában tüntek elő, azonban a táplálkozás szervei már teljesen kifejlődött állapotban voltak; a massa buccalis rendkívüli nagyságával azonnal szembeötlött. A bécsi példány néhány mérete: Testhossz: 57 mm, szélesség (a köpeny tájékán mérve): 16 mm, a középső talppászta szélessége 4 mm, a szélső pásztáké pedig 3 mm (mindkettő a köpenytájon mérve).

Ezt az egyetlen minket is érdeklő bécsi példányt 1902-ben gyüjtötte Holdhaus; termőhelye Ragusa. Ezenkívül csak Görögországból és Korfu szigetéről ismerjük.

4. Milax (Subamalia) Robici SIMROTH.

Amalia Robici SIMROTH, Vers. Naturg. deutsch. Nacktschn., p. 339, T. 7, F. 21, T. 10, F. 15—16, 1885.

Az állat közepes nagyságúra nő meg. Talpa világos, és ugyancsak meglehetősen világos testének elülső fele is, ellenben köpenye, háta, és testének hátulsó fele sötét; színezete eléggé változó, néha egészen fekete, olykor ellenben csupán vöröses szürke. Taraja háta vége felé fejlődött csak ki, talpa élesen, határozottan három részre tagolt, a középső pásztán a jellemző cikk-cakk vonal húzódik végig.

Ivarszervek. Hímnősmirigye olyan, mint a legtöbb *Milax*-fajé; a sárgásbarna mirigy lebenyei az alig kanyargós hímnősvezeték egyik oldalán ülnek. Vesicula seminalisa gömbalakú, fehérjemirigye sárgás színű, óriási nagyságú. A spermoviductus ugyancsak hatalmas terjedelmével tűnik ki; azon a helyen, ahol a vékony, keskeny különvált női vezetékbe a párzótáska nyele beömlik, találjuk meg a többi faj mirigyeitől meglehetősen eltérő, egyszerűbb alkotású és rövidebb, kicsike, levél- vagy gombócalakú mirigyeket. A petecsatorna és a párzótáska vele egyesült nyele nem nyílik be közvetlenül a meglehetősen rövid atriumba, hanem egy darabon közös vezetékben haladnak, amely azután az atriummal való összeköttetést létrehozza. Az eléggé rövid vas deferens után az epiphallus vezet be a penisbe, amelynek proximalis felében egy meghajlott, húsos kampó ül. Ezt SIMROTH ingerlőtestnek tartja. Felületét szemölcsök borítják.

Az eredetileg Krajnából leírt fajt STURANY megtalálta a horvátországi Devcicevacon és a Plitvicei tavak közelében.

Alnem: *Milax* GRAY s. str.

Az idetartozó fajok rendszerint többé kevésbbé világosan színezettek és hátuk egész hosszában tarajos. A hím és női vezeték egyesülése tájékán a legtöbb esetben mirigyes függelékeket hordanak, sőt olykor úgynevezett „ingerlőtestük" is van. A párzótáska nyele az atriumba vagy az oviductusba nyílik.

A *Milax* alnem sectióinak meghatározó táblázata.

1 (2) Az ivarszervek végső részén semmiféle mirigyes függelék sincs ..... *Promilax* H. WAGN.
2 (1) Az ivarszervek végső részein mirigyes függelékek vannak 3
3 (4) Az atriumba hatalmas fejlettségű mirigy vagy mirigyek

kivezető csatornái nyílnak; az atriumban gyakran úgynevezett „ingerlőtest" fejlődött ki ..... *Lallemantia* MAB.

4 (3) Az atriumba rendszerint csak kisebb mirigyek kivezető csatornái nyílnak; ingerlőteste a legtöbb esetben nincsen *Tandonia* LESS. & POLL.

a) *Promilax*, H. WAGNER, Zool. Anz. 88, 1930, p. 30.

Az állatok színesek, barnák, szürkék vagy feketék, hátuk egész hosszában tarajos, talpuk világos színű. Jellemző sajátságuk, hogy ivarszervükön még semmiféle mirigyes elkülönülés sem vehető észre. Ebből az anatomiai sajátságból kétféle fejlődési lehetőségre következtethetünk. A pitvarmirigyek hiánya ugyanis vagy ősi bélyeg, vagy pedig utólagos egyszerűbbé válás eredménye, tehát másodlagos elváltozás. Mivel a mirigyek nemcsak a *M. cavicolá*-n, hanem a szabadban élő alakokon is hiányozhatnak, nehezen értelmezhetjük redukciós jelenségnek. Sokkal valószínűbb, hogy ez az állapot az ősi. A *Promilax* sectio ilyen módon a *Milax* alnemben a rendszer élére kerül.

5. **Milax (Milax) cavicola** SIMROTH.

Amalia cavicola SIMROTH, Nachrbl. Deutsch. Mal. Ges. 48, 1916. p. 4—12, F. 1—2.

A fiatal állat kékes-zöld vagy sárgás, taraja világos; a közepes nagyságú példányok okkerszínűek, az egészen fejlettek okkersárgák szürke árnyalattal vagy vöröses lilák. Hátuk egész hosszában végighúzódó tarajuk valamivel halványabb színű, patkóalakú köpeny-vonaluk ellenben fekete; hátuk tájéka mindig sötétebb, a pigment pedig olykor-olykor fekete foltokat és pontocskákat hozhat rajtuk létre.

Anatomiai sajátságai közül jellemző a mirigyes függelékek teljes hiánya. Ingerlőteste sem a penisben, sem az atriumban nincsen. A penis és az epiphallus a közepes nagyságú példányokban alig különböztethető meg egymástól, a nagy példányokban azonban mindig fellelhetjük a jól elhatárolódott epiphallust. Penisretractoruk soha sincsen. Rendkivül érdekes a párzótáska alakja; a tartály az összes példányokban aránylag széles és izmos nyélen ül, azonban ez a nyél különböző hosszúságú és alakú s még jobban változik a végtartály alakja, amely egyszer hosszú és karcsú, máskor tojásalakú, néha pedig teljesen gömbölyű és a nyéltől élesen elhatárolódott. Tekintve, hogy a legtöbb esetben a párzótáska formája fontos faji bélyegül szokott szolgálni, a *Milax cavicola* példája nagy figyelmet érdemel. Egyéb anatomiai sajátosságai közül megemlíthetjük a kü-

lönvált oviductus feltűnő hosszúságát; ugyancsak hosszú és vékony a vas deferens is.

Előfordulás. SIMROTH ezt a fajt ABSOLON barlangi gyüjtéséből írta le, azonban az illető barlangok pontos helye mindmáig ösmeretlen; SIMROTH csak ennyit ír erről: „In wenigstens 2 Höhlen (Höhle Jama na Visokoj in Dalmatien?)". Szerencsémre a bécsi múzeumban sikerült egy példányt találnom, amelyet BABOR, nyilván az állat külseje alapján, *Milax dalmatinus*-nak határozott meg, azonban az állat felboncolása után kiderült, hogy az a *Milax cavicola*-val azonos, mert ivarkészüléke mindenben megegyezett a SIMROTH adta leírással. Ez eddig az egyetlen hiteles dalmáciai példány. Lelőhelye a Vitalina melletti barlang, Dél-Dalmáciában; gyüjtötte PAGANETTI 1902-ben.

Tandonia, LESSONA & POLLONERA, Mon. Limac. Ital., p. 54, 1882.

Tagjai nagyon különböző színűek, világosak vagy sötétek, egyszínűek vagy tarkák; talpuk rendszerint halványabb a test alapszínénél, tarajuk a pajzs végétől egészen a farok csúcsáig ér. Ivarszerveik végső részein mindig találunk mirigyes függelékeket, amelyek egyszer egészen kicsinyek, mindössze gombostűfej-nagyságúak, máskor azonban jól fejlett, több csatornával nyíló szervek. Anatomiai tulajdonságaik figyelembevételével bízvást elmondhatjuk, hogy a *Promilax* sectio tagjainál jóval magasabb fejlődési fokozatot értek el és mintegy átmenetet látszanak alkotni a *Lallemantia* sectio felé, ahol a *Milax gagates*, mint a *Milax*-ok legfejlettebb képviselője áll a sectio élén. Az ivarszervekre jellemző mirigyek rendszerint koszoru alakjában veszik körül a vaginát és az atriumot; ingerlőtestük csak egyes fajoknak van.

A *Tandonia* sectio fajainak meghatározó táblázata.

1 (8) Az állat egyszínű, de nem fekete; pajzsán semmiféle rajzot sem találunk 2

2 (5) Az állat háta hússzínű, okkersárga vagy barna 3

3 (4) Az állat hússzínű, okkersárga vagy barna, pajzsa egyszínű; a hát felső és oldalsó részein apró fekete, szögletes foltok vannak; a taraj világos színével élesen kiemelkedik az alapszínből ..... *Milax dalmatinus* SIMR.

4 (3) Az állat barnássárga, felül sötétebb, alul világos, azonban sem nem pontozott, sem nem foltos; taraja néha csak a hát

vége felé fejlődött ki élesen; az ivarszervek járulékos mirigyei apró gombostűfejhez hasonló nyúlványok
Milax hellenicus SIMR[1]

5 (2) Az állat háta többé vagy kevésbbé sötét szürkésbarna 6

6 (7) Az állat hátoldala sötét szürkésbarna, oldala a talp felé fokozatosan egészen okkersárgáig halványodik; a pajzs olyan sötét, mint a hát; a talp középső pásztája kávébarna színű, az oldalsó pászták okkersárgák, mint a test oldalának alsó részei ..... *Milax croaticus* H. WAGN.

7 (6) Az állat hátoldala sötét kékesszürke, oldala a talp felé fokozatosan egészen halványszürkéig halványul; a pajzs sötét színű, a talp egyszínű világossárga; ivarszervének járulékos mirigyei hosszú, keskeny csövek
Milax Adensameri H. WAGN.

8 (1) Az állat egyszínű, tarka vagy fekete; az egyszínű alakok pajzsát rendszerint a jellegzetes patkóalakú rajz dísziti 9

9 (16) Az állat fekete vagy csaknem fekete 10

10 (11) A pitvar mirigycsövei egészen kicsikék, csupán gombostűfej nagyságot érnek el, a párzótáska két oldalán ülnek, azon a ponton, ahol az a rövid pitvarral egyesül
Milax montenegrinus SIMR.

11 (10) A pitvarkörnyéki mirigyek fejlettebbek és más alakúak 12

12 (13) A tulajdonképpeni penis rövid és vastag, a hegyes csúcsban végződő párzótáska nyele a gömbölyü atriumba nyílik, ahová a csőalakú járulékos mirigyek is torkollanak; az állat fekete vagy sötétszürke ..... *Milax Reuleauxi* CLESS.

13 (12) A tulajdonképpeni penis meglehetősen hosszú; a párzótáska nyele a női vezetékbe nyílik 14

14 (15) Az ivarszerv járulékos mirigyei hosszú, keskeny csövek alakjában nyílnak a vaginába, stb. (l. föntebb a 7. alatt)
Milax Adensameri H. WAGN.

15 (14) Az ivarszerv járulékos mirigyei fürtalakúak és az atriumba nyílnak; az állat párzótáskájának tartálya gömbölyded vagy megnyúlt tojásalakú, de sohasem végződik hegyes csúcsban, nyele a petevezetékbe nyílik; epiphallusa hosszabb, mint a penis; a test színe nagyon változó: egészen sötétszürke, majdnem feketének mondható példányok mellett találunk halványszürke és szennyes okkersárga egyedeket is ..... *Milax gracilis* LEYD.

[1] Csupán azért vettem be a határozó kulcsba, hogyha esetleg egészen tarajos példány kerülne elő, akkor is meg lehessen határozni.

16 (9) Az állat soha sem fekete, legföljebb nagyon sötétszürke vagy barna, rendszerint azonban élénk tarka színű ... 17

17 (22) Az állat egyszínű 18

18 (19) A talp középső pásztája kávébarna színű; az állat hátoldala sötét szürkésbarna, stb. (L. föntebb a 6. alatt!) .....
Milax croaticus H. WAGN.

19 (18) A talp pásztái egyszínüek, halványak 20

20 (21) Az állat barnássárga, felül sötétebb, alul világos, stb. (L. föntebb a 4. alatt!) ..... *Milax hellenicus* SIMR.

21 (20) Az állatok hátoldala sötét kékesszürke, oldala a talp felé fokozatosan egészen halványszürkéig halványul; a pajzs sötét színű, stb. (L. föntebb a 7. alatt!)
Milax Adensameri H. WAGN.

22 (17) Az állat tarka 23

23 (24) Az állat pajzsa egyszínű; az ivarszerv járulékos mirigyei még a nagy példányokban is fejletlenek; a testen nincsen hálózatos pigmentáció, alapszíne hússzínű, okkersárga vagy barna, stb. (L. föntebb a 3 alatt!) ... *Milax dalmatinus* SIMR.

24 (23) Az állat pajzsán patkóalakú rajzot találunk; az ivarszerv járulékos mirigyei jól fejlettek; a test alapszínét pigmentfoltok és sávok tarkázzák 25

25 (26) A penis és az epiphallus körülbelül egyforma hosszú; a párzótáska tartálya lándzsaalakú; a test szennyessárga vagy szürkéssárga, különböző nagyságú szürke és fekete foltokkal tarkázott, amelyek egyenetlenül oszlanak el a test felületén ..... *Milax Sowerbyi* FÉR.

26 (25) A penis mindig rövidebb, mint az epiphallus, a párzótáska tartálya sohasem lándzsaalakú 27

27 (28) Az állat nagyobb termetű, alapszíne szürkéslila és pirosas lila között váltakozik, az alapszínt kisebb-nagyobb, rendszertelenül elhelyezett foltok tarkázzák; az epiphallus körülbelül nyolcszor hosszabb, mint a penis, a párzótáska nyele rövid és vastag, tartálya nagyjából tojásalakú
Milax marginatus DRAP.

28 (27) Az állat kisebb termetű, testszíne nagyon változó: mély sötétszürke, majdnem feketének mondható példányok mellet találunk halványszürke és szennyes okkersárga egyéneket is; az epiphallus csak kevéssel hosszabb, mint a penis, párzótáskájának tartálya gömbölyded vagy tojásalakú stb. (l. föntebb a 15 alatt!) ..... *Milax gracilis* LEYD.

6. **Milax (Milax) dalmatinus** SIMR.

Amalia dalmatina SIMROTH, Nachrbl. Deutsch. Mal. Ges., 1900. p. 106.

Az állat színe élénk hússzínű-okkersárga, a fiatal példányoké felül egy kissé sötétszürkébe hajló, a taraj világos színével tűnik ki. A köpeny egyszínű, a köpenycsatorna semmiféle rajzot sem visel. A hát felső és oldalsó részein apró, fekete, szögletes alakú foltokat találunk, amelyek mindig nagyobbak, mint a *Milax marginatus* testfoltjai, azonban ritkábban és elszórtabban fordulnak rajta elő. A faj anatomiája még nem ismeretes, mert még a kb. 5 cm hosszú példányokban sem találjuk meg kifejlődve jellemző szerveiket. Eddig csupán csak Dalmáciából ismerjük. SIMROTH Ragusából származó példányok alapján írta le a fajt, a Bécsben őrzött példányok ugyancsak Ragusából valók; utóbbiakat HOLDHAUS gyüjtötte 1902-ben.

7. **Milax (Milax) croaticus** H. WAGNER (26. rajz).

Milax (Milax) croaticus H. WAGNER, Ann. Mus. Nat. Hung., 26, 1929. p. 333—335, Fig. 3.

Az állat háta egyszínü sötét szürkésbarna, oldalai fokozatosan halványodók és sárgába átmenők. A test köpenyalatti része szintén halványsárga. Az elliptikusan lekerekített köpeny a hátoldalhoz hasonlóan sötét. A taraj a köpeny hátsó felétől a test végéig húzódik, színe a hátéval egyezik meg. A talp pásztáit mély barázdák választják el egymástól; a középső pászta kávébarna színű, míg a szélső pászták okkersárga-szürkések, akárcsak az állat testének az alsó oldala. Anatomiája ismeretlen. Egyetlen példánya (typus) a Magyar Nemzeti Muzeum állattári gyüjteményében van. Ennek a termőhelye a horvátországi Mali Halan a Velebitben, ahol SOÓS LAJOS gyüjtötte. Hossza 4 cm, szélessége 0.9 cm.

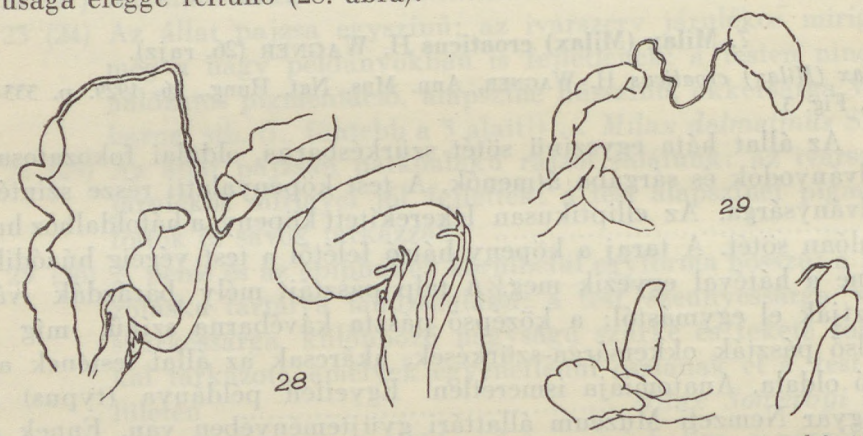
8. **Milax (Milax) Adensameri** H. WAGNER (27. rajz).

Milax (Milax) Adensameri H. WAGNER, Ann. Naturhist. Mus. Wien, 46, 1931, p 62—63, Abb. 6—7.

Az állat nagyon hosszú, karcsú, felül sötét, alul világosabb, a hát felső része egészen fekete, úgyszintén az oldalak is, amelyek csupán csak a talp felé halványodnak meg egy kissé; a pajzs felül egyszínű fekete, patkóalakú bemélyedése jól látható, alsó fele okkersárga. A fej elül sötétszürke, hátrafelé halványodó, a nyaki-, valamint a pajzs alatti részek okkersárga színűek. A taraj csak a farkon fejlődött ki élesen, határozottan, de azért egészen a pajzsig követhető. A talp barázdái nem éppen mélyek, mindazonáltal a talp három részre

való osztottsága élesen, határozottan fejlődött ki. A középső, a szélsőknél jóval szélesebb talppászta egészen halványsárga, az oldalsók egy árnyalattal határozottan sötétebbek.

Az ivarszerv egyes részei közül különösen a kivezető, végső darabok jellemzőek; a penis hatalmas, hengeres csöve előtt hosszabb, de egyúttal vékonyabb epiphallus alakult ki. A párzótáska hosszú, vastag kivezető csövének a végén megnyúlt tojásalakú tartály található. A sokkal vékonyabb oviductus különvált része meglehetősen hosszú; a párzótáska nyelével történt egyesülés után együtt haladnak, ezt az egyesült részt hüvelynek, vaginának hívhatjuk; a vagina középső része táján fejlődtek ki a járulékos mirigyek; a mirigyek egyes csövek alakjában találhatók meg, ezek a vagina oldalán helyezkednek el s váladékukat oda juttatják. A vagina hosszúsága eléggé feltünő (28. ábra).



28. rajz. *Milax Adensameri*, ivarkészülék 29. r. *M. Reuleauxi*, az ivarkészülék egyes részei.

Babor *Aspidoporus limax*-nak determinálta a példányokat, azonban anatomiailag nem vizsgálta meg őket, és így tévedése nagyon is érthető, mert külsőleg alig különböztethetők meg az *Aspidoporus*-tól. A faj typusai a bécsi múzeum malakologiai gyüjteményében vannak.

Méretei.

	Hossza.	Szélessége.	A pajzs hossza.	A pajzs szélessége.
1. példány.	41 mm.	8 mm.	13 mm.	8.5 mm.
2. példány.	44 „	8.5 „	14 „	9 „

A középső talppászta szélessége mindkét példány esetében 2 mm, a szélső pásztáké 1-1 mm volt.

Termőhely: Obrovazzo, Dalmácia (leg. Oberwimmer).

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

9. Milax (Milax) montenegrinus Simroth.

Amalia montenegrina Simroth, Nachrbl. Deutsch. Mal. Ges, 1900, p. 106—107.

Az állat fiatal korában sötét szennyes szürke vagy barnás, a nagyobb példányok sötétebbek. Ezek háta egyszínű fekete, oldalain a színeződés fokozatosan elhalványodik, főleg elül a köpeny alatt, míg a talp egészen halvány és csupán az oldalsó pászták szélei sötétedtek meg egy kissé.

Ivarszerveire jellemző, hogy a pitvar mirigycsövei egészen kicsikék, csak gombostűfej nagyságot érnek el, a párzótáska két oldalán ülnek, azon a tájékon, ahol az a rövid atriummal egyesül. Penise nagyon rövid, epiphallusa egyenletesen hengeres, egyes példányokban megnyúlt, másokban sarlóalakúan meggörbült. A párzótáska hatalmas nagyságot ér el, azonban alakja meglehetősen változó; egyes példányok tartálya gömbölyű, másoké hosszan megnyúlt, néha felül kihegyesedő; a nyele sem egyforma alakú a különböző példányokban és nem egyenlő hosszú: egyszer megnyúlt, alul kiszélesedő és vastagfalú, olykor rövid és orsóalakú, néha pedig nagyon kicsiny és jelentéktelen; nyele az oviductusszal egyesül. A vas deferens különböző hosszúságot érhet el.

Előfordul Montenegróban és Dalmácia déli részein. Simroth typusainak termőhelyei a következők: Cattaro, Zabljak, Rieka, Vir Bazar. A bécsi múzeum példányainak lelőhelyei Boszniában és Olaszországban (?) vannak. Utóbbi előfordulását fenntartással és kellő óvatossággal kell fogadnunk. A boszniai termőhely Celebié, Koinsko polje, ahol Sturany gyüjtötte az állatot.

10. Milax (Milax) Reuleauxi Clessin.

Amalia Reuleauxi Clessin, Mal. Bl. N. F. 9, 1887, p. 46.

Az állat vagy teljesen fekete, vagy kékesfekete, talpa és a köpeny által fedett nyaki része sárgásfehér; némileg a *Milax Robici*-hez hasonlít, amíg azonban a *M. Robici*-nek csak a farka vége tarajos, addig a *Milax Reuleauxi* taraja ha el is laposodik, mindig határozottan a köpenyig ér el. A vastag héj hosszúkás tojásalakú, szélei majdnem párhuzamosan haladnak egymással, eleje és vége lekerített, felül gyengén domború, alul kissé homorú; a jobbra tolódott nucleus nagyon közel esik a szélhez, a növekedési vonalai felül nagyon határozottak. Hossza 7 mm, szélessége 3.5 mm.

Az állkapocs feltűnően gyengén fejlődött, raduláján semmiféle különlegesen jellemző sajátosságot sem találtak; a középső fog háromhegyű, az oldalsó fogak ugyancsak háromhegyűek, a szélsők

közül azoknak, amelyek a közép felé esnek, erős kifejlődésű, kissé sarlóalakúan meggörbült középső fogcsúcsuk és csak gyengén fejlett szélső csúcsuk van, a radula széle felé azután ismét a külső fogcsúcsok jutnak inkább érvényre.

Az állat ivarszerveinek egyes részei közül főleg a végső darabok jellemzőek és ezért fontosak. A nagy, gömbalakú vaginába az oviductus, a párzótáska nyele és a penis nyílik be. A járulékos mirigyek kicsinyek, csőalakúak és az oviductusnak az atriumba való torkolata körül helyezkednek el. A párzótáska végtartálya hegyes csúcsban végződik, vezetéke a pitvarba nyílik. A penis rövid és vastag, epiphallusa sokkal vékonyabb (29. rajz).

Horvátországban és Dalmáciában él. Az irodalom alapján ismert termőhelyei a következők: Cattaro, a Cettina völgye Almissa mellett, a Jadro völgye Salona mellett. A Magyar Nemzeti Múzeum példányainak termőhelyei a következők: Gračac és Jablanac Horvátországban, valamint Cattaro és Almissa Dalmáciában. Az állatokat Horváth, Nussbaumer, Padewieth és Soós gyüjtötték. A bécsi Naturhistorisches Museumban a következő termőhelyekről származó példányokat találtam: Spalato, Almissa, Duare Almissa és Makarska között, Makarska, Brazza szigete, Busi szigete Lissa mellett, Curzola szigete és Cazza szigete Lagosta mellett. Hercegovinában ezeken kívül még Orjen és Baba közelében is gyüjtötték.

A *Milax Reuleauxi*-nak az alábbi egyetlen fajváltozatát irták le.

var. **punctata** Clessin, 1887. *Amalia Reuleauxi* var. *punctata* Clessin. Mal. Bl. N. F. 9, p. 46.

A törzsalaktól színezetében tér el: alapszíne csokoládébarna, hátán részben élesen határolt, részben elmosódott, mélyfekete foltokat, pettyeket hord, amelyek szabálytalanul oszlanak el rajta. Ha felülről nézzük az állatot, rajzolata teljesen a párducéhoz hasonlít. Anatomiája a törzsalakéval egyezik meg. Egyetlen eddig ismert termőhelye az Ombla völgye Ragusa mellett.

11. Milax (Milax) gracilis Leydig. (30. rajz).

Limax gracilis Leydig, Arch. Naturg., 42, 1876, p. 68, T. 12, F. 22.
Amalia budapestensis Hazay, Mal. Bl. N. F. 3, 1881, p. 37, T. 1, F. 1.
Amalia cibiniensis Kimakowicz, Verh. Siebenb. Ver. Naturw., 34. 1884, p. 103.

Az állat kicsiny vagy legfeljebb közepes nagyságot érhet el, színezete rendkívül változó; alapszíne szürke, szennyes okkersárga, szürkéssárga vagy fekete, háta sötétebb, oldalainak a talphoz közel

eső részei világosabbak; a hát felső része szürke, sötétszürke, szürkésfekete vagy egészen fekete, azonban ezt a színt itt-ott szennyessárga foltok tarkítják; feje és tarkója sötétszürke, úgyszintén a köpenye is. Talpa három részre osztott és a jellemző éles határbarázdákat viseli; a talp színe a különböző példányokon különböző árnyalatú szürke, a középső pászta olykor világosabb, olykor azonban ennek ellenkezőjét is láthatjuk. A köpeny hátsó vége lekerekített, a hát egész hosszában tarajos; a pajzs ovalis alakú, vastag, fehér színű, hossza 3, szélessége 2 mm.

A radula középfoga egyhegyű vagy háromhegyű, az oldalsó fogak háromhegyűek, a szélsők kéthegyűek vagy egyszerű áralakúak.

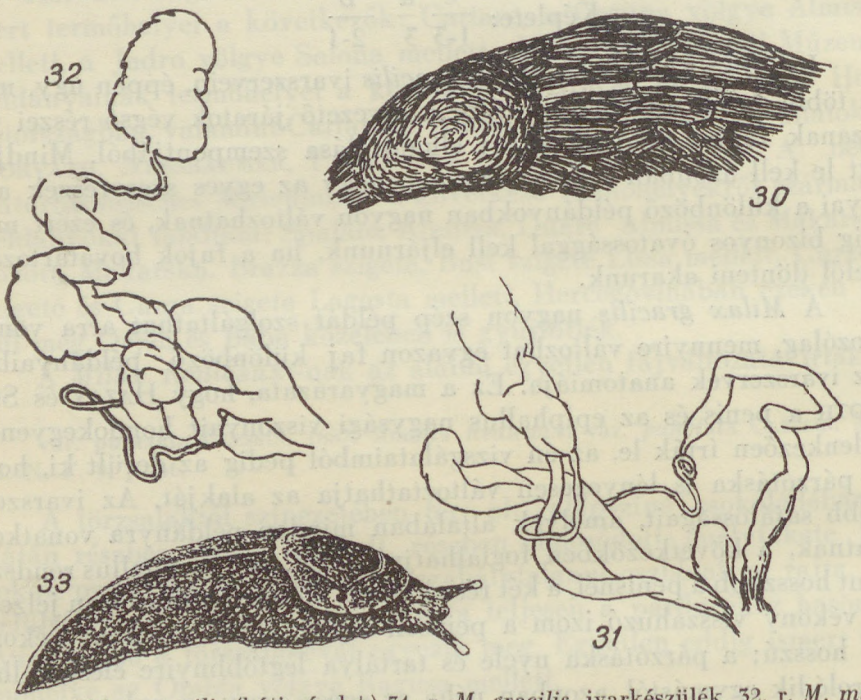
Képlete: $\frac{c}{1\text{-}3}\ \frac{a}{3}\ \frac{b}{2\text{-}1}$

Ivarszervek. A *Milax gracilis* ivarszervein, éppen úgy, mint a többi fajok esetében — főleg a kivezető járatok végső részei játszanak fontos szerepet a faj elhatárolása szempontjából. Mindjárt itt le kell azonban szögeznünk azt, hogy az egyes szervrészek arányai a különböző példányokban nagyon változhatnak, és ezért mindig bizonyos óvatossággal kell eljárnunk, ha a fajok hovatartozása felől dönteni akarunk.

A *Milax gracilis* nagyon szép példát szolgáltathat arra vonatkozólag, mennyire változhat egyazon faj különböző példányaiban az ivarszervek anatomiája. Ez a magyarázata, hogy Hazay és Simroth a penis és az epiphallus nagysági viszonyait homlokegyenest ellenkezően írták le, az én vizsgálataimból pedig az derült ki, hogy a párzótáska is lényegesen változtathatja az alakját. Az ivarszerv főbb sajátosságait, amelyek általában minden példányra vonatkozhatnak, a következőkben foglalhatjuk össze: Az epiphallus rendszerint hosszabb a penisnél, a két rész határa élesen, határozottan jelzett; a vékony visszahuzó izom a penisen tapad, a vas deferens vékony és hosszú; a párzótáska nyele és tartálya legtöbbnyire élesen elhatárolódik egymástól, azonban néha az egész szerv egyenletes vastagságú cső; vastag nyele oldalról a női vezeték végső darabját veszi föl és az így egyesült kettős vezeték az atriumba nyílik. A jól fejlett járulékos mirigyek ugyancsak az atriumba juttatják váladékukat (31. rajz).

Életmód. A *Milax gracilis* a legkisebb *Milax*-fajok egyike; karcsú, meglehetősen gyors mozgású állat. Életmódját a fogságban, mint annyi sok más házatlan csigáét, a legalaposabban Künkel tanulmányozta. A szabadban való életéről még mindig nem tudunk ele-

get. A katalógusok aránylag kevés termőhelyét sorolják fel, azonban bizonyos, hogy szorgalmas keresés révén igen sok új előfordulását ismernénk meg. Budapest egyes részein eléggé sűrün fordul elő, így például a Madártani Intézet környékén és a Zugligetben. Utóbbi helyen egyes kertekben állítólag olyan gyakori, hogy a megfigyelések szerint károssá is válhat. Gozmány D.-né megfigyelései azt igazolják, hogy a *Milax gracilis* a kertekben főleg a föld alatt él és egyes növények gyökereit rágja le. Mint az összes *Milax*-ok éjjeli állat, napközben kövek alatt, deszkák, fadarabok alsófelén és földalatti lyukakban tartózkodik. Néhány helyen az *Agriolimax*-okkal együtt fordul elő, amelyeket a megfigyelések szerint néha meg is támad.



30. rajz. *Milax gracilis* (háti részlet.) 31. r. *M. gracilis*, ivarkészülék. 32. r. *M. marginatus*, ivarkészülék. 33. r. *M. Sowerbyi*.

Földrajzi elterjedés: Dél-Németország, Csehország, Ausztria, Észak-Olaszország, Magyarország, Erdély, Krim-félsziget.

Eddig ismert hazai termőhelyei a következők: Budapest (Kertészeti tanintézet, Gellérthegy, Hűvösvölgy, Zugliget, Disznófő melletti mocsár, Herman Ottó-út, Belváros: Károlyi park, Kaposvár, Mecsek hegység: Mélyvölgy, Trencsén, Nagysalló, Nagyszeben. A pél-

dányokat gyűjtötték: Csiki, Dudich, Gozmány, Kleiner, Soós, Szabó, Vasvári és Wagner.

12. Milax (Milax) marginatus Draparnaud.

Limax marginatus Draparnaud, Hist. Moll. 1805, p. 124, pl. 9, f. 7.

Az állat közepes nagyságot ér el, színe rendszerint pirosas-szürke, fekete pontocskákkal és foltokkal díszitve; az alapszín a taraj közelében sötétebb, az oldalaknak a talp felé eső részein ellenben világosabb, a köpenyen meglehetősen sötét. A köpenyt két vastag, fekete, lyraalakú sáv díszíti. A talp sárgásfehér, három részre osztott, a középső pászta jóval szélesebb a szélsőknél. Idősebb példányok színeződése rendszerint sötétebb. A hát egész hosszában végighúzódó taraj sárgás, rajta semmiféle foltot sem találunk.

Bélcsatornája 4 kanyarulatot ír le, állkapcsa szarubarna színű. A radula középfoga háromhegyű, az oldalsó fogak szintén, a szélsők ellenben csupán kéthegyűek vagy egyhegyű áralakúak. Képlete:

$$\frac{c}{3}\ \frac{a}{3}\ \frac{b}{2\text{-}1}$$

Ivarszervek. A szürkéskék színű hímnősmirigy fehér vezetéke karcsú vesicula seminalisban végződik. A sárga fehérjemirigy számos lebenyből áll, ugyancsak sárga színű az oviductus is, míg a hím vezeték fehér. A párzótáska végtartálya hosszúkás romboid alakú, kivezető csatornája, amely jóval hosszabb, mint a *Milax Sowerbyi*-é az oviductusba nyílik. A hosszú vas deferens igen vékony, az ugyancsak hosszú epiphallus jóval vastagabb; a tulajdonképpeni penishüvely igen rövid, olykor az epiphallus hosszának mindössze $^1/_8$-a, hengeres, vékony falú; a visszahúzó izom vagy a penisen, vagy az epiphalluson tapad. A hím ivarszerv végső része, valamint az oviductus, rövid, vékonyfalú atriumba nyílik. Az atrium felső részén vagy az oviductuson és a párzótáska nyelén számos járulékos mirigycső található; ezek legtöbbnyire barna színűek (32. rajz).

A *Milax marginatus* Közép- és Déleurópában terjedt el; hazai termőhelyei a következők: Kőszeg, Szklenófürdő, Hermánd, Gyömbér, Murányalja, Detonáta és Zara Vecchia Dalmáciában. A gyűjtők: Csiki, Dudich, Soós, Sturany és Szabó-Patay voltak. A faunakatalógus a következő termőhelyeit sorolja fel: Nagyvárad, Kalota, Kőszeg, Pozsony-Szent-György, Detonáta.

13. **Milax (Milax) Sowerbyi** FÉRUSSAC (33. rajz).

Limax Sowerbyi FÉRUSSAC, Hist. Moll. Suppl., 1823, p. 96, pl. 8D, f. 7.

Az állat testének alapszíne sárga, szürkéssárga, izabellasárga vagy szürke, narancsszínű és sárga foltokkal és pettyekkel, amelyek elszórtan terülnek el rajta; hátát és oldalait fekete foltok tarkázzák és teszik sötétebbé, néha pedig hálózatos rajzolatúvá. A jól kiemelkedő, élesen kiugró taraj sárgás színű, a fekete foltokkal behintett és patkóalakú rajzzal díszitett pajzs az egész test hosszának harmadát éri el; a rövid feketés színű tapogatók sárga foltokkal pettyezettek; a halványsárga talp háromosztatú, a középső pászta a legszélesebb; a talp széle sárgásfehér színű. A héj hosszúkás tojásalakú, fehér színű; a nucleus helyzete a fiatal példányokban majdnem medialis és subterminalis, később, a fejlett állatokban mindinkább centralissá válik. A héj hossza 4.5—5.5 mm, szélessége körülbelül 3 mm.

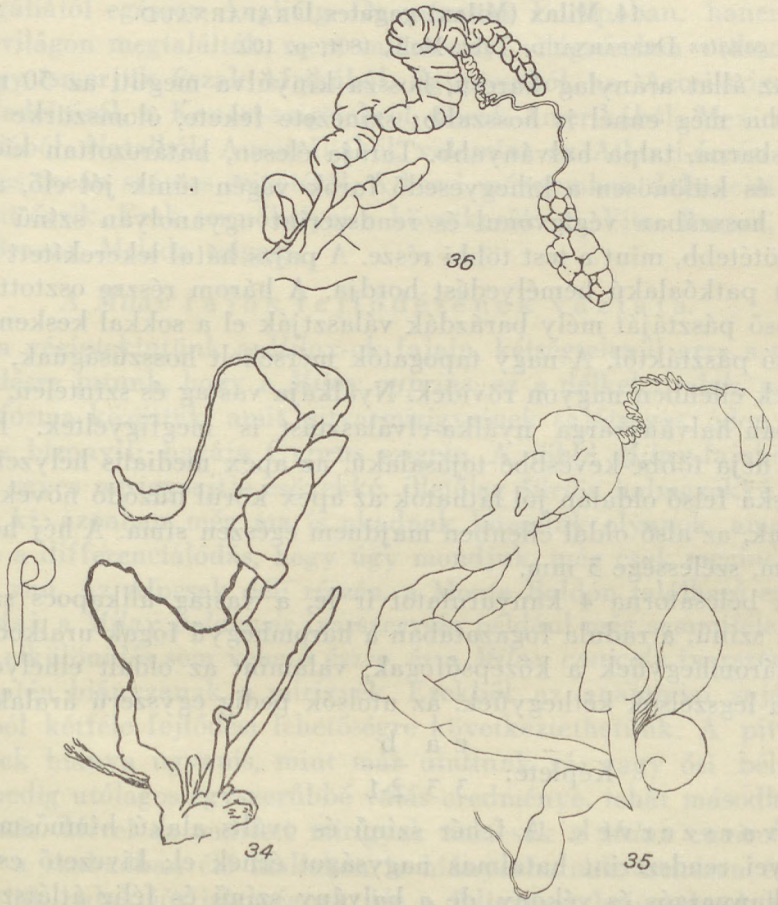
A buccalis massa, valamint az állkapocs sárgásbarna színűek, a középbél-mirigy gesztenyebarna. A radula középső foga és az oldalsó fogak háromhegyűek, a szélsők kéthegyűek vagy egyszerű tövisalakúak. A radula képlete:

$$\frac{c}{3}\ \frac{a}{3}\ \frac{b}{2\text{-}1}$$

I v a r s z e r v e k. A fehér színű hímnősmirigy csövecskéi nagyok és gömbölyűek, a kivezető csatorna feltűnően hosszú, elülső része vékony, második darabja ellenben igen vastag. A hatalmas fehérjemirigy sárgás színű, az oviductus felső része széles, a különvált oviductus ellenben vékony és hússzínű. Bázisán nyílnak a járulékos mirigy kivezető csatornái. A tejfehér színű vas deferens vékony és hosszú, az izmos epiphallust a penistől sphincter választja el; a penis rendszerint vékonyabb és valamivel rövidebb az epiphallusnál, néha azonban a két szerv egyenlő hosszú. (*A Milax marginatus* esetében, mint tudjuk, az epiphallus a penist hosszúságban többszörösen felülmúlja, úgy hogy ezen az alapon a két fajt meglehetősen biztosan elválaszthatjuk egymástól). A visszahúzó izom az epiphalluson tapad. A párzótáska tartálya jóval (kb. háromszor) hosszabb, mint kivezető csatornája, alakja hosszúnyakú üveghez hasonlít, amelynek meglehetősen széles alapja élesen elválik a rövid nyéltől (34. rajz).

Földrajzi elterjedés: Anglia, Franciaország, Németország, Belgium, Svájc, Olaszország, Spanyolország, Portugália, Balkán-félsziget, Ausztria, Oroszország. Horvátországból, Dalmáciából és az északadriai szigetekről a következő helyekről vált ismeretessé: Fiume,

Mali Halan, Palazzuoli, Oriule Grande és Asinello Lussin mellett, Lussinpiccolo, Lussingrande, Obrovazzo, Brazza szigete, Lissa és Busi szigete, Orebic a Sabioncello félszigeten, Cazza Lagosta mellett, Trstenik, Metković, Meleda, az Ombla völgye, Castelnuovo, Cameno és Budua.



34. rajz. *Milax Sowerbyi*, ivarkészülék. 35. r. *M. gagates*, ivarkészülék. 36. r. *Aspidoporus limax*, ivarkészülék.

c) *Lallemantia* MABILLE, Rev. et Magas. Zool. Ser. II, Tome, XX, 1868, p. 143.

Az állat színeződése olyannyira különböző, hogy a világossárgától a feketéig minden árnyalatot megtalálunk a fajok különböző példányain. Nagyon fontos az ivarszerv végső szakaszán kialakult mirigyek jelenléte, amelyek váladékukat finom alkotású csatornákon át juttatják be az atriumba. Ugyancsak az atriumban találjuk meg a szarvalakú, húsos, szemölcsös ingerlőtestet is. Egészen bizonyos,

hogy a *Milax*-ok legfejlettebb tagjai tartoznak ide, közöttük a legfontosabb a *Milax gagates*, ez a rendkívül változó színezetű, mesze elterjedt faj. Pitvarmirigyeinek alkotását is figyelembe véve, bízvást elmondhatjuk, hogy ebben a csoportban a legelőrehaladottabb állapotot érte el.

14. Milax (Milax) gagates DRAPARNAUD.

Limax gagates DRAPARNAUD, Tabl. Moll., 1801, p. 100.

Az állat aránylag karcsú, hossza kinyúlva megüti az 50 mm-t, de néha még ennél is hosszabb; színezete fekete, ólomszürke vagy sárgásbarna, talpa halványabb. Taraja élesen, határozottan kiemelkedő, és különösen a kihegyesedő farok végén tűnik jól elő, a hát egész hosszában végigvonul és rendszerint ugyanolyan színű vagy még sötétebb, mint a test többi része. A pajzs hátul lekerekített és az ismert patkóalakú bemélyedést hordja. A három részre osztott talp középső pásztáját mély barázdák választják el a sokkal keskenyebb oldalsó pásztáktól. A nagy tapogatók mérsékelt hosszúságúak, a kicsinyek ellenben nagyon rövidek. Nyálkája vastag és színtelen, néha azonban halványsárga nyálka-elválasztást is megfigyeltek. Fehér színű héja többé-kevésbbé tojásalakú, az apex medialis helyzetű. A héjacska felső oldalán jól láthatók az apex körül húzódó növekedési vonalak, az alsó oldal ellenben majdnem egészen síma. A héj hossza 4.5 mm, szélessége 3 mm.

A bélcsatorna 4 kanyarulatot ír le, a vastag állkapocs szarubarna színű, a radula fogazatában a háromhegyű fogak uralkodnak. Így háromhegyűek a középsőfogak, valamint az oldalt elhelyezkedők, a legszélsők kéthegyűek, az utolsók pedig egyszerü áralakuak.

Képlete: $\frac{c}{3}\,\frac{a}{3}\,\frac{b}{2\text{-}1}$

Ivarszervek. A fehér színű és ovális alakú hímnősmirigy lebenyei rendszerint hatalmas nagyságot érnek el; kivezető csatornája kanyargós és vékony, de a halvány színű és félig átlátszó fehérjemirigy közelében tetemesen megvastagszik. A hím vezeték tejfehér színű, az oviductus félig átlátszó, a különvált oviductus majdnem teljesen hengeres, a vas deferens nagyon rövid. A penis és a nálánál sokkal hosszabb epiphallus határát sphincter jelzi. A retractor az epiphallus közepe alatt tapad. A párzótáska hatalmas, gömbalakú tartályból és vastag, izmos nyélből áll. Ahol a női vezeték az atriumba nyílik, ott hatalmas, levél alakú mirigyek hosszú kivezető csatornái is betorkollanak az ivarkészülék végső szakaszába. Ezek a mirigyek inkább lemezes kifejlődésűek mintsem csövesek, és szinte azt mond

hatnók, hogy a nyálkamirigyekhez hasonlítanak. Az atriumban ingerlőtest fejlődött ki, amely hegyével nyugalmi állapotban a penis felé fordul (35. ábra).

Földrajzi elterjedés. A *Milax gagates* főleg a Földközi-tenger környéki országokban terjedt el, valamint az Atlanti-óceán partján, Portugáliától egészen Angliáig. De nemcsak Európában, hanem az egész világon megtalálták, mert valamennyi világrészben otthonossá lett. Így ismerjük Észak-Afrikából, Egyptomból, az Azori-szigetekről, Madeiráról, a Kanári-szigetekről, Észak-Amerikából, Mexicoból, Braziliából, Natalból, Ausztráliából, valamint az Atlanti-óceán és a Csendes-óceán számos szigetéről. A bécsi múzeumban dalmáciai példányait őrzik. Ezek termőhelyei a következők: S. Vito: Brazza, Neresi: Brazza, Meleda szigete.

A *Milax* fajok fejlődésének vázlata.

Ha végigtekintünk a *Milax*-ok fajain, kétségtelenül arra a meggyőződésre jutunk, hogy a *Milax cyprius*, ez a délkeleti alak, a legősibb forma közöttük, amit pitvarmirigyeinek sajátságos, ódon szabása is bizonyít; hazája Cyprus szigete. A többi *Milax*-fajokon a pitvar egyes mirigysejtje csövekké, illetőleg fürtös halmazokká fejlődtek ki, azonban még ma is akadnak közöttük olyanok, amelyeken ez a differenciálódás, hogy úgy mondjuk, még csak megindulófélben van. Az Alpesek déli részén, a Monte Baldón található egyik *Milax*-faj, a *Milax baldensis* ivarszervein például még semmiféle mirigyes elkülönülés sem vehető észre, és a *Milax cavicola* ivarszerveiről szintén hiányzanak a mirigyek. Ezekből az anatomiai sajátosságokból kétféle fejlődési lehetőségre következtethetünk. A pitvarmirigyek hiánya ugyanis, mint már utaltunk rá, vagy ősi bélyeg, vagy pedig utólagos egyszerűbbé válás eredménye, tehát másodlagos elváltozás. Mivel az említett mirigyek nemcsak a *Milax cavicola*-n, hanem a szabadban élő alakokon is hiányozhatnak, nehezen értelmezhetjük redukciós jelenségnek. Ha a feltevések helyeseknek bizonyulnak, akkor sokkal valószínűbbnek kell tartanunk azt, hogy ez az állapot — *Promilax* — az ősi.

A *Promilax* sectio tagjai után következnek a rendszerben azok az aránylag kicsi mirigyes függelékeket viselő alakok, formák, amelyeket csaknem egyenlő joggal és egyenlő elbánással lehetne akár a *Subamalia*, akár a *Milax* s. str. subgenusokba sorolni, tehát azok, amelyeknek a morphologiájában és anatomiájában még semmiféle fontos speciális sajátosságot nem találunk, illetőleg amelyeknek egyes szervei törzsfejlődéstani értelemben még nem fejlődtek ki teljesen.

még nem alakultak ki élesen, határozottan egyik irányban sem. Utánuk kell felsorolnunk a *Milax* fajok ősibb alnemét, a *Subamalia* subgenust; az ebbe a csoportba tartozó fajokra főleg a következő sajátosságok jellemzőek: színük leginkább fekete, mirigyes függelékeik nem túlságosan fejlettek, és legtöbbnyire az oviductusba nyíló bursa copulatrixot viselnek.

Ezek után következnek a *Milax* alnem typikus holocarinata képviselői. Legfejlettebb tagjuk kétségen kívül a *Milax gagates*, ez a rendkívül változó színezetű, messze elterjedt faj. Egészen különleges helyzetet foglal el a csoportban a *Milax jablanacensis*, ez a hatalmas párzótáskával jellemzett horvátországi alak, amely a nagy kiterjedésű és számos fajt magába foglaló mediterrán *Milax* törzsnek egyik oldalsó ágaként fogható fel.

A *Milax* fajok földrajzi elterjedése.

A *Milax* genus fajainak fő elterjedési területe mindenütt a tenger mellékére esik, ahol rendkívül sokféle alakot és formát öltve élnek ezek a pompás színezetű házatlan csigáink. Közülük a *Milax Sowerbyi* nemcsak a Balkán-félsziget tengerparti országaiban található meg, hanem számos lokális variációra hasadozva előfordul a Földközi-tenger majdnem valamennyi országában; már Kelet-Ruméliában is fellelhetjük és a tengerpartok mentén egészen Angliáig nyomul előre. Az Adria mentén Fiumétól kezdődőleg mindenütt megtalálható egészen Dalmácia legdélibb csúcsáig, a dalmát szigeteken is előfordul s feltehető, hogy a szárazföld belsejébe hatolva, egész Dalmáciát lakja.

Az általános elterjedést tekintve, hasonlít hozzá a *Milax gagates* esete. Ez a faj szintén a Földközi-tenger melléki országokban él és főleg a tengerpartok környékén terjedt el; azok a tudósítások, amelyek a *Milax gagates*-t a szárazföld belsejéből jelentik, rendkívül gyanusak, mivel ma már tudjuk, hogy ennek a legfejlettebb *Milax*-fajunknak az elterjedése a tenger környékére szorítkozik. Az Adria keleti vidékéről eddig csak Brazza és Meleda szigetéről ismeretes. A többi déli fajok közül nagyobb elterjedtségű a *Milax Reuleauxi*, a *Milax montenegrinus* és a *Milax hellenicus*.

Ezek közül az első faj szétszórtan valószínüleg egész Dalmáciában előfordul, de Hercegovina néhány pontján is megtalálták; a *Milax montenegrinus* Boszniában, Montenegróban és Dél-Dalmácia területén él, a *Milax hellenicus* pedig Görögországon kívül Ragusában is megtalálható (!), és így nem valószínütlen, hogy a ten-

gerpart mentén Görögországtól egészen a dalmát partokig mindenütt el van terjedve. Mivel nem gyakori állat, könnyen lehetséges, hogy a közbülső területeken a gyűjtők figyelmét mindmáig elkerülte. A többi alakok előfordulása jelenlegi ismereteink alapján csak egyes országok egészen kis területrészeire vagy egyes hegységek néhány pontjára szoritkozik csupán, és némelyikük anatomiai variabilitása joggal keltheti azt a látszatot, mintha náluk récens, még napjainkban is tartó, illetőleg továbbhaladó fajképződés lenne teljes folyamatban. Erősen korlátolt elterjedésű fajok minden valószínűség szerint a *Milax cavicola, Milax Adensameri, Milax croaticus, Milax jablanacensis, Milax dalmatinus, Milax Fejérváryi,* az Albániában élő *Milax albanicus* és *Milax adelphus,* a szerbiai *Milax serbicus* és *Milax Kuščeri,* a Taygetosból előkerült *Milax taygeticus, Milax athenensis, Milax scyrius.*

A *Milax Robici,* amely eddig csak Krajnából volt ismeretes, a Plitvicei-tavak környékéről is megkerült; feltehető, hogy a Keleti-Alpok nyúlványain keresztül terjedt át kelet felé, és valószínű, hogy azokban még más helyeken is előfordul.

A legismertebb fajok egyike, a *Milax gracilis* elterjedése nem szorítkozik a tengerpartra; valószínűleg Magyarország egész területén él, északon és délen egyaránt. Míg fönt a Kárpátokba nyúlik be elterjedése, addig délen az Adria országaiba hatol le, magam Padovában is megtaláltam, Keleten pedig Erdélyen át a Krimi-félszigetig nyomul előre. Hasonló, bár talán nem oly széles a *Milax marginatus* földrajzi kiterjedése; ez a faj szintén főleg Déleurópát lakja, míg északon a Harz-hegységig ér el.

Nem: **Aspidoporus** Fitzinger, 1833.

Aspidoporus Fitzinger, System. Verz. oesterr. Weichtiere, 1833, p. 90.

Az állat a *Milax*-okhoz hasonlít, azonban a köpenyében, közvetlenül annak hátsó széle előtt, hosszúkás nyílást találunk, amely a *Milax*-fajokon nincsen meg. Nyálkája szívós anyagú és színtelen. Állkapcsán hiányzik a középső kiugrás, bélcsatornája a szokottól eltérő módon csavarodott fel és 6 kanyarulatot ír le.

Ivarszerveire jellemző, hogy az atriuma oldalsó kitüremléseket bocsát a test felületére, azonban járulékos mirigyek sohasem fejlődnek ki rajtuk.

Földrajzi elterjedés: A bécsi „Wiener Wald", Stájerország, Tirol, Krajna, Dalmácia, Hercegovina, Montenegro.

A nemnek ezideig csak az alábbi faja ismeretes.

1. Aspidoporus limax Fitzinger.

Aspidoporus limax Fitzinger, Syst. Verz. Oest. Weichtiere, 1833, p. 90.

Az állat kb. 6 cm hosszúra nő meg, szélessége 5—6, magassága 10 mm-t ér el. Általában egészen *Milax*-szerű külseje van; szájnyílása háromszögalakú, tapogatópárjai meglehetősen rövidek és vastagok, feketén foltozottak, feje felső része feketés színű, tarkója majdnem síma, sárgásfehér. Tojásalakú pajzsa hátul kiszélesedő, elül megkeskenyedő, felületén élesen bevágódott patkóalakú barázdával. Pajzsa hátulsó széle vagy gyengén beöblösödő, vagy — és ez a gyakoribb eset — két barázda által határolt, rövid, de széles, a dorsalis falba mélyen benyomódott lemezkét visel; utóbbi esetben a köpenyen másféle skulpturát nem találunk, míg az első, jóval ritkább esetben, a pajzs hátulsó szélének a közvetlen közelében egy keskeny, karcszerű nyílás alakult ki, amely a héjzacskóba vezet. A háton hosszúkás-négyszögalakú, alacsony, meglehetősen nagy mezőcskék találhatók; a taraj, amely a farok táján élesen kiemelkedő, a nyak közelében meglehetősen ellaposodik, de azért rendszerint a pajzsig ér. A farok vége meglehetősen kihegyezett. Az állat színe a köpenyen és a háton sötétkék, néha majdnem egészen fekete, az oldalakon szürke, a nyálka sűrű, szívós és szintelen. A széles fehér talp három részre osztott. A bőr meglehetősen durva, vastag.

A kicsi héj keskeny, hosszúkás alakú, eléggé vastag, felületén jól látható növekedési vonalakat visel.

A kicsiny állkapocs meglehetősen vastag, pirosas színű, a radula középfoga háromhegyű, az oldalsók ugyancsak háromhegyűek, a szélsők egy- és kéthegyűek. A bélcsatorna 6 kanyarulatot ír le.

Ivarszerveinek (36. rajz) különböző részei közül itt főleg a kivezetőjárat végső részei tarthatnak számot érdeklődésünkre, mert a szervrendszer többi része nagyjából a *Milax*-okéval egyezik meg. Az oviductus különvált része hosszú, keskeny és vékonyfalú; a vas deferens ugyancsak hosszú, finom alkotású és hengeres, az epiphallus izmos és vastag; a penis és a csak valamivel vékonyabb epiphallus határán tapad a visszahúzóizom. A párzótáska tartálya nagyjából körtealakú; hengeres, egyszer hosszabb, másszor rövidebb nyele az atriumba nyílik. Járulékos mirigyek az ivarszerven nem fejlődtek ki; ezeket valószínüleg az atrium belső mirigysejtekben gazdag laterialis kitüremlései pótolják.

A bécsi Múzeum példányainak termőhelyei a következők: Spalato-Clissa (Werner), Salona (Werner), Cameno, Castelnuovo mellett (Paganetti), Castelnuovo (Holdhaus).

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS ZOOLOGICA.

ÜBER PALAEARKTISCHE SYRPHIDEN. I.

Von Z. Szilády (Budapest).

P. Sack's umfangreiche Arbeit, „31. Syrphidae" in Lindner „Fliegen" (1932) lieferte ein fruchtbares Mittel zur Förderung unserer Kenntnisse über diese formenreiche Gruppe der Dipteren. Zur Ergänzung und Weiterentwicklung seiner übersichtlichen Tabellen und Beschreibungen erlaube ich mir folgende Angaben anzuführen.

In der Tabelle der Unterfamilien bemerkt man einige Fehler.

1. Die Unterscheidung bei 1. (Seite 5) paßt nicht auf alle Familien; auf der Seite 13. steht nämlich unter 11. „r-m vor der Mitte von M2". Die später unter 12 angeführten acht Gattungen der Milesiinen kommen also in der Tabelle der Subfamilien zu 2. und nicht zu 10.

2. Die Entscheidung bei 3. ist auch nur mit Berücksichtigung der Ausnahmsfälle gültig; bei *Paragus* kommen nämlich Arten ohne gelbe Zeichnung vor.

Unter 13. (Seite 6) steht Arctophilinae anstatt Cinxiinae, wie die 13. Subfamilie auf S. 11 genannt wird.

Auf S. 10, oben in der 1. Reihe soll nach „schwarz" ein „oder" eingefügt werden und ebenda anstatt Hinterschenkel Hinterschienen gelesen werden.

Die Textfiguren 34 und 35 sind nicht richtig.

Pipiza Fall.

Unter *Pipiza festiva* Mg. kommt in Ungarn eine kleinere Varietät, meist unter 9 mm mit rotem 2. Fühlerglied vor. Diese benenne ich als v. *zonata* n. var.

Pipiza, Heringia und Cnemodon.

Die Merkmale von *Heringia* oder *Pipizella* sind nicht konstant. Die Länge des 3. Fühlergliedes ist bei *Pipiza* ebenso wie bei *Heringia* äußerst veränderlich. Der bei *Pipiza* als charakteristisch bezeichnete spitze Oberwinkel vom R_5 ist auch bei einer großen Gruppe von Heringien vorhanden.

Cnemodon Egg. gehört aus ähnlichen Gründen ebenfalls zu *Pipiza*. Das einzige Gattungsmerkmal, die Anwesenheit des Coxaldornes unterscheidet nur die Männchen. Ein zugespitzter Hinterleib kommt ja bei den Weibchen mancher Heringien, z. B. *Heringia curvinervis* ebenfalls vor.

Die bei Rondani angegebene Unterscheidung auf Grund der Aderverzweigung ist unhaltbar.

Nach einer kritischen Betrachtung all' dieser Schwierigkeiten finde ich derzeit keine bessere Lösung der Frage, als die Vereinigung von *Heringia* und *Cnemodon* mit *Pipiza* Fall. und die Wiederherstellung der alten Gattung im Sinne Fallen's. Oder man könnte eventuell die rechtwinkelige Endigung der Spitzenquerader als Gattungsunterschied für *Heringia* annehmen. Dann würde aber *H. curvinervis* Strobl. und *H. Heringi* Zett. auf Grund ihrer schiefen Spitzenquerader zu *Pipiza* gehören.

Chrysogaster Mg.

Die zweite Gruppe Sack's enthält nicht nur metallisch-schwarze, sondern auch dunkel-bronzefarbene und sogar blauschwarze Arten.

C. solstitialis ist eigentlich immer bronzegrün, nur bei frischen Exemplaren am Mittelrücken durch die schwarze Bereifung mattschwarz.

C. chalybeata Mg. ist mit Ausnahme der schwarzbereiften Teile des Rückens blauschwarz, ihr Hinterleib ist oft schwarz und der Mittelrücken hinter der Quernaht bronzegrün. In Mittel- und besonders Nordeuropa, z. B. in Finnland, kommen dunklere oder ganz schwarze Tiere vor: ab. *nigricans* m. Im Süden sind dagegen die Exemplare oft blauschwärzlich oder sogar blauschwarz. So erhielt z. B. unser Museum aus Tunis eine Reihe grell violettblauer Fliegen, — ich benenne sie ab. *azurea* m., — nur zwei ♂ und ein ♀ waren darunter dunkler. u. zw. z. T. schwarzgrün und oben schwarz bereift.

Die schwarze, rußähnliche Bereifung nimmt bei verschiedenen Arten dieser Gattung den vorderen Teil des Mittelrückens und die Mitte des Hinterleibsrückens ein. Die Hinterleibstergite sind matt, immer anders gefärbt, als die Seiten und bei frischen Exemplaren schwarz bereift. Dadurch entwickelt sich eine scharf begrenzte, oft vertiefte Fläche, die ich als wärmespeicherndes, thermoskopisches Organ bezeichnen möchte. Ähnlich gebildete, schwarze Flächen konnte ich schon früher bei Tabaniden und zwar

bei der Untergattung *Lophotabanus* Szil. aus Südamerika feststellen (Biol. Hung. 1926. VII. 25).

Die schwarze Bereifung dieser thermoskopischen Organe, sowie die des Mittelrückens ist bei den nicht schwarzen *Chrysogaster*-Arten, sowie bei manchen Orthoneuren, wo sie ebenfalls vorkommt, immer hinfällig, so daß diese Veränderung öfters Veranlassung zu kontradiktorischen Farbenangaben der Autoren gab.

Die Gattung *Liogaster* wurde hauptsächlich auf das Fehlen dieser Organe am Hinterleibe hin aufgestellt.

Orthoneura Mcq., **Liogaster** Rond. und **Chrysogaster** Mg.

Die Unterscheidung dieser Genera ist bei P. Sack gänzlich falsch.

Man bestimmt z. B. *Liogaster splendida* ♀ nach seiner Tabelle als *Chrysogaster insignis* Lw. Ich erhielt nämlich Pärchen von *L. splendida* aus Kleinasien, aus Turkestan und aus Tihany (Ungarn) bei denen die ♀♀ überall an ihrem Hinterleibsrücken violett gefärbt sind. Da sie ein kleines, oblong-ovales Endglied am Fühler besitzen (Fühlerdimorphismus), sollten sie nach der Tabelle jedenfalls zu *Chrysogaster* kommen. *L. splendida* ♀ mit gleichfarbigem Hinterleibsrücken gibt es überhaupt nicht, ich fand wenigstens unter unserem reichlichen Material kein einziges.

Bei der Tabelle dieser Genera hat P. Sack den Ausgangspunkt nicht richtig gefunden. Er wählte als Grundlage den veränderlichsten, sogar fast bei jeder einzelnen Art anders gebildeten Teil, das 3. Fühlerglied. Die Größe und Länge dieses Gliedes stellt kein Gattungsmerkmal dar und so muß die Tabelle der genannten Genera, die bei Verrall (1901. VIII. 188.) schon einmal besser angegeben war, hier als völlig verunglückt bezeichnet werden.

Nach Sack wäre z. B. *longicornis* Lw. mit seinen langen Fühlern eine *Orthoneura,* obwohl sie nach ihrer schiefen Spitzenquerader zweifelsohne nicht „ortho-neura", sondern nur eine *Chrysogaster* sein kann. *Ch. brevicornis* wurde aber einmal schon ganz richtig als recurrens benannt und ist nach ihrer Aderverzweigung sicher nicht *Chrysogaster,* sondern *Orthoneura.*

Die geringe Zahl der neubeschriebenen Arten Sack's (2) zeigt uns, daß die Bearbeitung ohne Berücksichtigung des Materials grösserer Sammlungen und oft auch ohne Kenntnis der Typen, also bloß als Papierarbeit verfaßt wurde. Wo bleibt da die berühmte „Gründlichkeit", wenn eine Syrphidenmonographie ohne Kenntnis

von VERRALL und von KERTÉSZ's Katalog geschrieben werden konnte?

Liogaster virgo ROND., *Chrysogaster aenea* MG., *aerosa* LW., *basalis* LW., *hirtella* LW., *inornata* LW., *nubila* ROND. und *virescens* LW. sucht man bei SACK vergeblich, oder sind diese nur Synonyma? Wann und wo wurden sie synonymiert?

Alle drei Gattungen bedürfen also einer gründlicheren Neubearbeitung. Vorläufig beschränke ich mich auf folgende Unterscheidung, die mir derzeit als einzig mögliche erscheint:

1 Spitzenquerader senkrecht oder rücklaufend: ... *Orthoneura* MCQ.
„ schief, geschwungen, mit dem Flügelhinterrand parallel 2

2 Augen des ♂ weit getrennt: ..... *Liogaster* ROND.
„ „ ♂ zusammenstossend: ..... *Chrysogaster* MG.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1935.
PARS BOTANICA.

REVISIO TYPORUM AB AUCTORIBUS VARIIS DESCRIPTORUM. I.

Auctore V. Kőfaragó-Gyelnik (Budapest).

Beobachtungen gelegentlich der Revision von Originalexemplaren gewonnen.

Typus = das Exemplar, welches als Grundlage bei der Originalbeschreibung einer neuen systematischen Einheit diente. Man nennt es auch spec. orig.

Cotypus = eine Pflanze (Art, Varietät oder Form), welche vom Autor — welcher diese systematische Einheit beschrieben hat — als mit dem Original identisch bestimmt wurde. Man nennt es auch spec. authent., obzwar es nicht immer authentisch ist.

herb. Ach. = Herbarium Acharianum. Botanisches Museum der Universität Helsinki, Unioninkatu 44.

herb. Nyl. = Nylander's Herbarium im Botanischen Museum der Universität Helsinki, Unioninkatu 44.

herb. Müll. Arg. = Herbarium Müller Argoviensis. Institut botanique de l'Université de Genève.

herb. Vain. = Herbarium Vainio (antea Wainio). Botanisches Institut der finnischen Universität Turku, Finnland.

herb. B. de Lesd. = Privatherbarium M. Bouly De Lesdain. Dunkerque. Rue Emmery 16.

herb. Servit. = Privatherbar M. Servit. C.S.R. Horice v. Podkrkonosi.

herb. acad. Leningrad = Botanisches Institut der Akademie der Wissenschaften Leningrad, 22, Pessotschnaja ½.

herb. univ. Uppsala = Botaniska Institutionen Uppsala, Universitet.

mus. Paris = Musée botanique, Laboratoire cryptogamique. Paris V, 63. rue de Buffon.

mus. Wien = Botanische Abteilung des Naturhistorischen Museums Wien, Burgring 7.

mus. Budapest = Museum Botanicum Budapest, V. Akadémia-utca 2.

1. **Alectoria acanthodes** Hue in Nouv. Archiv. du Muséum ser. 4. vol. I. 1899. p. 89. — Der Typus liegt im herb. mus. Paris. Der Originalwortlaut der Etikette lautet: „Herb. Mus. Paris *Alectoria acanthodes* Hue. Legit. R. P. Faurie, Jen tze hay, Chine, Yun nan. 31 juillet 1888."

Thallus erectus, fuscus vel subniger, 4—6 cm longus, bene lacunosus, esorediosus, opacus, pseudocyphellis deficientibus, ramulis divaricatis rectangulis, usque ad 3—4 mm longis instructus, K —, C —, KC —. Apothecia terminalia, eciliata, calcarata.

Nomenklatur: Identisch mit *Alectoria divergescens* Nyl. sec. typo.

2. **Alectoria divergescens** Nyl. in Flora, LXIX. 1886. p. 466. — Der Typus liegt im herb. Nyl., no. 35972. Der Originalwortlaut der Etikette lautet: „*Alectoria divergescens* Nyl. in Hue L. Yunnan. p. 20. Fret. Behr. p. 75. In monte Tsang-chan supra Ta-li, 4000 Th. K(CaCl) —. Delavay."

Thallus erectus, omnino fuscus vel subniger, 10—15 mm longus, bene lacunosus (ut in *Alectoria sulcata*), esorediosus, opacus, pseudocyphellis deficientibus, ramulis secundariis et tertii ordinis rectangulis, cca. 0.5—2 mm longis instructus, K —, C —, KC —, J —. Apothecia terminalia, eciliata, calcarata. — Similis Alectoriae bicolori (Ehrh.) Nyl. sed thallus omnino fuscus vel subniger et lacunosus, etc. — Similis Alectoriae nitidulae (Th. Fr.) Vain. sed thallus opacus, lacunosus, etc. — Ab Alectoria oregana Tuck. differt thallo omnino fusco vel subnigro, lacunoso et apotheciis eciliatis, etc.

3. **Alectoria implexa** var. **subprolixa** Nyl. in Meddel. Soc. Faun. et Flor. Fenn. I. 1876. p. 14 (Nomen und.); Stizenb. in Annal. Naturhist. Hofmus. Wien. VII. 1892. p. 131. — Der Typus liegt im herb. Nyl. no. 35889. Der Originalwortlaut der Etikette lautet: „35889. *subprolixa* Nyl. *subprolixa*. Petrosavodsk, leg. W. Nyl.?"

Thallus pendulus, elongatus, capillaris, fuscus, K + flavescens, KC —, ramis cylindricis, tenuibus, sat levibus, opacis, ramulis divaricatis deficientibus, sparse sorediosis, sorediis lateralibus, maculatis, granuloso-pulverulentis, albis. Pseudocyphellae desunt. Sterilis. — Similis Alectoriae jubatae (L.) Ach. var. prolixae Ach. sed thallus K + flavescens (non K —).

Nomenklatur: Diese Pflanze ist in jeder Hinsicht mit *Alectoria fuscescens* Gyel. var. *albosorediosa* Gyel. identisch.

4. **Alectoria intricata** Hue Lichens in Deux. Expédit. Antarct. Franc. 1915. p. 41. — Der Typus liegt im mus. Paris. Der Original-

wortlaut der Etikette lautet: „269. *Alectoria intricata* H. Legit M. GAIN sur les rochers Petite Isle dans la baie Marguerite. XVe Excursion, n. 269 le 27.1.9."

Thallus brevis, cca. 10 mm longus, K —, C —, KC —, ad basin niger, in partibus ceteris fuscus, substrato decumbens, caespitem compactum formans, subnitidus, ramulis divaricatis brevibus et tenuibus dense instructus, ramis inaequaliter cylindricis. Sterilis. — Similis Alectoriae bicolori (EHRH.) NYL. sed thallus substrato decumbens, caespitem compactum formans.

Nomenklatur: *Alectoria bicolor* var. *intricata* (*Alectoria intricata* HUE l. c.) GYELNIK n. comb.

5. **Alectoria jubata** var. **subcana** NYL. apud CROMB. in Journ. of Bot. XIV. 1876. p. 360. — Einen Cotypus habe ich vom herb. NYL. (no. 35833) erhalten. Der Originalwortlaut der Etikette lautet: „H. LOJKA. Lich. Hung. exs. (ined.) no. 331. ad int. *Alectoria jubata* f. *subcana* NYL. Fertilis. Supra ramulos Abietis excelsae vallis Ticha dolina prope Podbánszko com. Liptó in Hung. (Tátra). LOJKA."

Thallus pendulus, osteolo-griseus, cylindricus, levis, sorediosus, sorediis albis, maculiformibus, lateralibus, granuloso-pulverulentis, elacunosus, K —, KC —, C —, pseudocyphellis deficientibus, ramulis secundariis nullis. Apothecia lateralia, eciliata.

6. **Alectoria lactinea** NYL. Lich. Japon. 1890. p. 23. — Der Typus liegt im herb. NYL., no. 35882. Der Originalwortlaut der Etikette lautet: „K —. K(CaCl) =. *Al. lactinea* NYL. Japonia. Itjigome (Vega). E. ALMQUIST, 1879."

Thallus pendulus, partim osteolo-albus, partim osteolo-griseus, 9—11 cm longus, cylindricus, levis, esorediosus, elacunosus, K —, KC —, C —, J —, pseudocyphellis deficientibus, ramulis secundariis numerosis, 0.25—5 mm longis, rectangulis vel subrectangulis instructus, sat opacus. Apothecia eciliata. Medulla alba, K —, KC —, C —, J —. — Similis Alectoriae subacharianae GYEL. sed thallus ramulis secundariis dense instructus. — Similis Alectoriae subcanae (NYL.) GYEL. (in Nyt Magaz. for Naturw. LXX. 1932. p. 50) sed thallus esorediosus et ramulis secundariis instructus. — Ab Alectoria jubata (L.) ACH. differt thallo esoredioso, osteolo et ramulis secundariis instructo. — Ab Alectoria implexa (HOFFM.) RÖHL differt thallo osteolo, ramulis secundariis instructo et KC —, et K —, etc.

7. **Alectoria nidulifera** NORRL. apud NYL. in Flora, LVIII. 1875. p. 8. — Der Typus liegt im herb. NYL. no. 35879. Der Originalwort-

laut der Etikette lautet: „*Alectoria nidulifera* NORRL. Tavastia." In der Kapsel No. 35879 befindet sich eine kleinere Kapsel, welche einen Cotypus der *Alectoria nidulifera* NORRL. enthält, der mit dem Typus vollkommen übereinstimmt. Der Originalwortlaut der Etikette des Cotypus lautet: „181. *Alectoria jubata* var. *sorediata* (fertilis in specim. M. F.) c. sorediis proliferis. Korpilahti, super corticem pini. E. LANG. 1873."

Die Beschreibung des Typus ist die folgende: Thallus erectus, olivaceo-fuscus, nitidus, 2—3 cm longus, cylindricus, levis, elacunosus, K —, KC —, C —, pseudocyphellis deficientibus, ramulis divaricatis numerosis, non rectangulis, 0.25—2 mm longis instructus, dense sorediosus, sorediis lateralibus, maculiformibus, albis, isidialibus. — Similis omnino Alectoriae niduliferae NYL. et NORRL. Herb. Lich. Fenn. no. 15 (mus. Budapest).

8. **Alectoria nigerrima** HUE Lichens in Deux. Expédit. Antarct. Franc. 1915. p. 40. — Der Typus liegt in mus. Paris. Der Originalwortlaut der Etikette lautet: „*Alectoria nigerrima* HUE. Legit M. GAIN sur les rochers, Cap Tuxen (terre de Graham), alt. 20 m. X^e excurs., n. 190 p. p., 8 janvier 1909. Seconde expéd. antarct. du Dr. CHARCOT 1908—1910." Es liegt noch ein Exemplar vor: „*Alectoria nigerrima* HUE. Cap Tuxen. CHARCOT n. 190 p. p. 8 janvier 1909." Beide sind gleich.

Thallus brevis, 10—20 mm longus, omnino niger, subnitidus, substrato decumbens, laxe caespitosus, ramulis divaricatis sparsis, non rectangulis instructus, K —, C —, KC —. Pseudocyphellae sorediaque desunt. Sterilis. — Similis Alectoriae bicolori (EHRH.) NYL. sed thallus omnino niger, laxe caespitosus, substrato decumbens.

Nomenklatur: *Alectoria bicolor* var. *nigerrima* (*Alectoria nigerrima* HUE l. c.) GYELNIK n. comb.

9. **Alectoria ochroleuca** var. **ecuadoriensis** A. ZAHLBR. in Beihefte zum Bot. Centralblatt XIX. 2. Abt. 1905. p. 83. — Der Typus liegt im herb. mus. Wien, no. 301. Der Originalwortlaut der Etikette lautet: „Pflanzen aus dem Hochland Ecuador. No. 301. *Alectoria ochroleuca* var. *ecuadoriensis* A. ZAHLBR. N.O. Chimborazo: Paramo Region, bei 4000 m Seehöhe. 1903. VII. leg. Prof. Dr. HANS MEYER."

Thallus erectus, K —, KC + flavus, ochroleucus vel variegato-flavus, versus apices nigro-viridis vel nigrescens, pseudocyphellatus, pseudocyphellis albidis, maculatis vel plus minus elongatis, subelevatis, pulverulentis, sorediis deficientibus, ramis primariis planis, us-

que ad 10 mm latis, lacunosis, ramis ceteris cylindricis, versus apices dense divaricato-ramosus, ramulis divaricatis non rectangulis, brevibus, 1—3 mm longis. Sterilis. — Omnino similis Alectoriae ochroleucae (Hoffm.) Mass. sed rami primarii plani, lacunosi.

Nomenklatur: *Alectoria ecuadoriensis* (*Alectoria ochroleuca* var. *ecuadoriensis* A. Zahlrb. l. c.) Gyelnik n. comb.

10. **Alectoria oregana** Tuck. apud Nyl. Lich. Japon. 1890. p. 104. — Der Typus liegt im herb. Nyl., no. 35971. Der Originalwortlaut der Etikette lautet: „*Alectoria oregana* Tuckermann hb. Oregon. ...“ — Das Exemplar ist ein Gemisch. Auf der linken Seite des Bogens ist eine *Alectoria Achariana* Gyel., auf der rechten Seite eine *Alectoria oregana* Tuck. aufgeklebt. Die Beschreibung der letztgenannten ist die folgende:

Thallus erectus, ad basin osteolo-albus vel albescens vel grisescens, versus apices fuscus usque ad nigrescentem, 10—20 mm longus, cylindricus vel subcylindricus, minus lacunosus, nonnunquam minus contortus, esorediosus, K —, C —, KC —, pseudocyphellis deficientibus, ramulis divaricatis sat numerosis, 0.2—2 mm longis, non rectangulis instructus, sat opacus. Apothecia terminalia, ad marginem ciliata, subtus calcarata. — Similis Alectoriae divergescenti Nyl. sed thallus non omnino fuscus et minus lacunosus, apothecia ciliata. — Similis Alectoriae bicolori (Ehrh.) Nyl. sed thallus ad basin pallidus (non nigricans), versus apices fuscus (non pallidus), omnino lacunosus et apothecia ciliata, etc.

11. **Alectoria Smithii** Dr. in Arkiv f. Bot. XX. A. No. 4. 1926. p. 11, et 14, tab. II. fig. 1. — Der Typus liegt im herb. univ. Uppsala. Der Originalwortlaut der Etikette lautet: „Plantae Sinenses, No. 5025. *Alectoria Smithii* Dr. Prov. Sze-chuan, reg. bor.-occid. mellan Tsago-gomba och Tamba pa *Juniperus, Picea* och *Rhododendron*, 4000 m. s. m.; 1922. X, 2. leg. Harry Smith. Det. Dr. 1924.“

Thallus erectus, usque ad 7 cm longus, K —, C —, KC —, nigricans, versus apices pallidior, opacus vel subopacus, ramis divaricatis rectangulis subrectangulisve instructus, sorediosus, sorediis lateralibus, maculiformibus, plus minusve elongatis, granuloso-pulverulentis, albidis, partim isidialibus. Pseudocyphellae desunt. Sterilis. Habitu similis Alectoriae bicolori (Ehrh.) Nyl. sed sorediosus, sorediis partim isidialibus.

Nomenklatur. Die Pflanze ist eine Form der *Alectoria Berengeriana* (Mass.) Gyel. Es muß also heißen: *Alectoria Berengeriana*

(Mass.) Gyel. var. *Smithii* (*Alectoria Smithii* Dr. l. c.) Gyelnik n. comb.: a typo differt sorediis partim isidialibus.

12. **Alectoria sulcata** f. **vulpinoides** A. Zahlbr. apud Handel-Mazzetti, Symbol. Sinic. pars III. 1930. p. 202. — Der Typus liegt im herb. mus. Wien, no. 3606. Der Originalwortlaut der Etikette lautet: „Handel-Mazzetti, Iter Sinense 1914—1918 sumptibus Academiae scientiarum Vindobonensis susceptum. Nr. 3606. *Alectoria sulcata* f. *vulpinoides* Zahlbr. det. Zahlbruckner. Prov. Yünnan bor.-occid. Prope urbem Lidjiang („Likiang"), imprimis in monte Yülung-schan. Leg. VI—IX. 1914, 1915, 1916 collectores indigeni."

Thallus erectus, 70—80 mm longus, ad basin albido-pallidus, versus apices citrinus, in apicibus obscurus, ramis cylindricis, plus minusve elongato-lacunosus, in partibus pallidis K + flavus, KC + flavus, in partibus citrinis K —, KC + flavus, ramulis divaricatis non rectangulis, vulgo 10 mm longis dense instructus. Soredia et pseudocyphellae desunt. Apothecia pseudoterminalia (vel terminalia et calcarata), eciliata. Discus pallido-badius, pruinosus. Margines thallini citrini, integri. — Similis Alectoriae sulcatae (Lév.) Nyl. sed thallus partim citrinus. — Die blassen Lagerteile zeigen eine deutliche gelbe K Reaktion die zitronengelben Teile dagegen bleiben auf K unverändert. Die KC Reaktion ist schwach.

Nomenklatur: *Alectoria vulpinoides* (*Alectoria sulcata* f. *vulpinoides* A. Zahler. l. c.) Gyelnik n. comb.

13. **Bryopogon chalybeiforme** f. **pallidum** Sav. in Notul. Syst. Instit. Crypt. Horti Petropolit. I. 1922. p. 64. — Der Typus liegt im herb. acad. Leningrad. Der Originalwortlaut der Etikette lautet: „*Bryopogon chalybeiforme* (L.) Elenk. f. *pallidum* Sav. f. n. Statio Polonia. Umgebung Augustov (ante gub. Savalki) im hellen Föhrenwalde am Strande des Sees Bjeloje auf *Pinus*. Anno 1914. leg. V. P. Savicz."

Thallus pendulus, elongatus, pallide fuscus, subdichotomiter ramosus, K —, C —, KC —, ramis cylindricis, opacis, dense sorediosus, sorediis lateralibus, maculiformibus, granuloso-pulverulentis, albis. Ramuli divaricati, pseudocyphellae desunt. Sterilis.

Nomenklatur: Die Form ist identisch mit *Alectoria jubata* var. *prolixa* Ach.

14. **Bryopogon nitidulus** f. **caespitosus** Elenk. et Savicz apud Savicz in Trud. Student. Nautsch. fis.-mat. fak. Univ. Jurjew III. 1911. p. 40. — Der Typus liegt im herb. acad. Leningrad. Der Originalwortlaut der Etikette lautet: „No. W. 538. *Bryopogon nitidulum*

(Th. Fr.) Elenk. et Savicz f. *caespitosum* Savicz. Litus orientalis mari Albi Butschje (....). 1904: Leg. B. Pohle. Det. V. P. Savicz:"

Thallus substrato decumbens, caespitosus, brevis, K —, C —, KC —, nigrescens, versus apices ramorum olivaceo-castaneus, omnino nitidus, ramulis divaricatis non rectangulis praesentibus. Pseudocyphellae sorediaque desunt. Sterilis.

Ökologische Form der *Alectoria nitidula* (Th. Fr.) Vain.

15. **Bryopogon nitidulus** f. **patens** Savicz in Trud. Student. Nautsch. fis.-mat. fak. Univ. Jurjew III. 1911. p. 40. — Der Typus liegt im herb. acad. Leningrad. Der Originalwortlaut der Etikette lautet: „ N. 6. *Bryopogon nitidulum* (Th. Fr.) Elenk. et Savicz (Syn. *Alectoria jubata nitidula* Th. Fr.). KOH + CaClO —. f. *patens* Savicz f. n. det. V. Savicz. Dbl. ex mus. Acad. Scient. Petrop. Rußland. Sibirien. Reg. u. Kreis Jakutsk, Bergjoch Dzhugzhur. 2. VI. 1903. Leg. J. M. Stschegolev. Det. Elenkin et Savicz."

Thallus erectus, sat longus, K —, C —, KC —, nigrescens, versus apices olivaceo-castaneus, omnino nitidus, ramulis divaricatis non rectangulis praesentibus, ramis et ramulis divaricatis patentibus. Pseudocyphellae sorediaque desunt. Sterilis. — Zweifellos identisch mit *Alectoria nitidula* (Th. Fr.) Vain. und muß als dessen Stammform aufgefaßt werden.

16. **Lecanora purpurascens** Nyl. in Bot. Not. 1853. p. 162. — Der Typus liegt im herb. Nyl., no. 30949. — Der Originalwortlaut der Etikette lautet: „*Heppia purpurascens* Nyl. Collect. p. 13, Prodr. p. 80. Prope Monspelium ad Mirval. W. Nylander. 1853".

Lager durchwegs paraplektenchymatisch, krustig, am Rande wenig gelappt. Hymenium auf Jod blau, später die Schläuche rostrot. Eine gute Beschreibung ist zu finden bei Hue in Mémoir. Soc. Nation. Scienc. Nat. Cherbourg XXXVI. 1907. p. 21.

Die Art gehört nach meinen Untersuchungen nicht zur Gattung *Heppia* Naeg., sondern zu der Gattung *Neoheppia* Zahlbr. Lager krustig, durchwegs paraplektenchymatisch. Gonidien gloeocapsaartig. Sporen einzellig, viele im Schlauch. Da die Flechte am Rande effiguriert ist, stellt sie einen neuen Untergattung dar: *Gloeoneoheppia* Gyelnik n. subgen. generis *Neoheppia* Zahlbr. Thallus ad marginem effiguratus. Typus subgeneris *Neoheppia purpurascens* (Nyl.) Gyelnik n. comb. Der Typus der Gattung ist der Typus der anderen neuen Untergattung: *Euneoheppia* Gyelnik n. subgen. generis *Neoheppia* Zahlbr. *Thallus uniformis.* Typus subgeneris (et

etiam generis) *Neoheppia brasiliensis* ZAHLBR. in Denkschr. math.-naturw. Cl. Kais. Akad. Wien, LXXXIII. 1909. p. 144.

17. **Lecanora radiosa** var. **likana** SERVIT in Hedwigia LXIX. 1930. p. 29. — Der Typus liegt im herb. SERVIT. Der Originalwortlaut der Etikette lautet: „7507-P.G.-32. *Lecanora radiosa* v. *licana* SERVIT sp. orig. Velebit: Mirovo 1340 m. 1907. M. SERVIT."

Thallus K —, medulla etiam K —, in ceteris ut in Squamaria carbonatica GYEL. in Hedwigia LXXI. 1931. p. 131. Das Lager war in frischem Zustande lebhaft olivgrün. Diese lebhafte Färbung verschwand aber im Herbar und jetzt besitzt es eine blaß-grünlich-graue Farbe. Da diese Art in allen wesentlichen Merkmalen mit *Squamaria carbonatica* GYEL. übereinstimmt und da dies ein älterer Name ist, muß sie von nun an *Squamaria likana* (SERVIT) GYELNIK n. comb. heißen und *Squamaria carbonatica* GYEL. kann nur als dessen Synonym gelten.

18. **Lecanora radiosa** var. **subcircinata** f. **centrifuga** SERVIT in Hedwigia LXXI. 1931. p. 269. — Der Typus liegt im herb. SERVIT. Der Originalwortlaut der Etikette lautet: „17330. I—33. *Lecanora radiosa* var. *subcircinata* f. *centrifuga* f. n. spec. orig. Dalmatia: Hercegnovi. 1929. Dr. M. SERVIT."

Die Pflanze ist mit *Squamaria radiosa* f. *myrrhina* GYEL. in Hedwigia LXXI. 1931. p. 129 und f. *crenulata* GYEL. l. c. identisch, nur fehlt die Mitte des Lagers. Es sind nur die Randlappen vorhanden, die Mitte des Lagers ist abgestorben (wie es bei *Parmelia centrifuga* öfters der Fall ist), und somit konnte ich nicht ein einziges Apothezium finden.

Wegen der abgestorbenen Lagermitte kann sie als Form unterschieden werden und soll von nun an *Squamaria radiosa* f. *centrifuga* (SERVIT) GYELNIK n. comb. heißen.

19. **Lecanora solorinoides** NYL. in Mém. Soc. Scienc. nat. Cherbourg. t. II. 1854. p. 323. — Der Typus liegt im herb. NYL. in zwei Kapseln. Ihre Nummer sind: 30911 und 2484 (post mortem NYL. insert.). In beiden Kapseln liegt dasselbe Exemplar in zwei Teilen geteilt. — Der Originalwortlaut der Etikette lautet: „30911. *Heppia solorinoides* NYL. = *Endoc. reticulatum* DUF.! Beyruth. BLANCHE". und „Herb. NYLANDER. Post mortem Nylandri insertum. N. 2484. *Heppia solorinoides* NYL. Beiruth BLANCHE."

Thallus squamosus, squamis vulgo 5—7 mm magnis, subrotundatis, plerumque sublobatis, sat contiguis, superne pallide grisescentibus, rimoso-areolatis, areolis vulgo ⅓ mm magnis, subtus cum

hyphis substrato adfixis, superne apotheciiferis, apotheciis in centro squamarum immersis, 0.5—1.5 mm magnis, discis rotundatis, badiis. Thallus intus omnino paraplectenchymaticus, superne uno strato gonidiale, 42—52 mikr. crasso munitus, in partibus ceteris gonidiis instructus, gonidiis scytonemaformibus, ovoideis vel subglobosis, viridulo-coeruleis, 8—9 mikr. magnis, in coloniis dispositis. Apothecia in margine thallino et sub hypothecio gonidiifera. Epithecium subnullum, ecoloratum, J —. Hypothecium ca. 65 mikr. crassum, laete flavescens vel hyalinum, J + cyaneum. Hymenium hyalinum vel sordide hyalinum, J + cyaneum. Sporae monoblastae, hyalinae, ellipsoideae, in ascis octonae, 13:24 mikr. magnae.

Die Pflanze, wie das auch aus der Bemerkung NYLANDER's (siehe oben die Etikette) hervorgeht, ist mit *Heppia reticulata* (DUF.) NYL. identisch.

20. **Nephroma analogicum** NYL. apud CROMB. in Journ. Linn. Soc. London. Bot. XV. 1876. p. 231. — Der Typus liegt im herb. NYL., no. 32929. Der Originalwortlaut der Etikette lautet: „*Nephroma analogicum* NYL. Port Grappen. CUNNINGHAM. 1868."

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis subrotundatis, subimbricatis, 2—7 mm magnis, ad margines integris vel subintegris. Thallus superne glaber, sat nitidus, varie brunneus. Thallus subtus pubescens, levis, partim fuscus, partim pallidus. Isidia soredia desunt. Stratum corticale sup. luteolo-hyalinum, 25—34 mikr. crassum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, 8—10 mikr. magnis. Stratum gonidiale obsoletum, 20—26 mikr. crassum, sordide pallido subcyaneum, gonidiis nostocoideis, globosis vel subglobosis, subviridulis, 6—9 mikr. magnis. Stratum medullare sordide hyalinum vel luteolum, compactum, hyphis hyalinis, 4—5 mikr. crassis. Stratum corticale infer. luteolum vel luteolo-hyalinum, 12—13 mikr. crassum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis. Apothecia in dorsis apicum loborum fertilium adnata, in dorsis pubescentia, tenuiter areolata, thallo concoloria, marginibus thallinis valde angustis vel evanescentibus, integris, discis concavis, badiis, levibus, glabris, 3—5 mm magnis. Epithecium luteolum vel luteolo-hyalinum, J —. Hypothecium sordide luteolo-hyalinum, J —. Hymenium hyalinum, 35—45 mikr. crassum, J + primum subcoeruleum demum vinose rubens, paraphysibus septatis, eramosis, hyalinis, ca. 4 mikr. crassis, ascis 8-sporis, ad apices rotundatis. Sporae 1—3 septatae, curvatae, ad apices acuminatae, hyalinae, 6—9 mikr. crassae, 30—35 mikr. longae. Thallus superne

K —, C —, KC —. Medulla flava, K + rubescens, C + rubescens, KC —, J —. — Similis Nephromae Szatalae Gyel. sed apothecia in dorsis pubescentia, sporae longiores et ad apices acuminatae (non rotundatae) et hymenium J + vinose rubens (non J —). — Similis Nephromae dalmaticae Gyel. sed apothecia in dorsis pubescentia, etc. — A Nephroma lusitanico Schaer. differt thallo non isidioso, hymenio J + vinose rubente, etc. — Die fertilen Abschnitte sind zurückgebogen so daß die Scheiben der Apothezien mit der Oberfläche des Lagers parallel sind.

21. **Nephroma arcticum** var. **complicatum** Nyl. Prodr. Lich. Scand. in Notis. ur Sällsk. pro F. et Fl. Fenn. Förh. nov. ser. vol. V. 1866. p. 116. — Der Typus liegt im herb. Nyl., no. 32930. Der Originalwortlaut der Etikette lautet: „*Nephroma arcticum* var. *complicatum* Nyl. 64. Kletnich prope Jakonya. N. F. Fellmann. 1863."

Thallus complicatus, lobis minutis, circ. 1—3 mm magnis, dense imbricatis, numerosis, isidiatus, isidiis thallo concoloribus, rotundatis, quasi thallos juveniles formantibus, 0.5—4 mm magnis. Medulla albescens, K + flavescens, C —, KC —. Sterilis.

Die Pflanze ist wie die Beschreibung genau beweist identisch mit *Nephroma euarctoides* var. *Breutelii* Gyel. (in Annal. Crypt. exot. IV. 1931. p. 129) und gehört nicht zu den Formenkreis des *Nephroma arcticum* (L.) Torss. Dieser Umstand macht einige Änderungen in der Nomenklatur des *Nephroma arcticum* und *Nephroma euarctoides* nötig. Da im Formenkreise des *Nephroma euarctoides* der älteste Name das hier behandelte var. *complicatum* Nyl. ist, wird dieses der richtige Name der Art sein: *Nephroma complicatum* (*Nephroma arcticum* var. *complicatum* Nyl. in Notis. ur Sällsk. F. et Fl. Fenn. Förh. nov. ser. V. 1866. p. 116) Gyelnik n. comb. Der Name *euarctoides* wird die Stammform bezeichnen: *Nephroma complicatum* (Nyl.) Gyel. var. *euarctoides* (*Nephroma euarctoides* Gyel. in Hedwigia LXXII. 1932. p. 6.) Gyelnik n. comb. Als Synonym der var. *euarctoides* wird *Nephroma euarctoides* var. *magnilobatum* Gyel. (in Ann. Crypt. Exot. IV. 1931. p. 129) gelten. Endlich gehört hierher noch die var. *Breutelii* Gyel.: *Nephroma complicatum* (Nyl). Gyel. var. *Breutelii* (*Nephroma euarctoides* var. *Breutelii* Gyel. in Ann. Crypt. Exot IV. 1931. p. 129) Gyelnik n. comb.

Einen neuen Namen muß *Nephroma arcticum* var. *complicatum* Gyel. in: Ann. Crypt. Exot. IV. 1931. p. 128 (non Nyl.) bekommen: *Nephroma arcticum* var. *complicatoides* Gyelnik n. var. (Syn. *Nephroma arcticum* var. *complicatum* Gyel. l. c. non Nyl.). Der

Wortlaut der Etikette des Typus lautet: „Insel Kolgujev im Nördlichen Eismeer, leg. POHLE." — Ob *Nephroma complicatum* (NYL.) GYEL. auch weiterhin als Art bestehen kann ist fraglich.

22. **Nephroma helveticum** ACH. Lich. Univ. 1810. p. 523. — Der Typus liegt im Herbar ACH. — Herr C. F. E. ERICHSEN (Hamburg) war so freundlich während seiner Finnland-Reise in 1933 den Typus zu untersuchen. Seine Angaben sind folgende (in litt. ad GYEL. 28. VI. 1933):

„*N. helvetica.* 2 Belege aus Helvetia. a) oben glatt, braun, mehr weniger grubig, unten braun zottig, am Rande hell. Lappenrand etwas zerteilt aber weniger als bei 2. Oberfl. ohne Proliferationen. Fr. spärl. u. schlecht, aber mit prolifer. Rand. K —, KC —, C —, J +. b) Obers. glatt, nicht sored., kleinlappig, hier und da am Rand u. z. T. auch a. d. Oberfl. mit feinen, 0.1—0.2 mm br. fast zylindr. bis schmal blättchenf. Auswüchsen. K—, C —, KC —. Unterseite braun-schwärzl., nur am äußerst. Rand blaß, tomentös. Fr. zahlr. mit starken meißt gefingert proliferierend. Rand. Hym. J + blau. Beide ohne Pseudocyphellen."

Die obige Beschreibung zeigt deutlich, daß die Autoren diese Pflanze ganz falsch aufgefaßt haben. Sie kann nicht als Var. der *Nephroma resupinatum* angesehen werden. Sie hat mit *N. resup.* überhaupt nichts zu tun. Die Beschreibung paßt sehr gut auf *N. tropicum* (MÜLL. ARG.) ZAHLBR. und *N. denticulatum* (VAIN.) GYEL. Wenn die oben behandelten zwei Exemplare auf der Unterseite der Apothezien irgendwie behaart sind, so sind sie mit *N. tropicum* identisch. Wenn sie dort kahl sind, so sind sie mit *N. denticulatum* identisch. Wenn sie mit *N. tropicum* identisch wären, so wäre das keine Überraschung, da *N. tropicum* in der Schweiz von mir schon nachgewiesen wurde. Europäische Fundorte des *N. denticulatum* sind bisher unbekannt.

Nephroma resupinatum var. *helveticum* Auct. und ZAHLBR. Cat. Lich. Univ. III. 1925. p. 439 und GYEL. in Annal. Crypt. exot. IV. 1931. p. 131 und p. 144 wird einstweilen *Nephroma resupinatum* var. *rufum* BAB. ap. HOOK. Fl. Nova Zeland. II. 1855. p. 272 heißen.

23. **Nephroma homalodes** NYL. Lich. Nov. Zeland. 1888. p. 43. — Der Typus liegt im herb. NYL., no. 32922. Der Originalwortlaut der Etikette lautet: „*homalodes* NYL. *Nephroma antarcticum* v. *tenue* (NYL.). Nova Zelandia, leg. KNIGHT. 1882."

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis rotundatis subrotundatisve, usque ad 12 mm latis, plus minusve imbricatis, fertilibus vel steri-

libus, ad margines integris vel subintegris. Thallus superne levis, plerumque plus minusve impresso-inaequalis, glaber, sat opacus, flavus flavescensve. Thallus subtus pallidus, versus centrum nigrescens, glaber, levis, minus rugosus. Stratum corticale sup. 8—12 mikr. crassum, hyalinum vel subhyalinum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, 6—7 mikr. magnis. Stratum gonidiale 19—23 mikr. crassum, sordide viridulum, gonidiis palmellaceis, sordide viridibus, globosis vel subglobosis, 4—5 mikr. magnis. Stratum medullare hyalinum vel sordide hyalinum, in partibus superioribus rubrum, 95—105 mikr. crassum, compactum, hyphis hyalinis, ca. 4 mikr. crassis. Stratum corticale inf. hyalinum vel sordide hyalinum, 17—18 mikr. crassum, versus centrum thalli badium, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, 5—6 mikr. magnis. Apothecia in dorsis apicum loborum fertilium adnata et recurvata. Thallus in dorsis apotheciorum glaber, levis, minus areolatus, ceteris partibus thalli concolor. Margines thallini apotheciorum thallo concolores, integri vel subintegri, angusti. Discus recurvatus, glaber, levis, badius, 2—4 mm magnus. Epithecium fusco-luteolum. Hypothecium hyalinum vel sordide hyalinum. Hymenium hyalinum, 60—66 mikr. crassum, paraphysibus eramosis, septatis, hyalinis, ca. 4 mikr. crassis. Asci octospori, fusiformes, ad apices rotundati. Sporae 4- nonnunquam 2-blastae, hyalinae, fusiformes, ad apices rotundatae, rectae vel subcurvatae. Thallus in rimis et ad marginem isidiosus, isidiis squamiformibus, thallis juvenilibus simillibus, thallo concoloribus, 0.5—3 mm magnis ut in *Nephroma euarctoide* Gyel. Epithecium et hypothecium J —. Hymenium J + coeruleum. Thallus superne K + lente flavus, C —, KC —, J —. Medulla macroscopiciter pro maxima parte rubra, K + flava deindeque rubra, C —, J —, KC + flava (verschwindend). — Similis Nephromae arctico (L.) Torss. sed thallus isidiosus, subtus glaber, medulla rubra (non albescens), K + flava deindeque rubra, etc. — A Nephroma Homanii Gyel. differt medulla partim rubra, K + flava deindeque rubra, non K —, etc.

24. **Nephroma laevigatum** Ach. Syn. Lich. 1814. p. 242. — Der Typus liegt im herb. Ach. — Herr C. F. E. Erichsen (Hamburg) war so freundlich während siener Finnland-Reise in 1933 den Typus zu untersuchen. Seine Angaben sind die folgenden (in litt. ad Gyel. 28. VI. 1933).

„*Nephr. laevigat.*: 2 sehr kl. Proben c. fr. ab nicht sorediös od. isidiös. a) 1 Fr., Mark weissl., K + sofort rötl. violett, KC + ebenso, C —. Unterseite kahl, leicht warzig runzelig. b) Mark hellbräunl.

(Alter?), K + u. KC + rotviolett, C + violettrötlich. Unterseite leicht runzelig, fast glatt, hellbraun. Beide Belege wenig größer als 1 qcm. Beide Suecia." Die Angaben zeigen sofort, daß *N. laevigatum* (fast) sämtlicher Autoren, mit dem rechten *N. laevigatum* ACH. nichts zu tun hat. Es gehört in der Gruppe des *N. lusitanicum* SCHAER. Da aber die Typenexemplare so klein sind, daß man kein sicheres Bild von der Art bekommen kann, ist es am besten diesen Namen einstweilen fallen zu lassen. Die zwei Exemplare sind nicht gleich, man muß die morphologische und chemische Struktur des Apotheziums kennen um genau feststellen zu können, zu welcher Art diese Exemplare gehören.

25. **Nephroma Lyallii** BAB. apud HOOK. Flora Nov. Zeland. II. 1855. p. 272. — Ein kleines Stückchen des Typus liegt im herb. NYL., no. 33037. — Der Originalwortlaut der Etikette lautet: „*N. Lyallii* BAB.! N. Zel. Fig. in HOOK. opt.!" — Das Exemplar ist sehr klein und steril, so daß ich von der anatomischen Beschreibung abgesehen habe.

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis 4—7 mm longis, 2—4 mm latis, ad margines subflexuosis vel subintegris. Thallus superne levis, glaber, opacus, azureo-coeruleus. Thallus subtus albidus, pubescens, levis. Medulla alba, K —, C —, KC —. Soredia isidiaque desunt. Gonidia pulchre coerulea, 6—9 mikr. magna, globosa vel subglobosa, nostocoidea.

Leider ist das Exemplar steril. Auf dem Originalexemplar sind zwar Apothezien, aber das hier untersuchte Exemplar ist nur ein Bruchstück von jenem. Die Beschreibung NYLANDER's (Syn. Lich. I. 1860. p. 322) wurde wahrscheinlich vom ganzen Originalexemplar verfertigt: „receptaculis thallinis apotheciorum margine dentato-fimbriato." Er schreibt zwar in Lich. Nov. Zeland. 1888. p. 42.: „apothecia... margine receptaculari integro aut subcrenulato", aber diese Beschreibung wurde nach später gesammelten anderen Exemplaren und nicht nach dem Typus verfertigt.

26. **Nephroma resupinatum** var. **pruinosum** MONT. apud DUMONT d'URVILLE, Voyage Pol. Sud. Botan. 1837. 40. p. 192. — Siehe unter *Nephroma schizocarpum* NYL.

27. **Nephroma schizocarpum** NYL. Syn. Lich. I. 1860. p. 318. — Der Typus liegt im herb. NYL., no. 32927. Der Originalwortlaut der Etikette lautet: „*Nephroma schizocarpum* NYL. N. Zelandia. HOMBRON". Dieses Exemplar ist auch der Typus des *Nephroma resupinatum* var. *pruinosum* MONT. apud DUMONT d'URVILLE, Voyage

Pole Sud, Botan. 1837—40. p. 192. Wahrscheinlich hat NYLANDER von diesem Exemplar ein paar Stückchen erhalten und nochmals getauft.

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis flexuosis subflexuosisque, plerumque fertilibus, 2—5 mm magnis, ad margines subintegris. Thallus superne levis, glaber, sat opacus, fuscescens. Thallus subtus pallidus, versus centrum fuscescens, pubescens, levis. Stratum corticale sup. 17—20 mikr. crassum, hyalinum vel subhyalinum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, ca. 2—3 mikr. magnis. Stratum gonidiale ca. 20—22 mikr. crassum, sordide griseo-viridescens, gonidiis nostocoideis, viridibus, globosis vel subglobosis, 6.5—8 mikr. magnis. Stratum medullare microscopiciter hyalinum, macroscopiciter album, compactum, hyphis hyalinis, 4—5 mikr. crassis. Stratum corticale infer. ca. 8—9 mikr. crassum, hyalinum vel luteolo-hyalinum, paraplectenchymaticum, cellulis minutissimis. Apothecia in dorsis apicum loborum fertilium adnata et recurvata. Thallus superne in dorsis apotheciorum glaber, levis, minus areolatus, ceteris partibus thalli concolor. Margines thallini apotheciorum angustissimi vel evanescentes, integri. Discus recurvatus, glaber, levis, badius, vulgo 2—4 mikr. magnus. Epithecium luteolum vel luteolo-hyalinum. Hypothecium sordide hyalinum vel luteolo-sordide-hyalinum. Hymenium hyalinum, 55—60 mikr. crassum, paraphysibus septatis, eramosis, hyalinis, ca. 2 mikr. crassis. Asci 8-spori. Sporae 4-blastae (rarissime diblastae), hyalinae, fusiformes, ad apices rotundatae, rectae vel subcurvatae, 5—9 mikr. crassae, 17—19 mikr. longae. Isidia soredia et cephalodia desunt. Medulla alba, K + lente flava, KC + flava intensiva, C —, J —. Thallus superne K —, C —, KC —, J —. Epithecium et hypothecium J —. Hymenium J + coeruleum.

28. **Nephromium laevigatum** var. **subtomentellum** NYL. in Not. ur Sällsk. F. et Fl. Fenn. Förh. V. 1866. p. 116. — Das Originalexemplar liegt im herb. NYL., no. 32966. Der Originalwortlaut der Etikette lautet: „*N. subtomentellum* NYL. ad Onegam. Pertnavolok EH. SIMMING. 3/VII. 1863."

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis partim fertilibus, partim sterilibus, usque ad 7 mm latis et 10 mm longis, plus minusve imbricatis, subrotundatis, ad margines subintegris et dilaceratis. Thallus superne omnino brunneus, minus rugosus, in ceteris levis, glaber, sat opacus, K —, J —, C —, KC —. Thallus subtus pubescens,

tenuiter rugosus, nigrescens, versus periphaeriam pallidus. Thallus 190—200 mikr. crassus. Stratum corticale sup. 21—26 mikr. crassum, luteolum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, ca. 6—7 mikr. magnis. Stratum gonidiale coeruleum, 30—35 mikr. crassum, gonidiis nostocoideis, coeruleis, globosis vel subglobosis, 6—7 mikr. magnis. Stratum medullare hyalinum, compactum, 83—91 mikr. crassum, hyphis hyalinis, ca. 2—3 mikr. crassis. Stratum corticale inf. luteolum, 17—18 mikr. crassum, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, 4—5 mikr. magnis. Pili tomenti thalli inferioris brevi, usque ad 8 mm longi, hyalini, 1(—2) cellulares. Apothecia in dorsis apicum loborum fertilium adnata. Thallus superne in dorsis apotheciorum grosse rugoso-lacunosus et tenuiter areolatus, pubescens, thallo concolor. Margines thallini apotheciorum vulgo angusti, integri vel subintegri. Discus vulgo planus, badius, glaber, levis, diametr. usque ad 6 mm. Epithecium luteolum. Hypothecium sordide luteolo-hyalinum. Hymenium hyalinum, 43—53 mikr. crassum, paraphysibus septatis, eramosis, hyalinis, 2—3 mikr. crassis. Asci 8-spori. Sporae hyalinae, (1—)3-septatae, rectae vel minus curvatae, ad apices rotundatae, 6—7 mikr. crassae, 21—24 mikr. longae. Hymenium J + coeruleum Hypothecium et epithecium J —. Medulla thalli alba, J —, K − , KC —, C —. — Similis Nephromae massachusettsiano Gyel. sed thallus non isidiatus, etc.

Es müssen am Gesagten einige nomenklatorische Änderungen vorgenommen werden. *Nephromium laevigatum* f. *sublividum* Vain. in Meddel. Soc. F. et Fl. Fenn. VI. 1881. p. 128 kann nicht weiterhin als Form des *Nephroma subtomentellum* (Nyl.) Gyel. (siehe *Nephroma subtomentellum* f. *sublividum* Gyel. in Ann. Crypt. exot. IV. 1931. p. 124) gelten, sondern muß, da ihre Markschicht auf K + gelb reagiert und ihre Apothezien auf der Unterseite unbehaart sind, als Art unterschieden werden. Es wird also heißen: *Nephroma sublividum* (Vain.) Gyelnik n. comb.: a *Nephroma subtomentello* (Nyl.) Gyel. differt medulla K + flava (non K —) et apotheciis in dorsis glabris, non pubescentibus.

Die bisher als Formen des *Nephroma subtomentellum* (Nyl.) Gyel. bekannten zwei Formen sind von nun an als Formen des *Nephroma sublividum* (Vain.) Gyel. zu betrachten:

1. *Nephroma subtomentellum* f. *variegatum* Gyel. in Hedwigia LXXII. 1932. p. 30. = *Nephroma sublividum* f. *variegatum* Gyelnik n. comb.

2. *Nephroma subtomentellum* f. *carpaticum* GYEL. l. c. = *Nephroma sublividum* f. *carpaticum* GYELNIK n. comb.

3. *Nephroma subtomentellum* f. *sublividum* GYEL. in Annal. Crypt. exot. IV. 1931. p. 124 (non VAIN.) = *Nephroma sublividum* f. *sublividoides* GYELNIK nomen novum. Der Typus ist mit dem Typus der Art identisch.

29. **Nephromium lusitanicum** var. **hibernicum** NYL. apud LEIGHT. Lich. Fl. Great. Brit. ed. 3. 1879. p. 100. — Ein Cotypus liegt im herb. NYL., no. 32992. Der Originalwortlaut der Etikette lautet: „*N. lusitanicum* var. *hibernicum* NYL. Scotia. Barcaldine. CROMBIE. 1880."

Medulla flava, K + rubescens, KC —, C + rubescens, J —. Thallus in dorsis apotheciorum glaber, subtus pubescens. Apothecia ad marginem integra. Hymenium J + coeruleum. — Die Pflanze ist also mit *Nephroma amylophorum* GYEL. vollkommen identisch.

Die NYLANDER'sche Originalbeschreibung beweist klar, daß die var. *hibernicum* NYL. weißes Mark besitzt. Der hier untersuchte Cotypus hat gelbes Mark. Dieser Fall ist auch ein Beweis dafür, daß die Autoren oft auch solche Arten falsch bestimmen, welche sie selbst beschrieben haben. Eine Folge davon ist, daß von Cotypen nur dann nomenklatorische Schlußfolgerungen zu ziehen sind, wenn man sicher weißt, daß der Typus zugrunde gegangen ist.

30. **Nephromium Murrayamanum** NYL. Lich. Jap. 1890. p. 32. — Der Typus liegt im herb. NYL. no. 33045. Der Originalwortlaut der Etikette lautet: „K = *Nephromium Murrayamanum* NYL. (thallus). Japonia. Murajama. E. ALMQUIST. 1879."

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis minutis, 0.5—3 mm magnis, ad marginem subintegris. Thallus superne olivaceo-fuscus, pubescens, sat opacus, sat levis. Thallus subtus nigrescens, sat levis, tomentellus. Isidia sorediaque desunt. Stratum corticale sup. 12—13 mikr. crassum, badium, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, circ. 5—6 mikr. magnis. Pili tomenti thalli superioris badio-hyalini, usque ad 22 mikr. longi, 1—5-cellulares. Stratum gonidiale sordide viridescens, 20—25 mikr. crassum, gonidiis coeruleo-viridibus, 6—7 mikr. magnis, globosis vel ovoideis, nostocoideis. Stratum medullare microscopiciter hyalinum, macroscopiciter album, compactum, hyphis septatis, hyalinis, ca. 2—3 mikr. crassis. Stratum corticale inf. badium, paraplectenchymaticum, 17—22 mikr. crassum, cellulis rotundatis vel subrotundatis, 5—9 mikr. magnis. Pili tomenti thalli inferioris badio-hyalini, densi, 2—8

cellulares, usque ad 22 mikr. longi. Sterilis. Medulla K + flava, KC —, C —, J —.

31. **Nephromium sublaevigatum** Nyl. Syn. Lich. I. 1860. p. 321. — Der Typus liegt im herb. Nyl., no. 33005. Der Originalwortlaut der Etikette lautet: „*Nephromium. Nephroma laevigatum* Ach. f. *Nephromium sublaevigatum* Nyl. Mexico. Pic d'Orizaba. 6960. D. Galeotti." — Das Exemplar ist so klein, daß ich auf eine anatomische Untersuchung verzichten mußte.

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis 3—5 mm longis, 1—3 mm latis, subimbricatis, ad marginem subintegris vel subcrenulatis. Thallus superne versus periphaeriam reticulatus, in ceteris levis, brunneus, isidiatus, opacus. Thallus subtus pubescens, fuscus vel sordide fuscus, sat levis. Apothecia ad margines integra, in dorsis glabra. Medulla alba, K —, KC —. Gonidia viridia, 6—7 mikr. crassa, globosa vel subglobosa, nostocoidea. Epithecium luteolohyalinum. Hymenium hyalinum, 40—45 mikr. crassum. Hypothecium sordide hyalinum. Sporae 4 (rariter 2) cellulares, rectae vel subcurvatae, hyalinae, ad apices rotundatae, 8 mikr. latae, 17—22 mikr. longae. Epithecium et hypothecium J —. Hymenium J + coeruleum.

32. **Nephromium tomentosum** var. **isidiosum** Nyl. in Notis. ur Sällsk. F. et Fl. Fenn. Förh. VIII. 1866 junio. p. 180 not.: *Nephromium isidiosum* Nyl. in Flora LXIX. 1866 octob. p. 417. — Der Typus liegt im herb. Nyl., no. 33043. Der Originalwortlaut der Etikette lautet: „*Nephromium isidiosum* Nyl. Ad Onegam. Pertnavolok. Th. Simming. 3/VII. 1863."

Thallus foliaceus, horizontaliter diffusus, dorsiventralis, lobatus, superne subtusque corticatus, lobis numerosis, vulgo 4—5 mm latis et 4—8 mm longis, imbricatis, plus minusve crispatis. Thallus superne omnino brunnescens, glaber, max. part. reticulatus, in jugis reticulum dense isidiosus, isidiis cylindrico-papillosis, sat caespitosis, thallo concoloribus, coralliformibus, plerumque plus minusve ramosis, opacus. Thallus subtus nigrescens, versus periphaeriam pallidior, epapillosus, tomentellus, sat levis. React. Thallus superne K —, C —, KC —, J —. Medulla alba, K —, C —, KC —, J —. Thallus 150—215 mikr. crassus. Stratum corticale sup. ca. 17—18 mikr. crassum, hyalinum vel badium, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, vulgo 6—7 mikr. magnis. Stratum gonidiale ca. 42—51 mikr. crassum, viridescens, gonidiis palmellaceis (?), 4—5 mikr. magnis, viridibus, globosis vel subglobosis.

Stratum medullare microscopiciter hyalinum, compactum, hyphis hyalinis, 4—5 mikr. crassis. Stratum corticale inf. 35—43 mikr. crassum, vulgo badium, paraplectenchymaticum, cellulis rotundatis vel subrotundatis, vulgo 8—9 mikr. magnis. Pili tomenti numerosi, paralelle multo-cellulares, hyalini, 1—15 cellulares. Sterilis.

Es ist eine sehr schwere Aufgabe die nostocoiden und palmelloiden Gonidien unter Mikroskop von einander zu unterscheiden. Nur sehr selten findet man Farbenunterschiede, ebenso kann man auch keine Unterschiede in der Form bemerken. Eine kettenförmige Ausbildung der nostocoiden Gonidien kann man auch bei den Peltigeraceen nicht bemerken. Den einzigen Unterschied fand ich in der Größe. Bei den Nephromen sind die *Palmella* Gonidien im allg. 4—5 mikr., die *Nostoc* Gonidien dagegen im allg. 6—7 mikr. groß. Aus diesem Grunde teile ich die Nephromenexemplare in den zwei Sektionen Eunephroma Stizenb. und Nephromium (Nyl.) Stizenb. ein. Ob die auf diese Weise gruppierten Arten gut eingeordnet sind, bleibt naturgemäß fraglich bis diese Frage mit Reinkulturen nicht gelöst wird. Auf Grund des Gesagten gehört *Nephroma isidiosum* in die Sektion Eunephroma Stizenb.

33. **Pannularia perfurfurea** Nyl. in Acta Soc. Sc. Fenn. XXVI. no. 10. 1900. p. 29. not. — Der Typus liegt im herb. Nyl., no. 31135. Der Originalwortlaut der Etikette lautet: „*Pannularia perfurfurea* n. sp. Burnfoot Hill, New Galloway, Scotland. J. McAndrev. leg. 10/98."

Muscicola. Apothecia biatorina. Epithecium rufescenti-brunneum vel pallide rufescenti-brunneum. Hymenium hyalinum vel subhyalinum, 60—100 mikr. crassum, J + coeruleum deindeque rufescens. Hypothecium rufescens vel fusco-rufescens. Sporae in ascis uniseriales, rariter irregulariter biseriales, octonae, hyalinae, ellipsoideae, monoblastae, 2—6 : 6—10 mikr. magnae. Gonidia coeruleo-viridia, 4—5 mikr. magna, globosa vel subglobosa, in coloniis disposita. — Lager ganz in Isidien aufgelöst, braun, K —, KC —, C —. Vorlager habe ich nicht beobachtet. Apothezien 0.5—1 mm groß bräunlich rot. Scheibe nackt, glatt. Frucht meist etwas blasser als die Scheibe, später verschwindend. Excipulum paraplektenchymatisch, farblos. — Von *Parmeliella coralloides* (Hoffm.) Zahlbr. kann ich sie nur als Form unterscheiden. Sie wird heißen: *Parmeliella coralloides* f. *perfurfurea* (*Pannularia perfurfurea* Nyl. l. c.) Gyelnik n. comb.: moosbewohnend, Lager durchwegs in Isidien aufgelöst, Lagerlappen nicht zu unterscheiden.

34. **Parmelia abstrusa** var. **laevigata** LYNGE in Arkiv. f. Bot. XIII. No. 13. 1914. p. 147. — Ein Cotypus liegt im herb. mus. Wien, no. 2616. Der Originalwortlaut der Etikette lautet: „Lichenes austro-americani ex Herbario Regnelliano. No. 95. *Parmelia abstrusa* WAINIO var. *laevigata* LYNGE, B. LYNGE, Arkiv f. Bot. XIII. 13. (1914), p. 147. Brasilia: Matto Grosso, Serra da Chapada, pr. Bocca da Serra: In arbore solitaria. 1894. 15. 6. Leg. G. O. MALME. Determ. B. LYNGE."

Thallus typice foliaceus, iteratim dichotome laciniatus, laciniis sinuato-lacinulatis, discretis vel contiguis, 0.75—1 mm latis, sat longis, laciniis lacinulisque conniventibus, lacinulis brevibus, superne levis, stramineo-viridescens, subopacus, versus periphaeriam nitidus, esorediosus, exisidiosus, subtus niger, rhizinosus. Medulla alba, C —, KC + rubescens, K + flava deindeque rubescens. Apothecia superficialia, parmelioidea, sessilia, 1.5—2 mm magna, marginibus thallinis angustis, crenulatis, pycnoconidiiferis, discis pallido-badiis, levibus, epruinosis. Lichen sectionis Xanthoparmeliae VAIN. — Est forma Parmeliae Kilaueae. A. ZAHLBR.

f. *laevigata* (*Parmelia abstrusa* var. *laevigata* LYNGE l. c.) GYELNIK n. comb. Laciniae discretae vel contiguae, 0.75—1 mm latae. Margines thallini apotheciorum pycnoconidiiferi et crenulati. Thallus superne partim nitidus.

35. **Parmelia adplanata** MÜLL. ARG. in Flora 1885. p. 502. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Subtus subpallida. Valde adpressa, intus argillac.-flavic., tenuis. *Parmelia adplanata* MÜLL. ARG. b. forma *isidiigera* ... L. B. n. 935. Zanzibaria prope Mombossa. HILDEBRANDT. 1885." — Die Bezeichnung b. forma „*isidiigera*" bezieht sich auf *Parmelia adplanata* f. *isidiigera* MÜLL. ARG. (siehe dort).

Thallus lobatus, lobis rotundatis, sat latis, subsinuatis, ad margines non nigris, superne levis, subnitidus, non isidiosus, esorediosus, subtus pallidus. Medulla aurantiaca, K + extemplo rubra, KC + rubescens, C —. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. — Die Farbe des Markes ist Orangegelb; diese Farbe ist wahrscheinlich von gleichen Ursprungs wie die Farbe des Markes der *Parmelia somloënsis* GYEL. nur blieb die Färbung in einem jüngeren Stadium stecken. Das ganze Exemplar macht den Eindruck einer jungen Pflanze.

36. **Parmelia adplanata** f. **isidiigera** MÜLL. ARG. in Flora. 1885. p. 502. — Der Typus liegt im herb. MÜLL. ARG. — Neben dem Originalexemplar der *Parmelia adplanata* MÜLL. ARG. liegt ein

Steinstückchen, welches MÜLLER ARG. als f. *isidiigera* beschrieben hat. Das Exemplar ist so klein, daß ich es durchaus nicht rekonstruiren kann. Die Isidien sind auch sehr spärlich entwickelt. Es ist am besten diese Form der Vergessenheit zu übergeben.

37. **Parmelia adpressa** var. **endochrysea** MÜLL. ARG. in Flora 1879. p. 289. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia adpressa* v. *endochrysea* MÜLL. ARG. in Flora 1879. L. Beitr. n. 116. Am Hügel von Gumango, Bendos District im Lande der Niamniam, Afr. centr. 1870. comm. Dr. SCHWEINFURTH. 1877." — Die Pflanze besteht aus 4 Steinstücken.

Thallus lobatus, lobis primariis substrato adpressis, sat angustis, vulgo 1 mm, usque ad 1.5 mm latis, discretis, ramosis, versus apices nigro-marginatis, lobis adventivis hic illic praesentibus, brevibus, in ceteris ut in laciniis primariis, superne viridescens, versus centrum fusco-viridescens, opacus, levis, isidiosus, isidiis 0.05—0.1 mm crassis, thallo concoloribus, ovoideis, verruciformibus, eramosis, subtus nigrescens. Medulla partim alba partim lutea, C —, K + flava, KC + rubra. Sterilis. Soredia desunt. — Similis Parmeliae regis Matthiae GYEL. sed medulla partim lutea.

Die Pflanze ist eine gute Art und muß von nun an *Parmelia endochrysea* (*Parmelia adpressa* v. *endochrysea* MÜLL. ARG. l. c.) GYEL. in FEDDE, Repert. XXIX. 1931. p. 288 heißen. Species sectionis Xanthoparmeliae VAIN.

38. **Parmelia adpressa** var. **stenophylloides** MÜLL. ARG. in Revue Mycolog. vol. X. 1888. p. 56. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia adpressa* v. *stenophylloides* MÜLL. ARG. L. Parag. n. 32. Paraguay. BALANSA. 1878." — Das Exemplar ist so klein, daß eine Rekonstruktion ganz unmöglich ist. Das ganze Lagerfragment das als Typus vorliegt ist nicht größer als ½ cm^2. Man kann selbst die Reaktionen nicht durchführen. Am besten der Vergessenheit zu übergeben.

39. **Parmelia amphixanthoides** STEINER et A. ZAHLBR. apud A. ZAHLBR. in ENGLER, Bot. Jahrbücher LX. 1926. p. 505.— Der Typus liegt im herb. mus. Wien, no. 8347. Der Originalwortlaut der Etikette lautet: „J. BRUNNTHALER, Reise nach Deutsch-Ostafrika. Herb. Musei Hist. Natur. Vindob. (Botanische Abteilung des Naturhist. Museums, Wien). *Parmelia amphixanthoides* STNR. et A. ZAHLBR. Kapland: Laingsberg, (große Karroo) an Sandsteinfelsen, c. 700 m. 11. 11. 1909. leg. J. BRUNNTHALER."

Thallus quasi ut in Parmelia vagante NYL. graciliore, ca. 3 cm magnus, subdichotomiter ramosus, laciniis convexis, angustis, laxe

imbricatis, laciniis primariis ca. 2 mm latis, superne rugoso-verruculosis, laciniis secundariis vulgo 1 mm latis, superne levibus, esorediosus, exisidiosus, non subpulverulentus, subtus pallidus, versus periphaeriam nigrescens, rhizinosus. Medulla alba, C + flava, KC + rubescens, K + flava deindeque rubescens. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. — Valde similis Parmeliae vaganti NYL. f. eleganti MERESCHK. typo sed thallus superne partim rugoso-verrucosus, subtus pro max. p. pallidus et medulla C + flava (non C —).

40. **Parmelia Bouly de Lesdaini** GYEL. in FEDDE, Repert. XXIX. 1931. p. 281. — Der Typus liegt im herb. BOULY DE LESDAIN, ein Bruchstück des Typus im herb. mus. Budapest. Der Originalwortlaut der Etikette lautet: „Dr. B. DE LESDAIN. Spec. b. *Parmelia Bouly de Lesdaini* GYELNIK n. sp. Typus. 1931. I. Rev. Dr. V. GYELNIK. *M. coerulea (caesia)*, KC —, K —, C —, J —. Perou, Hacienda D'Angasmurca, Départ. de Libertad au Pied de la Cordillère Occidentale à environ 160 kil. de Trujillo, 2700—3000 m. Février 1906. Leg. Abbé STANDAERT."

Thallus lobatus, lobis angustis, vulgo 1 mm latis, numerosis, imbricatis, lobis adventivis deficientibus, superne pallide viridis, levis, glaber, exisidiosus, esorediosus, subtus opacus, nigrescens, erhizinosus. Medulla caesia.

Die Pflanze ist mit *Parmelia subcongruens* MÜLL. ARG. sehr nahe verwandt. Ich habe von derselben Lokalität eine ein andersmal von STANDAERT gesammelte Pflanze aus dem Herbar B. DE LESD. erhalten. Sie sind in jeder Hinsicht völlig gleich, nur die Farbe der Markschicht zeigt Übergänge zwischen weiß und aschgrau; *Parmelia subcongruens* MÜLL. ARG. tpyus hat medulla alba. Ich muß also annehmen daß die aschgrau gefärbte Markschicht nur ein Zufall ist, was keinen systematischen Wert besitzt. Die *Parmelia Bouly de Lesdaini* wird also von nun an als Varietät der *Parmelia subcongruens* MÜLL. ARG. gelten: var. *Bouly de Lesdaini* (*Parmelia Bouly de Lesdaini* GYEL. l. c.) GYELNIK n. comb.

Auf *Parmelia Bouly de Lesdaini* GYEL. habe ich die Subsect. Endocoerulea GYEL. l. c. p. 282 gegründet. Dieser Untersectionsname bleibt weiter gültig, nur die Diagnose wird geändert: Thallus subtus nudus (erhizinosus). In ceteris ut in sect. Xanthoparmelia VAIN.

41. **Parmelia Brunnthaleri** STEINER et A. ZAHLBR. apud A. ZAHLBR. in ENGLER, Bot. Jahrbücher LX. 1926. p. 505. — Der Typus liegt im herb. mus. Wien, no. 8368. Der Originalwortlaut der Etikette lautet: „J. BRUNNTHALER, Reise nach Deutsch-Ostafrika. Herb.

Musei Hist. Natur. Vindob. (Botanische Abteilung des Naturhist. Museums, Wien). *Parmelia Brunnthaleri.* Kapland: Matjesfontein, große Karroo, Sandsteinfelsen, 950 m. 10. 11. 1909. leg. J. BRUNNTHALER."

Thallus subcrustaceus, versus centrum areolatus, areolis 0.5—2 mm magnis, planis vel convexiusculis, partim tenuiter pruinosis, versus periphaeriam lobatus, lobis planiusculis vel convexiusculis, ca. 3 mm longis, 1—2 mm latis, contiguis vel discretis, in apicibus nigro-marginatis superne griseo-viridescens, levis, exisidiosus, esorediosus, subtus pallido-rhizinosus, pallidus, in zona marginale oltvaceo-fuscescens. Medulla alba, K —, C —, KC —. Apothecia sessilia, superficialia, parmelioidea, marginibus thallinis integris vel subcrenatis, angustis, discis badiis, levibus, epruinosis. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae Worcesteri STEINER et A ZAHLBR. sed medulla thalli C —, KC —.

42. **Parmelia caperata** var. **glaucopis** MÜLL. ARG. in Engler, Bot. Jahrbüch. XX. 1894. p. 258. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia caperata* v. *glaucopis* MÜLL. ARG. L. Usamb. n. 87. Matangiri (Mgogo), D. O. Afr. Exped. ... STUHLMANN. 559. 1894."

Thallus subcrustaceus, versus centrum verruculosus, verrucis vulgo 0.5 mm magnis, versus periphaeriam lobatus, lobis rotundatis, ca. 2 mm latis, contiguis vel subimbricatis, superne nudus, luteolo-viridescens, exisidiosus, esorediosus, subopacus, subtus niger, nigro-rhizinosus. Apothecia superficialia, sessilia, usque ad 2 mm magna, marginibus thallinis crassis demum radiatim verrucosis, discis concaviusculis vel planiusculis, partim caesio-pruinosis. Medulla alba, C —, K + flavescens, KC + rubescens. Corticola. Est bona autonoma species sectionis Xanthoparmeliae VAIN.: *Parmelia glaucopis* (*Parmelia caperata* var. *glaucopis* MÜLL. ARG. l. c.) VAIN. in Mémoir. herb. Boiss. no. 5. 1900. p. 4. — Similis Parmeliae novomexicanae GYEL. sed medulla KC + (non KC —), thallus versus centrum verrucosus (non globuloso-verrucosus), margines thallini apotheciorum crassi (non angusti) et verrucosi (non integri), disci apotheciorum pruinosi (non nudi) et est species corticola (non saxicola).

43. **Parmelia centrifuga** var. **muscivaga** NYL. in Bull. Soc. Linn. Normand. sér. 4. vol. I. 1887. p. 201. — Der Typus liegt im herb. NYL., no. 34677. Der Originalwortlaut der Etikette lautet: „*P. centrifuga* var. *muscivaga* NYL. Fretum Behring. S. Lawrencebay. E. ALMQUIST. 1879."

Thallus superne conspersa viridis, K + flavus, C —, subtus fuscus vel fusco-niger. Isidia sorediaque desunt. Medulla K —, C —, KC + rosea (verschwindend). — Lageroberseite bleibt auf KC gelb. Lagerlappen überall gleich schmal, meißt 0.75—1 mm breit, lineal, dichotomisch verzweigt, dorsiventral. Wo sich zwei Lappenäste dichotomisch verzweigen, dort bilden sie einen Winkel von 90°, Lager also locker lappig.

Auf Grund des Gesagten ist klar, daß man hier eine gute selbstständige Art vor sich hat: *Parmelia muscivaga* (Nyl.) Gyelnik n. comb.

44. **Parmelia conspersa** var. **caespitosa** Müll. Arg. in Bull. Herb. Boiss. IV. 1896. p. 90. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *caespitosa* Müll. Arg. Grampians, Victoria: Sullivan. comm. F. v. Mueller 1894."

Thallus lobatus, lobis minutis, vulgo 0.25—1 mm latis, brevibus, dense imbricatis, erectis, caespitem compactum formantibus, superne griseo-viridescens, subnitidus, esorediosus, exisidiosus, levis, subtus parce rhizinosus, niger. Sterilis. Medulla alba, K + citrina deindeque fusca, C —, KC + rubra. Lichen sectionis Xanthoparmeliae Vain.

Est forma Parmeliae laxae (Müll. Arg.) Gyel.: f. *caespitosa* (*Parmelia conspersa* var. *caespitosa* Müll. Arg. l. c.) Gyelnik n. comb. Similis f. felkaënsi Gyel. sed lobi erecti.

45. **Parmelia conspersa** var. **constrictans** f. **isidophora** Müll. Arg. in Flora 1883. p. 48. — Der Typus in 2 Exemplaren liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „37. *Parmelia conspersa* v. *constricta* f. *isidiophora* m. Mt. Macedon. Victoria: Moffat. F. v. Müller 1882" und „38. *Parmelia conspersa* v. *constrictans* f. *isidiophora* Müll. Arg. L. B. 575. Mt. Macedon. Victoria: Moffat. F. v. Müller 1882." — Beide Exemplare sind ganz gleich.

Thallus lobatus, lobis angustis, vulgo 0.25—0.5 mm latis, ramosis, omnino bene nigromarginatis, contiguis vel subdiscretis, lobis adventivis deficientibus, superne conspersa-viridis vel fusco-viridis, sat levis, subopacus, esorediosus, isidiosus, isidiis demum cylindricis, ramosis, sat longis, 0.05—0.1 mm crassis, subtus niger. Apothecia superficialia, parmelioidea. Medulla alba, K + citrina deindeque rubescens, C —, KC + rubra. Lichen sectionis Xanthoparmeliae Vain.

Est bona forma Parmeliae isidiigerae (MÜLL. ARG.) GYEL.: f. *isidiophora* (*Parmelia conspersa* var. *constrictans* f. *isidiophora* MÜLL. ARG. l. c.) GYELNIK n. comb.

46. **Parmelia conspersa** var. **felkaënsis** GYEL. in Magyar Botanikai Lapok 1930. p. 32. — Der Typus liegt im mus. Budapest. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* ACH. var. *felkaënsis* GYELNIK n. var. spec. orig. 1929. XII. 2. Rev. Dr. V. GYELNIK 3618. sz. *Parmelia conspersa* (EHRH.) ACH. var. *georgiana* ACH. Gránitsziklán a „Felkai vízesés" felett a patak medrében a M. Tátrában, ca. 1820 m, Szepes vm. 1917. VIII. 1. Gyüjt. TIMKÓ GYÖRGY".

Medulla alba, KC + rosea. Lobi thalli minuti, vulgo 1 mm lati, sat breves, dense imbricati, non erecti vel adscendentes, caespitem compactum formantes.

Est forma Parmeliae laxae (MÜLL. ARG.) GYEL.: f. *felkaënsis* (*Parmelia conspersa* v. *felkaënsis* GYEL. l. c.) GYELNIK n. comb. A f. *caespitosa* (MÜLL. ARG.) GYEL. differt lobis thalli substrato adpressis, non adscendentibus vel erectis.

47. **Parmelia conspersa** var. **hypoclysta** f. **isidiosa** MÜLL. ARG. in Flora 1883. p. 47. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Isidöse Form. *Parmelia conspersa* v. *hypoclysta* NYL. f. *isidiosa* MÜLL. ARG. Bourbon: Leper-vanche 97. Dr. BORNET 1877." Es liegen auf ein Papierstückchen geklebt 4 Exemplare vor.

Thallus lobatus, lobis rotundatis ut in Parmelia conspersa v. latiore SCHAER. (in GYEL., FEDDE, Repert. XXIX. 1931. 1931. p. 153), lobis adventivis deficientibus, superne conspersa-viridis, levis, subopacus, dense isidiatus, isidiis cylindricis, sat longis, 0.05—0.1 mm crassis, ramosis, thallo concoloribus, subtus pallidus. Medulla alba, K + flavescens, C —, KC + rosea. Fertilis. Apothecia superficialia, parmelioidea et etiam isidiosa ut in thallo. Similis Parmeliae pseudoservitianae GYEL. sed thallus subtus pallidus. Lichen sectionis Xanthoparmeliae VAIN.

Diese Form ist mit *Parmelia conspersa* v. *polyphylloides* f. *exasperata* MÜLL. ARG. identisch (siehe über diese die Bemerkung weiter in dieser Abhandlung).

48. **Parmelia conspersa** var. **hypoclystoides** MÜLL. ARG. in Flora 1883. p. 48. — Drei Typen liegen vor (im herb. MÜLL. ARG.). Da die drei Exemplare verschiedene Formen darstellen siehe ich die Erste als Typus an (Zeilenpriorität). I. Der Originalwortlaut der Etikette lautet: „41. *Parmelia conspersa* v. *hypoclystoides* MÜLL. ARG. L. B. 575. Mt. Macedon, Victoria: Moffat. F. v. MÜLLER 1882."

Thallus lobatus, lobis brevibus, sinuatis, hic illic minus nigro-marginatis, dense imbricatis, superne sat levis, pallido-conspersa-viridis, opacus vel subnitidus, esorediosus, isidiatus, isidiis verruciformibus, ovoideis, eramosis, 0.05—0.1 mm crassis, brevibus, subtus pallidus. Sterilis. Medulla alba, K —, C —, KC + rubra. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae Linkolae GYEL. sed medulla KC + rubra (non KC —).

Diese Flechte muß als Art folgenderweise benannt werden: *Parmelia hypoclystoides* (*Parmelia conspersa* var. *hypoclystoides* MÜLL. ARG. l. c.) GYELNIK n. comb.

II. Der Originalwortlaut der Etikette lautet: „637. *Parmelia conspersa* var. *hypoclystoides* MÜLL. ARG. L. B. n. 575. Clarendon, South. Austral.: Tepper. F. v. MUELLER 1882."

Thallus non isidiatus. Medulla alba, K + citrina deindeque rubescens, C —, KC + pallide rosea.

III. Der Originalwortlaut der Etikette lautet: „Thall. K $\begin{matrix}+\text{gelblich}\\+\text{gelb-roth}\end{matrix}$ *Parmelia conspersa* v. *hypoclysta* NYL. Syn. p. 391. sed *brachyphylla* v. *hypoclystoides*. Mauritius: ROBILLARD 1876."

Thallus non isidiatus. Medulla alba, C —, KC + rosea, K + citrina deindeque rubescens.

49. **Parmelia conspersa** var. **imitans** MÜLL. ARG. in Flora 1891. p. 378. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Wie v. *stenophylla* aber subtus pallida. *Parmelia conspersa* v. *imitans* MÜLL. ARG. L. B. n. 1653. On quartzous rocks in Nila Valley, N. W. Ind., Tihri-Garhwal: DUTHIE. hb. Kew 1891."

Thallus lobatus, lobis numerosis, circ. 1 mm latis, laxe imbricatis, elongatis, subdichotomiter ramosis, partim nigromarginatis, lobis adventivis deficientibus, superne viridescens, partim fuscescens, sat levis, exisidiosus, esorediosus, subopacus, subtus pallidus. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. Medulla alba, C —, KC + rubescens, K + citrina deindeque lente fusca.

Identisch mit *Parmelia hypopallida* GYEL. in FEDDE, Repert. XXX. 1932. p. 217. — Es wird also heißen: *Parmelia imitans* (*Parmelia conspersa* v. *imitans* MÜLL. ARG. l. c.) GYELNIK n. comb. f. *hypopallida* (*Parmelia hypopallida* GYEL. l. c.) GYELNIK n. comb.

50. **Parmelia conspersa** var. **laxa** MÜLL. ARG. in Flora 1883. p. 41. — Drei Typen liegen im herb. MÜLL. ARG. Da die 3 Typen verschiedene Formen darstellen, nehme ich das Exemplar von Upper Ovens River als Typus an (Zeilenpriorität). 1. Der Originalwort-

laut der Etikette lautet: Phytologic. Museum of Melbourne. *Parmelia conspersa* v. *laxa* MÜLL. ARG. L. B. no. 575. Upper Ovens River 1882. M'CANN. Baron FERD. VON MUELLER, Ph. et MD. 1882."

Thallus lobatus, lobis sat angustis, vulgo 1—2 mm latis, subdichotomiter ramosis, dense imbricatis, plus minusve nigromarginatis, superne conspersa-viridis, partim fusco-viridis, levis, subnitidus, esorediosus, non isidiosus, subtus nigricans. Apothecia superficialia, parmelioidea. Medulla alba, K + citrina demum sanguinea, C —, KC + rubra. Lichen sectionis Xanthoparmeliae VAIN.

Die Pflanze, als früher beschrieben, wird den Namen *Parmelia pulvinaris* (ZAHLBR.) GYEL. in FEDDE, Repertorium XXIX. 1931. p. 155 unterdrücken: *Parmelia laxa* (*Parmelia conspersa* var. *laxa* MÜLL. ARG. l. c.) GYELNIK n. comb. Der Name *pulvinaris* gehört hierher als var.: *Parmelia laxa* var. *pulvinaris* (*Parmelia conspersa* var. *pulvinaris* A. ZAHLBR. in Fl. Hung. exs. no. 618, [1925]; Syn. *Parmelia pulvinaris* var. *hungarica* GYEL. in FEDDE, Repert. XXIX. 1931. p. 156) GYELNIK n. comb.

2. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *laxa*, MÜLL. ARG. Mount Kosciusko, N. S. W.: FINDLEY. F. v. MUELLER 1882."

Medulla rosea. Die Reaktionen wie bei 1. Lagerlappen viel breiter.

3. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *laxa* MÜLL. ARG. L. B. n. 575. Gippsland, Australia: I. STIRLING. F. v. MUELLER 1882."

Medulla alba. Die Reaktionen wie bei 1. Lagerlappen breiter, mehr weniger abgerundet.

51. **Parmelia conspersa** var. **laxa** f. **isidiigera** MÜLL. ARG. in Flora 1883. p. 48. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „L. 52. *Parmelia conspersa* v. *laxa* f. *isidiigera* m. L. B. 575. King Georges Sound: HARRIS. FERD v. MUELLER 1881."

Thallus lobatus, lobis primariis latis, rotundatis, plus minusve nigromarginatis, lobis adventivis deficientibus, superne conspersa-viridis, partim fusco-viridis, sat levis (vel tenuiter rimoso- vel rugoso-areolatus), versus apices loborum subnitidus, in ceteris opacus, isidiatus, isidiis cylindricis, sat longis, 0.025—0.1 mm crassis, ramosis, subtus nigrescens. Medulla alba, K + citrina demum fusco-rubra, KC + rubra, C —. Soredia desunt. Apothecia superficialia, parmelioidea, ad marginem isidiata ut in superficie thalli. Lichen sectionis Xanthoparmeliae VAIN. — Bei oberflächlicher Beobachtung

scheint es so, als ob das Lager der primären Lagerlappen ähnliche adventive Lappen tragen würde. Bei genauerer Untersuchung stellt es sich aber sofort heraus, daß hier die Thalli übereinander wuchsen und daß diese kleine Adventivlappen sind.

Die Pflanze muß nach meinen bisherigen Untersuchungen als Art angesehen werden: *Parmelia isidiigera* (*Parmelia conspersa* var. *laxa* f. *isidiigera* Müll. Arg. l. c.) Gyelnik n. comb. Als Synonym oder als Stammform dieser Art wird *Parmelia pseudoramigera* Gyel. in Fedde, Repert. XXIX. 1931. p. 286 gelten: *Parmelia isidiigera* f. *pseudoramigera* (*Parmelia pseudoramigera* Gyel. l. c.) Gyelnik n. comb.

52. **Parmelia conspersa** var. **obtecta** A. Zahlbr. apud Skottsberg, The Nat. Hist. Juan Fernandez II. 1924. p. 386. — Der Typus liegt im herb. mus. Wien, no. 539 et no. 841. Der Originalwortlaut der Etikette des No. 539 lautet: „Herb. Musei Palat. Vindob. *Parmelia conspersa* var. *obtecta* A. Zahl. Juan Fernandez. Masafuera, an Sandsteinfelsen umweit Casas. II. leg. 1917. C. et I. Skottsberg".

Thallus typice foliaceus, lobis irregularibus, subimbricatis, lobis adventivis deficientibus, superne conspersa-viridis, sat laevis vel inaequalis, opacus, diffuso-sorediosus, sorediis partim granulosis, partim granuloso-pulverulentis, flavescentibus, subtus rhizinosus, pallidus. Medulla omnino rosea, C —, KC + rosea, K + flava deindeque rubescens. Sterilis. Lichen sectionis Xanthoparmeliae Vain. — Similis omnino Parmeliae rugulosae (Müll. Arg.) Vain. sed medulla non alba sed omnino rosea. — Die Lagerlappen sind besonders in der Mitte des Lagers unregelmäßig wellig-bogig.

Nomenklatur: *Parmelia obtecta* (*Parmelia conspersa* var. *obtecta* A. Zahlbr. apud Skottsberg l. c.) Gyelnik n. comb.

53. **Parmelia conspersa** var. **polyphylla** f. **sorediosa** Müll. Arg. in Flora 1891. p. 378. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *polyphylla* f. *sorediosa* Müll. Arg. L. B. n. 1653. St. Michel, Azores: F. D. Godman. hb. Kew 1891."

Thallus foliaceus, lobatus, lobis sat rotundatis (quasi ut in Parmelia conspersa v. latiore Schaer. Gyel. in Fedde, Repert. XXIX. 1931. p. 153 sed fragmentum est), lobis adventivis sparse praesentibus, subimbricatis, subsinuatis, hic illic nigromarginatis, sat latis, minus subscrobiculatis, superne sat levis, conspersa-viridis, subopacus, maculato-sorediosus, sorediis flavescentibus, pulverulentis, subtus niger. Medulla rubescens, C —, KC + rubra, K + citrina deindeque violacea. Lichen sectionis Xanthoparmeliae Vain.

— Similis Parmeliae sorediantí Nyl. sed medulla rubescens, non alba.

Der richtige Name ist: *Parmelia San Miguelii* Gyel. in Fedde, Repert. XXIX. 1931. p. 288. Syn. *Parmelia conspersa* var. *polyphylla* f. *sorediosa* Müll. Arg. l. c.

54. **Parmelia conspersa** var. **polyphylloides** Müll. Arg. in Flora 1883. p. 47. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *polyphylloides* Müll. Arg. L. B. 575 (*Parmelia conspersa* v. *hypoclysta* Nyl. sed angustior). Wie var. *polyphylla* aber subtus pallida! 118 pr. p. Fowlers Bay, South Australia: Richard. F. v. Mueller 1882." — Es liegen auf ein Papierstückchen geklebt 4 Stücke vor.

Thallus lobatus, lobis sat angustis, 1.5—3 mm latis, sat brevibus, subdichotomiter ramosis, imbricatis, superne viridescens, levis, glaber, subnitidus, subtus pallidus. Isidia sorediaque desunt. Sterilis. Medulla rubescens, C —, K + citrina deindeque violacea, KC + rubra. Lichen sectionis Xanthoparmeliae Vain.

Die Pflanze ist identisch mit *Parmelia viriduloumbrina* v. *somloënsis* Gyel. in Fedde, Repert. XXX. 1932. p. 211. Da aber die oben behandelte Form eher beschrieben wurde, wird sie als Artname, u. zw. *Parmelia polyphylloides* (*Parmelia conspersa* var. *polyphylloides* Müll. Arg. l. c.) Gyelnik n. comb.; und der Name *viriduloumbrina* als Form derselben u. zw.; *Parmelia polyphylloides* f. *viriduloumbrina* (*Parmelia conspersa* f. *viriduloumbrina* Gyel. in Magy. Bot. Lap. 1930. p. 31; *Parmelia viriduloumbrina* Gyel. in Fedde, Repert. XXX. 1932. p. 210; *Parmelia viriduloumbrina* f. *umbrina* Gyel. l. c. p. 211) Gyelnik n. comb. gelten.

55. **Parmelia conspersa** var. **polyphylloides** f. **exasperata** Müll. Arg. in Flora 1883. p. 47. — Die zwei Typi liegen im herb. Müll. Arg. 1. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *polyphylloides* f. *exasperata* Müll. Arg. Wie var. *polyphylla* aber th. subt. pallid. Toowoomba, Queensland: Hartmann. F. v. Mueller 1882." — 5 größere und 1 kleine Exemplare sind auf dem Papierstück aufgeklebt.

Thallus lobatus, lobis sat angustis, ca. 1.5—3 mm latis, discretis, convexiusculis, subdichotomiter ramosis, lobis adventivis sparse praesentibus, sat angustis, ca. 1.5—3 mm latis, plus minusve imbricatis, latere utroque revolventiis, subdichotomiter ramosis, superne viridis, versus centrum fusco-viridis, levis, subnitidus, isidiatus, isidiis thallo concoloribus, cylindricis, sat longis, 0.05—0.1 mm crassis, ramosis, subtus pallidus. Soredia desunt. Sterilis. Medulla alba,

C —, KC + rubra, K + flavescens. Lichen sectionis Xanthoparmeliae VAIN.

2. Der Originalwortlaut der Etikette lautet: „WRIGHT. Lichenes Cubae. No. 77. *Parmelia conspersa* (EHRH.) ACH. *Parm. conspersa* v. *polyphylloides* m. f. *exasperata* MÜLL. ARG. A. GRAY 1878." — Zwei größere Exemplare und ein Bruchstück sind auf einem Papierstück aufgeklebt. Dieses Exemplar weicht vom vorigen wesentlich ab. Es genügt schon nur die Isidien zu beschreiben: Isidia verruciformia, ovoidea, 0.05—0.1 mm crassa, eramosa. Als Typus muß das zuerst beschriebene Exemplar angesehen werden (Zeilenpriorität); es ist mit dem Typus der *Parmelia conspersa* v. *hypoclysta* f. *isidiosa* MÜLL. ARG. gleich und muß als Art angesehen werden. Den Namen *isidiosa* kann man als Artnamen nicht benutzen da das zu Irrtümern führt, es muß also der Name *exasperata* herangezogen werden. Dieser Name wurde aber auch schon von ACHARIUS für eine andere Art benützt. Sie mußte also neu getauft werden, was ich schon durchgeführt habe: *Parmelia subexasperata* GYEL. in FEDDE, Repert. XXIX. 1931. p. 288.

56. **Parmelia conspersa** var. **rugulosa** MÜLL. ARG. in Mission Scientif. Cap Horn. vol. V. 1889. p. 158. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* v. *rugulosa* (f. *sorediosa*) m. Cap Horn n. 30. Ilot de Flores près Montevideo: D'HAZCOT n. 42. 1886."

Thallus lobatus ut in Parmelia conspersa v. latiore SCHAER. (GYEL. in FEDDE, Repert. XXIX. 1931. p. 153), lobis rotundatis, sat latis, contiguis vel subimbricatis, lobis adventivis deficientibus, superne conspersa-viridis, levis, glaber, subopacus, diffuso-sorediosus, sorediis granuloso-pulverulentis, flavescentibus, subtus pallidus. Medulla alba, C —, KC + rosea, K + flava deindeque rubescens. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae antarcticae VAIN. (in Résult. Voyage S. Y. Belgica. Botan. 1903. p. 13) sed thallus subtus pallidus. — A Parmelia sorediante NYL. (in Bull. Soc. Linn. Norm. ser. 2. vol. VI. 1872. p. 259) differt sorediis diffusis et thallo subtus pallido.

Nomenklatur: *Parmelia rugulosa* (*Parmelia conspersa* var. *rugulosa* MÜLL. ARG. l. c.) VAIN. l. c.

57. **Parmelia conspersa** var. **stenophylloides** MÜLL. ARG. in Hedwigia XXXI. 1892. p. 193. — Die Typi liegen im herb. MÜLL. ARG. Einer von Everard Range und einer von Depot. Den ersten muß man als Typus ansehen da dieser die Zeilenpriorität hat. Die zwei Typen gehören nicht zu derselben Art. Der Originalwortlaut der

Etikette lautet: „95. *Parmelia conspersa* v. *stenophylloides* MÜLL. ARG. Everard Range, W. Austral. HELMS. F. v. MUELLER 1892."

Thallus subcrustaceus, versus centrum gleboso-areolatus, versus periphaeriam lobatus, lobis sat latis (ca. 1.5—2.5 mm), contiguis, planiusculis, superne luteolo-viridescens, nudus, exisidiosus, esorediosus, subopacus, sat levis, apotheciiferus, apotheciis sessilibus, usque ad 1.5 mm magnis, marginibus thallinis integris, thallo concoloribus. Medulla alba, C —, KC + rosea, K + citrina deindeque rubri-fuscescens. Thallus subtus rhizinosus, pallidus. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae neoconspersae GYEL. sed thallus subtus pallidus, superne epruinosus.

Est autonoma species. Da aber eine *Parmelia stenophylloides* schon existiert (VAIN. Etud. Lich. Brésil. I. 1890. p. 62) muß sie einen neuen Namen bekommen: *Parmelia subcrustacea* GYELNIK nomen novum. Syn.: *Parmelia conspersa* var. *stenophylloides* MÜLL. ARG. l. c. non VAIN.

58. **Parmelia conspersa** var. **strigosa** MÜLL. ARG. in Bull. Herb. Boiss. IV. 1896. p. 90. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „12. *Parmelia conspersa* v. *strigosa* MÜLL. ARG. Beechworth, Austral.: FALCK. 1881. Victoria. comm. F. v. MÜLLER 1894."

Thallus lobatus, lobis latis, (usque ad 10 mm) ramosis, laxe imbricatis, superne griseo-viridescens, levis, exisidiosus, esorediosus, subopacus, apotheciiferus, apotheciis subsessilibus, usque ad 5 mm magnis, marginibus thallinis angustis, subintegris, subtus olivaceo-fuscus, densissime rhizinosus, rhizinis plerumque ad apices papposis, vulgo 2 mm longis. Medulla alba, C —, KC + rosea, K + citrina deindeque rubescens. Lichen sectionis Xanthoparmeliae VAIN.

Est forma Parmeliae laxae (MÜLL. ARG.) GYEL.: f. *strigosa* (*Parmelia conspersa* v. *strigosa* MÜLL. ARG. l. c.) GYELNIK n. comb.

59. **Parmelia constrictans** var. **eradicata** NYL. apud CROMB. in Journ. of Bot. XIV. 1876. p. 19. — Der Typus liegt im herb. mus. Wien, no. 7422. Der Originalwortlaut der Etikette lautet: „Ex Herb. Kew. *Parmelia constrictans* var. *eradicata* NYL. ... of Table Mt. Cape of Good Hope... legit A. EATON. 9. 1874."

Lager wie bei *Parmelia centrifuga* var. *muscivaga* NYL. typus, nur die Lazinien sind schmaler (ungef. 0.25 mm breit) und bilden bei den Verzweigungen einen Winkel von nicht ganz 90°, das Lager ist auf der Oberseite matt und schwarz, nur an den Enden ist es conspersa-grün. Rhizinen spärlich vorhanden, sie sind aber lang (1—2 mm), ausnahmslos schwarz oder schwarzbraun. Ob diese Pflanze

mit *Parmelia centrifuga* var. *muscivaga* Nyl. identisch ist bleibt fraglich, sie muß mit derselben nocheinmal verglichen werden.

Soredia et isidia desunt. Thallus ca. 3—4 cm magnus, nigro-marginatus, laxe ramosus et laxe imbricatus, subtus nigrescens vel fusco-nigrescens, levis. Medulla alba, K —, KC + rosea, C —.

60. **Parmelia constrictans** var. **inactiva** B. de Lesd. in herb. — Der Typus liegt im herb. B. de Lesd. Der Originalwortlaut der Etikette lautet: „Dr. B. de Lesdain. K =, C =, KC =. *P. constrictans* Nyl. nov. var. *inactiva* B. de Lesd. 257. Mexico, Salazar, sur un rocher, 13 Avril 1925. Leg. Frère Amable."

Thallus lobatus, lobis numerosis, imbricatis, angustis, vulgo 0.5—1 mm latis, sat elongatis. superne viridescens, levis, glaber, esorediosus, non isidiosus, subtus pallidus. Medulla alba, K+ sordide flavescens, KC + rosea. Sterilis.

Identisch mit *Parmelia digitulata* Nyl. var. *citrinireagens* Gyel.

61. **Parmelia convexula** Müll. Arg. in Proceed. Roy. Soc. Edinburgh. XI. 1882. p. 458. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia convexula* Müll. Arg. Diagn. Lich. Soc. p. 3. Ins. Socotra: Balf. n: 1373: 1881."

Medulla alba, C —, KC —, K + citrina.

Es liegen auf ein Papierstück aufgeklebt 5 Steinchen vor. Ein Steinchen ist 1 cm groß, zwei 4—5 mm groß und auf den übrigen zwei Steinchen sind die Flechten noch winziger, was — besonders bei Rekonstruktion von Laubflechtenarten — eine Rekonstruktion unmöglich macht. Am besten diese Art der Vergessenheit übergeben.

62. **Parmelia diffugiens** A. Zahlbr. in Botan. Magaz. Tokyo XLI. 1927. p. 348. — Der Typus liegt im herb. mus. Wien. no. 821. Der Originalwortlaut der Etikette lautet: „Lichens of Japan. No. 542. *Parmelia diffugiens* A. Zahlbr. (Spec. orig.). Hab. Berg Komagatake Prov. Shinano, Mittel Jap. auf den Gipfel ca. 2500 m. Date 26. VII. 1926. Coll. I. Asahina."

Thallus typice foliaceus, laciniatus, laciniis primariis 1—2 mm latis, ca. 1—2 cm longis, ramosis, densis, imbricatis, laciniis adventivis deficientibus, superne centrifuga-viridis, levis, glaber, opacus, esorediosus, exisidiosus, subtus nigrescens, in zona marginalia pallidior vel pallidus. Medulla alba, K —, C —, KC + flava deindeque rubescens. Sterilis. Lichen sectionis Xanthoparmeliae Vain. — Sat similis Parmeliae centrifugae (L.) Ach. sed thallus subtus nigrescens, habitus alior et medulla KC + primum flava deindeque rubescens. — A Parmelia relicinula Müll. Arg. differt habitu aliore, medulla KC +. — A Parmelia muscivaga (Nyl.) Gyel. differt

habitu aliore, medulla KC + primum flava deindeque rubescente.

63. **Parmelia digitulata** Nyl. in Flora 1878. p. 247. — Der Typus liegt im herb. Nyl., no. 34770. Der Originalwortlaut der Etikette lautet: „K ‡ fl. K(CaCl) ∓ erythr. *P. conspersa* * *digitulata* Nyl. In Vogesis. Mougeot."

Medulla alba, K + citrina, KC + rubescens (verschwindend), C —. Thallus lobatus, lobis exactius ut in Parmelia conspersa var. angustiphylla (Gyel. in Fedde, Repert. XXIX. 1931. p. 153), superne conspersa-viridis, levis, sat opacus, non isidiosus, esorediosus, subtus albidus pallidusve. Sterilis.

Auf Grund des Gesagten wird der Name *Parmelia digitulata* die Namen *Parmelia mitrovicensis* Gyel. (in Fedde, Repert. XXX. 1932. p. 216) und *Parmelia citrinireagens* Gyel. (l. c. XXIX. 1931. p. 252) unterdrücken. Die zwei letzteren werden als Formen der *Parmelia digitulata* gelten. Es wird also heißen: Species: *Parmelia digitulata* Nyl. (l. c.); var. 1. *mitrovicensis* Gyelnik n. comb.; var. 2. *citrinireagens* Gyelnik n. comb.

64. **Parmelia ecaperata** Müll. Arg. in Flora 1891. p. 378. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „Ad truncos Palmarum. Dr. Kirk... *Parmelia ecaperata* Müll. Arg. L. B. n. 1651. River Shire (Ausfluß von Nyassa). Africa. hb. Kew. 1890"

Habitus thalli ut in Parmelia conspersa. Thallus lobatus, lobis minus latis, subrotundatis, subsinuatis, contiguis vel subimbricatis, lobis adventivis deficientibus, superne conspersa-viridis, subopacus, levis, esorediosus, isidiosus, isidiis 0.05—0.1 mm crassis, primum ovoideis, verruciformibus, sat brevibus, eramosis, demum cylindricis, sat longis, etiam ramosis, subtus nigrescens. Medulla alba, K —, C —, KC + (plus minusve leviter) violacea. Sterilis. Lichen sectionis Xanthoparmeliae Vain. — Similis Parmeliae Linkolae Gyel. sed isidia demum cylindrica, sat elongata, thallus subtus nigrescens, medulla KC + violacea. — A Parmelia hypoclystoide (Müll. Arg.) Gyel. differt isidiis demum cylindricis, sat elongatis, thallo subtus nigrescente. — Die Isiden sind denen der *Parmelia bohemica* Gyel. ähnlich, unverzweigt, und sehen keineswegs so wie bei *Parmelia isidiata* (Anzi) Gyel. aus.

Bona autonoma species.

65. **Parmelia endomiltodes** Nyl. apud Cromb. in Journ. Linn. Soc. London. Bot. XV. 1876. p. 168. — Der Typus liegt im herb. Nyl., no. 34793. Der Originalwortlaut der Etikette lautet: „*Parmelia endomiltodes* Nyl. Cap B. Spei. Table mountain. Eaton. 1874."

Medulla cinnabarina, K + extemplo violaceo-nigra (ohne erst gelb oder anderswie gefärbt werdend), KC — (die schwärzlich-viola Farbe bleibt unverändert, nur nach einer Zeit wird sie durch die Einwirkung des C weiß), C + violacea pulchra. — Habitus thalli ut in Parmelia conspersa var. vadaskertense GYEL. (in FEDDE, Repert. XXIX. 1931. p. 291). Thallus superne levis, esorediosus, non isidiosus, conspersa-viridis, subtus pallidus.

Das Exemplar ist klein, wenig von Schimmel überzogen, ihre Oberseite wurde, wie das auch bei dem Originalexemplar der *Parmelia loxodes* der Fall ist, braun, deshalb habe ich von einer eingehenden Untersuchung abgesehen. Die obige Beschreibung gibt auch Ihre systematische Stellung genau an.

66. **Parmelia endorosea** A. ZAHLBR. in Annal. Crypt. exot. I. 1928. p. 203. — Der Typus liegt im herb. mus. Wien, no. 4242. Der Originalwortlaut der Etikette lautet: „V. SCHIFFNER. Iter Indicum 1893/94. No. 3304. Parmelia endorosea A. ZAHLBR. Java: Prov. Preanger. In decliv. austral. montis Pangerango; in horto montano „Tjibodas". 1894. Regio nubium, alt. ± 1420 m. s. m."

Thallus iteratim dichotome lobatus, lobis sinuato-lobulatis, lobis lobulisque conniventibus, lobis primariis ca. 3 mm latis, non nigro-marginatis, sat longis, subimbricatis vel contiguis, lobis adventivis deficientibus, superne viridescenti-ochroleucus, levis, esorediosus, sat opacus, isidiosus, isidiis numerosis, brunneis, ca. 0.1—0.2 (0.3) mm crassis, versus periphaeriam thalli ovoideis, verruciformibus, eramosis, versus centrum thalli cylindricis, sat longis, ramosis, subtus omnino nigrescens, rhizinosus. Medulla partim rosea, partim rubra, C —, KC + rubescens, K + flava deindeque rubra. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae vestitulae A. ZAHLBR. sed laciniae thalli latiores et isidia crassiora.

67. **Parmelia endoxantha** MERRILL in The Bryologist XII. 1909. p. 73. — Ein Typus liegt im herb. mus. Wien, no. 61. Der Originalwortlaut der Etikette lautet: „337. *Parmelia endoxantha* MERRILL sp. nov. On trees. Sanford. leg. S. RAPP. 8/1925."

Thallus 5—8 cm magnus, typice foliaceus, lobatus, lobis subrotundatis vel minus elongatis, subimbricatis, lobis adventivis deficientibus, superne griseo-viridescens, subopacus, levis vel minus rimosus, esorediosus, exisidiosus, subtus pallidus, in zona marginalia olivaceo-viridis. Medulla flava, C + aurantiaco-rubra, KC + aurantiaco-rubra, K + flava. Apothecia superficialia, parmelioidea, marginibus thallinis integris vel subcrenatis, discis rufescenti-badiis,

epruinosis, levibus. Sporae ellipsoideae vel subglobosae, 5—10 mikr. longae, 4—7 mikr. crassae.

Mit *Parmelia Uleana* Müll. Arg. in jeder Hinsicht übereinstimmend und muß als Synonym derselben gelten. Die geographische Verbreitung der *Parmelia Uleana* wird damit bis Florida erweitert.

68. **Parmelia ferax** Müll. Arg. in Flora 1886. p. 257. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia ferax* Müll. Arg. L. B. n. 1016. Guntawang, N. S. Wales, Australia: Hamilton. F. v. Müller 1885. Sporae majores quam in *P. conspersa*... thalli laciniae centro latiss. confluentes crebris plicat. rug. et dense fertil."

Thallus lobatus ut in Parmelia conspersa v. latiore Schaer. (Gyel. in Fedde, Repert. XXIX. 1931. p. 153), superne viridescens vel fusco-viridescens, constanter dense verrucosus, verrucis irregularibus, varie magnis (usque ad 1 mm), bene rugosus, esorediosus, non isidiosus, subtus nigrescens. Fertilis. Medulla alba vel albida, K + flavescens vel aurantiaca, KC + rubra, C —. Lichen sectionis Xanthoparmeliae Vain. — A Parmelia subconspersa Nyl. (sec. typo) differt thallo superne constanter rugoso et verrucoso. — Est synonyma Parmeliae Jelinekii Krempelh.

69. **Parmelia flavobrunnea** Müll. Arg. in Flora 1891. p. 379. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „the centro glebos. subt. nudus. lacin. convex. *Parmelia flavobrunnea* Müll. Arg. L. B. n. 1654. Azangaro, Peru: Lechler n. 1766. hb. Kew 1891."

Thallus subcrustaceus, versus centrum verrucoso-glebosus, versus periphaeriam lobatus, lobis usque ad 5 mm latis, rotundatis, superne luteolo-viridescens, levis, opacus, exisidiosus, esorediosus, subtus nudus, erhizinosus, nigrescens, opacus. Apothecia superficialia, lecanorina, sessilia, usque ad 2.5 mm magna, marginibus thallinis thallo concoloribus, integris vel subintegris. Medulla alba, K —, C —, KC —. Bona autonoma species.

Ganz eigentümlich ist bei dieser Art die nackte, völlig rhizinenlose Unterseite. Bei *Parmelia subcongruens* Müll. Arg. ist die Unterseite ebenfalls völlig rhizinenlos. Bei den Xanthoparmelien ist es keine Seltenheit, daß Rhizinen nur ganz spärlich vorhanden sind, aber daß sie ganz und gar fehlen sollten, war bisher nicht bekannt. Diese zwei Arten sind auf der Unterlage ebenso befestigt wie dies z. B. bei *Parmelia physodes* (L.) Ach. der Fall ist. Man könnte sie eventuell in der Subsect. Solidae Bitt. unterbringen. Dagegen spricht aber die strohgelb-grünliche Farbe, ganz dieselbe, wie man

sie bei der *Parmelia conspersa* Gruppe immer beobachtet und auch die Ganze Gestalt, welche auf den Xanthoparmelien erinnert. Ich glaube sie bestens in einer anderen Sektion zu unterbringen, u. zw. Endocoerulea Gyel. in Fedde, Repert. XXIX. 1931. p. 282 (siehe noch die Bemerkung in dieser Abhandlung unter *Parmelia Bouly de Lesdaini* Gyel.): Thallus superne conspersa-viridis, subtus erhizinosus. Medulla thalli solida. Typus sectionis: *Parmelia subcongruens* var. *Bouly de Lesdaini* Gyel. Hierher gehören noch *Parmelia subcongruens* Müll. Arg. typus und *Parmelia flavobrunnea* Müll. Arg.

70. **Parmelia foliosa** Krempelh. in herb. — Ein Fragmentum des Typus liegt im herb. mus. Wien, no. 7740. Der Originalwortlaut der Etikette lautet: „Herb. Musei Palat. Vindob. *Parmelia foliosa* Krphrb. (e spec. orig.). New South Wales, leg. Leichardt."

Thallus umbilicatus, foliaceus, laciniatus, laciniis radiatim dispositis, linealibus, usque ad 25 mm longis, vulgo 1—1.5 mm latis, nigromarginatis, densis, sat laxe imbricatis, superne conspersa-viridis, levis, glaber, esorediosus, exisidiosus, subtus partim nigrescens, partim olivaceo-fuscus, erhizinosus. Sterilis. Medulla alba, C —, KC —, K + flavescens.

Lager auf der Unterseite mit einigen Nabeln am Substrat befestigt und nicht Rhizinös. Die Farbe der Oberseite ist die der Xanthoparmelien. Die Art gehört also in die Untergattung *Omphalodium* (Mey. et Flot.) Nyl. und bildet eine Sektion derselben. *Parmelia* subgen. *Omphalodium* sect. *Xanthomphalodium* Gyelnik sect. nova: thallus umbilicatus, erhizinosus, superne conspersa-viridis. Typus sectionis: *Parmelia foliosa* Krempelh. Hierher gehört wahrscheinlich noch *Parmelia convoluta* (Hue) A. Zahlbr.

71. **Parmelia glabra** var. **sorediomanes** Nyl. in Flora 1875. p. 448. — Der Typus liegt in herb. Nyl., no. 34398. Der Originalwortlaut der Etikette lautet: „2957. *Parm. glabra* var. *sorediomanes* Nyl. Sine ap. et sperm. Ad corticem Populi; Gárdony com. Fehér in Hungaria. 1874. Lojka." Auf der Kapsel: „2957. C +. K —. verruculifera Nyl."

Das Exemplar ist ein sehr kleines Bruchstück, aber soviel ist doch noch sicher feststellbar, daß es mit *Parmelia verruculifera* Nyl. identisch ist. Medulla alba, K —, KC + rosea, C + rubescens. Thallus superne fuscus, sorediosus.

72. **Parmelia interrupta** Stizenb. Bericht über die Thätig. St. Gallisch. naturw. Ges. 1888—89, 1890. p. 154. — Der Typus liegt im herb. mus. Wien, no. 6769. Der Originalwortlaut der Etikette lautet: „Herb. Musei Palat. Vindob. *Parmelia interrupta* Stzb. (e spec. orig!). Cap bon. Spei., leg. Mac Owan."

Thallus crustaceus, citrino-flavus, versus centrum areolatus, areolis discretis, usque ad 0.5 mm magnis, convexiusculis, ad marginem effiguratus, lobulis ca. 0.25—0.3 mm latis, usque ad 1 mm longis, convexiusculis, subdichotomiter ramosis, discretis vel contiguis, inter areolas hypothallo nigro munitus, subtus nigrescens, erhizinosus, hypothallo nigro, bene evoluto instructus. Isidia, soredia et cephalodia desunt. Fertilis.

Est *Squamaria interrupta (Parmelia interrupta* STIZENB. l. c.) GYELNIK n. comb.

73. **Parmelia isidiata** f. **lacinulata** GYEL. in Magy. Bot. Lap. XXIX. 1930. p. 31. — Der Typus liegt im herb. NYL., no. 34769. Der Originalwortlaut der Etikette lautet: „*P. conspersa* var. *georgina* ACH. 19. 7br. 1822. Bonnamaiton. GUIMPER." Der Originalwortlaut des Revisionszettels lautet: „*Parmelia isidiata* (ANZI) GYEL. f. *lacinulata* GYEL. n. f. 34769. rev. 1927. VIII. GYELNIK."

Medulla partim alba, partim rubescens, C —, KC + rubescens, K + citrina demum rubescens. Thallus lobatus, lobis primariis deficientibus, lobis adventivis numerosis praesentibus, angustis (vulgo 1 mm latis), dense imbricatis, nigromarginatis, superne fusco-conspersa-viridis, levis, esorediosus, plus minusve opacus, isidiatus, isidiis cylindricis, thallo concoloribus, ramosis, numerosis, 0.05—0.1 mm crassis, sat longis, subtus nigrescens. Fertilis. — A *Parmelia Lojkana* GYEL. differt medulla partim alba, partim rubescente.

Nomenklatur: *Parmelia lacinulata* (*Parmelia isidiata* f. *lacinulata* GYEL. l. c.) GYELNIK n. comb.

74. **Parmelia Jelinekii** KREMPELH. in Reise Österr. Fregatt. Novara. Bot. Theil. I. 1870. p. 114. tab. XIII. fig. 1: — Der Typus liegt im herb. mus. Wien. — Der Originalwortlaut der Etikette lautet: „Exped. Novara. No. 27. Hrb. Musei Palat. Vindob. *Parmelia Jelineki* KRPHBR. spec. nova! N. Hollandia. l. JELINEK."

Thallus lobatus (quasi ut in Parmelia conspersa v. latiore GYEL. in FEDDE, Repert. XXIX. 1931. p. 153), lobis adventivis deficientibus, superne conspersa-viridescens, opacus, constanter dense rugoso-verrucosus, verrucis irregularibus, varie magnis (usque ad 1 mm), esorediosus, exisidiosus, subtus nigricans, rhizinosus. Medulla alba, C —, K + flava, KC + rubescens. Apothecia superficialia, sessilia, parmelioidea, marginibus thallinis integris vel laceratis, discis badiis, epruinosis, levibus. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae subconspersae NYL. sed thallus superne constanter rugoso-verrucosus. — Est bona autonoma species.

75. **Parmelia Kilaueae** A. ZAHLBR. apud RECHINGER in Denkschr

math.-naturw. Classe K. Akad. Wiss. Wien LXXXVIII. 1911. p. 30. — Der Typus liegt im herb. mus. Wien, no. 5022. Der Originalwortlaut der Etikette lautet: „ Reise nach den Samoa Inseln. 1905. No. 3383. *Parmelia Kilaueae* (A. Zahlbr. Insel Hawaii (Sandwich-Inseln). Vulkan Kilaueae ca. 1000 mt. auf Sträuchern. 27 April 1905. leg. Dr. K. u. L. Rechinger."

Thallus foliaceus, iteratim dichotome laciniatus, laciniis sinuato-lacinulatis, imbricatis, 1—2—3 mm latis, sat longis, laciniis lacinulisque subconniventibus, lacinulis sat longis, superne levis, stramineo-viridescens, subopacus, esorediosus, exisidiosus, subtus niger, dense rhizinosus. Sterilis. Medulla alba, C —, KC + rubescens, K + flava deindeque rubescens. — Am Typus findet man nur an einem Flecke wenige Isidien. Diese gehören aber einer anderen Flechte an oder sind keine wirklichen Isidien vielleicht nur zufällige Auswüchse. *Parmelia honoluluana* Gyel. (in Fedde, Repert. XXXVI. 1934. p. 267) wird als Form dieser Art gelten. Es wird also heißen: *Parmelia Kilaueae* A. Zahlbr. apud Reching. l. c.

var. *honoluluana (Parmelia honoluluana* Gyel. l. c.) Gyelnik n. comb.: laciniis subcontiguis, laciniis lacinulisque conniventibus, lacinulis sat brevibus. Corticola.

var. *ramicola* Gyelnik nom. nov. Syn. *Parmelia Kilaueae* A. Zahlbr. apud Reching. l. c.: laciniis laxe imbricatis, laciniis lacinulisque subconniventibus, lacinulis sat longis. Ramulicola.

76. **Parmelia Lechleri** Müll. Arg. in Flora 1891. p. 379. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „*Parmelia Lechleri* Müll. Arg. L. B. n. 1656. Paß der westl. Cordillerenkette von Lampa nach Arequipa. Perou: Lechler. hb. Kew 1891."

Medulla alba, K —, C —, KC —. — Das Exemplar ist zu klein um einen richtigen Eindruck von der Art gewinnen zu können. Man sieht, daß es sich hier um eine *Xanthoparmelia* handelt, obzwar das Exemplar schon fast durchwegs gebräunt ist. Wurde auch zu stark gepreßt, so daß man nicht mehr sicher ihre Gestalt erkennen kann. Am besten der Vergessenheit zu übergeben.

77. **Parmelia limbata** var. **endococcinea** Müll. Arg. in Flora 1887. p. 318. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „L. 19. a. typ. b. transitus. c. f. *endococcinea*. *Parmelia limbata* Laur. c. f. *endococcinea* m. Russel River, Queensland: Sayer. F. v. Mueller 1886."

Thallus lobatus, lobis angustis, ca. 0.5—1 mm latis, subdichotomiter ramosis, substrato sat adpressus, subcontiguus, lobis adven-

tivis deficientibus, superne luteolo-viridescens, partim roseolus, levis, glaber, esorediosus, exisidiosus, subopacus, subtus niger. Fertilis. Medulla partim alba, partim rubra, in partibus albidis K + citrina demum rubra, C —, KC —; in partibus rubris K + violacea, C —, KC —. Lichen sectionis Xanthoparmeliae VAIN. — Wo das Lager innen rot gefärbt ist dort ist die Oberseite auch rötlich gefärbt; wo das Lager conspersa-grün gefärbt ist, dort ist die Markschicht weiß. Das rote Mark wird auf KC allmählich farblos. Die Pflanze ist höchstwahrscheinlich eine langsam schon zugrunde gehende Flechte.

Nomenklatur: *Parmelia endococcinea* (*Parmelia limbata* var. *endococcinea* MÜLL. ARG. l. c.) GYEL. in FEDDE, Repert. XXIX. 1931. p. 288. Species corticola.

78. **Parmelia limbata** f. **isidiosa** MÜLL. ARG. in Flora 1887. p. 59. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia limbata* LAUR. f. *isidiosa* MÜLL. ARG. (*P. limb.* KRPLH. Austr. n. 84 p. p.) Richmond River, corticola. Miss HODYKINSON."

Das Exemplar ist so winzig, daß man sie nicht untersuchen kann. Wenn ich die drei Reaktionen durchgeführt (nicht sicher, daß das Exemplar dazu genügt hätte), und 1—2 Querschnitte für mikroskopische Untersuchung gemacht hätte, wäre von dem Exemplar nichts geblieben. Am besten der Vergessenheit übergeben.

79. **Parmelia Linkolae** GYEL. in Magy. Bot. Lap. XXVIII. 1929. p. 60. — Der Typus liegt im herb. NYL., no. 34708. Der Originalwortlaut der Etikette lautet: „*Parmelia subconspersa* NYL. in Flora 1869. Nova Zelandia... ad saxa basaltica. Dr. LINDSAY 1861." Der Originalwortlaut des Revisionszettels lautet: „*Parmelia Linkolae* GYELNIK n. sp. exempl. orig. 34708. rev. 1927. VIII. 29. GYELNIK.

Medulla alba, K —, C —, KC —. Habitu similis Parmeliae isidiatae var. adventivae GYEL. Thallus subtus pallidus, superne conspersa-viridis, levis, sat opacus, esorediosus, isidiosus, isidiis ovoideis, eramosis, thallo concoloribus, brevibus, 0.05—0.1 mm crassis. Fertilis.

80. **Parmelia loxodes** NYL. in Flora 1872. p. 426. — Der Typus liegt im herb. NYL., no. 34782. Der Originalwortlaut der Etikette lautet: „*P. loxodes* NYL. K —, CaCl —, K (CaCl) ∓ leviter. erythrin." Im Kapsel: „Drem... fertilis. Sporae non visae."

Medulla alba, C —, KC + violaceo-rubra (langsam verschwindend), K + primum nulla demum rubescens rufescensve plus minusve intensiva (ut in Parmelia protomatrae GYEL.). Thallus loba-

tus, lobis primariis deficientibus, lobis adventivis numerosis praesentibus, angustis, vulgo 1—1.5 mm latis, circ. 1 cm longis, sat imbricatis, non nigromarginatis, superne pallide brunnescens, levis, esorediosus, sat opacus, verruciformi-isidiosus, isidiis numerosis, demum pulvinulos formantibus, varie ($^1/_{10}$—$^1/_3$ mm) crassis, thallo concoloribus, globosis vel ovoideis, eramosis, subtus niger. Sterilis.

Die ursprüngliche Farbe der Oberseite veränderte sich im Herbar, aber trotzdem kann man deutlich erkennen, daß ihre ursprüngliche Lagerfarbe die typische conspersa-grüne Farbe war. Ihre Isidien sind nach der Beschreibung gleich mit den Isidien der *Parmelia Kőrösi-Csomae* Gyel. In der Wirklichkeit ist das aber nicht so, nur ist der Unterschied schwer zu beschreiben. Ihre Isidien stimmen mit den Isidien der *Parmelia Kőrösi-Csomae* überein, indem sie nicht verzweigt sind und die gleiche bedeutende Dicke erreichen. Sie sind aber unterschieden, indem ihre Isidien verschieden groß sind (so unregelmässig wie z. B. bei *Parmelia prolixa* var. *rugosa* Gyel.) und 20—30—40-weise dicht nebeneinander stehen und kleine Polster bilden. Somit gewinnt man den Eindruck als ob das Lager sorediös und nur noch die Rindenschicht der Sorediënkörnern nicht aufgebrochen wäre. Diese Verhältnisse erinnern an *Parmelia farinacea* Bitt.

81. **Parmelia lusitana** Nyl. in Flora 1881. p. 449. — Der Typus liegt im herb. Nyl., no. 34775. Der Originalwortlaut der Etikette lautet: „22. K. medulla fl. vel fulvoluteus. *P. lusitana* Nyl. Subsp. *P. conspersa* Ach.? Portugal. I. Newton. 1879."

Medulla alba, K + citrina, C —, KC —. Thallus lobatus, lobis primariis praesentibus, rotundatis, sat latis, minus imbricatis, versus apices nigromarginatis, lobis adventivis deficientibus, superne conspersa-viridis, levis, esorediosus, plus minusve opacus, isidiosus, isidiis numerosis, ramosis, cylindricis, $^1/_5$—$^1/_{10}$ mm crassis, thallo concoloribus, sat longis, subtus niger. Fertilis. — Von *Parmelia Servitiana* Gyel. nur dadurch unterschieden, daß ihre Isidien noch einmal so dick sind.

82. **Parmelia Meyeri** A. Zahlbr. in Beihefte zum Bot. Centralbl. XIX. 2. Abt. 1905. p. 82. — Beide zitierten Typen liegen im herb. mus. Wien, no. 7511 und no. 7525. Da die zwei Exemplare zweierlei Arten darstellen, habe ich das Exemplar No. 7511 als Typus angesehen und als *Parmelia Meyeri* A. Zahlbr. untersucht. Dieses Exemplar stammt von Paquios und ist in der oben zitierten Abhandlung als die vom ersten Standort angegeben (Zeilenpriorität). Der Originalwortlaut der Etikette lautet: „Pflanzen aus dem Hoch-

land von Ecuador. No. 338. *Parmelia Meyeri* A. Zahlbr. Paquios: Paramo-Region, bei 3800 m Seehöhe. 1903. VII. leg. Prof. Dr. Hans Meyer."

Thallus typice foliaceus, lobis primariis 2—3 mm longis, 1—2 mm latis, imbricatis, subimbricatis vel contiguis, inaequalibus, sat nigromarginatis, lobis adventivis deficientibus, superne conspersa-viridis, opacus, levis, diffuso-sorediosus, sorediis pulverulentis, viridescenti-flavis, subtus fuscus, rhizinosus. Medulla alba, C —, K + flava, KC +↯ rosea. Sterilis. Muscicola. Lichen sectionis Xanthoparmeliae Vain. — Subsimilis Parmeliae baltimorensi Gyel. et Fór. sed thallus diffuso-sorediosus, sorediis flavescentibus, etc. — Similis Parmeliae molliusculae Ach. sed habitus thalli alior et soredia diffusa, etc. — A Parmelia sorediante Nyl. differt thallo diffuso- (non maculato-) soredioso et medulla K + flava, etc.

Es muß betont werden, daß die Flechte zweifellos zu den Xanthoparmelien gehört und auf der Lagerunterseite mit Rhizinen besetzt ist.

Das andere Exemplar von Chimborazo (no. coll. 365) hat medulla K + gelb späterhin allmählich braunrötlich, usw., ist also eine andere Pflanze aber unzweifelhaft auch eine Xanthoparmelia mit Rhizinöser Lagerunterseite.

83. **Parmelia molliuscula** Ach. Lich. Univ. 1810. p. 492; Ach. Syn. Lich. 1814. p. 211. — Der Typus liegt im herb. Ach. Herr C. F. E. Erichsen (Hamburg) war so freundlich während seiner Finnlandreise 1933 den Typus zu untersuchen. Seine Angaben sind wie folgt (in litt. ad Gyel. 28. VI. 1933).

„*Parm. molliuscula.* 2 kl. Stücke vom Cap. b. Spei. Das kleinere kaum ½ qcm gr. sterile Stück weicht vom großerem durch viel breitere Lappen ab, ist schlecht u. kaum bestimmbar. Das etwas größere Stück ist grau, glatt, hat ca. 1 mm br. stark zerteilte Lappen, die am Ende fast koralloid feinlappig sind, angedrückt. Oberfl. n i c h t subpulverulent, wie Ach. sagt. Kl. Stück völlig glatt. Größeres mit. vereinzelt, sorediös. Aufbrüchen, die den Eindruck des Zufälligen machen, sonst glatt, leicht u. spärl. rissig. Unterseite ganz anders wie bei *stenophylla* Ach. Auch bei älteren Lappen nie dunkel, sondern hellbraun, matt, fein chagriniert, nie runzelig oder papillös, etwas kanalikulat, mit kräftig. Seitenrand. K ± leicht gelb > bräunl. gelb (nicht rot), C =. Sie ist weder mit *stenophylla* noch mit *vagans* Nyl., dessen Original ich daneben hatte, irgendwie nahe verwandt. Schon makroskopisch ist der Unterschied entscheidend."

84. **Parmelia montevidensis** MÜLL. ARG. in Flora 1891. p. 379. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Ist intenser gelb u. turgider als *P. consp. Parmelia montevidensis* MÜLL. ARG. L. B. n. 1655. Cerro Melones, Montevideo: FELIPONE. 8. hb. Kew 1891."

Thallus lobatus, lobis sat brevibus, sat latis, sat numerosis, imbricatis, turgido-convexis, superne luteolo-viridescens, levis, glaber, subopacus, esorediosus, exisidiosus, apotheciiferus, apotheciis superficialibus, parmelioideis, usque ad 8 mm magnis, flexuosis, marginibus thallinis thallo concoloribus, integris vel subintegris, subtus niger et plus minusve rhizinosus. Medulla alba, C —, KC + rosea, K + citrina deindeque rubescens. Lichen sectionis Xanthoparmeliae VAIN.

Est forma Parmeliae laxae (MÜLL. ARG.) GYEL.: f. *montevidensis* (*Parmelia montevidensis* MÜLL. ARG. l. c.) GYELNIK n. comb.: lobi numerosi, imbricati, turgido-convexi.

85. **Parmelia Mougeotii** var. **obscurata** MÜLL. ARG. in Bull. Soc. Bot. Belgique. vol. XXXI. 1892. p. 30. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia Mougeotina* NYL. Lich. Nov. Zel. p. 27. *Parmel. Mougeotii* v. *obscurata* m. L. KNIGHT. n. 21. New Zealand: Dr. KNIGHT 1883. Laciniae aliquot superne ut in pl. norm."

Das Exemplar ist zu klein um es rekonstruiren zu können. Selbst die Reaktionen können nicht durchgeführt werden. Man kann nicht einmal sicher feststellen ob es sich hier wirklich um eine *Parmelia Mougeotii* SCHAER., oder einer Verwandten handelt. Am besten der Vergessenheit übergeben.

86. **Parmelia neoconspersa** GYEL. in FEDDE, Repertorium, XXXVI. 1934. p. 273. — Fragmentum typi est in mus. Budapest. Der Originalwortlaut der Etikette lautet: „E herb. BOULY DE LESDAIN, Dunkerque, comm. V. GYELNIK. *Parmelia neoconspersa* GYELNIK n. sp. E typo. 20681. New Mexico, environs de Las Vogas, Canon Sud. 29 Avril 1929. Leg. Frère A. BROUARD."

Thallus subcrustaceus, in centro bullato-areolatus, areolis irregulariter verruciformibus, convexis, 0.5—1 mm magnis, laciniis in periphaeria thalli planis, subsinuatis, subnigromarginatis, contiguis vel subdiscretis, 1—2 mm latis, substrato sat adpressis. Thallus subtus rhizinosus. — Von *Parmelia xanthomelana* MÜLL. ARG. ist diese Art gut zu unterscheiden. Im Zentrum des Lagers sind die Areolen unregelmäßig gestaltete große Warzen, die nicht nebeneinander ste-

hend das Lager bilden. Die Lazinien sind viel breiter, Lageroberseite an den Lappenenden bereift. Das ganze Lager macht einen viel robusteren kräftigeren Eindruck, als *Parmelia xanthomelana*, deren Lager mit ihren winzigen und viel dünneren Lazinien und im Zentrum des Lagers mit kleineren und meißt flachen Areolen ausgezeichnet ist. Übrigens siehe die Originalbeschreibung.

87. **Parmelia ochroleuca** Müll. Arg. in Flora 1882. p. 306, non Ach. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „Phytologic Museum of Melbourne. *Parmelia ochroleuca* Müll. Arg. L. B. n. 409. Illawarra Kirton. Die naheverwandte *P. subcaperatula* Nyl. ap. Cromb. Lich. Austral. R. Br. p. 394 ..." — Die Pflanze besteht aus 3 Stückchen. 2 größere und ein kleines Stückchen auf Rinde.

Thallus lobatus (ut in *Parmelia caperata* vel *Parmelia conspersa* v. *latiore* typica), lobis rotundatis, 3—9 mm latis, contiguis vel subimbricatis, ad marginem integris vel grosse crispatis, eciliatis, superne viridis vel ochroleucus, dense rugosus, esorediosus, subtus nigrescens, versus periphaeriam pallido-fuscus, versus centrum rhizinosus, versus periphaeriam in zona ca. 2—4 mm lata nudus, erhizinosus. Apothecia superficialia, parmelioidea ut in Parmelia caperata. Isidia desunt. Medulla alba, C —, KC + rosea, K + leviter flavescens. Habitu similis Parmeliae caperatae (L.) Ach. Species sectionis Subflavescentes Vain., subsectionis Eciliatae Gyel.

Eine *Parmelia ochroleuca* wurde schon von Taylor (in Transact. Bot. Soc. Edinburgh vol. III. 1847. p. 24) beschrieben. Unsere oben behandelte Pflanze sollte also als jüngerer Name durch einen neuen ersetzt werden. Da aber nach der Literatur (siehe A. Zahlbr. Cat. Lich. Univ. VI. 1930. p. 145—146) diese Pflanze mit *Parmelia rutidota* Hook. et Tayl. identisch ist, wäre das nicht zweckmäßig. Ob *Parmelia rutidota* Hook. et Tayl. und *Parmelia ochroleuca* Müll. Arg. (non Ach. et non Tayl.) wirklich Synonyme sind, läßt sich einstweilen nicht sicher beantworten, da ich das Originalexemplar vom Erstgenannten nicht untersuchen konnte.

88. **Parmelia ochroleuca** f. **sorediosa** Müll. Arg. in Flora 1883. p. 47. — Die zwei Typi liegen im herb. Müll. Arg. 1. Der Originalwortlaut der Etikette lautet: „*Parmelia ochroleuca* var. *sorediosa* Müll. Arg. Twofold Bay, N. S. W., Austral. Tyroni White. F. v. Müller 1882." — Auf dem Papierstück fand ich eine Rindenschicht mit genannter Flechte.

Thallus lobatus, lobis rotundatis, vulgo 5 mm latis, contiguis vel subimbricatis, superne ochroleucus, sat tenuiter rugosus, diffuso-sorediosus, sorediis flavescentibus, granulosis, maculas 1—3 mm magnas formantibus, subtus nigrescens et nigro-rhizinosus, in zona periphaerica 2—3 mm lata erhizinosus, nudus, fuscescens. Sterilis. Medulla alba, K + citrinescens, C —, KC + rosea. Habitu similis Parmeliae caperatae (L.) Ach. sed medulla K + flavescens. Lichen sectionis Subflavescentes Vain. subsectionis Eciliatae Gyel.

2. Der Originalwortlaut der Etikette lautet: „*Parmelia ochroleuca* v. *sorediosa* Müll. Arg. L. B. n. 574 = *P. rutidota* f. *sorediosa* Müll. Arg. L. Knight. n. 19. Near Mt. Dromedary, N. S. Wales: Beader. F. v. Müller 1882". — Auf dem Papierstück fand ich ein Exemplar aufgeklebt.

In jeder Hinsicht der vorigen ähnlich nur die Soredien sind: soredia maculata, ¼—⅓ mm magna, in superficie thalli inspersa. Reaktionen und Sektionszugehörigkeit sind dieselben. Fertilis. Apothecia ad marginem et subtus granuloso-sorediosa.

Als Typus der *Parmelia ochroleuca* f. *sorediosa* Müll. Arg. nehme ich das erstbeschriebene Exemplar an, da dies bei der Originalbeschreibung die Zeilenpriorität besitzt. Diese Form muß als gute Art gelten und wird *Parmelia pseudosorediosa* Gyel. (in Fedde, Repertorium XXIX. 1931. p. 288) heißen.

89. **Parmelia papillosa** Lynge in herb. — Der Typus liegt im herb. mus. Wien, no. 451. Der Originalwortlaut der Etikette lautet: „Herbario del Dr. F. Felippone. Plantas de la Republica del Uruguay. No. 752. La Paz. Canelones. Ad saxa ... 912." Die Diagnose Lynge's liegt auch bei: „*Parmelia papillosa* n. sp. Thallus (fragmentum) 4—5 cm latus, isidiis sorediisque destitutus, papillis crassis brevibus, non vel parce ramosis, fere omnino tectus, laciniae marginales solum liberae, parce evolutae, breves, 0.5—1 cm latae. Cortex continuus. Color pallide ochroleucus vel cinereo-flavescens. Cortex superior 13—20 mikr. altus, hyphae indistinctae perpendiculares. Medulla alba, mollis. Cortex inferior ater, 13—25 mikr. altus. Apothecia numerosa, in papillas fere immersa videtur, 7—8 mm lata, imperforata. Discus badio-rufescens, epruinosus, margo papillosus vel microphyllinus, receptaculum margine thallo concolor, praeterea niger, rugosum. Cortex receptaculi 30—100 mikr. altus, parte exteriore ater, parte interiore incoloratus, cortex interior crassitudine variante: 20—30 mikr. Medulla alba, hyphae dense contextae, gonidia strato crasso continuo, valde irregulari sub cortice

interiori inclusa, in ipsa medulla desunt. Hypothecium (genuinum) 18—25 mikr. altum. Hymenium 80—100 mikr. altum, superne sat dilute flavescens, strato amorpho 7—8 mikr. alto tectum. Paraphyses apice distincte clavatae, ramosae vel etiam ramoso-connexae. Asci saccati, membrana apice mediocriter incrassata. Sporae ellipsoideae vel subovales, mediocriter limbatae, 16—18.5 mikr. longae, 9—10.5 mikr. crassae (adsunt tamen etiam sporae pachydermaticae majores: usque 31 : 16 mikr., an quaternae?). Pycnoconidia recta vel subrecta, 7—8 mikr. longa. React. Thallus KOH extus flavescens, intus e flavo dilute aurantiacus. Gelatina hymenialis et paraphyses I e coeruleo mox sordide flavofuscescentes, asci I persistenter caerulescentes, hypothecium dilutissime, sed persistenter coerulescens. Thallus CaClO extus et intus immutatus. Uruguay: La Paz, depart. Canelones, ad saxa (Herb. Felippone). Die Art ist mit *Parmelia conspersa* nahe verwandt, hat aber viel größere Sporen und einen papillosen Thallus, der keine Tendenz zur Isidienbildung hat, wie das bei der *Parmelia conspersa* f. *isidiata* der Fall ist."

Meine Untersuchung ergab die folgende Beschreibung: Thallus typice foliaceus, lobatus (quasi ut in Parmelia conspersa var. latiore Gyel. in Fedde, Repert. XXIX. 1931. p. 393?), lobis adventivis deficientibus, superne conspersa-viridis, esorediosus, exisidiosus, subopacus, dense grosse papillosus (non isidiosus!), papillis verruciformibus, ovoideis, raro subramosis, ca. 0.5 mm crassis, subtus nigrescens, rhizinosus. Medulla alba, C —, KC + rubescens, K + flava deindeque rubescens. Apothecia sessilia vel quasi innata, parmelioidea, marginibus thallinis dense grosse papillosis (exactius ut in thallo), discis rufescentibus, epruinosis. Lichen sectionis Xanthoparmeliae Vain. — Similis Parmeliae Jelinekii Krempelh. (= *P. feraci* Müll. Arg.) sed medulla K + demum rubra et thallus superne papillosus non rugoso-verrucosus. — A Parmelia laxa (Müll. Arg.) Gyel. sensu lat. differt thallo superne constanter grosse papilloso. — A Parmelia imitanti (Müll. Arg.) Gyel. sensu lat. differt thallo subtus nigro et superne constanter grosse papilloso.

90. **Parmelia Regnellii** Lynge in Arkiv f. Bot. XIII. no. 13. 1914. p. 140. tab. V. fig. 1—2. — Ein Typus liegt im herb. mus. Wien, no. 202. Der Originalwortlaut der Etikette lautet: „Ex Herb. Brasil. Regnell. Musei Bot. Stockholm. Exped. I-mae Regnellian. Lichenes No. 308. *Parmelia Regnellii* n. sp. det. B. Lynge. Brasiliae civit. Minas Geraes, Sao Joao d'el Rey ad rupes itacolumitas. 1. 9. 1892. leg. Gust. A:n Malme."

Thallus typice foliaceus, lobatus, lobis primariis contiguis vel subimbricatis, sinuatis, ca. 1—2 mm latis, lobis adventivis sparsissimis, lobis primariis simillibus, superne citrinus (non conspersa-viridis), hic illic nigro-fuscus, levis, esorediosus, exisidiosus, epruinosus, subtus pallidus, in zona marginalia fusco-niger, rhizinosus. Medulla alba, K + flava, KC + aurantiaco-rubra, C + aurantiaco-rubra. Apothecia numerosa, superficialia, parmelioidea, sessilia (quasi substipitata), marginibus thallinis sat angustis, subcrenatis, discis badiis, levibus, epruinosis. Lichen sectionis Xanthoparmeliae VAIN. — Est bona autonoma species.

91. **Parmelia relicinula** MÜLL. ARG. in Flora 1882. p. 317. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Herbarium Junghuhnianum in Hort acad. Lugd. Bat. *Parmelia relicina* FR. (*P. angustifolia* PERS.) = *Parm. relicinula* MÜLL. ARG. L. B. n. 412. Java coll. JUNGH. v. d. BOSCH. Ex hb: HAMPE 1877." — Es liegen Pflänzchen auf drei Rindenstücken vor.

Thallus partim nigro-marginatus, laciniatus, laciniis angustis, 0.5—1 mm latis, substrato adpressis, subdichotomiter ramosis, planis, discretis, laciniis adventivis deficientibus, viridescens, levis, glaber, opacus vel subopacus, subtus nigrescens, versus periphaeriam saepe pallidior. Apothecia superficialia, marginibus thallinis constanter crenulatis vel evanescentibus. Medulla alba, K —, C —, KC —, Habitu similis Parmeliopsidi ambiguae. Isidia sorediaque desunt. Species sectionis Xanthoparmeliae VAIN.

92. **Parmelia samoënsis** A. ZAHLBR. apud RECHINGER in Denkschr. math.-naturw. Classe Kais. Akad. Wiss. Wien. LXXXI. 1907. p. 272. tab. 2. fig. 6. — Der Typus liegt im herb. mus. Wien, no. 5020. Der Originalwortlaut der Etikette lautet: „Reise nach den Samoa Inseln 1905. No. 5005. *Parmelia samoënsis* A. ZAHLBR. Insel Upolu. Malifa auf Rinde v. *Cocos nucifera* ... leg. Dr. K. u. L. RECHINGER."

Thallus typice foliaceus, iteratim dichotome laciniatus, laciniis sinuato-lacinulatis, sat angustis (0.75—1 mm latis), sat longis, laciniis lacinulisque conniventibus, substrato adpressis, contiguis vel subimbricatis, superne pallide viridescens, levis, subopacus, esorediosus, exisidiosus, subtus niger, rhizinosus. Apothecia superficialia parmelioidea, marginibus thallinis bene lobulato-crenatis, discis rufescentibus, levibus, epruinosis. Medulla thalli alba, C —, KC + rubra, K + flava. Lichen sectionis Xanthoparmeliae VAIN. — Similis Parmeliae flavescentireagenti GYEL. sed laciniae non imbricatae

et margines thallini apotheciorum lobulato-crenati. Es wird also heißen: *Parmelia samoënsis* A. ZAHLBR. l. c. typus: laciniae thalli non imbricatae. Margines thallini apotheciorum lobulato-crenati. — var. *flavescentireagens* (*Parmelia flavescentireagens* GYEL. in FEDDE, Repert. XXXVI. 1934. p. 266) GYELNIK n. comb.: laciniae thalli imbricatae. Margines thallini apotheciorum integri vel subintegri.

93. **Parmelia Schenckiana** MÜLL. ARG. in Flora 1888. p. 529. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Laciniae in saxo adplanatae, modis magis turgid. s. P. congruenti, magis flav. et minus divisa. *Parmelia Schenckiana* MÜLL. ARG. L. B. n. 1386. Obib, in der Nähe der Oranje River, Groß Namaland, Afr. occid. A. SCHENCK n. 542. comm. Dr. SCHINZ 1888."

Thallus subcrustaceus, lobatus, lobis ad apices rotundatis, 0.5—4 mm latis, superne levis, flavo-viridescens, exisidiosus, esorediosus, subopacus, subtus nigrescens, rhizinosus. Apothecia juniora. Medulla alba C —, K + lutescens, KC + rosea. Lichen sectionis Xanthoparmeliae VAIN.

Lagerlappen der Unterlage angepreßt, quer rissig, so daß das Lager areoliert aussieht. Sie steht der *Parmelia subconspersa* NYL. nahe, nur im Habitus sind Unterschiede. Während *Parmelia subconspersa* das Aussehen einer typischen *Parmelia conspersa* hat, hat *Parmelia Schenckiana* MÜLL. ARG. ein mehr *Squamaria*-artiges Aussehen. Das Exemplar ist zu winzig um einen endgültiges Bild von ihm zu gewinnen. Wenn man sie nochmals trifft, muß ihre Gestalt genauer beschrieben werden. Der Typus besteht aus Fragmenten, welche man von der Unterlage (Silikat-Gestein) losgetrennt hat. Sie ist mit *Parmelia novomexicana* GYEL. auch verwandt aber nicht identisch. Die Unterschiede genau zu beschreiben, ist nach den Bruchstücken des Typus nicht möglich.

94. **Parmelia soredians** NYL. in Bull. Soc. Linn. Norm. ser. 2. vol. VI. 1872. p. 259. — Der Typus liegt im herb. NYL., no. 34687. Der Originalwortlaut der Etikette lautet: „No. 487. *Parmelia soredians* NYL. Sur un Cerisier à la Mothe St. Uferay (Deux Sèvres). 13 Oct. 1869..."

Leider konnte ich die oben zitierte Abhandlung NYLANDER's nicht bekommen und so weiß ich nicht sicher ob die hier besprochene Pflanze der Typus oder ein Kotypus ist.

Medulla alba, C —, KC + rubra (verschwindend), K + citrina demum rubra. Thallus lobatus, lobis primariis substrato adpressis, irregularibus, lobis adventivis nonnullis, irregularibus, praesentibus, superne levis, glaber, sat opacus, non isidiosus, sparse maculato-sorediosus, sorediis flavescentibus (non albescentibus), granulosis, subtus niger. Lichen sectionis Xanthoparmeliae VAIN. — Der Habitus des Exemplars ist ganz der der *Parmelia conspersa* ACH. Auf der Lageroberseite sind nur wenige Soredienflecke, diese sind gut begrenzt, 1—2 mm groß und gleich der Soredien der *Parmelia Teresiana* GYEL.

Als *Parmelia soredians* wurden bisher zwei Exsiccatenexemplare ausgegeben, u. zw.: 1. A. ZAHLBR. Lich. rar. exs. no. 236 und 2. HARM. Lich. Gall. rar. exs. no. 68. Beide Exemplare weichen von dem *Parmelia soredians* NYL. typus ab, aber der Unterschied ist schwer wiederzugeben. Ihr Habitus ist ganz gleich der *Parmelia caperata* (L.) ACH. Sie gehören eher der Subsect. *Subflavescentes* VAIN. als der *Xanthoparmelia* VAIN. an, obzwar die Rhizinenlose Zone des Lagerrands viel schmäler ist als bei *Parmelia caperata* und sie sich dadurch den Xanthoparmelien nähern. Ihre Soredien sind diffus obzwar sie manchmal den fleckenförmigen Soredien sehr ähnlich sind. Ich bin gezwungen diese Flechten sowohl von *Parmelia soredians* als auch von *Parmelia caperata* abzutrennen (vom letzterwähnter durch ihre positive Kalireaktion leicht zu unterscheiden). Es wird also heißen:

Parmelia Halmaiana GYELNIK n. sp. — A *Parmelia caperata* differt medulla K + citrina demum rubra. Typus: A. ZAHLBR.: Lich. rar. exs. no. 236 (mus. Budapest). — Diese Art habe ich zu Ehren meines Amtskollegen, des unlängst in Ruhestand gegangenen Bibliothekars I. HALMAI (jetzt Pápa) benannt.

95. **Parmelia sorediantha** MÜLL. ARG. in Flora 1889. p. 509. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „Prox. *P. Moug.* v. *discr.* sed albior, opaca. *Parmelia sorediantha* MÜLL. ARG. Lich. Argent. n. 16. Conception in Argentinien: Dr. LORENTZ 1882."

Thallus subcrustaceus, laciniis angustis, ca. $^1/_5$—$^1/_3$ mm latis, minus ramosis, subnigromarginalis, discretis, 1—2.5 mm longis, convexiusculis, versus apices planiusculis, superne luteolo-viridescens, sat levis, maculato-sorediosus, sorediis flavescentibus, granuloso-pulverulentis, vulgo 0.25 usque ad 1 mm magnis, subtus nigrescens. Medulla alba, C —, K + citrina vel aurantiaca, KC —. Lichen sectionis Xanthoparmeliae VAIN.

Est forma Parmeliae Mougeotii Schaer.: f. *sorediantha (Parmelia sorediantha* MÜLL. ARG. l. c.) GYELNIK n. comb.: laciniis vulgo brevioribus, angustioribus, subconvexis.

96. **Parmelia sphaerosporella** MÜLL. ARG. in Flora 1891. p. 378. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia sphaerosporella* MÜLL. ARG. L. B. n. 1650. Galton Mountains, Oregon. Dr. LYALL. hb. Kew. 1891."

Thallus lobatus ut in Parmelia caperata (L.) ACH., lobis rotundatis, sat latis, contiguis vel subimbricatis, superne luteolo-virides-cens, glaber, constanter valde rugosus, apotheciiferus, apotheciis parmelioideis, usque ad 5 mm magnis, marginibus thallinis integris, discis rufescentibus vel pallide rufescentibus, subtus pallidus, versus periphaeriam minus fuscescens, in zona periphaerica ca. 2—3 mm lata nitidus, nudus, erhizinosus, in partibus ceteris rhizinosus. Medulla alba, K —, C —, KC —. Lichen sectionis Subflavescentes VAIN., subsectionis Eciliatae GYEL.

97. **Parmelia stramineo-nitens** A. ZAHLBR. in Annal. Naturhist. Hofmus. Wien XI. 1893. p. 195. — Der Typus liegt im herb. mus. Wien, no. 6092. Der Originalwortlaut der Etikette lautet: „*Parmelia stramineo-nitens* m. Spec. orig.! det. Dr. ALEX. ZAHLBRUCKNER. Lord Howe Island. 17. leg. MOORE."

Thallus typice foliaceus, exisidiosus, esorediosus, lobatus, lobis primariis sat latis, rotundatis, contiguis vel subimbricatis, lobis adventivis praesentibus, sat latis, sinuato-rotundatis, superne conspersa-viridis, levis, glaber, epruinosus, subtus nigrescens, versus periphaeriam olivaceo-fuscus, rhizinosus. Sterilis. Medulla partim rosea, partim rubra, C —, KC + rubra, K + flava deindeque rubra. Lichen sectionis Xanthoparmeliae VAIN. — Similis omnino *Parmeliae polyphylloidi* GYEL. (in FEDDE, Repert. XXXVI. 1934. p. 277).

98. **Parmelia subcongruens** MÜLL. ARG. in Flora 1889. p. 64. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „*Parmelia congruens* KRPLH. Lich. Argent. no. 40. Argentinien: LORENTZ = *Parmelia subcongruens* MÜLL. ARG. Abs. in L. Argent. n. 40."

Die Pflanze ähnelt ganz einer *Parmelia conspersa* ACH. nur ist die Unterseite völlig rhizinenlos. Deshalb kann sie schwer unter den Xanthoparmelien eingereiht werden. Oberseite conspersa-grün, glatt, matt, Soredien- und Isidienlos. Mark weiß, K —, C —, KC —. Unterseite schwärzlich, am Rande blaßbraun, rhizinenlos, matt. Thallus lobatus, lobis sat latis, subrotundatis, subcontiguis, lobis ad-

ventivis deficientibus. Siehe noch die Bemerkung unter *Parmelia flavobrunnea* MÜLL. ARG.

99. **Parmelia subconspersa** NYL. in Flora 1869. p. 293. — NYLANDER erwähnt in seiner Originalbeschreibung diese Art von 5 Standorten vor, uzw.: N. Zelandia, N. Hollandia, ins. Borbonia, Brasilia et (ni fallor) in Gallia meridionalis. Die südgallische Pflanze kann man bei der Revision ganz fallen lassen da selbst der Autor die Bestimmung nicht für sicher hält. Es bleiben 4 Exemplare. Von diesen ist die Flechte von Neuseeland mit *Parmelia Linkolae* GYEL. identisch, also kommt auch diese nicht in Betracht. Bleiben also 3 Exemplare, mit deren Hilfe man den Typus feststellen muß. Sehen wir nur diese nacheinander.

I. Der Typus liegt im herb. NYL., no. 34701. Der Originalwortlaut der Etikette lautet: „*P. conspersa* PERS. Brasil." Auf der Kapsel: „Herb. W. NYLANDER. 34701. *Parmelia subconspersa* NYL." Enthält 2 Apothezien und nichts anderes.

II. Der Typus liegt im herb. NYL., no. 34698. Der Originalwortlaut der Etikette lautet: „medulla K —. *Parmelia conspersa* ACH. Nova Hollandia. Sydney. Dr. L. LINDSAY. 1862." Auf der Kapsel: „Herb. W. NYLANDER. 34698. *Parmelia subconspersa* NYL." Zwei kleine Stückchen auf Holz. Medulla alba, C —, KC + violascens (verschwindend), K + citrina. Habitus ut in Permalia conspersa var. latiore SCHAER. (GYEL. in FEDDE, Repert. XXIX. 1931. p. 153). Isidia, soredia desunt. Thallus subtus niger.

III. Der Typus liegt im herb. NYL., no. 34702 b. Der Originalwortlaut der Etikette lautet: „*Parmelia conspersa* ACH. Ins. Borbonia."

Medulla alba, C —, KC + violascens (verschwindend), K + citrina. Habitus ut in Parmelia conspersa var. latiore SCHAER GYEL. l. c.). Isidia sorediaque desunt. Thallus subtus niger.

Von den drei Exemplaren kann der I. weggelassen werden, da es so klein und unvollkommen ist, daß man mit dessen Hilfe die Art unmöglich rekonstruiren kann. Die Exemplare II und III sind ganz gleich. Das Exemplar II (no. 34698) werde ich als Typus der *Parmelia subconspersa* NYL. auffassen. Dieses Exemplar ist mit *Parmelia portugalica* GYEL. (in FEDDE, Repert. XXIX. 1931. p. 282) identisch. Die Angabe NYLANDER's, daß die Kalireaktion des Markes negativ väre, fand ich für nicht richtig.

100. **Parmelia subflabellata** STEINER in Bull. Herb. Boiss. ser. 2. vol. VII. 1907. p. 639. — Ein Typus liegt im herb. mus. Wien, no.

16026. Der Originalwortlaut der Etikette lautet: „No. 7. Herb. Musei Palat. Vindob. *Parmelia subflabellata* STNR. specim. origin.! Africa australis, Stellenbosch. Leg. DUTHIE."

Thallus usque ad 35 mm magnus, exisidiosus, esorediosus, lobis convexiusculis, angustis, lobis primariis superne tenuiter et inaequaliter verruculosis, usque ad 2 mm latis, lobis secundariis superne levibus, vulgo 1 mm latis, subtus omnino fuscus, rhizinosus, planiusculus. Medulla alba, C —, KC + rubescens, K + flava deindeque rubescens. Terricola. Lichen sectionis Xanthoparmeliae VAIN. Apothecia superficialia, parmelioidea, substipitata, marginibus thallinis sat angustis, subintegris, discis rufescentibus, levibus, epruinosis. — Similis omnino *Parmeliae vaganti* f. *eleganti* MERESCHK. sed thallus subtus planiusculus, non concaviusculus. Est forma *Parmeliae vagantis* NYL.

Nomenklatur: *Parmelia vagans* NYL. f. *subflabellata* (*Parmelia subflabellata* STEINER l. c.) GYELNIK n. comb.

101. **Parmelia tegulicola** A. ZAHLBR. in Annal. Mycol. XXIX. 1931. p. 85. — Der Typus liegt im herb. mus. Wien, no. 987. Der Originalwortlaut der Etikette lautet: „*Parmelia tegulicola* A. ZAHLBR. (spec. orig.). Chili. Villa Alegra de Lencomilla. leg. M. R. ESPINOSA. det. Dr. ALEX. ZAHLBRUCKNER."

Thallus typice foliaceus, lobatus, lobis primariis praesentibus, sat latis, subrotundato-sinuatis, contiguis vel subimbricatis, lobis adventivis praesentibus, sparsis, imbricatis, superne conspersa-viridis, sat levis, opacus, diffuso-sorediosus, sorediis granuloso-pulverulentis, flavescentibus, subtus rhizinosus, subpallidus. Medulla omnino rosea, C —, KC + rubescens, K + flava deindeque rubra. Sterilis. Lichen sectionis Xanthoparmeliae VAIN. — Similis *Parmeliae obtectae* (A. ZAHLBR.) GYEL. sed lobi adventivi praesentes.

Nomenklatur: *Parmelia obtecta* (A. ZAHLBR.) GYEL., typus: lobi adventivi desunt. — var. *tegulicola* (*Parmelia tegulicola* A. ZAHLBR. l. c.) GYELNIK n. comb.: lobi adventivi adsunt.

102. **Parmelia ulcerosa** A. ZAHLBR. in Annal. Mycol. XXIX. 1931. p. 84. — Der Typus liegt im herb. mus. Wien, no. 992. Der Originalwortlaut der Etikette lautet: „*Parmelia ulcerosa* A. ZAHLBR. Spec. orig. Chili, prov. Santjago, ad saxa Chinihua. leg. M. R. ESPINOSA. det. ALEX. ZAHLBRUCKNER."

Thallus lobatus, lobis primariis sat latis, rotundatis, contiguis vel subimbricatis, lobis adventivis deficientibus, superne conspersa-viridis vel fuscescenti- viridis, subrugosus, glaber, opacus, exisidio-

sus, sorediosus, sorediis maculiformibus, granuloso-pulverulentis, flavescentibus, subtus fuscus, rhizinosus. Medulla alba, C —, KC + rubescens, K + flava deindeque rubra. Apothecia sessilia, parmelioidea, marginibus thallinis integris vel subintegris, sat crassis, saepe sorediosis, discis levibus, badiis, epruinosis.

Mit *Parmelia soredians* Nyl. identisch. Kann als Stammform der *Parmelia soredians* gelten. Es wird also heißen: *Parmelia soredians* Nyl. f. *ulcerosa* (*Parmelia ulcerosa* A. Zahlbr. l. c.) Gyelnik n. comb.: forma typica, thallus lobis adventivis deficientibus.

103. **Parmelia Uleana** Müll. Arg. in Flora 1889. p. 506. — Der Typus liegt im herb. Müll. Arg. Der Originalwortlaut der Etikette lautet: „10. *Parmelia Uleana* Müll. Arg. L. B. n. 1500. Auf der Rinde eines Baumes des Morro da Nova Cintra bei Rio de Janeiro in Brasilien. August 1887. leg. E. Ule. 1889."

Thallus foliaceus, lobatus, lobis rotundatis, subimbricatis, lobis adventivis deficientibus, superne griseo-viridescens, subopacus, versus periphaeriam nitidiusculus, exisidiosus, esorediosus, sat levis, (versus centrum minus rimosus), subtus versus marginem fuscus, in partibus ceteris pallidus. Medulla lutea, C + aurantiaco-rubra, K + flavescens, KC + aurantiaco-rubra. Apothecia superficialia, parmelioidea, marginibus thallinis integris vel subcrenatis. Lichen sectionis Xanthoparmeliae Vain. — Bona autonoma species.

104. **Parmelia vagans** f. **elegans** Mereschk. Lich. Ross. Exs. no. 58 (1913). — Ein Typus liegt im herb. mus. Wien, no. 8751. Der Originalwortlaut der Etikette lautet: „Prof. C. Mereskowsky. Lichenes Rossiae exsiccati. No. 58. *Parmelia vagans* Nyl. f—a *elegans* Mer., nov. f—a. Ad terram in valle Salgir, prope Simpheropolin, in peninsula Taurica. Cette forme très constante dans la localité où elle a été trouvée (vis-à-vis du Jardin de Worontzow) et où la forme typique est absente, est caractérisée par les lobes très étroits du thalle, ce qui lui donne un aspect gracieux et élégant ainsi que par la surface inférieure noire. Suffisement distincte de l'espèce type pour justifier l'établissement d'une forme spéciale. Ex auctore! 1910. Leg. et det. C. Mereschkowsky."

Thallus usque ad 40 mm magnus, exisidiosus, esorediosus, lobis convexis, angustis, lobis primariis superne areolato-rimosis, usque ad 3 mm latis, lobis secundariis superne levibus, vulgo 1 mm latis, subtus omnino nigrescens vel nigro-fuscescens, concaviusculus, rhizinosus. Medulla alba, C —, KC + rosea, K + flava deindeque

lente rufescens rubescensve. Planta deserticola. Lichen sectionis Xanthoparmeliae VAIN. — Est forma bona Parmeliae vagantis NYL.

105. **Parmelia vagans** f. **elegans** sf. **minuscula** SAVICZ in herb. — Ein Typus liegt im herb. mus. Wien, no. 25252. Der Originalwortlaut der Etikette lautet: „Institutum Cryptogamicum Horti Botanici Reipublicae Rossicae (antea Petropolitani). *Parmelia vagans* NYL. f. *elegans* MER. subf. *minuscula* SAVICZ f. n. Statio Mongolia. Prope lac. Kossogol in decliviis stepposis. Anno 1925. Leg. V. SMIRNOV. N. 482. Det. V. P. SAVICZ."

Thallus usque ad 20 mm magnus, exisidiosus, esorediosus, lobis convexis, angustis, lobis primariis superne levibus, 1—1.5 mm latis, lobis secundariis superne etiam levibus, vulgo 0.5—0.75 mm latis, subtus partim nigrescens, partim albidus. Medulla alba, C —, KC + rubra, K + flava deindeque lente rufescens rubescensve. Planta deserticola. Lichen sectionis Xanthoparmeliae VAIN. — Est forma Parmeliae vagantis NYL.

106. **Parmelia verrucigera** NYL. in Flora 1872. p. 426. — Der Typus liegt im herb. NYL., no. 34780. Der Originalwortlaut der Etikette lautet: „*Parmelia verrucigera* NYL. Fougères. DELISE. 1815. ap. vetust. sine sporis." — Das Exemplar ist ein sehr kleines Fragmentum.

Medulla alba, C —, KC —, K + citrina deindeque aurantiaca, sed non rubescens. Thallus superne pallide conspersa-viridis, sat opacus, verruciformi-isidiosus (exactius ut in typo Parmeliae loxodis NYL.), subtus niger. Sterilis. Es liegen zwar zwei Apothezien daneben, aber diese gehören nicht diesem Exemplar an. — A Parmelia loxode NYL differt medulla KC —, K + citrina aurantiacave. — *Parmelia verrucigera* NYL. in Flora 1873. p. 196. est sec. specim. authent. (no. 34778 in herb. NYL.) alia.

107. **Parmelia vestitula** A. ZAHLBR. in herb. — Der Typus liegt im herb. mus. Wien, no. 4217. Der Originalwortlaut der Etikette lautet: „Sept. 1919. Island of Kauai. Coll. J. AU : : : : comm. C. C. PLITT. K ‡ red CaCl =. *Parmelia vestitula* A. ZAHLBR. Spec. orig."

Thallus iteratim dichotome laciniatus, laciniis sinuato-lacinulatis, plerumque angustis, sat longis, laciniis lacinulisque conniventibus, laciniis primariis vulgo 1—2 mm latis, non nigromarginatis, non imbricatis, lobis adventivis deficientibus, superne flavo-ochroleucus, levis, esorediosus, sat opacus, isidiosus, isidiis numerosis,

brunneis, ca. 0.05—0.1 mm crassis, versus periphaeriam thalli ovoideis, verruciformibus, eramosis, versus centrum thalli cylindricis, sat longis, ramosis, subtus omnino nigrescens, rhizinosus. Medulla partim alba, partim rubra, C —, KC + rubescens, K + flava deindeque rubra. Lichen sectionis Xanthoparmeliae VAIN. — Similis omnino Parmeliae pseudalbulae GYEL.

108. **Parmelia Worcesteri** STEINER et A. ZAHLBR. apud A. ZAHLBR. in ENGLER, Bot. Jahrbücher LX. 1926. p. 511. — Der Typus liegt im herb. mus. Wien, no. 8395. Der Originalwortlaut der Etikette lautet: „J. BRUNNTHALER, Reise nach Deutsch-Ostafrika. Herb. Musei Hist. Natur. Vindob. (Botanische Abteilung des Naturhist. Museums, Wien). *Parmelia Worcesteri* STNR. et A. ZAHLBR. Kapland: Worcester, Hügel nördl. d. Ortes Schiefer. 250—300 m. 7. 11. 1909. leg. J. BRUNNTHALER."

Thallus subcrustaceus, versus centrum areolatus, areolis 0.25—1 mm magnis, planis vel convexiusculis, pro p. pruinosis, versus periphaeriam lobatus, lobis planiusculis vel convexiusculis, 2—3 mm longis, 1—2 mm latis, subimbricatis vel contiguis, non vel minutissime nigromarginatis, superne conspersa-viridis vel fusco-viridis, levis, glaber, exisidiosus, esorediosus, subtus rhizinosus, versus periphaeriam nigrescens, versus centrum pallidus. Medulla alba, K —, C + rubra, KC + rubra. Apothecia sessilia, superficialia, parmelioidea, marginibus thallinis integris vel subcrenatis, sat angustis, discis levibus, badiis, epruinosis. Lichen sectionis Xanthoparmeliae VAIN. — Similis *Parmeliae Brunnthaleri* STEINER et A. ZAHLBR. sed medulla thalli C + rubra et KC + rubra.

109. **Parmelia xanthomelana** MÜLL. ARG. in Flora 1883. p. 48. — Der Typus liegt im herb. MÜLL. ARG. Der Originalwortlaut der Etikette lautet: „28. *Parmelia xanthomelana* MÜLL. ARG. L. B. n. 576. Grampians, Australia: Sullivan. F. v. MÜLLER 1882."

Thallus gracilis, subcrustaceus, substrato adpressus, lobatus, in centro areolatus, areolis plerumque planis, saepe minus convexis, usque ad 0.25 mm magnis, in periphaeria laciniatus, laciniis linealibus, ramosis, constanter planis, contiguis vel subdiscretis, usque ad 0.25 mm latis, subnigromarginatis, superne sat levis, subnitidus, non isidiosus, esorediosus, conspersa-viridis vel pro maxima parte fuscescens, subtus niger. Apothecia superficialia, lecanorina, rotundata, diametr. usque ad 2 mm, marginibus thallinis integris vel subcrenulatis. Medulla alba, K + citrina deindeque rubra, C —, KC —. Lichen sectionis Xanthoparmeliae VAIN.

Diese Pflanze gehört in der Verwandschaft der *Parmelia Mougeotii* SCHAER, welcher sie ziemlich ähnlich ist, nur trägt sie keine Soredien. Die KC Reaktion war sehr schwer festzustellen auf dem winzigen Lager. — Von *Parmelia neoconspersa* GYEL. ist sie gut unterscheidbar. Lager viel kleiner, dünner, in der Mitte sind die Areolen kleiner, die Randlappen lineal bei *Parmelia neoconspersa* sind die Randlappen der Spitze zu fächerartig verbreitet, viel schmäler und endlich ist die KC Reaktion negativ.

KITAIBEL HERBÁRIUMA.

Irta dr. JÁVORKA SÁNDOR.

HERBARIUM KITAIBELIANUM.

Auctore Dr. A. JÁVORKA.

IV.

Pisum XXIV.

arvense inter segetes Bartphae (No 27); [*arvense L.*] P. cor. albis in satis ad Arács sub finem Junii (LVIII. No 7).

[*biflorum* l. *Iomardi, sativum*].

Iomardi ex definitione; fl. albi. Inter segetes Bartphae cum P. arvensi fl. violac. (No 48) [*biflorum* f. *albiflorum Beck?*].

maritimum ex horto (No 49).

Ochrus (No 50).

sativum sponte copiosum inter segetes Sclavoniae, potissimum ad Orehoviczam, sed pedunculi tantum biflori (No 46) [potius *biflorum Raf.*]

Plantago VII.

albicans a Willdenow (No 174); *albicans*... a Balbis (XLV. No 65); *albicans* Languedoc — Dc. (XLV. No 76).

alpina Kitaib. [a Roemer] (XLV. No 112).

altissima A Wolny 807 ad aquas substagnantes (No 164); [*altissima L.*] Preßburg Mühlau translata. R. 30. Aug. 1803 v. Rochel (No 164 *a*).

amplexicaulis (No 187).

[*anomala* l. *salina*].

!! *arenaria n. sp.* [*W.* et *K.* Icon. I. p. 51 tab. 51 = *indica L.* = *ramosa (Gilib.) Aschers*]. — 13 — In arenosis inter Komaromium et Jaurinum, in toto item tractu arenoso, qui Vacio juxta Danubium usque ad Tibiscum extenditur; item in Banatu inter Albam-Ecclesiam et Pancsovam, ad Balatonem lacum, nec non in Cttu Szathmariensi (No 182); *arenaria* Ex arenosis Borussiae (No 182 *a*); *arenaria* (XLIII. No 48); *arenaria* [!] pro Psyllio missa ab Haberle ad Bag, Tiszsza Földvár (LVII. No 75).

[*argentea* l. *sericea*].

asiatica sub nom. novae v. *pauciflorae* missa a Wolny 807. Alia specimina sunt ex horto. Folia in omnibus raris pilis adspersa utrinque (No 157) [*major* f. *asiatica (L.)*].

atrata fol. lanceol. subdentatis, scapo tereti hirsuto, spica subovata,

nigricante. Hoppe. Hanc Persoon pro varietate lanceolatae sub γ. habet. In alp. Carpat. Junio, Julio (No 167) [*montana Huds.* var *carpatica Pilger*].

[*carinata l. subulata*].

cordata (XLV. No 103).

Coronopus ex horto (No 186; XLV. No 106).

crassa? at foliis utrinque pilis praesertim nervis pagin. inf. consitis... ad fontem petrog. 8. Jul. — A Wolny (LV. No 76) [*major L.*]; *crassa?* v. asiatica? ad tegulariam... trinam Pestini [?] Junio [Wolny] (LV. No 77) [*major*]; *crassa* In via profunde nudiuscula inter vineas quae ad vallem Bukovátz descendit... [Wolny] (LV. No 78) [*major*, caule foliato]; [*major*] nova? In cultis et hortensibus Carlovitz, etiam capsula polysperma [Wolny] (LV. No 79).

[*cretica* l. *patagonica*].

Cynops initio Maji (No 177; VI. No 242).

! [*hirsuta Kit.* in Steud. Nomencl. ad II. 2. p. 349. deest].

!! *hungarica* [*W.* et *K.* Icon. III. p. 225, tab. 203 = dubia L. sec. Aschers]. — X. 34. — (No 162); [*hungarica*] E salsis versus Poroszló (LVII. No 152, 161).

incana Ram. an alpinae varietas? Pyrenées — Dc. (XLV. No 77).

indica? (No 180). [l. még *arenaria, ramosa*].

Lagopus Folia tamen obsolete nervosa (No 176).

[*lanceolata β capitellata (Koch) Deg.*] bey Szluin (No 165); *lanceolata* (No 166); videtur lanceolatae varietas sed cultura...

[?] (XLV. No 81); *lanceolata* pubescens Ab Ill. D. A. Festetics (LI. No 39); *lanceolata glabriuscula* Ab Ill. D. A. Festetics (LI. No 40).

! *limosa mihi* [apud Schult. Österr. Fl. I. p. 294—5] A P. majore diversa foliis 5-nerviis, petiolo longioribus, oblongis; spica brevi, scapis superne angulatis. A P. media foliis subnudis, petiolis longioribus, scapo superne angulato, capsularum loculis polyspermis, nec quae Smith ei tribuit, seminibus solitariis. A Pl. solitaria spicis densis. Ad stagna locis humidis limosis (No 159) [est forma *P. majoris*].

lusitanica E seminibus a Wiborg missis (No 175).

[*major L.* cum frondescentia bractearum inferiorum] A Wolny missa 807 sub P. foliis latissimis, scapis basi compressis. Capsulis polyspermis 10—12 (No 158); [*major* f. *pauciflora Gilib.*] ex inundatis arenosis. A Wolny (LV. No 82); [l. még *asiatica, crassa*].

maritima pro alpina missa a Mauksch e Scepusio, ubi ad balneam Ganoczensem crescit (No 170); *maritima* e salsis supra Szegedinum. In planiore parte Hungariae, praesertim locis sublimpidis frequens. Spica ante anthesim mutans, antherae sulphureae (No 171).

maxima E seminibus a Wiborg. Cucullatam vocat Persoon cum Lamarck (No 161).
media ab Ill. D. Ant. Festetich (XLV. No 22).
[*montana* l. *atrata*].
pro *patagonica* missa, sed non est. Accedit potius ad creticam (No 172).
! [*pilosa Kit.* in Spr. Syst. I. p. 435, deest].
Psyllium (No 183; XLV. No 83).
pumila (No 179).
[*ramosa (Gilib.) Aschers* = *indica* L.] (LV. No 15; LVIII. No 61); [l. még *arenaria*].
! *salina* s. *anomalia* n. sp. [= *tenuiflora W.* et *K.* Icon. I. p. 37 tab. 39.] — 12 — Iam medio Majo floret; sed stamina nunquam vidi, licet multoties investigaverim. Corolla 4-petala: petalis membranaceis, minutis, conniventibus, apici germinis insidentibus clausa (No 185).
!! *sericea* [*W.* et *K.* Icon. II. p. 163 tab. 151 = *argentea Chaix*] In montibus calcareis ad Inotam, Palotam, Füred, Harsány [a Horhi] (No 168); *sericea?* [!] in alpe Számár (No 169); *sericea* in lapidosis supra vineas ad Arács (LVIII. No 14).
serpentina All. Taurini in aridis a Balbis (XLV. No 64).
squarrosa Willd. v. *Panzer* (No 181); *squarrosa* (XLV. No 16).
stricta (XLV. No 21, 107).
! *subulata* [*W.* et *K.* Icon. I. p. XXXI. non *L.*] Flumine, in Carniolia, ad Kolár in Cttu Posoniensi (No 184) [*carinata Schrad.*]; *subulata* — Marseille — Dc. (XLV. No 73).
tenella Murr. von Panzer (No 178).
!! *tenuiflora* [*W.* et *K.* Icon. I. p. 37, tab. 39] Ex horto (XLIII. No 18); *tenuiflora* (XLIII. No 8, 44); *tenuiflora?* [!] folia glabra. In salsis inter Egyek et Hortobágy; scil. in praedio Ohat (LVII. No 148). [l. még *salina*].
vaginata (XLV. No 109).
villosa (No 173).
virginica (No 163).
spec. (XLV. No 19).

Platanthera XXI.

[*bifolia (L.) Rchb.*] ex it. Baranyens.? (No 1 *b.*); [l. még *Orchis bifolia*].
[*chlorantha (Cust.) Rchb.*] Labello cornuque breviore, quam in septentrionalibus regni partibus (No 1 *c.*); [*chlorantha*] (LXIII. No 103); [l. még *Orchis bifolia*].

Platanus XL.

acerifolia (No 159).
occidentalis Garten (No 213).
orientalis Garten (No 214).

Plectranthus XVIII.

fruticosus a Seidel Dresdae (No 99); *fruticosus* (No 100).
parviflorus Ex horto (L. No 40).

Pleurospermum

[*austriacum* l. *Ligusticum austriacum, scoticum*].

Plinia XIV.

sub nomine *pedunculatae* data, quae non habetur in sp. pl. (No 162).

Plumbago VIII.

europaea L. e Gallo-provincia a Balbis (XLII. No 39); *europaea?* [!] A Pfist. (LV. No 11).

zeylanica (No 138).

Poa III.

abyssinica L. v. Panzer (No 210); *abyssinica* (No 210 *a*).

aegyptiaca (XLV. No 155).

alpina in alp. Velebich (No 122); *alpina* Jul. Aug. in Alp. a. 798 n. 19 [Mauksch] (No 123) [potius *Furkotae Deg.*]; *alpina*. Minus specimen est ex alpe Marmarosiensi Petrosa, alterum a Wolny acceptum e Chots. Spiculae 6-florae . . . (No 124); [*alpina L.*] ex alpe Chocs (No 124 *a*); *alpina* v. Operschall (No 124 *b*); *alpina* a Willdenow (No 124 *c.*); [*alpina β. gelida Schur?*]. Ex Velebich alpe (No 124 *d.*); *alpina vivipara* In alp. Velebich (No 125); *alpina β vivipara* sp. pl. Poa vivipara, distincta spec. Willd. Enum. Ex alp. Scepusii (No 125 *a*); *alpina vivipara*. Aliae eodem in loco eodem anno seminiferae erant (No 126); [*alpina L.*] *vivipara Willd.* Ex pl. hort. Berol. E Krivan (No 126 *a*).; [*alpina* f. *vivipara L.*] Ex alp. arvensibus (No 126 *b.*); *alpina* E Scepusio missa, in horto educata (No 127); *alpinae* varietas flosculis lanatis... Host pro varietate pratensis habet. Crescit in alpe Pop Iván (No 128), [l. még *badensis, bulbosa, coarctata, supina*].

amabilis? (VI. No 303).

! *ambigua mihi* Ex horto (XLV. No 237) [*nemoralis L.*].

! *angulata mihi* E seminibus a Mauksch missis (No 148) [*granitica Braun-Bl.* = *media* auct., non *Schur*].

! *angulosa* n. sp. [apud Sadler Magy. Fűnem. p. 148 et 155 nomen solum] Culmus erectus subcompressus, post exsiccationem compressus, obtuse angulatus sulcatusque, spithamaeus aut paulo longior, nodis 4—5 distinctus. Folia angusta, erecta, succesive in apicem acutum angustata, striata, nuda, laevia, marginibus scabriuscula. Vaginae striatae, laeves, ligula membranacea brevissima truncata terminatae. Panicula secunda, erecta, angusta, rara: ramis pedunculis que hispidis, setulis brevibus. Spiculae erectae, oblongae, acutae, carinatae. Calycis valvulae subaequales, flosculum infimum fere aequantes, subulatae, carinatae, marginibus submembranaceae, carina versus apicem scabriuscula, utrimque linea pellucida notatae. Glumae coroll. subaequales, interior non raro longior, marginibus membranaceis inflexis interjecto sulco bicarinato, carinis viridibus; exterior carinata, basi, ca-

rina et marginibus vix notabiliter villosa, utraque glabra. Antherae purpurasc. Stigmata pilosa alba. Crescit in Matra (No 189) [*nemoralis L.* monstros.? *angulosa (Kit.)*, caule praecipue superne ancipite].

angustifolia a Willdenow (No 140); *angustifolia?* E sylvis Pomász (No 140 *a.*) [*palustris L.*]; *angustifolia* in pratis humidis ad rivum Pecze. Floret initio Maji (No 140 *b.*); *angustifolia* ex insula Pesthinensi (No 141); *angustifolia* In pratis initio Maji etiam Essekini (No 142); [*angustifolia L.*] Von der Mada Gebürg (No 143); [*angustifolia L.*] v. Keszthely (No 144); *angustifolia* pratensis Hostii. Glumae calycinae et corollinae albo-marginatae... Floret sub medio Maji (No 145); *angustifolia?* [!] Culmi teretes scabri [!] Vaginae sursum ducendo, folia deorsum scabra. Ligula oblongo ovata, obtusa (No 146); [*angustifolia L.*] Flor. Jun. in pratis ad molam papyraceam [Mauksch] (No 146 *a.*) [*angustifolia L.*] a Wolny (No 147). [l. még *setacea, trivialis*].

annua L. (No 201); *annua* (XLV. No 202).

aquatica Folia sicca in lectis substernunt accolae Marusii, quod in iis molliter cubatur. Spiculae 4—5-florae, etiam triflorae, quo in casu spiculae ovatae potius, quam lineares dicendae (No 109) [*Glyceria aquatica (L.) Whlbg.*]; *aquatica* in Cottu Liptov. collecta (VI. No 251) [*Glyceria aquatica*]; *aquatica* (VI. No 296) [*Glyceria aquatica*].

! [*aspera Kit.* apud Schult. Österr. Fl. I. p. 229, apud Sadl. Fűneműek p. 148 et 155, non *Jacq*, nec *Gaud.* = *scabra Kit.*].

alpina, potius collina seu *badensis* In horto nata e seminibus, nescio ubi lectis — in monte Zobor (No 118); alpina secundum herbarium Mygindi. Est potius *badensis*... (No 118 *a.*); *badensis* collina Host. Planta biennis, in rupibus calcareis calidioris Hungariae crescens (No 118 *b.*); [*badensis Hke.*] In Velebich (No 120 *c.*). ;[l. még *collina, serrata*].

! [*banatica Kit.* Addit. p. 7., Neilr. Diagn. p. 139, Janka ÖBZ (1872) p. 153 deest; sec. Neilr. et teste herb. Willdenowii (No 1905, e Banatu) = *Festuca drymeia M.* et *K.*; confer *trinervata, Festuca banatica*].

[*brevifolia* l. *membranacea*].

bulbosa seminifera. Ex arenosis Pesthanis, ubi cum vivipara simul crescit; spiculae quaepiam etiam 5-florae (No 114); *bulbosa* ex arena Pesth. initio Maji (No *114 a.*); *bulbosa a.* Non multum differt a P. alpina nisi foliis (No 114 *b.*); [*bulbosa* L.+*angustifolia L.*] ad Hajós in arenosis (No 115); *bulbosa* vivipara [*crispata Thuill.*]; in sylva ad Pecze Szt. Márton nata (No 116); *bulbosa* comata (No 117) [f. *crispata Thuill.*]; *bulbosa?* In

summa montis Straschow inter Drabam aizoidem 13. Jun. 1803 [Rochel] (No 201 *a.*) [*alpina L.?*]; *bulbosa* (VI. No 266).

! [*caduca Kit.* apud Sadl. Fűnem. p. 148; Roch. Ban. p. 26, Addit. p. 7, sub hoc nomine deest].

caesia (No 166 *a.*).

cenisia spiculae 7-florae (No 121); *cenisia?* sed spiculae bi-triflorae. Ni fallor, ex alpibus carpathicis (No 129) [*granitica Braun.-Bl.;* [l. még *coarctata, distichophylla, laxa, variegata*].

[*cernua* l. *effusa*].

[*Chaixii* l. *rubens*].

[*Chaixii Vill.*] E Cserna Hora a Wolny adlatum specimen. Culmus anceps (No 199); [l. még *sudetica*].

ciliaris in alpibus Aug. [Mauksch] (No 131 *b.*) [*laxa Hke.*]; *ciliaris* (No 214; XLV. No 155 *a.*); *ciliaris* ex horto (XLV. No 206).

! *coarctata mihi* [in Steud. Nomencl. II. p. 359; apud Borb. Math. Term. Közl. XV. (1878) p. 326] — 63 — In subalpinis Scepus. Junio. Est varietas alpinae sec. Willdenow, sed spiculae 3-florae (No 122 *a.*) [est *cenisia* var. *contracta (Neilr.)* sec. Borbás; *alpina* f. *coarctata (Kit.) A.* et *G.* sec. A. et G. Syn. — Meo sensu potius ad *P. alpinam* pertinet, foliis angustis, caespite non stolonifera; exemplar majus vero ad *P. pratensem* (eius var. *Furkotae Deg.*) pertinet].

alpina potius *collina* ad Scram regiam in margine aprico Smiszanini [?] [Szonntag] (No 120) [*badensis Hke.*]; alpina, potius *collina* ex alpe Plissivicza (No 120 *a.*) [*badensis Hke.*]; alpina potius *collina* in pratis ad fluvium Hernad (Szonntag) (No 120 *b.*) [*badensis Hke.*]; collina Host — *badensis*]![(XLII. No 213); [l. még *membranacea*].

! *complanata mihi* a Festetics ad Füred (VI. No 243) [*compressa L.*].

[*compressa L.*] In Merszin (No 195); *compressa L.* Iuveni saepius prope furnos laterum Pesthini et in collibus argillosis inter vineas Budae (No 203); *compressa* in agris glareosis inter sata Jul. [Mauksch] (No 203 *a.*) [ad var. *Langeanam (Rchb.)* vergens]; *compressae* varietas ad Ránk, in sylva (No 204) [ad var. *Langeanam* vergenes]; *compressa?* [!] In sylva ad Tés (No 204 *a.*); *compressa?* diversa culmis 2—3 pedalibus; panicula aequali; rachi laevi; spiculis trifloris. Inter arbores ad Parád (LVI. No 60) [*compressa L.* var. *Langeana Rchb.*, vel *compressa* × *nemoralis?*]; *compressa* foliis omnino laevibus, spiculis 3—4-floris. In lapidosis montis ad Arács (LVIII. No 8); [l. még *complanata, fragilis, planiculmis, pratensis, Aira flexuosa*].

cristata Aira cristata. Culmus erectus... In montibus ad Budaörs Majo et in clivis arenosis Pesthini, ubi tamen folia an-

gustiora, rigidiora, marginibus scabra habet. Specimen longius, laevius, pallidius spiculis 1—2 floris est e sylva Mutensi in Cttu Tolnensi. Quae Scheuchzer et Morison de hoc gramine dicunt, uti et figura, conveniunt. (No 78) [*Koeleria gracilis (Pers.) Dom.* + *K. glauca* × *gracilis?*]; *cristata* var. culmo breviore, geniculo infracto; foliis mollibus, canis, mollissime villosis. Vaginae totum culmum tegunt... Carina calycum per microscopium inspecta ciliata est. Floret in montibus budensibus Majo, panicula patula, eleganter splendente. (No 79) [*Koeleria gracilis (Pers.) Dom.*]; cristata in apricis aridis Jun. [Mauksch] (No 79 a.) [*Koeleria gracilis*, p. p. ad var. *glabram Janka vergens*]; *cristata* E seminibus a Wiborg (No 79 *c.*); *cristatae* varietas, culmo altiore, maxima parte nudo... In pratis Pesthanis Majo (No 80) [*Koeleria gracilis (Pers.) Dom.*]; *cristata* in Plissivicza (No 81) [*Koeleria eriostachya Panč.!* cum var. *carniolica (Kern)?*]; *cristata* (No 81 a.); [*cristata* = *Koeleria gracilis*, ad var. *glabram* Janka vergens.] Von den Mada Gebürg (No 82).

dahurica [?] Ex horto (VI. No 234).

! ramosa seu *depauperata* n. sp. [*Kit.* apud Spr. Pug. I. (1813) p. 7.; apud Schult. Österr. Fl. I. p. 228 = *Kitaibelii Kth.* Rev. Gram. I. p. 117 et Enum. I. p. 364; confer Neilr. Diagn. p. 138, Ascherson in Verh. zool.-bot. Ges. (1867) p. 568; Borbás Math. Term. Közl. XV. (1878) p. 324] culmis ramosis; panicula depauperata secunda; spiculis bifloris; calycibus flosculos aequantibus; ligula oblonga diversa a nemorali. Ad Cassoviam lecta. — X. 16 — Est nemoralis varietas secundum Willd. in litteris (No 187) [*palustris L.* f. *depauperata* (*A.* et *G.*)]; *depauperata mihi* Ex horto — Schult. 8. — (No 188) [*palustris* f. *depauperata*]; — [*palustris* f. *depauperata*] ad Ránk? (No 188 *a.*).

distans e salsis Banatus (No 112) [*Puccinellia (Atropis) limosa (Schur) Holmb.*]; — ad *P. Peisonis (Beck) vergens*]; *distans* a Jacquin missa a Willdenow (No 112 *a.*) [*Puccinellia distans (L.) Parl.*]; *distans?* spiculis 3-floris Ex Biha[-r?] (No 112 *c.*) [*Puccinellia distans*]; *distans* In locis humidis, praesertim salsis (Székes-Föld) Pesthini, Budae, in Cttu Albensi, in Jazygia, in Szathmariensi, Szaboltsensi frequens (No 112 *d.*) [*Puccinellia distans*]; *distans* e salsis Cttus Békesiensis (No 112 *e.*) [*Puccinellia distans*]; *distans* Bartphae ad acidulas Aug. (VI. No 224) [*Puccinellia distans*]; *distans* (VI. No 290 [*Puccinellia distans*]. [*disticha*, Haberle indexe szerint, de a növény hiányzik] (No 213); *disticha* — 13 — Pyrenées — Dc. (VI. No 135).

distichophylla? Versus Hradek ad ped. montium C. Lipt. [Rochel] (VI. No 183) [*granitica Braun — Bl.?*]; — *distichophylla Gaudin* — Poa flexuosa Host gram. a Schrader (VI. No 195); *distichophylla* Gou. Culta, an P. alpina? [Rochel] (XLV. No 227) [an *granitica Braun-Bl.?*].

divaricata a Willd. (No 113); *divaricata* Montpellier — Dc. (XLV. No 266).

! *effusa v. miliacea mihi* [apud Schult. Österr. Fl. I. p. 227; Addit. p. 6. No 22; Heuff. En. p. 195] — Schult. 11 — (No 193) [*palustris* f. *effusa (Kit.)* sec. A. et G. Syn. II. 1. p. 417, 418, sed ligula brevis, truncatula]; *cernua* vel *effusa mihi* ad Herlein in sylva. Descripta in horto (VI. No 123) [*palustris* f. *effusa (Kit.) A.* et *G.*, ligula brevi truncatula]; *effusa mihi* ex horto (VI. No 190) [*palustris* f. *effusa*, ligula brevi].

elongata ex horto (VI. No 142, 149; XLV. No 161).

Eragrostis Per totam Hungariam, Transsylvaniam, Croatiam, Sclavoniam et Banatum infra altiores montes locis duris apricis, ad vias et in hortis (No 207) [*Eragrostis minor Host*]; *Eragrostis*, dürren Hügeln [Wolny] (No 208) [*Eragrostis minor*]; *Eragrostis* Peterwardeiner Festungs-Felsen [Wolny] (No 208 a.) [*Eragrostis minor*]; *Eragrostis* E Banatu. Ad Dombó infra Siklós crevit majus specimen (No 209) [*Eragrostis megastachya (Koel.) Lk.*]; *Eragrostis* Littorale — v. Sieber (VI. No 159).

fertilis? a Wolny 807 (No 192) [*palustris L.*].

festucaeformis Insel Caorle — v. Sieber (VI. No 164); — *festucaeformis* (XLV. No 182).

! [*firma Kit.* Addit. p. 6. No 22. = *effusa Kit.*].

flexuosa Culta (No 184).

nova *fragilis* praeterito anno nomine compressa missa, in siccis sabulosis aest. [Mauksch] (No 202 a.) [*compressa L.*].

[*Furcotae* l. *alpina, coarctata*].

! *glandulosa mihi* sub nomine amabilis missa, an barbata? ... Von Tés auss. den Wald (No 205) [*Eragrostis minor Host*].

glauca ex horto (No 166).

[*granitica* l. *angulata, cenisia, coarctata, distichophylla, variegata*].

! palustris? *hydrophila Persoon* [et *Kit.* apud Sadler, Magyar Fűnem. p. 149] — X. 16 — sed scabrities in foliis et vaginis est nimis modica, nec panicula adeo densa, qualis a Morisonio pingitur ... In fossis circum agros Oryzae in Banatu (No 167) [*palustris L.*, confer Ascherson Verh. zool. bot. Ges. (1867) p. 568, Janka ÖBZ. (1872) p. 153; Neilr. Diagn. p. 138; Borb. Math. Term. Közl. XV. p. 324.]; *hydrophila Persoon* spiculis 4—5-floris (No 168) [*palustris L.*]; [l. még *obtusata*].

! *intermedia mihi* [apud Sadl. Magy. Fűnem. p. 149 et 155] Culmo conpresso, cum annua et compressa, paniculae forma cum priore, duratione, culmis erectis, flosculis villosis cum posteriore convenit. E Cottu Arvensi (No 202) [*pratensis L.*, ad var. *Furkotae Deg. vergens*].

japonica Thunbg. v. Panzer (No 212).

[*Kitaibelii Kth.* En. I. p. 364 l. *depauperata; Kitaibelii Schult.* Österr. Fl. I. p. 225 est sec. Steud. Nomencl. = *trivialis L.*].

laxa? [!] — F. 5 — Ex alpe Krivan (No 131) [Specimen Willdenowio missum est sec. Borb. Math. Term. Közl. XV. p. 326 = *cenisia* var. *contracta Neilr.*]; *laxa?* [!] in alp. Aug. a. 798. [Mauksch] (No. 131 *a.*); *laxa* in Alpibus Aug. [Mauksch] (No 165 *a.*) [*nemoralis L.*]; *laxa* [Mauksch] (No 185 *a.*) [*nemoralis*]; *laxa* von Böhmen — v. Sieber (VI. No 181; [l. még *ciliaris*].

litoralis Montpellier — Dc. (VI. No 132); *litoralis* — a Sprengel (VI. No 213).

an *maritima?* ex horto (No 110) [*Puccinelliae* spec.]; *maritima.* Culta. Videtur differre panicula strictiore, glumisque glaberrimis, sed forte P. distantis varietas [a Willdenow] (No 110 *a.*) [*Puccinelliae* spec.]; maritima a Willd. Haec magis refert distantem, quam prior (No 111); *maritima* Board d. l. mer. — Dc. (VI. No 131).

[*media* auct. non *Schur* l. *granatica Braun-Bl.*].

! *membranacea mihi* (XLII. No 142) [proxima *P. alpinae* var. *brevifoliae Gaud.*].

! [*miliacea Kit.* apud Schultes Österr. Fl. I. p. 227; *R.* et *Sch.* Syst. II. p. 547, non *Lk.*, l. *effusa*].

[*minor* l. *supina*].

[*nemoralis L.?*] ex itinere banatico in hortum illata (No 140 *c.*); nemoralis. Jul. Aug. a. 1798 [Mauksch] (No 147 *a.*) [*pratensis L.*]; [*nemoralis L.*] Culmus vaginae laevis... (No 152); *nemoralis?* [!] — 64 — In alpibus Scepusii Augusto. A Mauksch a. 798 sub n. 16 missa. Est pratensis sec. Willdenow, sed spiculae nec 5-florae sunt, nec glabrae (No 165); [*nemoralis*] Lig. truncata brevior, a Wolny (No 170); [*nemoralis*] similis illi, quam Willdenow pro pratensi declaravit... In sylva Hódos, ad limites Cttus albensis et Veszprimiensis Junio (No 171); *nemoralis* spiculae triflorae... (No 173); *nemoralis* e sylva ad Herlein (No 173 *a.*); *nemoralis* e seminibus a Wiborg (No 174); *nemoralis?*... (No 174 *a.*); an *nemoralis?* [!] e Cttu Bihar (No 174 *b.*); *nemoralis* in alpe Badány (No 175); *nemoralis* E Szitnya (No 176); *nemoralis* est sec. Willdenow — 29 — E monte Czobor... (No 177; *nemoralis* E sylvis Sümeghiensibus (No 179) [+ *palustris L.*]; *nemoralis* in sa-

licetis, ligula oblonga [Mauksch] (No 179 a.) [*palustris L.*]; [*nemoralis*] Auf Felsen an den Meh. Bädern. Ligula nulla, ex it. ban. 2-do (No 181); [*nemoralis*] Culmi vaginae laeves. Ligula nulla ... ad thermas Herculis in rup. calc. (No 183); *nemoralis* E rupibus alpis Rosály et ex alpe Trojaga (No 184); *nemoralis* a Wolny (No 185); *nemoralis* varietas, quam pro Melica nova habui. Ex alp. Pop Iván (No 186) [*nemoralis* var. *montana Gaud.*]; [*nemoralis*] ad Versetz? (No 198); [*nemoralis*] Ex Hung. in hortum illata (VI. No 304); [*nemoralis*] ex horto (XLV. No 144); — *nemoralis* a Barone Splényi (XLV. No 168); [*nemoralis*] Ex alpibus Beregh (XLV. No 278); [*nemoralis*] spiculo subbifloro flosc. basi connex. (LVI. No 15); *nemoralis?* [!] ad Parád in umbra. Panicula nutans (LVI. No 20); *nemoralis* omnibus notis, ad Parád in sylvaticis (LVI. No 61); [*nemoralis*] E rupe montis Kőhát (LVII. No 200); [l. még *angulosa, laxa, pratensis, odorata, serotina. Agrostis gracilis, Aira flexuosa*].

sub nomine P. *nervosa* missa, forte cilianensis? videtur esse Briza an geniculata? (VI. No 323).

[*nutans Kit.* Addit. p. 6 = *effusa Kit.*].

! obtusata [= *obtusa W.* et *K.* apud Rumy in Magy. Orv. Term. Munk. II. (1842) p. 53] e Syrmio, quam scripsi, me etiam in Croatia reperisse. Poa hydrophila Persoon Syn. (No 169) [*palustris L.* sec. Janka ÖBZ. (1872) p. 153].

! odorata mihi Panicula odorata est, saltem in sicco. Videtur esse *P. nemoralis* [!] Culmi vaginaeque laeves. Folia scabra. Ligula brevissima (No 182).

[*palustris L.*] Flor. Jun. Jul. ibidem — Szonntag (No 149 a.); [*palustris* var. *leviculmis Borb.*] ex arenosis inter Igmánd et Szt. Iván (No 170 a.); [*palustris L.* saltem pro maxime parte] ex alpe Petrosa et Cassovia allata. Poa laxa sub hoc nomine missa, sed non est, nisi forte cultura ita mutaverit. Panicula enim non contracta subracemosa. Lig. oblonga membran. (No 180); *palustris* (VI. No 211) [*trivialis L.*]. *palustris* — Kitaib. — [Roemer] (XLV. No 125; [*palustris*] Ex insula (XLV. No 137); [*palustris?*] (XLV. No 216); [l. még *angustifolia, depauperata, fertilis, hydrophila, nemoralis, obtusata, pratensis, umbrosa*].

Peruviana Jacq. v. Panzer (No 211).

Phoenix a Lumnitzer (V. No 10) [*Bromus inermis Leyss.*].

pilosa L. — v. Panzer (No 206) *Eragrostis pilosa (L.) Beauv.*]; *pilosa* var.? Ex horto (No 206 a.); [*pilosa* = *Eragrostis pilosa*] Exit. Beregh. (No 206 *b.*); *pilosa* In Cttu Sümeghiensi, Temesiensi, Borsodiensi, Hevesiensi, Baranyensi, in Forojulio (No 206

c.) [*Eragrostis pilosa*]; *pilosa* in arenosis ad Kaál Septembri (VI. No 221) [*Eragrostis pilosa*].

! planiculmis mihi ex horto (XLV. No 235) [*compressa L.*].

pratensis a W. (No 149) [*palustris L.*]; *pratensis* a Lumnitzer (No 150 *a*); *pratensis* Flosculi omnino nudi, 4—5 in calyce (150 *b.*) [*trivialis L.*]; *pratensis* Culmus laevis, (sub panicula etiam) Vagina laevis... (No 151); *pratensis.* Host Gram. II. A. 61. — angustifolia sp. pl. ex definitione et secundum Host. In Plissivicza (No 153); *pratensis,* humilis Ehrh. (No 154); *pratensis* var. *angustifolia Schrad.?* secundum Willdenow in litteris (No 155); [*pratensis L.* ad var. *angustifoliam L.*] Von der Wiesen unter Potcenar. Exit. Beregh. (No 155 *a.*); trivialis an *pratensis* ex arenosis Pesth. (No 156) [ad var. *angustifoliam L.*]; [*pratensis* var. *angustifolia*] In pratis comit. Szalad. (No 156 *a.*); *pratensis* (No 157); [*pratensis L.*] E Szitnya (No 158); [*pratensis* var. *angustifolia*] ad Marton-Vásár in prato sicco et ad Kiss Hörcsök (No 160 *a.*); *pratensis* — 30 — sec. Willdenow ... (No 161) [*nemoralis L.*]; *pratensis* [+ *nemoralis* + *palustris*] spiculae 5-florae... (No 162); *pratensis* Culmi vaginaeque laeves... Ad Pecze Szt. Márton (No 163) [potius *nemoralis L.*]; pratensis ad limites agrorum et pratorum [Mauksch] (No 164); [*pratensis*] In Schatten an dem Teich des Gartens in Tó-Almás Julii (LVI. No 51); [l. még *coarctata, intermedia, nemoralis, trivialis*].

procumbens (XLV. No 148). [*ramosa* l. *depauperata*]. [*remota* l. *sudetica*].

! rhombea? [= *Festuca rhomboidea Kit.* Addit. p. 10?; eadem ac Festuca sylvatica XLV. No 256. Est spec. Festucae ignota, ulterius inquirenda!] (XLV. No 139).

rigida (VI. No 299).

! rubens? [*Kit.* in herb. Willd. apud Borb. in Math. Term. Közl. XV. p. 328? sec. Borb. in herb. Willd. adest Poae Chaixii forma] — 65 — videtur esse mera trivialis varietas. In agrorum et pratorum Scepusiensium locis humidis. Ita etiam Willdenow. (No 138) [*trivialis L.!*]; — *rubens* In pratis circa fossas et in agris locis udis Jul. [Mauksch] (No 138 *a.*) [*trivialis,* floribus sordide violaceis]; *rubens* Von Genersich, der sie mit Hoppe für neu hält (No 139) [*trivialis*].

salina missa (No 112 *b.*).

! scabra [*Kit.* apud Steud. Nomencl. ed. 2. II. p. 362; Addit. p. 7. nomen solum non *Ehrh.* confer Kern. ÖBZ. XIV. p. 85 nota, Aschers. Verh. zool. bot. Ges. (1867) p. 568, Borb. Math. Term. Közl. XV. (1878) p. 322] — X. 17 — Schultes 9 — Culmis, vaginis, foliisque scabris. Im Scharer Berg. Potius *aspera*

dicenda cum scabra jam detur. Videtur eadem cum illa e Syrmio esse. (No 190) [certe ergo *Poa aspera Kit.* apud Schult. identica cum *P. scabra* nomenque *P. asperae* anteponendum!]; *scabra mihi* E Mátra (VI. No 322).

serotina? Flosculi basi villo connexi. Ligula truncata brevis. E sylva ad Bekecs (No 172) [*nemoralis L.?* ligula brevi].

! serrata mihi — 27 — alpina? secundum herbarium Mygindi, cujus exemplaria pariter, ut mea, spiculas non 6-floras, ut in definitione ponuntur, verum 10—12-floras gerunt; magnitudine tamen superat illa. Flosculorum glumae magis villosae sunt, quam in speciminibus alpium. Hoc e montibus budensibus attuli. Membrana oris foliorum integra, truncata. A cenisia, ad quam spectata definitione accedit, diversa est docente icone et descriptione Hostii. Ad P. cenisiam proxime accedit, fors eadem (No 130) [*badensis Hke*].

! setacea [*Kit.* in Rel. Kit. p. 96] — D. 6. — Spiculis ovatis, 4 floris, corollis basi vix notabiliter pubescentibus, acutis; foliis setaceis, glaucis. Inter rupes vallis Forkassich (No 196 *a.*) [*angustifoliae L.* forma, paleis angustioribus, margine glabris; confer Borb. Math. Term. Közl. XV. p. 326].

sudetica in agrorum et pratorum locis humidis Jun. Jul. [Mauksch] No 138 *b.*). [*trivialis L.*]; *sudetica* in alpibus Jun. Jul. [Mauksch] (No 199 *a.*) [*Chaixii Vill.*]; *sudetica* In Rosály, Guttin, Kriván, alp. Scepus., Beregh. (No 199 *b.*) [*Chaixii Vill.*]; *sudetica* in alpibus et subalpinis m. Kriván (No 200) [*remota Forselles*].

supina Schrad.? — Schult. 7 — In Plissivicza (No 122 *b.*) [*minor Gaud.*]; *supina Schrader.* Habitat per omnes alpes Europae, Poae annuae maxime affinis — v. Sieber (VI. No 167); *supina Schrad.?* In altioribus mont. calc. C. Trent. [Roch.] (VI. No 186) [*alpina* f. *subalpina Schur*]. sub nomine *tenella missa* — an P. debilis? (XLV. No 287).

[*tricurvata* l. *trinervata*].

! trinervata Ehrh. [et *Kit.* in herb. Willd. = *tricurvata Kit.* Addit. p. 7 no. 26 = *banatica Willd., Kit.* apud Borb. in Math. Term. Közl. XV. p. 330 = *Festuca drymeia M.* et *K.*] Gotting. — v. Schrader (No 119).

trivialis a W. (No 133); *trivialis* e Scepusio, in horto nata (No 133 *a.*); *trivialis* E seminibus in Báb collectis nata (No 134); *trivialis* (134 *a.*); *trivialis* In mont. Marmaros, Szathmár et in humidis ad Biha [Bia], Pomász (No 135); *trivialis* spiculae triflorae basi pubescentibus flosculis, etiam 4—5-florae. In insula urbica pesthan. et sylvis Sümeghiensibus et ad Káloz. Ligula quidem longior, quam in

aliis, nec tamen longissima. (No 136); *trivialis* Willd. sp. pl. et Smith Fl. angl. ad Szalatnya (No 137); *trivialis* ad limites agrorum et pratorum Jul. [Mauksch] (No 138 *c.*); *trivialis* a Lumnitzer (No 142 *a.*) [*angustifolia L.*]; [*trivialis L.*] (No 159); *trivialis* Spiculae pleraeque biflorae. Ad Káloz (No 160); [*trivialis L.*] Culmi et vaginae sursum, folia deorsum ducendo scabra. Ligula oblonga inciso-dentata. Spiculae bi-triflorae flosc. acut. nudis. — Schult. 10 — E Syrmio (No 191); [*trivialis L.*] Lig. obl. spic. 2. fl. ex itin. croatico (No 194); [*trivialis*] E sylva Bartph. Aug. (VI. No 220); *trivialis* (XLV. No 283); *trivialis* Ab A. Festetics (LVII. No 12) [*pratensis L.*]; [*trivialis*] A nemorali diversa panicula patente, ligula elongata. Ab A. Festetics (LVII. No 92); [l. még *Kitaibelii, palustris, pratensis, rubens, sudetica, Aira semineutra*].

! [*uliginosa Kit.* apud Gombocz l. c. p. 133 deest; P. uliginosa Willd. (an Kit?), teste herb. Willdenovii sine loco natali est *Glyceria poiformis Fr. — R. Soó* in litt.].

umbrosa (No 175 *a.*); *umbrosa*, biflora Boujardi, a qua tamen differre videtur (No 178) [*palustris L.*].

variegata — 32 Host pro pratensi habet. Ex alpibus Scepusii, ubi Julio, Augusto floret. Missa a Mauksch. Etiam Willdenow pro pratensi declaravit in litteris — Poa sed quae species? Ignota Jul. Aug. in alpibus, potest conferri cum Poa ciliari [Mauksch] (No 148) [*granitica* Braun-Bl. = *media* auct., non *Schur*]. sub nomine Poa *violacea* missa (XLV. No 230); [l. még *Festuca poaeformis*].

Poa nova (No 197).

Podospermum

[l. *Scorzonera Jacquiniana, laciniata*].

Polemonium VIII.

coeruleum sub Carpatho in der kleinen Kohlbach in silvis caeduis, etiam in subalpinis Völkgrund (No 155); *coeruleum* — Baumgarten (LIX. No 128); *coeruleum* (XLVI. No 38).

Pollichia I.

campestris ex horto (No 3).

Polycarpon VI.

tetraphyllum ex horto (No 254, 401).

Polycnemum VI.

arvense (No 278); *arvense* in agris fere ubique, praesertim post messem observabilis (No 356) [*majus A. B.*]; *arvense* (No 359) [*majus*]; *arvense* in arenosis, potissimum culcatis, Pesthini (XLV. No 177).

[*majus* l. *arvense*].

Polygala XXIII.

amara ex alpibus — a Balbis (No 191); *amara* [*β fatua Kit.* Addit. p. 249?] Icon et descriptio Jacq. in Fl. aust. T. V. t. 452 huic accurate convenit. E Scepusio a Mauksch (No 192); *amara* ex alp. Velebich et Plissivicza, etiam in subalpinis (No 195) [*croatica Chodat = Rossiana Borb.*]; *amara* E m. Szmrkovicza. Sapor amarus (No 196); *amara* ad Palotam locis montosis etiam in pratis praedii Péth primo vere — ab Horhi, fol. insipida (LII. No 50) [*amarella Cr.*]; *amara* ab Oberschall (LII. No 68); *amara* — Baumgarten (LIX. No 12) [! fl. albescente? non P. vulgaris, uti Simk in En. p. 114 no. 270 monet].

[*amarella* l. *amara*].

Chamaebuxus [= *Chamaebuxus alpestris Spach*] (No 203); *Chamaebuxus* e monte Merszin ad *Koreniczam* (No 203 *a.*); *Chamaebuxus* — Baumgarten (LIX. No 14).

[*comosa Schk.*] media inter amaram et vulgarem, sapor parum amarus... Ubi collegerim, non memini (No 193); [*comosa*] Ex itinere arvensi (No 199 *a.*); [*comosa*] A Wolny (XLII. No 144); [l. még *vulgaris*].

[*croatica* l. *amara, multicaulis*].

! glandulifera n. sp. In alpe Rosály. Willdenow scribit esse officinalem. Haec omnino diversa est a P. amara, quae est tota glabra. (No 196 *a.*) [*vulgaris L.*].

major In graminosis montanis Budae (No 201); [*major Jacq.*] XLII. No 214; LIII. No 24).

monspeliaca E Gallo-Provincia [a Balbis] (No 202).

! multicaulis mihi [Addit. p. 249 no. 1070] sapor in sicco fatuus, e sylvis versus Flumen (No 194) [proxima *croaticae Chodat = Rossianae Borb.*, a qua alis acutiusculis vel saltem non adeo rotundatis differt.].

[*Rossiana* l. *amara, multicaulis*].

vulgaris in Szitnya (No 197); [*vulgaris L.*] Haec accedit ad glandulosam nostram quam uti hanc in alpe Rosály invenimus; sed differt statura minore, omnibus partibus nudis, caule simplici, racemo paucifloro (No 197 *a.*); *vulgaris* in graminosis versus Szilas (No 198) [*comosa Schk.*]; *vulgaris* e Banatu et Syrmio (No 199) [*comosa*]; *vulgaris* (No 200; LIII. No 23) [*comosa*]; [l. még *glandulifera*].

[spec.? l. *Veronica cuneifolia*].

Polygonatum

[l. *Convallaria*].

Polygonum XII.

alpinum — Kitaib. [a Roemer] (XLVII. No 202).

amphibium aquaticum In aquis stagnantibus Jul. Aug. rar. [Mauksch] (No 292); *amphibium* f. *terrestre* In cultis oleraceis circa Kesmark passim Aug.

Sept. Floret annis pluviosis, ideoque rarius [Mauksch] (No 293); *amphibium* β e Cottu Szabolcs, a B. Splényi (XLVII. No 189); *amphibium* ad Dégh in rivo Junio (LVIII. No 18).

!! *arenarium* n. sp. [*W.* et *K.* Icon. I. p. 69 tab. 67 = *floridum Winterl.*] Vermutlich hält man diese Pflanze für eine Abart v. P. aviculare; aber sie ist gewiss eine eigene Art, die aus Samen gezogen immer gleich bleibt und sich vorzüglich durch den Blüthenstand, der Blattlose Ähren bildet, unterscheidet. In arena mobili. Floret Septembri et Octobri (No 308); *arenarium?* E Podolia a Besser (XLII. No 121); *arenarium* n. sp. In arenosis Pesthini, Banatus (LIII. No 177).

aviculare ubique ad vias (No 306); *avicularis* var. *indica* (No 307); *aviculare* (LIII. No 176); an varietas *avicularis?* vel P. Bellardi? ad Nerodin [?] ochreis laceris [a Wolny] (LV. No 88) [*aviculare L.*]

Bellardi? videtur novum aut illud a Wolny (No 309) [*patulum M. B.* ssp. *Kitaibelianum* Sadl.]; *Bellardi* E monte Gerardi (No 310) [*patulum* ssp. *Kitaibelianum*].

Bistorta In prato ad Sztraskam Carpat. Auf dem Petrosa um der Schäferhütte (No 289); — hoc P. simillimum est *Bistortae* [!] in pratis succulentis obviae; crescit tamen in summis pratis alpinis, legi exemplaria in flore et ecce flores disparuerunt et semina apparent [Mauksch] (No 290); *Bistorta* ex horto (XLVII. No 160); *Bistorta* E Liptov. ab Operschal (XLVII. No 197); *Bistorta* e cottu Sümegh (XLVII. No 201); *Bistorta* radice (ut Adler adfert [?]) diversa. Ex alp. Marmat (LVII. No 215).

! [*ciliare Kit.* Addit. p. 39 no. 236 sub hoc nomine deest].

convolvulus Ex horto pro P. dumetorum missum (No 316) [*dumetorum L.* = *Fagopyrum dumetorum Schreb.*]; *Convolvulus* In fruticetis et sepibus vinearum Budae, in Cottu Hevesiensi (No 317); [l. még *humile, pusillum*].

divaricatum (No 311).

dumetorum? [!] Ex itinere Beregh (No 319); [l. még *P. convolvulus*].

[*Fagopyrum* = *Fagopyrum sagittatum Gilib.*] (No 314, 314 a.); *Fagopyrum* Seritur ad fructum [?] in Liptovia (XLVII. No 186).

[*floridum* l. *arenarium*].

frutescens (XLVII. No 173).

! *glandulosum mihi* [Addit. p. 39. no. 238] Pedunculi et corollae glandulis nigricantibus scabrae (No 299) [*lapathifolium L.*, tepalis hinc inde nigro punctulatis].

humile — III. 34 — In sabulo, circum paludes aut in quo aqua stagnaverat. Floret Majo (No 318) [P. *convolvulus L.* = *Fagopyrum convolvulus H. Gross*].

Hydropiper E Syrmio (No 296) [*lapathifolium L.* + *mite Schrk.*]; *Hydropiper* E Banatu specimi-

na minora (No 297); *Hydropiper* Flores albi, 7-bri Bartphae (XLVII. No 182); *Hydropiper* (LIII. No 173); *Hydropiper* Copiosissimum in Marmatiae humidis (LVII. No 211); *Hydropiper* fl. albis ... fol. planiusculis. In fossis ad Parád Aug. (LVI. No 91); *Hydropiper* Caulis basi decumbens, radicans. Ergo P. minus caule radicante non distinguitur ab Hydrop. Folia obtusiusc. utr. glabra, ciliata, subtus vix observabiliter punctata. Stipula erecta (nec laxa). Calycis foliola superiore parte alba, inf. viridia (nec intus flavescenti-viridia extus rubella) ... punctata, bracteae virides, superiore parte purpurascentes, pariter elevato punctatae. Ad sepes sub fine Aug. Dum aliae similes species flor. rubellis, sapore miti, foliis planis (nec ut in Hydrop. undulatis) (LVI. No 119).

incanum? sub nomine tomentosi acceptum (No 300) [*tomentosum Schrk.*].

! [*intermedium Kit.* apud Roch. Ban. 26; Addit. p. 59 no. 236., deest = *ciliare*].

[*Kitaibelianum* l. *Bellardi*].

[*lapathifolium L.* = *nodosum Pers.*] non puto diversum a Persicaria — a Wolny (No 301); *lapathifolium* fl. rubro caule maculato (LVI. No 100); *lapathifolium* fl. albis (LVI. No 101); [l. még *obliquum, Persicaria, punctatum*].

maritimum (No 305).

minus Ait. kew. 2. p. 31. Spec. pl. per Willden. P. mite Schrk. bav. I. p. 668. P. persicaria β L. Sp. pl. 518 Ad Csáktornyam in fossis (No 294); *minus* β Spec. pl. per Willd. ad Quinque Ecclesias in humidis et in palude Ecsediensi (No 295); *minus* Bartfae et in fossis per Cottum Saáros atque Abaujvár. Aug. et 7-bri (XLVII. No 184); *minus* (LVI. No 99).

[*mite Schrk.*] Descript. in diar. itin. parad. Floret aug. locis humidis (LVI. No 111); [*mite*] *minus?* Flores purpurei, insipidi In aquosis ad Bustyaháza et alibi (LVII. No. 217); [*mite*] (LXIII. No 133); [l. még *Hydropiper*].

! *obliquum mihi* [Addit. p. 60 no. 239] (No 303) [*lapathifolium L.*, foliis ovato-lanceolatis].

orientale In Banatu sponte ad hortos (No 304).

[*patulum MB.* ad ssp. *Kitaibelianum Sadl.* vergens] (LVIII. No 48); [l. még *Bellardi*].

Persicaria? Folia subtus punctata, rachi margine venisque a setulis scabra, petioli subhispidi (No 302) [*lapathifolium L.*]; [*Persicaria L.*] videtur a congeneribus diversum ochreis laxis obtusis inermibus; in umbrosis silvis et humidis [Wolny] (LV. No 87); *Persicaria* (LVI. No 90).

! *punctatum mihi* [Addit. p. 59 no. 237] v. Nesselthaler (No 298) [*lapathifolium L.* ex Janka l. c. p.

153]; *punctatum mihi,* mite, fl. albi. Styli usque ad basin discreti, in spicas conferti, oblongas cylindricas. Caul. glabr. Petioli setis brevibus... Folia lata lanc. plana subtus punctata, glabra, costa med. utrinque setulis scabra, supra med. utrinque setulis raris adspersis. Ochrea truncata, costata glabra, raro una alterave... ciliata (XLVII. No 180 [*lapathifolium* ex Janka l. c. p. 153, sed ochreis sat longe ciliolatis].

! *pusillum mihi* [Addit. p. 60 no. 243] an novum? Auf dem Ginserberg [= Güns = Kőszeg, nec „Grusiensi" ut in Addit. p. 60 citatur] von D. Kittel (No 315) [*P. Concolvulus* ex Janka l. c. p. 153].

tataricum L. [= *Fagopyrum tataricum (L.) Gärtn.*] (No 312); [*tataricum*] a Fagopyro diversum seminum angulis... (No 313).

[*tomentosum* l. *incanum*].

! [*tumens Kit.* apud Kanitz et Knapp in Verh. zool. bot. Ges. (1866) p. 26, deest sub hoc nomine].

viviparum Ex alp. Scepus. et alpe Petrosa in Cottu Marmaros (No 291); *viviparum* E Liptov ab Operschal (XLVII. No 188); — [*viviparum L.*] (LIII. No 174); *viviparum* — Baumgarten (LIX. No 112).

Polymnia XXXIII.

Uvedalia (No 145).

Polypogon

[*monspeliensis* l. *Agrostis panicea*].

Populus XXXVIII.

alba Ex insula leporina (No 24); *alba* ♀ Ex horto initio Aprilis (No 24 *a.*) [amentum ♀ et folia turionum aestivalium *P. albae* + folia subtus glabrescentia opaca ramulorum vernalium *P. albo* × *tremulae*]; [*alba L.* amento ♂] (No 31); [l. még *canescens*].

[*alba* × *tremula,* foliis glabrescentibus viridibus opacis] Ex it. Slav. (No 29); [*alba* × *tremula*] (No 92); [l. még *alba*].

balsamifera Garten (No 34).

canescens ex it. banat. (No 25) [*alba L.,* foliis subtus albidis nitidis].

cordata [*Hort? = tremuloides Michx.*] Wedrőd (No 32).

[*croatica* l. *pannonica*].

[*deltoidea Marsh?*] Von Sólymos unweit Gyöngyös (No 35).

laevigata sub hoc nomine Viennae data (No 33).

! [*pannonica Kit.* apud Bess. En. Volh. p. 38 = *croatica W.* et *K.* apud Bess. in Flora 1832 II. Beibl. 1 p. 14; Neilr. Nachtr. p. 76, deest].

[*tremula L.* var. *villosa Láng*] Inter Sümegh et Szalabér in sylva (No 26); [*tremula L.*] E sylva bud. (No. 27); [*tremula,* de a növény hiányzik] ad Szalabér inter vineas (No 27 *a.*); *tremula*

[var. *villosa Láng.*]; *tremula?* [!] ex aula an graeca? (No 93).

Populus [? vix] Im Prinzen bei Weißburg (No 30).

Portulaca XIV.

[spec.] (No 4).

Potamogeton VII.

[*acutifolius* l. *compressum*].

alpinum Balb. ex Valle augustana — a Balbis (XLV. No 66); [l. még *serratum*].

compressum a Lumnitzer [*acutifolius Lk.*] (No 218).

! crassipes mihi [in Chamisso et Schlechtend. De plantis, Linnaea II. (1827) p. 204] Fol. lineari-lanceolata, acuta, remote setaceo serrulata [?], inferiora sessilia, superiora ad pedunculos petiolata. Pedunculi triplo crassiores caule. In paludibus Pesthini. Junio. Fors P. heterophyllum (No 229) [*gramineus L.*] [*crispus L.*] Planta Poprado fluvio inmersa, flores ad serum autumnum usque frustra inquisivi, non enim prodierunt (No 221); *crispum* ad Guttenbrunn in rivo (No 224); *crispum* in Hungaria lectum (No 225); [*crispus?*] stagna ad Carlovitz [Wolny] (LV. No 89); [l. még *serratus, verticillatus*].

densum L. In aquis, fossis profundioribus circa Argentoratum Julio — von Strassburg [a Nestler] (No 227); *densum* [!] a Lumnitzer (No 227 a.).

[*gramineus L.*] A Wolny (No 219); [*gramineus*] In Sclavoniae paludibus profundis (No 220); [*gramineus?*] A Wolny 817 cum interrogatione an Potamogeton? [No 240); l. még *crassipes*].

[*helveticus* l. *marinum*].

[*interruptus* l. *pectinatum, verticillatum*].

lucens a Lumnitzer (No 226).

marinum In littore Balatonis lectum. A P. pectinato non diversum sec. Smith. Fl. Brit. I. 198 (No 232) [*helveticus (G. Fischer) Baumann* var. *balatonicus Gams* in Arch. Balatonicum I. (1926) p. 30]; *marinum?* E salsis aquis Cottus Csongradiensis (No 239) [*pectinatus*]; *marinum* Ex Monte Cenisio — a Balbis (XLV. No 67).

natans Im Stadtwäldchen in Graben (No 230).

pectinatum Marinum ab hoc non differre dicit Smith in Fl. brit. I. 198 (No 217); *pectinatum* — Kitaib. [a Roemer] (XXXV. No 115); [*pectinatus*] rarissima ad Wagum. 1801 [Rochel] (XL. 2); — [*pectinatus L.*] (LV. No 91, 92); [*pectinatus L.*] Aus dem Teiche an der Altofener Pulvermühle Anf. Julio (LXIII. No 174).

perfoliatum In Balatone ad Fok. Specimina sine spicis (No 228); [*perfoliatus L.*] E Croatia (No 228 a.).

pusillum In Kikiri tó in Cottu Veszprim (No 233); *pusillum* Pesthini in fossa prati civita-

tensis s. sylvae civitatis et in Banatu in rivo ad Guttenbrunn (No 234); *pusillum* L. Gotting. — a Schrader (No 234 *a.*); [*pusillus* f. *tenuissimus M.* et *K.*] A Wolny e Syrmio (No 235); [*pusillus*] Ex it. Barany? (No 236); an *pusillum?* [!] an compressum? in aquis lente fluentibus Jul. 1800 [Mauksch] (No 237); *pusillum* ex fossis moret-tensibus [?] — a Balbis (XLV. No 68).

serratum? Fol. certe superiora, ut Smith notat, opposita, omniaque, quod Willdenow in nota ponit, integerrima. In rivis sub alpinis Scepusii raro. Junio (No 222) [*alpinus Balb.* = serratus Roth, non Dc.]; *serratum* Folia tamen suprema argute serrata. Ad Guttenbrunn in rivo (No 223) [*crispus* var. *serrulatus Schrad.*].

[an *trichoides Cham?*] (XL. No 96).

variifolium (VI. No 155) [a növény már Ramisch indexe szerint is hiányzik; Haberle indexe szerint *Sesleria tenella* volt — planta deest].

! verticillatum [*Kit.* non auct.] vel *interruptum mihi* [apud Schult. Österr. Fl. I. p. 328] — X. 39. In stagno salso ad Királytelek in Cottu Szabolcsensi (No 328) [*pectinatus L.* sat typicus, foliis sat tenuibus, ad summum 0.5 mm latis, vaginae sat tenues].

Potamogeton In Sclavoniae paludibus profundis (No 241) [*Agrostis* spec.?].

Potentilla XV.

[l. még *Fragaria, Tormentilla*].

!! adscendens [*W.* et *K.* apud Wildd. Enum. Berol. I. p. 554 = *szalatnyensis Kit.* apud Th. Wolf. Monogr. Pot. p. 275] — F. 22 — von Szalatnya (No 94) exemplar authenticum sec. *Borbás,* est eadem ac *canescens Bess.,* foliolis sat acute et grosse dentatis].

alba (No 112).

anserina (No 80; XLIX No 24).

[*arenaria Borkh.*] (No 110); [l. még *verna*].

argentea e Cottu Sümegh (No 8); *argentea* (No 97) [var. *tenuilobae* Jord. respondet].

aurea ad Rézbányam (No 107) [*thuringiaca Bernh.*]; *aurea,* sed folia rad. pleraque ternata. Pili sericei folia et calyces tegunt. In rupibus alpis Petrosae et in Pop Iván non procul perpetua nive (No 107 *a.*) [*thuringiaca Bernh.* + *thur.* var. *Nestleriana Tratt.?*]; *aurea* ex h. M. (No 107 *b.*) [*aurea L.* + *thuringiaca Bernh.*]; *aurea* ex herb Waldstein (No 107 *c.*); *aurea* in sylvis subalpinis aestate [Mauksch] (No 108) [*aurea* + *arenaria Borkh.*]; *aurea* ex alpe Rohács (No 108 *a.*); — [*aurea* + *thuringiaca*] Gesammelt von der Pollonina ex alp. Beregh. (No 108 *c., d.);* sub nom. aureae missa, sed est diversa. Ex horto (No 109); [*aurea*] ab Operschall

(XLIX. No 137); [l. még *grandiflora*].

[*canescens Bess.*] Flor. Junio auf dem todten Garten [Sonntag] (No 96); [*canescens*] E rupibus montis Feketehegy, ad Tibiscum (XLIX. No 150); [*canescens*] ad Arács cum obscura in siccis (LVIII. No 6); [*canescens* an var. *Fussii Röm.?*] (LXIII. No 78). [l. még *adscendens, husztensis, intermedia*].

caulescens (No 113); *caulescens* [!] Baumgarten (LIX. No 83).

Clusiana v. Schneeberg (No 114)! *Clusiana* a C. Festetits (No 114 a.).

[*Crantzii* l. *salisburgensis*].

[*erecta* l. *Tormentilla erecta, T. reptans*].

fruticosa (No 79).

geranioides ex definitione. In horto sub nomine pratensi, an e patente orta? (No 102).

grandiflora E Transsylvania a Baumgarten, fors var. aureae (No 108 *b.*) [*aurea L.*]; *grandiflora,* in alpinus Szurul et Zood frequens — Baumgarten (LIX. No 84) [*ternata C. Koch*].

hirta (No 98) [*obscura Willd.*]; *hirta?* von dem Tokay Gebürg (No 99) [*obscura*]; *hirta?* A. 70. In pratis siccis infra praedium Szt. Iván in Cttu Pesth et in Cttu Barsiensi, etiam ad agrorum versuras. Sub finem Maji (No 100) [est certe specimen orig. *P. laciniosae* Kit.; planta dense patule hirta, ca 3 dm alta, foliolis oblongis (foliorum sup. anguste obl.), ultra medium laminae dimidiae, hinc-inde etiam duplicato-incisa.].

! *husztensis* an intermedia? (No 95) [*canescens Bess.*, forma foliolis foliorum radicalium duplicato pinnatifidis, dentibus fol. super. integris, ergo f. *laciniosa M.* et *K.*, non Kit., sensu Th. Wolf. Monogr. Pot.].

inclinata (XLIX. No 35); pro *inclinata* missa (LVII. No 124).

intermedia In agris sterilibus Scepusii et in eorum marginibus. Junio. Recte sic dicta consentiente Willdenow in litteris (No 93) [*canescens Bess.*]; *intermedia* Kitaib. [a Roemer] (XLIX. No 30) [*thuringiaca Bernh.*]; *intermedia* e Fekete hegy ad Szöllős, in horto educata (LVIII. No 104) [*canescens Bess.*]; — *intermedia* ex horto (LVIII. No 105).

! [*laciniosa Kit.* apud Nestl. Monogr. Pot. (1816) p. 45, et Poir. Encycl. Bot. IV. Suppl. (1816) p. 540; Lehm. Monogr. Pot. (1820) p. 86 tab. VII.; Addit. p. 292] (No 100); + *laciniosa* [Kit.!] ex horto (No 101) [adsunt specimina duo, unum est certe idem ac No 100 ex cultura ortum, alterum pauciflorum habet foliola multo profundius, fere usque ad rhachin pinnatisecta, laciniis angustis, basi iterum laciniata. An ex eodem loco, id est e praedio Szt. Iván vel e Cttu Barsiensi allata?]; [l. még *hirta*].

[*micrantha* l. *Fragaria praecox, sterilis, recurva*].

monspeliensis (No 116).

multifida (No 81); *multifida major* (No 82).

nitida, Lienzer Alpen, v. Sieber XLIX. No 21).

norvegica — von Bunisch (No 117); *norvegica* vera a Willd. (No 117 *a.*); *norvegica* in sterilibus saxosis, agris eorumque limitibus raro. Jun. Jul. [Mauksch] (No 118) [*norvegica L.!* = *scepusiensis Kit.* Addit. p. 293? sed descriptio Kitaibelii non quadrat.]; [l. még *supina*].

[*obscura Willd.*] a Mauksch (No 89 *b.*); *obscura?* Inter Pahrndorf et Bruck ad margines sylvarum 1. Jul. 1802. Ich habe sie auch lebend. — v. Rochel. (No 91) [*leucotricha Borb.*, ad *laciniosam Kit.* vergens]; *obscura?* hirta — 1187 (XLIX. No 124); an *obscura?* Petalis subaequalibus calyci; ad vineas 19. Jun. A Wolny. (XLIX. No 153) [ad var. *leucotricham Borb.*]; [l. még *hirta*].

opaca [a Generšich?] (No 105) [*rubens (Cr.) Zimm.*]; *opaca* (No 111) [*rubens*]; [*opaca L.* = *rubens*] a Buday e Syrmio (No 111 *a.*)

patens ex horto (No 103) [*patula W.* et *K.* ad *Schurii Fuss* vergens]; *patens* (XLIX. No 32) [verosimiliter = *patula W.* et *K.*].

!! patula? [*W.* et *K.* Icon. II. p. 218 tab. 199] Ex it. Beregh (No 104) [*patula!* ad *Schurii Fuss* vergens, sed foliola supra glabra]; [l. még *patens*].

pedata, sub hoc nomine missa (LVIII. No 106).

pensylvanica (No 84).

pilosa? [!] si petala calyce breviora A Wolny sub no. 62 (No 92); [l. még *recta*].

[*recta*] E Cottu Sümegh (No 9); *recta* in pratis et pascuis Mezőhegyes (No 88) [*recta* var. *pilosa Willd.*, ad var. *leucotricham Borb.* vergens]; *recta* e Matrae montibus. Majora specimina ad Bibersburg in Cttu Poson sunt lecta (No 89); *recta* a Lumnitzer (No 89 *a.*); *recta* (No 90); [l. még *obscura, pilosa, hirta*].

reptans in agris humidis eorumque ad limites aestate [Mauksch] (No 115); [*reptans L.*] E Cottu Liptov. a Rochel ad Lutsky? (XLIX. No 22); *reptans* (XLIX. No 33); [*reptans*] Tormentilla reptans. Ardennes — DC. — (XLIX. No 37).

[*rubens* l. *opaca*].

rupestris In sylva inter Lövő et Cseszteg in monte pone arcem Lendva, et ad St. Rochum in Muraköz; Baksa ad Patta in Matra, in praedio Diós, 1 milliari Keszthelyino distante (No 83); *rupestris* a Lumnitzer (No 83 *a.*); *rupestris* ex horto (No 83 *b.*); *rupestris* Im Walde am Praedium Diós eine Meile von Keszthely (XLIX. No 25).

salisburgensis? Ad lacum Račkowa (XLIX. No 31) [*villosa* = *Crantzii (Cr.) Beck.*]; *salisbur-*

gensis ex horto (XLIX. No 123).

! [*scepusiensis* Kit. Addit. p. 293 no. 1231, nincs meg ilyen néven a gyűjteményben, esetleg azonos a No 118 alatti *norvegica*-val, bár *Kit.* leírása erre a növényre nem illik rá teljesen. Sub hoc nomine deest; an est identica cum *norvegica* No 118?].

supina (No 85); *supina β* Ad Almás in ripa Danubii similibus et udis sabulosis locis etiam Pesthini. Videtur a supina diversa: caule erecto, simplici, petiolis, foliis, calycibusque hirsutis (No 86) [*supina L.*]; *supina γ.* foliis omnibus ternatis (No 87) [*norvegica L.*]; *supina* (XLIX. No 26, 34).

! [*szalatnyensis Kit.* l. *adscendens*].

[*ternata* l. *grandiflora*].

[*thuringiaca* l. *aurea, intermedia*].

tridentata Ait. A Sprengel (XLIX. No 28).

valderia e Thermis Valderiis [!] — a Balbis (XLIX. No 27).

verna Pesthini (No 106) [*arenaria Borkh.* + *opaca L.*].

[*villosa* l. *salisburgensis*].

[Potentillae spec. indeterminatae exoticae vel sine loco natali: XLIX. No 29, 36, 108—122, 125].

Poterium XL.

!! *polygamum* [*W.* et *K.* Icon. II. p. 217 tab. 198 = *Sanguisorba muricata (Spach)*] (No 95); [l. még *P. Sanguisorba*].

Sanguisorba (No 34, 139) [= *Sanguisorba minor Scop.*]; *Sanguisorba* In siccis duris Hungariae fere ubique (No 81); *Sanguisorba* Caul. angulat. strictiss. floribus hermaphrodit. polyandris. Tota planta calva excepta foliolorum costa pilis raris adspersa. Ad Szt. Márton initio Juni (No 82) [*Sanguisorba muricata Spach*]; [*Sanguisorba*] E Syrmio (No 82 a.); *Sanguisorba* in Merszin (No 124); [*Sanguisorba*] ex it. Barany? (No 150).

Prasium XVIII.

majus (No 122).

Prenanthes XXVI.

hieracifolia (No 68) [= *Crepis pulchra L.*); *hieracifolia* E monte Gerardi (No 69) [*Crepis pulchra*].

muralis (No 70) [*Cicerbita muralis (L.) Wallr.*]; *muralis* ad Parád in umbrosis Julio (LVI. No 18) [*Cicerbita muralis*].

! *purpurea* a D. Kittel e Cottu Castriferrei (No 62); *purpurea β.* [*multiflora Kit.* Addit. p. 108] seu Lactuca montana purpureo-coerulae major Bauh. Pin. 123 fors diversa species: caule nudo, paniculato, ramis multoties divisis, foliis scabro denticulatis, pedunculis subbifloris, altero subsessili. Ad Gospich in sylva (No 63); *purpurea* In Scepusio et in Cottu Sáros var. *α* [*pauciflora Kit.* Addit. p. 108] (No 64).

ramosissima All. ex Liguria (No 65).

sarmentosa Ex India orientali a Willdenow (No 67).

tenuifolia All. ex montibus Segusianis — a Balbis (No 61).

viminea nec Lactuca (No 66) [*Lactuca viminea Presl*]; *viminea* v. Blocksberge (LIV. No 63) [*Lactuca viminea*].

Prenanthes (LVI. No 78) [hiányzik — deest].

Primula VIII.

acaulis (XLVI. No 32).

Allionii Lois. Fl. gall. Suppl. P. glutinosa All., auct. — a Balbis (XLII. No 27).

Auricula [áthúzva] Hoc ac. 1802 ex monte Gerava (deutsch Gerau) mihi allata est. A Szontag missa e Scepusio (No 103 a.) [*auricula* var. *Obristii Stein*]; *Auricula* In rupestribus alpium Majo Jun. passim [Mauksch] (No 108); [l. még *marginata*].

! *calycina mihi* [Mauksch apud Kit. Addit. p. 147 no. 681] serius floret 10 diebus quam P. veris, in collibus siccis (No 99 a.) [*elatior (L.) Schreb.*].

[*canescens* l. *veris*].

! *cordifolia* [Kit. Addit. p. 147] an mera varietas P. veris? sed differt foliis spathulato-cordatis, grossius remotiusque dentatis, dentibus minus eminentibus: tubi collo cylindrico, nec oblongo-ovato. Caeterum flores suaveolentes, exsiccatione non virescunt, serius tamen virides evaserunt. Ni fallor, e Croatia. (No 100) [*veris Huds.*].

cortusoides Specimen hoc fuit inter specimina Cortusae Matthioli nescio ubi lectum (No 104).

crenata Alpes de Provence — Dc. (XLI. No 180).

elatior (No 102); [l. még *calycina, officinalis*].

farinosa Ex alpibus Scepusii a Mauksch (No 105); *farinosa e* ducatu Megapolitano a Willd. (No 105 a.); *farinosa* fl. albis — Balbis (XLII. No 28); *farinosa* (XLVI. No 31); *farinosa* — Baumgarten (LIX. No 131) [foliis subtus haud farinosis, denudatis].

glutinosa a C. Festetits (No 106); *glutinosa* in Steyermark — v. Sieber (XLVII. No 47).

! *inflata* [*Kit.* Addit. p. 147 non *Lehm.*] — X. 42 — Differt a P. veris statura et omnibus partibus minoribus; foliis obsoletius dentatis; calycibus ovatis, inflatis; collo tubi corollini cylindrico. In horto nata. E Scepusio. Pro varietate P. veris habet Willdenow. (No 99) [*veris Huds.* = *officinalis (L.) Schreb.*].

integrifolia — M. (No 110); *integrifolia* Alpen Kärnthens — v. Sieber (XLVII. No 45).

[*Kitaibeliana* l. *viscosa*].

longiflora ex Helvetia a Balbis (XLII. No 31).

! an *marginata?* [*Kit.* Addit. p. 148 nomen solum] E Chots (No 107 [*auricula L.*, ex Janka l. c. p. 155; Degen in M. B. L. (1908) 102].

minima sed folia nuda, minimeque hirsuta, qualia in edit. Syst. veget. Reichard. statuuntur. Corollae violaceae, nec flavae aut carneae. In alpibus Scepusiensibus et Marmarosiensibus, in Liptoviensibus. (No 109) [*minima L.*] Diese Pflanze, die Sie im vorigen Jahre für die Primula minima hielten, hat den generischen Character der Primulae nicht, außerdem ist die corolla Primulae minimae lutea intus hirsuta, vid. Syst. vegetabilium von Murray 1774. Mir scheint sie ein neues genus zu seyn. Hier ist die Beschreibung: Perianthium 5-fidum persistens, laciniis ovatis coloratis; 6-ta lacinia libera angustior e basi ad medium tubum protensa ... (No 109 *a.*); *minima* (XLVI. No 30). [*officinalis L.* + *elatior (L.)* Schreb.] E Liptovia ab Operschall. (XLVII. No 37); [l. még *inflata, veris*].

[*pubescens* l. *villosa*].

veris (No 98); *veris acaulis* In Cttu Syrmiensi (No 101) [*vulgaris Huds.*]; *veris* (XLVI. No 25) [var. *canescens Op*].

! villosa β. seu *pubescens Jacq?* [*Kit.* Addit. p. 148] Cum hoc certe maxime convenit, carniolica esse nequit, cum calyces sunt obtusissimi. E monte Gerova Scepusii misit D. Szontag (No 103) [*Clusiana Tausch!*; sec. Janka l. c. p. 155 P. auricula].

! viscosa? [*W.* et *K.* Icon. II. p. XXVIII.; Schult. Österr. Fl. I. p. 376, non *All.*] folia certe odora — D. 13 — In rupibus alp. et subalp. Velebich (No 111) [*Kitaibeliana Schott*]; *viscosa All.* e monte Cenisio a Balbis (XLII. No 32).

Prunella XVIII.

alba (L. No 29) Ex horto [*laciniata L.*].

[*bicolor* l. *grandiflora*].

grandiflora sub alpe Badány (No 118); [*grandiflora Jacq.*] ad Pancsovam (No 118 *a.*); *grandiflora* [× *laciniata* = *bicolor G. Beck.*] (No 119); [l. még *major*].

hyssopifolia ex horto (No 121).

laciniata (No 120); [*laciniata L.*] E Syrmio (No 120 *a.*); [*laciniata*] ex it. Slavon. (No 120 *b.*); *laciniata* Von Ofen Anfangs Juni (L. No 23); *laciniata* [× *vulgaris*] fl. violaceis ex horto (L. No 36, 204); *laciniata* [× *vulgaris*] fl. albo et coerul. A Festetics v. Füred (L. No 125); *laciniata* [*vulgaris*] fl. viol. ad Parád sub m. Jul. (LVI. No 50).

major [= *grandiflora Jacq.*] (L. No 128).

[*vulgaris L.*] e Syrmio (No 116); *vulgaris*, varietas foliis cordatis, apice rotundatis integerrimis. Crescit in umbrosis Budae (No 117).

Prunus XIV.

[Confer. *Jávorka* in Bot. Közlemények (1915) p. 67; vide etiam *Amygdalum*].

avium (No 148); *avium?* [!] Bartphae ad theatrum (No 149); [l. még *Padus*].

! bicrenata mihi Ab D. A. Festetits missa (LV. No 54) [turio aestivalis sterilis *P. fruticosae*].

brigantiaca — Briancon — Dc. (No 151).

Cerasus (No 146); *Cerasus* fl. pleno (No 147); [*Cerasus L.*] a C. Waldstein (No 150).

Chamaecerasus Haec proprie definitionem Chamaecerasi habet: foliis obovatis. Ad arcem Scepusii, a Genersich, alibi a me lecta (No 143) [*fruticosa Pall.*]; *Chamaecerasus* In vineis versus Veliki Remete in Syrmio (No 144) [*fruticosa*, teratologia cum inflorescentia pedunculata] umbellis pedunculatis stylo glabro diversa a *Chamaeceraso*. E Budensi territorio, vid. descr.? (XLII. No 179); *Chamaecerasus* (LIV. No 123) [*fruticosa*].

! cuneifolia [vel *flava Kit.* Addit. p. 299 no. 1249] fruct. flavus ad Madocsány in C. Lipt. — F. 19 (No 161) [flores et fructus desunt; folia *P. spinosae* typicae].

[*domestica* l. *Rhamnus saxatilis*].

! flava [*Kit.* Addit. p. 299 no. 1249 = *cuneifolia Kit.*] (XLII. No 180) [*spinosa L.* inevoluta, foliis sat angustis, floribus paucis an flavicantibus?].

[*fruticosa Pall.* f. *dispar G. Beck.*] — A. 58 — Inter et supra vineas ad Monasterium Gergetek in Syrmio. Willdenow novam putat, salicifoliam dicendam sed vix differt a Chamaeceraso (No 145); [l. még *bicrenata, Chamaecerasa, salicifolia*].

insititia In fruticetis Budae, sub finem aprilis (No 152); *insititia?* [*Kit.* Addit. no. 1247, non *L.*] In Banatu, ubi spontanea forma fruticis (No 153) [*spinosa* var. *dasyphylla Schur*]; *insititia?* sub finem Apr. in horto (XLIX. No 126).

[*laxiflora* l. *serotina*].

lusitanica Garten (No 138).

videtur a *Mahaleb* [!], pro qua legi, differre (No 139); *Mahaleb* (No 140; LIV. No 122; [*Mahaleb L.*] e monte Czobor Cottus Nitriensis adlatum specimen a C. Waldstein (No 141).

[*nana (L.) Stokes*] (LIV. No 120).

Padus In Cottu Sárosiensi ad acidulas Barthphenses, in Scepusiensi, in insulis Danubialibus ad Posonium (No 132); *Padus* accepi 5-ta Maji 1813. E sylvis Hattháziensibus a Samuele Diószegi (No 133) [mellékelve a növényhez Diószegi Sámuelnek következő, rendkívül érdekes levele:

„Jam dudum aegrote ex viribus pene exhaustus sum. Haec est ratio tot debitorum litteralium necdum exsolutorum. Ramum fruticis in silvis Hattháziensibus repertum hodie ab Amico accepi. Eum tibi determinandum mitto. Prunum esse credo, sed differentias cum speciebus Willdenowii combinare non potui. Vale et esto memor post Fata mea, sinceri hono-

ris et existimationis qua Te semper suspexit

Samuel Diószegi mpr.

Botanica practica jam post duas hebdomadas praelum relinquit. Prior ista pars, a popularibus nostris tam frigide accepta, nondum eo maturuit, ut supplementum mereatur. Haec est ratio, quod in supplemento addendo propositum mutaverim."] *Padus?* Bartphae in Pineto (No 134) [*P. avium*]; *Padus* (LIV. No 121).

pumila Ex horto (No 142); [*pumila* = *fruticosa Pall?*] (XLIX. No 128); *pumila* ex horto initio Maji (XLIX. p. 136).

! *salicifolia mihi* (LIV. No 124) [*fruticosa Pall.* var. *dispar G. Beck*].

! ut videtur *serotina* — Von ein. Freund in Wien 1802 v. Rochel (No 136); [*Cerasus β. semperflorens Ehrh.* et *hort.* = *laxiflora Kit.* Addit. p. 298 no. 1246] nova, proxima *serotinae.* Aus dem neu angelegten kleinen Garten des B. Prónay Coloman in Atsa, der mich versicherte, daß sie an den Botyáner Weingärten wild wachse (No 137); Virginia potius *serotina* [!] Garten (No 154).

spinosa [var. *dasyphylla Schur*] fr. glob. magn. sapore P. spinosae a Wolny (No 155); [*spinosa* f. *coëtanea (W.* et *Gr.) Beck*] + var. *dasyphylla*] fructus P. spinosae; sed flores bini, terni; folia obovata (No 156); *spinosa* [cum var. *dasyphylla*] (No 157, 158); *spinosa* In sylvis Cottus Sümegh (No 159); [*spinosa* var. *dasyphylla*] E territorio budensi in hortum illata ante spinosam descriptam floribus ingrate odoris (No 160); [*spinosa* f. *coëtanea*] a Wolny missa (XLII. No 177); *spinosa* [var. *dasyphylla*] cum flava eodem tempore sata eodem tempore florens (XLII. No 181); *spinosa* [var. *dasyphylla*] ad N. Károly (LVII. No 177); [l. még *cuneifolia, flava, insititia*].

! *suaveolens* [*Kit.* p. 278 no. 1248] an insititia? (No 154) [verosimiliter *spinosa* var. *dasyphylla Schur!;* sec. Neilr. Aufz. p. 327 est P. insititia, sed petala speciminis Kitaibeliani sunt oblonga, parva, pedunculi breves].

Pseudorchis

[*Loeselii* l. *Ophrys Loeselii*].

Psiadia XXXIII.

glutinosa W. H. T. [a Balbis] (No 165).

Psoralea XXV.

bituminosa (No 124).
corylifolia (No 126).
fruticosa (No 125).
lathyrifolia Balb. H. T. — a Balbis (No 127).

Ptelea VII.

trifoliata (No 190).

Pteronia XXVII.

Porophyllum a Schultes sed flores radiatae, folia pinnatifida (No 122).

Ptychotis

[*ammoides* l. *Seseli ammoides*].

Puccinellia

[l. *Poa distans, maritima*].

Pulicaria

[l. *Inula dysenterica, odora, pulicaria*].

Pulmonaria VIII.

angustifolia L. [!] In nemorosis siccis, rarius Majo Junio (No 57); *angustifolia* (XLI. No 240 [*mollissima Kern.*]; *angustifolia* ex horto (LVII. No 67).

mollis ex horto, paulo serius floret quam angustifolia... (LVII. No 66).

[*mollissima Kern.* + *obscura* Dum.] (XLVI. No 16; [l. még *angustifolia, officinalis, Anchusa pubescens*].

[*obscura* l. *mollissima, officinalis*].

officinalis [ssp. *obscura Dum.* + *mollissima Kern.*] a Buday (No 61); *officinalis* E Scepusio et sylvis Budensibus (No 61 *a.*); *officinalis* ex horto (XLI. No 223); [l. még *Anchusa pubescens*].

[*rubra Sch.* et *Ky.*] floribus coccineis sub rupe Muntschel in Cttu Bihar 19 Maj. (No 56).

Pulsatilla LIX.

[l. még *Anemone*].

verna — Baumgarten (No 71) [*vernalis L.!* vide Simk. En. p. 40].

Punica XIV.

Granatum (No 128).

Pycreus

[l. *Cyperus flavescens*].

Pyrethrum XXXI.

[l. még *Chrysanthemum*].

alpinum ex alp. Krivan (No 139) [*Chrysanthemum alpinum L.* var. *Tatrae Vierh.*]; *alpinum* e Monte Cenisio [a Balbis] (No 139 *a.*); *alpinum* E Liptovia ab Operschall (No 139 *b.*).

bipinnatum (XXXII. No 1).

ceratophylloides Willd. Enum. pl. horti ber. (No 140); *ceratophylloides* ex herb. cl. Allionii [a Balbis] (No 140 *a.*).

corymbosum [= *Chrysanthemum corymbosum L.*] Budae Junio (No 142); *corymbosum* (No 143); corymbosis foliis villosis, foliolis distantibus (No 144); *corymbosum* gesammelt von der Pollonina ex alp. Beregh (No 145); [*corymbosum* ad *subcorymbosum Schur* vergens] (No 146).

inodorum [*Matricaria inodora L.*] missum (No 151); *inodorum* von Kopenhag [?] (No 152); *inodorum* a Willden. (No 152 *a.*); *inodorum* verum Bartfa (No 153); *inodorum?* [!] Caulis erectus, superne corymboso-ramosus. Fol.

subtripinnata, pinnata nempe: foliolis simplicibus, inferioribus pinnatis; pinnis subfiliformibus; acutis, petiolo communi marginibus subrevolutis, supra convexis. Lamina 4-angula, angulis 3 adproximatis sulco interjecto, latere 4-to convexo; corona pallidior, 4-angula. Ex horto (No 154).

[*macrophyllum Willd.* l. *Chrysanthemum macrophyllum*].

maritimum a Wolny (No 155) [*Matricaria inodora L.*].

Parthenium [= *Chrysanthemum Parthenium (L.) Pers.*] (No 149); *Parthenium* (No 150).

! *uliginosum* [*W.* et *K.* in Willd. Spec. pl. III. p. 2152 = *Chrysanthemum uliginosum* (*W.* et *K.*) *Pers.*] (No 136; XLIII. No 106); *uliginosum* infra Otsa inter arundinem (No 137); *uliginosum* In fossis inter Bene et Musay sub medium 7-bris (No 137 a.); *uliginosum* ex horto (No 138; XLIII. No 107).

Pyrola XIII.

minor Specimina foliis ovato-rotundatis sunt e Cottu Scepus. Lipt. et Arvensi (No 52); *minor* aus dem Sauwinkel (No 52 a.) [specimen unum est *P. minor L.*, alterum *P. media Sw.*]; *minor* (LIII. No 181).

rotundifolia (No 51); [*rotundifolia L.*] E Cottu Castriferrei (XLVIII. No 96); [*rotundifolia*] A B. Splényi (LVII. No 58).

secunda In sylva montis Domugleto ad thermas Herculis (No 53); *secunda* (LIII. No 185).

umbellata E monte Czare ad limites Arv. et Thurócz (No 54) [*Chimaphila umbellata (L.) Nutt.*].

uniflora Ex vallibus Cottus Arvensis, Liptoviensis. Ex h. M. (No 55); *uniflora* (LIII. No 187).

Pyrus XIV.

[confer Jávorka in Bot. Közlemények (1915) p. 65].

Amelanchier [= *Amelanchier ovalis Medic.*] In Merszin, Vilena Draga (No 197); [*Amelanchier ovalis*] Ni fallor, e sylva budensi (No 198); *Amelanchier* (LIV. No 132).

! *angulata mihi* [apud Roch. Ban. p. 26; Addit. p. 279 no. 1177] In sylva inter Oraviczam et Dognácskam ad viam (No 206) [*Malus silvestris (L.) Mill.*].

! *baranyensis mihi* [Addit. p. 278 no. 1173] In praedio Trinitas ad Vokány (No 199) [*Malus pumila Mill.*].

! *ciliata* vel *marginata mihi* [Addit. p. 278 no. 1175] Pro nivali missa a Mauksch e Scepusio, ubi in hortis ruricolarum sponte nascit. (No 200) [*P. Pyraster (L.) Borkh.*].

! [*communis cana Kit.* ex Kanitz et Knapp in Verh. zool. bot. Ges. (1866) p. 157, deest].

coronaria Der Wirginische Apfelbaum Sch.-Br. (No 208).

! Inter plantas csiklovienses, hinc *P. csikloviensis* interea *mihi* dicta [apud Roch. Ban. p. 26; Addit. p. 279 no. 1178] (No 207) [*Malus pumila Mill.* var. *domestica Borkh.*].

Cydonia [= *Cydonia oblonga Mill.*] In fruticetis Banatus (No 209); *Cydonia* (LIV. No 133).

edulis ex horto [non est] (No 211).

! *matrensis mihi* [Addit. p. 278 no. 1174] In sylvis Matrae, initio Maji. Pedunculi calycesque lanati (No 205) [*Malus silvestris (L.) Mill.*].

nivalis? [*Jacq.!*] (No 293); [l. még *slavonica*].

Pollveria? [!] ex horto [= „Pinus" Pollvéria Janka in OBZ. (1872) p. 156].

[*Pyraster* l. *ciliata*].

salicifolia Sch. Br. [non est] (No 210).

! *slavonica* v. *albicans mihi* [Addit. p. 279 no. 1176] Ad arcem vetustam non procul Nassicza in Slavonia (No 201) [*nivalis Jacq.* forma foliis parum angustioribus].

! *syrmiensis mihi* [Addit p. 277 no. 1172] ad Velika Remete (No 204) [*Malus silvestris (L.) Mill.*, folia ramulorum vernalium multo minora, plus minus glabra].

torminalis (No 215) [*Sorbus torminalis (L.) Cr.*].

Quercus XXXVII.

[L. Simonkai: Magy. Növ. Lapok VII. (1883) 66—67 lap].

! *ambigua mihi* [Addit. p. 50] Pubescenti proxima, diversa fructibus longius pedunculatis — N. 5 — (No 28) [*lanuginosa* f. *ambigua (Kit.)* = *budensis Borb.*, foliis alte lobatis, lobis rotundatis, ± undulatis; pedunculo 2—3.5 cm longo]; [l. még *lanuginosa.*]

[*aurea* l. *hungarica, robur, sessilis*].

austriaca? [!] ad Kövéres in Cttu Temes (No 55); [l. még *cerris*].

cerris a Wolny (No 6); *cerris* [f. *cycloloba Borb.*] ad Parád (No 46); [*cerris L.*] (No 47, 51); *cerris* E Cottu Sümegh (No 48, 54); [*cerris* f. *austriaca (Willd.)*] (No 49); [*cerris* f. *austriaca*] E sylva budensi (No 50); [*cerris*] ad Parád (No 52); [*cerris*] ad Szilas in Cottu Temes (No 53); *cerris* f. *austriaca* + *lanuginosa (Thuill.) Lam.*] von Bruckenau (No 57, 59); [*cerris*] E sylva Bruckenau (No 58); *cerris* ad Harsány (No 77); *cerris* longiores rami cum foliis minoribus sunt ad Vats autumno collectae; brevis autem cum foliis maximis profundissime laciniatis in Banatu Junio est lectus. (No 205); [*cerris L.*] Quercus haec definitionem Esculi quidem habet et convenit etiam cum specim. Mygindi; vix tamen aliud est quam Qu. cerris... Crescit in sylva Budaörsensi supra vineas Budenses (XL. No 206); [l. még *coculus*].

coccifera Legi in Forojulio (XL. No 198) [*pseudosuber Santi*];

coccifera a Ferari. Ita accepta a Pfisterer (LV. No 8).

Ex definitione pro *Coculo* [?] haberem; nisi ad hanc Linnaeus notaret, folia etiam subtus nuda esse, quae in prosente utrinque cano-tomentosa sunt. A Qu. Cerri, ad quem accedit, differt laciniis foliorum in acumen terminatis. Legi in Forojulio (XL. No 200) [kerti hybrid? levele némileg a Qu. macrolepis Kotschy leveléhez hasonló, a levélhasábok hosszú szálkájúak, a levél fonáka vastagon csillagszőrös. Planta hybrida in horto orta?].

! [*conferta Kit.* apud Schult. Österr. Fl. I. p. 619, Addit. p. 50 + *conferta* × *lanuginosa*] Inter vineas Ménesienses (No 24); *conferta* mihi. Ad Szilas in Cottu Temesiensi (No 36); [*conferta*] (nova species) ad Szilas in sylva (in Cottu Temesiensi); [*conferta*] Ex it. slav. (No 38, 40, 43, 44, 45); [*conferta*] (No 39, 42); [*conferta*] Inter plantas montis Papuk (No 41); *conferta mihi.* Gránvik, Gránicza, Kittnyák. (No 76) [*lanuginosa (Thuill.) Lam.*, ad *β subconfertam Borb.* vergens]; [l. még *spectabilis*].

[*crispata* l. *undulata*].

! *cuneata mihi* [Addit. p. 51 non auct.] accedit ad ilicifoliam et aegilopem. In monte Tiliarum Budae. (No 2) [*lanuginosa* f. *Kitaibelii Simk.*].

[*dasyclados Borb.* l. *lanuginosa, spicata*].

discolor a Willdenow (XL. No 196).

! *fasciculato pilosa mihi* A Pfisterer (LV. No 7) [forma *Qu. Cerris*].

! *fructipendula Schrankii* [et *Kit.* Rel. Kit. p. 85] e Syrmio missa a Wolny, sed est tomentosa (XL. No 203) [virágzó *lanuginosa (Thuill.) Lam.*, esetleg a f. *Budayana Haberle*, nem a fructipendula Schrk., sem Heuff., utóbbiak a Qu. Robur alakjai].

[*hiemalis* l. *pedunculata*].

! *hungarica* interea *mihi* [Addit. p. 49 non Hubeny] N. 3. — Ni fallor, in sylva bud. lecta (No 14) [est forma *Qu. aureae Wierzb.* cum pedunculis ca. 1 cm longis glabris, foliis magnis; ergo ad f. *Welandii Heuff.* vergens].

ilicifolia ex America septentrionali a Willdenow (XL. No 195).

[*lanuginosa (Thuill.) Lam.* l. *ambigua, conferta, fructipendula, pubescens*].

! *Ménesiensis* interea *mihi* [Addit. p. 49] Inter vineas Ménesienses N. 8 (No 27) [*confertae hybrida* + *lanuginosae* forma?].

pro *nigra* mihi data, sed definitio et specimina Mygindi nimis discrepant (XL. No 194).

! *pendulina mihi* [apud Schultes Österr. Fl. I. p. 620 Addit. p. 49] in sylva budensi ad Schöne Schäferin (No 13) [Forma *Qu. languinosae* pedunculo (a ramulo abrupto) 10 cm longo].

pedunculata Initio Maji jam deflorata (No 3 a.) [= *robur L.*]; *pedunculata* E Cottu Sümegh (No 12) [*robur* f. *hiemalis Stev.*, ex Borb. Erd. Lapok (1886) p. 539]; *pedunculata* seu femina cum gallis gemmaceis: squamis imbricatis. E sylva ad Debreczinum (XL. No 204) [*robur*].

Phellos (XL. No 193).

[*pseudosuber Santi*] Legi in Forojulio (XL. No 197).

pubescens [= *lanuginosa (Thuill.) Lam.*] Ex sylva Bud. 20. Maji (No 15, 16); *pubescens* E Cottu Szalad. (No 17); *pubescens* A Wolny 807 missa cum quaestione: an pubescens (No 18); *pubescens* A Wolny 807 missa cum quaestione: an nova (No 19) [*Streimii Heuff* esse videtur — Borbás]; [*lanuginosa*] E montibus basalticis Cottus Szalad. (No 21); [*lanuginosa*] v. Gödöllő (No 22, 62) [*lanuginosa* ad var. *Streimii Heuff* et *dasycladon Borb.* accedens, pedunculo 1—2 cm longo]. Huic adjectum erat specimen Qu. pedunculatae; a Wolny 1807 missa cum quaestione: an pyrenaica, an eadem cum adnexa pedunculata? 10 sub 7 (No 26); [*lanuginosa*] e sylva bud. (No 56); [*lanuginosa*] E sylvis Bruckenau (No 60); [*lanuginosa*, ad var. *Streimii Heuff* accedens] (No 61, 63); [*lanuginosa* var. *Streimii Heuff.*] Czeracz dicta rascianis. Sub Sztári Grád ad Orahoviczam (No 64); *pubescens* e Cottu Sümegh (No 66); *pubescens?* ad Harsány (No 69) [*lanuginosa* f. *undulata Kit.*]; [*lanuginosa*] (No 71, 72; XL. No 111, 112, 152; LV. No 18); *pubescens?* [= *lanuginosa*] In montanis Cottus Alb., Veszprim, Szálád, Baranya (No 73); *pubescens* pedunculata E sylva Harsány (No 74) [*sessilis Ehrh.* + *lanuginosa* f. *dasyclados Borb.* [= f. *Budayana* Haberle?] pedunculo ca. 3 cm longo]; *pubescens* fructu sessili ad Harsány (No 75); [*lanuginosa*] Willdenow hanc pro pubescente sua declaravit; sed folia hujus triplo majora et aliter formata sunt. Ramulos duos candicantes et corticis frustulum misit Wolny e Syrmio. Crescit Budae, Pesthini, in Mátra, alibique in planiore Hungaria (XL. No 83); *pubescens* fol. undulatis. In sylva inter Kenese et V. Berény, ad Arács, Füred etc. (LVIII. No 39).

Robur e Cottu Sümegh (No 3, 67) [*sessiliflora Salisb.*]; *Robur* ad Parád in Mátra (No 4) [*sessiliflora* var. *aurea Wierzb.*]; *Robur* inter vineas Ménesienses (No 4 a.) [*sessiliflora* var. *aurea*]; *Robur* var. lobis foliorum quibusdam lobulatis. A Wolny 807 (No 8) [*sessiliflora* var. *aurea*]; *Robur* var. foliorum lobis oblongis, integerrimis. Ex it. Slavon. (No 9) [*sessiliflora* var. *aurea*]; *Robur* ad Harsány (No 78) [*sessiliflora* var. *aurea*]; [*robur L.* = pedunculata Ehrh.]

(XL. No 98; XLII. No 192); *Robur* (XL. No 127) [*sessiliflora*]; *Robur* [!] (XL. No 142); *Robur* fol. ovatis a Willdenow (XL. No 202) [*sessiliflora* f. *mespilifolia (Wallr.)*]; [*robur L.*] v. Dargó (LV. No 64); [*robur*] (LVI. No 19); [l. még *pedunculata*].

rubra — a Willdenow (XL. No 199).

[*sessiliflora Salisb.* f. *mespilifolia (Wallr.)*] (No 1); [*sessiliflora* foliis convolutis, basi cuneatis] Zwischen Muszaj u. Beregszász (No 7); [*sessiliflora*] e Szitnya (No 9); [*sessiliflora* + *robur*] (No 11); [*sessiliflora*] Von der Schönen Schäferin am Zäunen. Floret Majo. (No 70); [*sessiliflora*] (XL. No 118); [l. még *pubescens, spicata*].

[*sessiliflora* × *lanuginosa?*] Robur? Petiolorum longitudine quidem convenit cum Qu. Robore vulgari fructu sessili, sed foliorum figura discrepat. E sylva budensi (XL. No 201); [*sessiliflora* × *lanuginosa?*] v. Dargó (LV. No 65) [*sessiliflora aurea* × *lanuginosa* = *Tiszae Simk.*] (No 23).

! spectabilis mihi [apud Simk. M. N. Lapok VII. (1883) p. 67] sub nomine spicatae, quod alteri indidi, descripta in diario itineris a. 1810 peracti. Habitat inter vineas Ménesienses. A Qu. slavonica (Kittnyák) diversa fructibus pedunculatis (No 34) [*conferta* f. *Heuffelii Simk.*, cum pedunculo ca. 2 cm longo].

! spicata mihi [Addit. p. 50 nomen solum] ab ill. D. Ant. Festetics (No 5) [*sessiliflora* f. *glomerata Lam.* = f. *Welandii Heuff.*]; *spicata mihi* In sylva Budensi. No 6 (No 29) [*lanuginosa* f. *dasyclados Borb.* = f. *Budayana Haberle?* = f. *vértesiensis Kit.* fide Borbás, foliis magnis, breviter lobatis, glabrescentibus, pedunculo 1—3 cm longo]; [*spicata Kit.* = *sessiliflora* f. *glomerata Lam.*] (No 30); *spicata mihi* in sylva budensi 20 Maji. No 6. (No 31) [planta juvenilis *lanuginosae* f. *dasyclados Borb.*]; [*spicata Kit.* = *lanuginosa β dasyclados Borb.*] von Ofen (No 32).

[*Streimii* l. *pubescens*].

! [*sublobata Kit.* apud Schult. Österr. Fl. I. p. 619., Addit p. 51. nincs meg ilyen néven a gyűjteményben; deest in herbario].

[*Tiszae* l. *sessiliflora* × *lanuginosa*].

! turbinata mihi [Addit. p. 49] an pubescentis varietas? E sylva Gödöllőensi (No 20) [*lanuginosa (Thuill.) Lam.*, ad f. *pinnatifidam (Gmel.) vergens*].

! undulata mihi [Rel. Kit. p. 110, Addit. p. 50] an pubescentis varietas? Videtur diversa foliis undulatis lobis acutis. No 4. In sylvis budensibus (No 25) [*lanuginosa* f. *undulata (Kit.); crispata Stev.* secundum Borbás]; [l. még *pubescens*].

! vértesiensis mihi [Addit. p. 50]

In monte Tiliarum Budae lecta 20 Maji. No 7 (No 33) [a *lanuginosa* f. *dasyclada Borb.* differt lobis foliorum angustioribus ac acutioribus].

virescens ex horto (XLII. No 168).

Queria VI.

canadensis (No 402).

Ranunculus XVI.

abortivus ex horto initio Maji (No 182).

aconitifolius? a Szücs (No 161) [*polyanthemos L.*]; *aconitifolius* A Schmidt auctore Florae bohaemicae per C. W. (No 202) [*platanifolius L.*]; *aconitifolius* Ex alpe Krivan (No 202 *b.*) [*platanifolius*]; *aconitifolius* in sylvis Merszin et Plissiviczae (No 203) [*platanifolius*].

acris L. (No 233); *acris* e pratis humidis Pesthanis (No 237); [*acer L.*] Ex it. Bereg (No 237 *a.*); *acer* e Scepusio (No 237 *b.*); [*acer*] ad Avas Ujfalu (XLIX. No 161); [*acer*] E Cottu Marm. (XLIX. No 162); [*acer* forma] (LVIII. No 117); [l. még *polyanthemos*].

alpestris E Scepusio a Mauksch et e Schneeberg a C. W. (No 223).

alpinus nob. montes alpestres C. Trencs. Lipt. [Rochel] (No 185) [*Hornschuchii Hoppe*].

[*aquatilis L.*] Ex it. Beregh. (No 249 *a*); *aquatilis* (No 250) [*circinatus Sibth. + trichophyllus Chaix*]; *aquatilis* ad Kajár in littore Balatonis (No 251) [*trichophyllus*, pro p. f. *terrestris*]; *aquatilis L.* (LV. No 47) [*trichophyllus*]; [l. még *peltatus*].

arvensis von der Hevescher Wiesen (No 241); *arvensis* In agris Cottus Pesth, Poson, Sopron, Arvensis (No 242); *arvensis* v. Operschall (No 242 *a.*).

auricomus? ad pedes Choes in pratis rarior [Rochel] (No 178); *auricomus* (No 197, 199 *b.*); [*auricomus L.*] von Hevescher Wald (No 198); [*auricomus* var. *fallax*] Von Genersich (No 198 *a.*) — [*auricomus* f. *binatus (Kit.)*] Ab Oberschall (XLIX. No 177); [l. még *binatus, cassubicus*].

! binatus mihi [apud Rchb. Fl. excurs. p. 723] in vallibus sylvat. E Liptovia ab Genersich (No 171) [ad R. auricomum accedens, foliorum caulin. laciniis integerrimis, foliis radicalibus exterioribus integris, lobatis, interioribus succedanee palmatifidis palmatisectisque, fol. rad. intimorum laciniis lineari-lanceolatis. Statura humilis, conf. Janka in ÖBZ. (1856) p. 346; Schiller in Math. Term. Értes. XXXV. (1917) p. 361—447].

bulbosus? In lutosis agris et pratis sub finem Maji (No 172) [*sardous Cr*]; *bulbosus* ex horto (No 226, 226 *a.*) [*sardous*]; *bulbosus* in agris calcar. ad balneum Gánóczense aestate [Mauksch] (No 229); *bulbosus?* In humidis Cottus Heves (XLIX.

No 163) [*sardous*]; [l. még *hirsutus*].

[*carinthiacus* l. *montanus*].

! carpaticus n. sp. [non *Herbich*] Willdenowio videtur distinctus a notis. Calyx parum hirsutus, caulis quantulum. Caules plures ex eadem radice. Host dubie pro nivali habuit. Hedwigianum specimen R. nivalis ad hunc accedit. Ex alpibus carpathicis in h. M. (No 212 a.) [*montanus Willd.*]; [*carpathicus Herbich* l. *trilobatus*].

cassubicus in sylvis montanis Majo (No 199) [*auricomus* f. *fallax W.* et *Gr.*]; *cassubicus* e C. Lipt.? (No 199 a.) [*auricomus* f. *fallax*].

[*circinatus* l. *aquatilis*].

! [*complicatus* seu *latilobus Kit.* Addit. no. 840 l. *trilobatus*].

!! crenatus n. sp. [*W.* et *K.* Icon. I. p. 9. tab. 10] In alpe Petrosa Marmarosiensi circa nivem perpetuam (No 224).

! cuneatus mihi Inter segetes ad Ránk et Herlein (No 243) [*arvensis* var. *tuberculatus Kit.* in Balb. Cat. h. Taur. (1813) p. 64. ex DC. Prodr. I. p. 41].

dalmaticus (mihi), an *parviflorus* [!] Ex indeterm. sem. enatus (No 246).

falcatus (No 247) [*Ceratocephala testiculata (Cr.) Kern.*]; *falcatus* Baumgarten (LIX. No 81) [*Ceratocephala testiculata*].

Ficaria e Liptovia (No 170); *Ficaria* in salicetis Apr. Majo [Mauksch] — a Buday (No 194).

Flammula In humidis sylvaticis Borussiae et Saxoniae. Inter Csesztreg et Lendva, atque in Muraköz locis humidis occurrit foliis ovato-oblongis caule erectiusculo (No 150); *Flammula* rarior in udis montosis circa Rownye C. T. 1803. Copiosissima in vetulinis aquosis inter Dovalo et Kokava C. Lipt. 1807 [Rochel] (No 150 a.); *Flammula* Rownye 19. Jul. 1803. Ad fontes — a Rochel (No 151); [*flammula L.*] (LIV. No 169); [l. még *junceus*].

[*fluitans* l. *fluviatilis*].

fluviatilis a Willdenow (No 252) [*fluitans Lam.*]; *fluviatilis* in Poprad Jul. [Mauksch] (No 252 a.) [*fluitans*].

glacialis — Kitaibel [a Römer] (No 153); *glacialis* In summis Krivan C. Lipt. (No 167); *glacialis* Schleinitz-alpe bei Linz 1812 — v. Sieber (No 176); *glacialis* Ex mente Hostii. In alpina valle Völkgrund in Scepusio (No 207) [*Callianthemum coriandrifolium Rchb.*]; *glacialis* ... E Scepusio a Mauksch est multiflorum specimen, uti et illud cum flore explanato; reliqua sunt e Schneeberg (No 208).

Gouani ex horto Maji initio (XLIX. No 157); *Gouani* A B. Splényi e Tátra (XLIX. No 171) [*montanus Willd.*]; *Gouani* v. montanus a Rochel in hortum vivus missus sub nom. pyrenaici. Initio Maji (XLIX. No 169) [*Hornschuchii Hoppe*]; an *Gouani,* calyce patulo cum R. bul-

boso eodem loco aestate prima [Mauksch] (XLIX. No 221) [*repens L.*].

! [*hamatus Kit.* apud Gombocz l. c. p. 65 nincs meg ilyen néven; deest].

hederaceus a Willdenow (No 248).

hirsutus seu Philonotis [= *sardous Cr.*] Copiosissimus in pratis et pascuis Banatus (No 227 *a.*); an *hirsutus* seu Philonotis Ehrh. In subalpinis comitatus arvensis Augusto. Willdenow scribit, hunc a bulboso non esse diversum. (No 228) [*bulbosus L.*]; *hirsutus* Ab Haberle. Ad Aszód (XLIX. No 172) [*sardous Cr*].

[*Hornschuchii* l. *Gouani, montanus, nivalis, pyrenaeus*].

[*hybridus* l. *Thora*].

! *junceus mihi* [Rel. Kit. p. 43, 44] In Avasujfalu et versus Técső in fossis (XLIX. No 164) [*flammula L.*]; *junceus mihi,* qualis in horto e seminibus primo anno obtentus est. (LVII. No 116) [*flammula*].

illyricus Crescit in monte Gerardi, in collibus ad Rákos, in arena vinearum ad lapicidinam Pesthini. Florte Majo. (No 205); [l. még *sericeus*].

laciniatus — Baumgarten (LIX. No 72) [*polyanthemos L.*].

lanuginosus [a Wolny] (No 234) [*polyanthemos L.* + *Steveni Andrz.?*]; *lanuginosus* in sylvis Matrae (No 238); *lanuginosus.* Definitiones et descriptiones a variis datae hunc esse suadent, quamvis figura Oederi et specimina Mygindi spectata foliorum forma aliquantum discrepat. In monte Trojaga retro Borsam. (No 238 *a.*); *lanuginosus* (No 238 *b.*); *lanuginosus?* [!] E sylvis comitatus Hontensis retro Börsöny (No 238 *c.*); *lanuginosus* a Lumnitzer (No 238 *d.*).

Lingua (No 180); *Lingua* In arundinetis, fossis, stagnis Hungariae, Sclavoniae, Banatus (No 186); *Lingua* — Baumgarten (LIX. No 67).

montanus — Kitaib. [a Römer] (No 155, 158); *montanus* Mont. calc. in umbrosis C. Trent. (No 168) [*Hornschuchii Hoppe*]; *montanus?* [!] In summis Kriwan C. Trent. [Roch.]; *montanus* von der Schleinitzalpe bei Lienz 1812 — v. Sieber [nyomtatva] (No 175); *montanus?* in summo m. Strazsow 13. Jun. 1803. copiose — v. Rochel (No 210 *b.*) [*Hornschuchii Hoppe*]; *montanus* ex alpe Krivan (No 212) [ad f. *gruinalem (Schott)* vergens]; [*montanus Willd.* ad f. *gruinalem (Schott)* vergens] Ex alp. Joliens. (No 213); *montanus* — D. 58 — In Plissivicza et Merszin (No 214) [*carinthiacus Hoppe*]; *montanus?* In Debelo Berdo ad nives (No 215) [*carinthiaco* proximus]; *montanus* a C. Festetits (No 216); *montanus* Ex alpe Ohniste C. Lipt. [Rochel] (No 218) [*Hornschuchii*]; *montanus* v. d. Babka c. Trentsch. [Rochel] (No 218 *a.*)

[*Hornschuchii*]; *montanus* ex horto (XLIX. No 175) [*Hornschuchii*]; [l. még *carpaticus, Gouani, nivalis*].

muricatus (No 244).

[*nemorosus DC.*] Ex alp. Beregh (No 222).

nivalis Ex alpe arvensi Rohács (No 210) [*montanus* f. *gruinalis Schott.*]; *nivalis* ex alp. Scepusii (No 210 a.) [*montanus Willd.*]; *nivalis* ex Schneeberg Austriae (No 211); *nivalis* var.? [Mauksch] (No 219) [*Hornschuchii Hoppe*].

!! [*nodiflorus L.; W.* et *K.* Icon. II. p. 192 tab. 176] Von Hathröngyös (No 187); *nodiflorus* In sylva pomáziensi ad aquas stagnantes, inter Szalanka et Szarkad in Cottu Bihar, ad Rátóth in Cottu Veszprém, ad Tibiscum in Cottu Heves, ad Heves. Locis humidis, inundatis, etiam subsalsis (No 187); *nodiflorus* von den Wiesen bey Hevesch (No 189).

sub nomine *nodosi* acceptus (XLIX No 179).

ophioglossifolius Vill. (No 181); l. még *oppositifolius.*

! *oppositifolius* [*Kit.* Rel. Kit. p. 89] (No 193) [a növény a vignettájával együtt hiányzik; helyette egy cédulán a következő megjegyzés áll: 1868 dec. 6-án Janka Viktor cs. k. főhadnagy úrnak (Sz. Gotthárd Szamosújvár mellett Erdélyben) hivatalosan küldetett rövid időre tud. használatra. — Ramisch katalógusa szerint Kitaibel vignettáján: *locis uliginosis* állott; Janka Viktor szerint (Österr. Bot. Zeitschr. 1872. p. 155) Kit. növénye = *ophioglossifolius Vill.* — Specimen in herbario deest].

parnassifolius Kitaib. [a Römer] (No 154); *parnassifolius* Glockner v. Sieber (No 174).

parviflorus aus dem Garten (No 245); [l. még *dalmaticus*].

!! *pedatus* [*W.* et *K.* Icon. II. p. 112, tab. 108] ausser Gyöngyös (No 239); *pedatus* e loco natali (No 240).

peltatus a Wolny (No 249) [*aquatilis L.*].

Philonotis E Cottu Sümegh (No 165) [*sardous Cr.*]; *Philonotis*, cultus [Rochel] (No 184) [*sardous*]; *Philonotis* nudus (No 227) [*sardous* var. *hirsutus Curt.*]; *Philonotis hirsutus* (No 227 *b.*) [*sardous*]; *Philonotis* in humidis Syrmii (No 230) [*sardous* + *polyanthemos*]; *Philonotis*, ut videtur. Ab A. Fest. (XLIX. No 170) [*sardous* var. *hirsutus Curt.*]; *Philonotis* — Baumgarten (LIX. No 73) [*Steveni Andrz.*] [*platanifolius L.*] e Papuk (No 204) [l. még *aconitifolius*].

polyanthemos In pratis mont. C. Trencsin. [Rochel] (No 183); [*polyanthemos L.* + *acer L.*] e Szitnya (No 232); *polyanthemos* a Wolny (No 233 a.); *polyanthemos*, sed folia nequaquam magis glabra sunt, quam in R. acri ut L. in Fl. Su. dicit, verum multo hirsutiora... (No 235); [l. még *aconitifolius, laci-*

niatus, lanuginosus, philonotis].

!! [*polyphyllus W.* et *K.* Icon. I. p. 44, tab. 43] von Hathröngyös (No 190, 191); *polyphyllus* ex turfosis paludum exsiccatarum ex Hortobágy provenientium, non procul Kardszag (No 192).

polyrrhizos Stephan. Sarepta — a Sprengel (No 163).

! [*protensus Kit.* Addit. p. 180, nincs meg ilyen néven Kit. gyűjteményében — deest in herbario].

pyrenaeus — Kitaib. [a Römer] (No 156, 159); *pyrenaeus Gounani.* Willd. E Scepusio in hortum illatus (No 220) [*Hornschuchii Hoppe*].

repens L. (No 231); [*repens L.?*] ab Oberschall (XLIX. No 178); [l. még *Gouani*].

reptans — Kitaib. [a Römer] (No 157).

rutaefolius Ad lacum Račkowa C. Lipt. [Rochel] (No 166, 177) [*Callianthemum coriandrifolium Rchb.*]; *rutaefolius* (No 209).

[*sardous Cr.*] in salsis inter Árokszállás et Kaál 7-bri (No 162); [*sardous*] in inundatis ad Boros-Jenő (No 225); [l. még *bulbosus, hirsutus, philonotis*].

[*sceleratus L.*] (No 164); *sceleratus* (No 179, 200); [*sceleratus*] ex humidis (XLIX. No 166) [l. még *trifidus*].

!! [*scutatus W.* et *K.* Icon. II. p. 205, tab. 187] aus der Kuppe von Plissivicza (No 195 a.); [*scutatus W.* et *K.*] In Merszin et Plissivicza (No 196); [l. még *Thora*].

! [*segetalis Kit.* apud M. Uechtritz in Flora (1821) I. p. 40; nincs meg Kit. gyűjteményében — deest in herbario].

sericeus Ita videtur ob folia pinnata. Auf dem Lindenberg in der Mitte May. (No 206) [*illyricus L.*].

! *stagninus mihi, sceleratus?* [!] In stagno versus Isaszeg Julii (XLIX. No 159).

Steveni Andrz. e Wolhynia — v. Besser (XLIX. No 174); [l. még *philonotis*].

Thorae varietas. Ex alpibus Scepusii a Mauksch (No 195) [*thora L.* + *scutatus W.* et *K.* + *hybridus Biria;* bizonyára csak a R. thora példánya való a Szepességből].

[*trichophyllus* l. *aquatilis*].

! *trifidus mihi,* an *sceleratus?* [!] Radix fibrosa alba... Crescit in aquosis cum R. scelerato (No 201).

! *trilobatus mihi* [apud *Schlechtend.* Animad. Ranun. II. (1820) p. 21, non *Don*] — 97 — In alpe Petrosa Augusto, est nivalis varietas sec. Willdenow, qui scribit, ut conferat fl. lapp. Nunc autem videtur eum pro R. Gouani s. R. pyrenaeo Gouani habere, utpote, quam in alp. Marin. crescere dicit. Sp. pl. (No 217) [*carpaticus Herbich = dentatus (Baumg.) Simk. =* an *complicatus* seu *latilobus Kit.* Addit. no. 840?].

trilobus ex horto (No 160); *trilobus* missus (XLIX. No 190).
! [*tuberculatus* l. *cuneatus*].
[spec.?] (No 152, LXIII. No 156).

Raphanus XXII.

cheiranthifolius (No 4).
Raphanistrum In satis vinealibus ad Schemniczium, Antal, infra Szitnyam (No 6); *Raphanistrum* [+ *Eruca sativa Gars.*] (No 7).
sativus varietas (No 8); [*sativus L.?*] (No 9).
tenellus Pall. (No 5); *tenellus Pall.* in quo videbis siliquam Raphani — a Willd. (No 5 a.).

Rapistrum

[*perenne* l. *Myagrum perenne*].

Reichardia

[l.*Sonchus chondrilloides*].

Reseda XIV.

alba (No 19); *alba* Montp. a Decandolle (No 19 *c.*).
dipetala? sed petala nunquam bifida; calycis foliola 3. (No 16).
fruticulosa (No 18).
glauca ex horto (No 15); *glauca* Pyrenées — a Decandolle (No 15 a.).
[*inodora* l. *mediterranea*].
lutea In aridis saxosis, muris, aggeribus (No 21); *lutea angustifolia.* In aggere infra vineas Érdenses sub finem Maji cum vulgari (No 22) [forma *luteae* foliolis anguste linearibus]; lutea ad Érd; in Blocksberg (LIV. No 101); [*lutea* f. *gracilis Ten.* [Phyteuma a Pfist. (LV. No 42).
luteola (No 14; LIV. No 93; LXIII. No 154).
mediterranea L. Inveni in monte Gerardi, qua in orientem respicit, et Vacii in arvis prope Danubium versus vineas et in Cttu Albensi ad Káloz (No 24) [*inodora Rchb.*].
Phyteuma in Blocksberg Budae, auf Markengraben [?] auf den Äckern (No 23).
sesamoides L. Ex Galliae australiori. Dept. du la Sarthe, circa Lemaine lecta — v. Strassburg [a Nestler] (No 17); *sesamoides* a Willd. (No 17 a.).
undata (No 20).

Rhagadiolus XXVII.

edulis ex horto (No 112); *edulis* Ex horto botanico (No 115).
stellatus W. H. T. [a Balbis] (No 113, 114).

Rhamnus IX.

Alaternus (No 144).
alpinus In montibus Croatiae ad viam Carolinam (No 141) [*fallax Boiss.*]; *alpinus* ex horto initio Maji (LVII. No 77).
! *cardiocarpus* [*Willd.* MS. ex R. et Sch. Syst. V. p. 276; Kit. apud Kanitz et Knapp in Verh. zool. bot. Ges. (1866) p. 26; apud Kanitz Versuch p. 120]. A. 62 — In Syrmio, Banatu, Serbia et

Wallachia (No 137) [*tinctoria W.* et *K.* Icon. III. tab. 255].

catharticus Locis humidis et siccissimis per totam Hungariam (No 134); *catharticus* [!] aut novus a Frangula certo diversus foliis serratis. Specimen tamen videtur Frangula (No 135); *catharticus* (XLVI. No 63).

an non *colubrina?* Flores non reperi in subalpinis (XL. No 167) [*Fagus silvatica L.*].

[*fallax* l. *alpinus*].

Frangula In pratis humidis et uliginosis Pesthini, Babocsae, in Syrmio, Banatu (No 143); *Frangula* E Cottu Sümegh (XLI. No 220); *Frangula* Ex it. Slavon. (XLI. No 280).

infectorius L. — Kitaib. [a Roemer] (XLII. No 57).

oleoides In Gärten (No 136).

Paliurus In sepibus vinearum Budae et Flumine (No 146) [*Paliurus spina Christi Mill.*].

pumilus In alpibus Carnioliae et Styriae (No 142) [*rupestris Scop.*].

[*rupestris* l. *pumilus*].

saxatilis? E monte Czobor in Cttu Nitriensi (No 139) [*Prunus* an *domestica?*]; *saxatilis* ex horto (No 140); *saxatilis* mas von Petersdorf (No 140 *a.*).

!! [*tinctoria W.* et *K.* Icon. III. p. 283, tab. 255] In Syrmii fruticetis, longior ramus est e monte arcis Devae (No 138); *tinctorius* ex horto (XLI. No 224; XLVI. No 66); [l. még *cardiocarpus*].

Rheum XIII.

Ribes (No 8).

tataricum (No 16).

spec? (No 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17 [üres ív] 18, valamennyi bizonyára a schönbrunni parkból való.)

Rhinanthus XIX.

Alectorolophus a Lumnitzer (No 5) [*Alectorolophus major (Ehrh.) Rchb.*].

! *alpinus n.* sp. In alpibus Cttus Scepusiensis, Arvensis et Marmaros. Jul. et Aug. Nec Willdenow, nec Hedwig hunc novit (No 4) [*Alectorolophus pulcher (Schum.) W.* et *Gr.*].

Crista galli Ad Káloz Junio. Calycis et foliorum margo serrulato-scaber (No 2) [*Alectorolophus major (Ehrh.) Rchb.* + *Borbásii Dörfler?*]; *Crista galli* In pratis Taur. A Balbis (L. No 79); *Crista galli* var. *alpestris?* fl. obscure-violaceis. Račkova [Rochel] (L. No 202) [*Alectorolophus pulcher (Schum.) W.* et *Gr.*].

[*Alectorolophus glandulosus (Simk.) Stern.* = *rumelicus Vel.*] E Banatu (No 2 *b.*).

! [*maculatus Kit.* apud Gombocz l. c. nincs meg ilyen néven — deest in herbario].

[*Alectorolophus major (Ehrh.) Rchb.*] E Syrmio (No 2 *a.*); *major Bess.?* Inter segetes C. Bribilino [Rochel] (L. No 43) [*Alect. hirsutus All.*].

minor — Baumgarten (LIX. No 49) [*Alect. stenophyllus (Schur)?*].

[*pulcher (Schum.) W.* et *Gr*] E Kriván (No 3); [l. még *Bartschia alpina*].

Trixago L. — Bellardia Trixago All. Ex Auripoli [?] A Balbis (L. No 78); *Trixago L.* Meliora specimina non possideo. Kitaib. [a Roemer] (L. No 155).

spec? (L. No 97).

Rhodiola XLVIII.

rosea E Scepusio, ubi in Völkgrund copiose occurrit (No 30) [var. *Scopolii Kern.*].

Rhododendron XIII.

Chamaecistus a C. Festetits (No 43); *Chamaecistus* Aus der Wocheiner Alpe Vogu, 1812 — v. Sieber (XLVIII. No 51).

ferrugineum [W. et *K.* Icon. I. p. XXX., non *L.*] In Izvoru Kailor, in Petrosa (No 41) [*Kotschyi Simk.* + *hirsutum L.* posterius vix e loco citato!]; *ferrugineum* E m. Cenisio a Balbis (XLVII. No 213); *ferrugineum* (LIII. No 183) [*Kotschyi*]; *ferrugineum* Baumgarten (LIX. No 96) [*Kotschyi*].

hirsutum a C. Festetits (No 42); *hirsutum* Loibl — v. Sieber (XLVIII. No 50).

[*Kotschyi* l. *ferrugineum*].

Rhus XI.

angustifolia Glashaus (No 138).

copallinum Garten (No 139); *copallino* proximum (No 141); *copallinum* Sch. Br. (No 142).

Cotinus (No 144); *Cotinus* a Festetits (XLI. No 215) [= *Cotinus Coggygria Scop.*]; *cotinus* — Baumgarten (LIX. No 118).

Fernix Garten (No 140).

radicans Garten (No 136).

Toxicodendron (No 135, 137).

spec.? (No 143).

Rhynchospora

[l. *Schoenus albidus, biceps*].

Ribes IX.

acerrimum [Roch. apud Schult. Österr. Fl. I. p. 432] Kvaznicska. Weneiz [?] [Rochel] (XLII. No 87) [*petraeum Wulf.*].

alpinum Folia utrinque pilis adspersa. Ex horto (No 164); *alpinum* a Mauksch (No 165); *alpinum* [!] Baccae huic erant valde minutae. Videtur ab illa, quod Mauksch miserat, differre. Legi ad acidulas Neolublov. ad Sztráskam, germanis Nerr? (No 166); an *alpinum?* [!] (XLI. No 243, 247); [l. még *lucidum*].

! *carpaticum* [Kit. apud Schult. Österr. Fl. I. p. 432; Addit. p. 177] — X. 46 — convenit cum ciliato caeterum, sed bracteae pedunculis breviores [non!]. Fructus acidissimus notante Mauksch. In saxosis alpium Scepus. Majo. Scheint neu zu seyn, rescribit Willdenow. (No 160) [*petraeum Wulf.*].

Cynosbati (No 176).

diacanthum ♂ (No 171; XLI. No 242; LVIII. No 107); *diacantha* Kitaib. (XLII. No 60).

! *ciliatum* [*Kit.* Addit. p. 176] Pedunculis pubescentibus; bracteis pedicello longioribus, calycibusque petalisque ciliatis, germinibus glabris. Petioli foliaque ciliata utrinque pilis raris adspersa. A Mauksch e Scepusio (No 159) [est *petraeum Wulf.*, nec *petraeum* × *rubrum* = *Kitaibelii Dörfl.*, confer Simk. Bot. Közlem. VIII. (910) p. 12].

floridum ex horto (No 170; XLI. No 241).

Grossularia In Matrae montibus frequens (No 172); *Grossularia* e Croatia (No 172 a.); *Grossularia* e monte Szántó. Videtur diversum caulibus aculeatissimis, ciliis nudis (No 173); *Grossularia* In sylvis montanis H.... Croatiae (XLVI. No 71); *Grossularia* Besseri, Schultesii post medium April, ex horto (LVII. No 64); *Grossularia* [!] Hoffm., Roth, Willd. nam cilia pilosa. Ramis angulatis, inermibus. Spinis ternis subaxillaribus majoribus, foliis minoribus; germinibus dense molliterque pilosis diversa (LVII. No 65).

[*Kitaibelii* l. *ciliatum*].

! *lucidum mihi* [Addit. p. 177] an alpinum? sub priori nomine descriptum. E Cottu Liptov. adlatum (No 167) [forma *R. alpini* foliis basi fere cuneato-contractis = *R. Hladnikii Rchb.* Exs. fl. Germ. no. 2245 sec. G. Beck in Fedde Rep. XVIII. p. 131].

! *multiflorum* [*Kit.* apud Schult. Österr. Fl. I. p. 433] (XLI. No 232); [l. még *vitifolium*].

nigrum [!] Fertur in Carpatho crescere (No 169); *nigrum* (XLI. No 239); [l. még *tuberculatum*].

[*opulifolium* l. *vitifolium*].

oxyacanthoides ? aculei terni sub gemmis... (No 175).

[*petraeum Wulf.*] E loco umbroso humido in Völkgrund in Scepusio (No 161); [*petraeum*] ex horto sed flores campanulati, nec planiusculi (No 163); [*petraeum* = *acerrimum Roch.* = *carpaticum Kit.*] Quasznicza. Differt a rubro racemis longioribus, floribus subsessilibus, bracteis et calycis laciniis ciliatis. Petala minuta truncata, non emarginata, purpurascentia; calycis laciniae obtusae, non emarginatae. Foliis majoribus, exacte ciliatis, supra setulis raris, subtus venis tantum setulis adpressis et... scabriusculis. Statura majore, ramis crassioribus.... (LVII. No 56); [l. még *acerrimum, carpaticum, ciliatum*].

rubrum E Croatia (No 157 a.); *rubrum* Ex horto (No 158); *rubrum* In Scepusii sylvis. Dicitur etiam in Cttu Marmarosiensi et Liptoviensi crescere (No 157) [*vulgare Lam.*]; *rubrum* (XLVI. No 67).

! *triflorum mihi* [*Willd.* Hort. berol Icon. tab. 61!] etiam Willdenow. Videtur diversum a cognitis foliis subrotundis, 3—5 lo-

bis, glabris, nitidis, subtus lucidis, petiolis ciliatis, pedunculis 2—3-floris, aculeis 1—3 sub gemmis. Ex horto (No 174); *triflorum Willd.* ex horto (LV. No 81).

! *tuberculatum mihi,* an nigrum? Folia brevissimis pilis pubescentia, triloba aut sub 5-loba, cordata, utrinque, magis autem subtus glandulis flavis, in foveolos, in altera pagina in tubercula prominentes, demersis consita. Petioli villosi, glandulis similibus adspersi. Pedunculi, bracteae, germina, calyces petalaque villosa. Ab Operschall e Liptovia (No 168) [*vulgare Lam.* + *nigrum L.*].

! *vitifolium* [*W.* et *K.* apud Host Fl. Austr. I. p. 309; *Kit.* in Rel. Kit. p. 103; *vitifolium* vel *opulifolium Kit.* Addit. p. 176 et 179 =*spicatum Schult.* Österr. Fl. I. p. 432, non *Robs.*] E Croatia missum. Differt a R. petraeo, cui habitu hyemali affinis: foliis latioribus, villosioribus, petiolis dilatatis, ciliis horum pilosis; racemis florum pendulis seu recurvis; bracteis truncatis; odore...; iisdem notis etiam a R. rubro (No 162) [*multiflorum Kit.*].

[*vulgare* l. *rubrum, tuberculatum*]. [spec.?] ex horto (XLI. No 98).

Ricinus XL.

communis (No 15, 38, 166).

Ricotia LI.

aegyptiaca (No 91).

Rindera

[*umbellata (W.* et *K.) B.* et *H.*] (XXXIX. No 300; XLI. No 150); [l. még *Cynoglossum umbellatum*].

Rivina VII.

humilis L. (No 208, 208 *a., b., c.*).
laevis Ex horto (No 209).

Robinia XXV.

Caragana (No 4).
Chamlagu a Sprengel (No 7).
hispida (No 3).
frutescens Garten (No 8; LIII. No 55).
Halodendron (No 6).
[*hispida L.*] (LII. No 58, 62).
Pseudoacacia (No 1).
pygmaea ex horto (No 9).
spinosa (No 5).
viscosa (No 2).
[spec.?] (LIII. No 56).

Roripa XX.

[*amphibia* l. *Myagrum austriacum, Sisymbrium amphibium*].
[*austriaca* l. *Myagrum austriacum*].
[*palustris* l. *Sisymbrium amphibium, islandicum, palustre*].
[*pyrenaica* l. *Sisymbrium pyrenaicum*].
[*sylvestris* l. *Sisymbrium palustre, pyrenaicum, sylvestre, tenuifolium; Sium catholicum*].
[spec?] Ex it. Slavon. (LI. No 166).

Rosa XV.

[Kitaibel herbáriumának rózsáit. legalább nagyjából, Borbás Vince és Kmeť András revideálták. A Borbás neve után álló lapszámmal az ő „Magy. Birodalom vadon termő rózsái monographiájának kísérlete" című munkáját idézem. Rosae Kitaibelianae a V. Borbás (in „Primitiae" ejus citatae) ab A. Kmet revisae sunt].

! *adenophora* mihi [apud Schult. Österr. Fl. II. 69 et Addit. p. 283 no. 1194] in sylvis Leibnitzensibus Junio, Julio rarius. A Mauksch (No 2).

alba (No 48).

alpina (No 23; XLIX. No 81, 135); *alpina* ex horto (No 24; LIV. No 142); [*alpina* = *pendulina* L.] ex horto. Prae pluribus aliis floret medio Maji (No 40); videtur mihi diversa a *R. alpina:* sed nec fructum, nec flores reperi in colle subalpino [Mauksch] (No 49); [*alpina*, det. Borbás] In Domuglet ad thermas Herculis (No 51); [v. *pumila, pyrenaica*].

altaica [Kit. apud Roch. Ban. p. 26, et Addit p. 282 non *Willd.*] In agris et sub alpibus Scepusii Majo, Junio raro. A Mauksch. (XLIX. No 97) [R. altaica Kit. p. p. non Willd. = *spinosissima* f. *minutifolia*, det. Borbás]; [l. még *pimpinellifolia*].

[*arvensis L.*, det. Borb.] Ex itinere Slavonico (No 52); *arvensis* (XLIX. No 86); *arvensis.* Baumgarten (LIX. No 85); [l. még *repens*].

! *balsamea* [vel *recurva Kit.* Addit. p. 286 no. 1204, Rel. Kit. p. 129] ex horto (No 27) [*balsamea* + ad *R. Monspeliacam Gouan* vergens, det. Borbás; confer. Borb. p. 514, 530]; *balsamea* mihi, alpinae proxima sed germinibus hispidis, foliolis magis pubesc. subtus villosis, petiolis aculeatis setoso-glanduliferis diversa. E Cottu Liptoviensi (No 28); *balsamea* e Matra, germ. ovatis pedunculisque hispidis, petiolis hispidis subaculeatis, foliolis oblongo ovatis subtus pubescentibus, fructibus oblongis recurvis. Olim recurva mihi dicta (No 29); *balsamea* mihi e Papuk (No 31); *balsamea* a Mauksch pro alpina missa (No 32); *balsamea.* E Matra Solymosiensi, initio Junii (No 33); *balsamea* mihi. In sylvis subalpinis Völkgrund (No 34); *balsamea β.* In rupibus supra cataractam Moticskensem (No 35); *balsamea* ex horto (XLIX. No 83); *balsamea* mihi (LIV. No 143).

balsamica Suppl. IV. — v. Besser (XLIX. No 138) [*R. balsamicam* Besser postea *R. Kluckii* nominavit, specimen hoc hujus authenticum est. Borbás].

canina In sylva ad Pétsvárad initio Septenbris (No 42); *canina* E Szitnya (No 43) [*canina* var. *insignis* Borb. det. Borbás]; *canina* E Szitnya (No 44) [*canina*

L. + *collinae Jacq.* var., det. Borbás].

Caroliniana, serius, quam reliquae floret [Mauksch] (No 3).

! [*carpatica* Kit. Addit. p. 288, nincs meg ilyen néven a gyűjteményben — deest].

centifolia L. (No 17).

[*cinerascens* l. *villosa*].

cinnamomea (XLIX. No 96).

collinam esse dubito licet cum hac eodem tempore et loco legerim. Germen subangulatum, magis hispidum. Pili longis in petiolis an ex his nati an peregrini sint non distinguo [Mauksch] (No 46); *collina* ex horto (XLIX. No 76, 131).

corymbifera Baumg. (LIX. No 86) [= *solstitialis Bess.* ex Simk. En. Transs. p. 209].

! *croatica* mihi [Addit. p. 285 no. 1200] ad viam Carolinam in Croatia versus Fiume (No 4) [confer Borb. p. 540, 546].

damascena? In Popischano Brdo ad vineas prope Carlowitz — A Wolny (XLIX. No 152) [an *R. Herculis Borb.?*].

davurica (No 41).

[*dumetorum* l. *intermedia*].

eglanteria bicolor (XLIX. No 95).

! [*elongata Kit.* apud Gombocz l. c. p. 133, sub hoc nomine deest].

[*ferruginea* l. *glaucescens, rubrifolia*].

frutetorum Suppl. III. e Volhyn. v. Besser (XLIX. No 141) [Specimen hoc, quod ad R. frutetorum Bess. pertinere videtur, cum *R. glaucesceenti* Bess. (non alior) XXXXIX. 139 erat confusum — Borbás].

[*gallica L.*] von dem Berge bei Oravicz (No 50); [l. még *pumila*].

! *glabrata mihi*, an rubrifolia? [Addit. p. 284 no. 1197; Borb. p. 458] sed pedunculi brèves, glabri aut paucissimis setis adspersi. Nescio ubi in Hungaria lecta. Est rubrifolia. Eandem serius misit Wolny ad monasterium Schischatovicz lectam et a me sub nomine polyanthae vel macrae descriptam (No 5). [„Nescio ubi in Hungaria lecta" adnotat Kitaibel. Probabiliter legit illam in Gospich Croatiae Littoralis, quia simillima Rosae Herb. Kit. No 16 (4366) ad Gospich lectae. Accedunt ambo ad *R. Ilseanam* Crép. — A. Kmet].

glandulosa Bellardi — R. Reynieri Hall. f. — Briançon a Decandolle (No 1).

glaucescens ad arcem vetustam Szitnya (No 43) [*ferruginea Vill.* var. *Ilseana* Crép. sec. Borb. p. 43]; *glaucescens* E Szitnya? (XLIX. No 77); *glaucescens* mihi v. Besser (XLIX. No 139); [l. még *frutetorum*].

[*Herculis Borb.* l. *damascena*].

! *humilis* mihi [Addit. p. 286 no. 1205, non aliorum] an alpina? Ad Koreniczam in Merszin et Vilena Draga (No 25) [= *Malyi Kern.* f. *megalophylla Borb.* p. 536, 551 + *spinosissima* K. *dimorphophylla* Borb. l. c.]; *humilis mihi* (XLIX. No 82) [=

Malyi Kern. + *Malyi* × *spinosissima* det. Borbás].

[*Ilseana* l. *glabrata*].

! incana mihi [apud Schult. Österr. Fl. II. p. 70, Addit. p. 287 no. 1207, Borb. p. 447] ad Hradek (No 15) [*incana Kit.* ad f. *Kmetianam Borb.* transiens, sepalis et pedunculis modice glandulosis. Tales formae transeuntes circa Schemnitzium sunt frequentes — A. Kmet.]; an eadem cum *incana* mea collatione inquirendum ad Parád (LVI. No 11).

! intermedia mihi [Addit. p. 287 no. 1207] a canina differt foliolis petiolisque villosis, a collina pedunculis glabris petiolisque eglandulosis. Ad Koremiczam (No 45) [*dumetorum* f. *intermedia Kit.* Ramuli bini superiores ab inferioribus quidem diversi, verum proxime accedunt ad typum Rosae dumetorum. A Rosa incana Kit. penitus abhorrent. — A. Kmet.]; *intermedia* mihi. A canina differt foliis villosis, a collina pedunculis nudis, petiolisque subglandulosis. Ad Koreniczam (XLIX. No 95).

[*Jundzillii* l. *pumila*].

[*Kluckii* l. *balsamea*].

[*Kmetiana* l. *incana*].

[*Kosinsciana Bess.* flore solum minore differt — Borbás] Ab alpina diversa serraturis foliolorum eglandulosis (No 26).

lutea (XLIX. No 94).

[*Malyi* l. *humilis*].

! Maukschii [*Kit.* apud Schult. Österr. fl. II. p. 69 et Addit. p. 283—4 no. 1195, Borb. Primit. p. 431] (XLIX. No 88); *Maukschii* E Scepusio a Mauksch (XLIX. No 105).

nitidula Suppl. IV. — v. Besser (XLIX. No 146).

parviflora ? (XLIX. No 104).

pendulina ? sed germina plerumque hispida; ad acidulas Lublovienses in sylva, etiam in Matra (No 30) [*alpina* f. *Lagenaria Vill.* A. Kmet.]; [*pendulina*] (XLII. No 207); [v. etiam *alpina*].

[*pimpinellifolia L.*] Ex it. Beregh (No 33); [*pimpinellifolia*] germ. pedunc. petiolis foliisque nudis, laevibus, aculeis rectis subsetaceis. Flores odore ingrato, fere Rosae luteae (No 34); *pimpinellifolia* Pallas. altaica Willd. Ex horto (XLIX. No 98); *pimpinellifolia* In Scepusio (XLIX. No 99); [l. még *altaica, scotica, spinosissima*].

[*petiolaris* vel *carpatica* l. *carpatica*].

ad *provincialem* accedens, eadem Germ. subglob. subhispido, pedunc. calycesque hispidi setis glandulifer. Petioli pubescentes setis glandulif. aculeisque raris adspersi. Foliola ovata, acuta, utrinque villosa et canescentia, serraturis glandulosis caules setis glandulif. hispidis interspersis aculeis subulatis, rectis patentissimis. Petala obcordata. pallidissime rubella. Floret initio Maji inter Primas. Ex Hun-

Foliola duplicato-serrata (XLIX. No 89).

pumila In Cttu Neogradensi, in montosis Budae, in collibus Pesthini, ad vias in Banatu et Syrmio, in Cttu Tolnensi (No 19) [= *gallica* f. *austriaca Cr.*]; *pumila* perpera pro rubiginosa missa a Mauksch et Lumnitzer (No 20) [egy példány: *alpina* L. f. det. A. Kmet.]; *pumila* e Nagy Szál (No 21) [*Jundzillii Bess.* var. *reticulata Kern.* fide Borbás]; *pumila* (XLIX. No 75); *pumila* In collibus apricis semel reperta (XLIX. No 79); *pumila* (LIV. No 144).

pyrenaica Helvetia, a Sprengel. Est diversa a pyrenaica Willd. (No 36); pyrenaica a Willd. (No 37); pyrenaica e Mátra (No 38) [est *alpina* d. *adenosepala Borb.* p. 529]; — an a *pyrenaica diversa*? fructibus ovatis, subnudis. E Mátra (No 39); ex longa silva Kesmark, alpina non est propter aculeos, nonne *pyrenaica* ? crescit in humidis frigidis [Mauksch] (LVIII. No 68).

! [*pyriformis Kit.* apud Kanitz et Knapp, Verh. zool. bot. Ges. (1866) p. 26, deest].

repens Scop. Carn. 2. n. 610. In Syrmio, Banatu, Cttu Veszprim et Baranya in sylvis et dumetis (No 47) [= *arvensis Huds.*]; *repens.* Foliola supra glabriuscula subtus pubescentia, seu villosa pallidiora; petiolis villosis aculeatis. Pedunculi uti glanduliferis adspersi. Petala pallide purpurea. Ex itinere Slavonico (XLIX. No 78).

!! [*reversa W.* et *K.* Icon. III. p. 293 t. 264, deest; adest in herb. Willdenowiano].

rubiginosa A Báb in cttu Nitriensi a C. Waldstein lecta germinibus ovatis, pedunculisque glabris, foliolis ovatis acuminatis etc. (No 22) [*rubiginosa* + *sepium* f. *vinodora Kern.* det. Borbás]; *rubiginosa* (XLIX. No 80); [l. még *sepium*].

rubrifolia ad Gospič. D. 52 (No 16) [= *ferruginea Vill.*]; [l. még *glabrata*].

! [*scepusiensis* vel *Maukschii* l. *Maukschii*].

scotica, sub hoc nomine missa distincta a nobis. Floret Majo, suaveolens (XLII. No 186) [= *pimpinellifolia* L.].

[*sepium* f. *vinodora Kern.* Exempl. foliis minoribus propius accedunt ad typum Kerneri, quam formae Schemnitzienses. — A. Kmet. Ad Báb in Cttu Nitriensi a C. Waldstein lecta, cum R. rubiginosa erant haec exemplaria confusa. Bpest 16/1. 1880. Borbás] (No 22, de nem volt számozva).

solstitialis ? In coll. ad Wagum C. Trencs. [Roch] (No 10); *solstitialis* Prim. Fl. Gal. e Galicia v. Besser (XLIX. No 142).

spinosissima Budae, in Sárhegy ad Gyöngyös, ad Rendek, in Szitnya monte (XLIX. No 100); *spinosissima.* Ex umbrosis sylvae Budensis. 16 Maji (XLIX.

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No 101); *spinosissima* von Gyöngyöser Steinbruch (XLIX. No 102); *spinosissima* e Volhyn. v. Besser (XLIX. No 140); *spinosissima* (LIV. No 141).

[*subglobosa* l. *villosa*].

terebinthinacea mihi — v. Besser (XLIX. No 143).

uncinella Suppl. IV. — v. Besser (XLIX. No 145).

! villosa ex horto (No 6); *villosa*, sed foliola pleraque acuta (No 11); *villosa β.* germinibus glabris. Ad Mehadiam (No 12) [*subglobosa Sm.* det. Borbás]; *villosa β.* germ. subovat. glabris basi tantum subhispidis foliolis acutis, ad Koreniczam in Croatia (No 13) [confer. Addit. p. 286 no. 1206, Neilr. Veget. Croat. p. 234, Borb. p. 514]; *villosa β*... E Cottu Zoliensi (No 14) [= *R. cinerascens Dumort.* f. *heterodonta Borb.* det. Borbás. Nomen cinerascens f. heterodonta Borb. est synonymon R. cinerascenti Dum. f. subadenophyllae Borb. Nomen superfluum, cum nec in Monographia Rosarum assumatur, v. p. 510. A. Kmet.]; *villosa* (LIV. No 140).

[*Rosa spec.* (XV. No 4, szám nélkül és cédula nélkül), No 18; XLII. No 116; XLIX. No 132; LIV. No 145)].

Rosa a canina diversa germinibus hispidis, foliolis subtus pubescentibus. Initio Maji ex horto (XLIX. No 85); *Rosa* germ. erat pedunculis glabris, pet. acul. (XLIX. No 87); *Rosa* convenit plerisque notis cum illa, quam ad provincialem accedere dixi; sed corolla alba, subochroleuca; foliolorum serratura minus glandulosa. Ex Hung. in hortum illata (XLIX. No 90); *Rosa* e sem. syrmiensibus nata (XLiX. No 91); *Rosa* germ. ovatis glabris, ped. petiolis glanduloso-hispidis inermibus (XLIX. No 92); *Rosa* diversa a pimpinellifolia caule aculeatissimo, petiolis laevibus, a spinosissima pedunculis petiolisque glabris, quoad florum colorem... convenit hoc etiam ab illa diversa (XLIX. No 103); *Rosa* germ. subrot. glabris, pedunc. glabr. aut glanduloso-hispidulis, foliolis biserratis serraturis glanduloso-denticulatis, foliolis pubescentibus, sub finem Maji (XLIX. No 144).

Rothia XXVII.

cheiranthifolia (No 79, 80).

Rottboellia V.

biflora Persoon Synops. 1. p. 106 Non differt a pannonica (No 138).

filiformis Ex horto (No 141).

incurvata Ex horto. Morisoni icon hanc bene repraesentat (No 142).

interrupta ex horto (No 137).

pannonica Im Jagwald bey Temeswar (No 139 *a.*) [*Pholiurus pannonicus (Host) Trin.*]; *pannonica Host* In praedio Hatrongyos non procul Tibisco (No 139 *b.*) [*Pholiurus pannonicus*].

! salina [*Kit.* in Rel. Kit. p. 3, 83] Ad Sió Fok loco paludoso cum Carice mea striata (No 139) [*Pholiurus pannonicus (Host) Trin.*]; *salina*, qualis in aquario horti crevit. Descriptionem vid. in diario itineris marmaros. Minora specimina sunt e loco natali: Poroszló, cttu Békesiensi 4 (No 140) [*Pholiurus pannonicus*]; *salina* e Cttu Bihar (No 140 *a.*) [*Pholiurus pannonicus*].

Royena XIII.

hirsuta Glashaus (No 57).

Rubia VII.

tinctorum L. [+ *Galium rubioides*] in humidis ad Végles v. Schwarzmann (No 88 *c.*); *tinctorum* Budae in monte urbis superioris, qua parte Christinianam respicit, et inter vineas (Burgerberg) ac ad marginem vinearum infra montem Gerhardi; Pesthini in aggere quo vineae infra urbem defenduntur (No 153).

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1935.
PARS MINERALOGICA, GEOLOGICA, PALAEONTOLOGICA.

PATHOLOGISCHE UNTERSUCHUNGEN AN UNGARLÄNDISCHEN VERSTEINERUNGEN.

VII. Einige Beispiele für die Paläopathologie der Extremitätenknochen.

(Mit den Tafeln XV—XVI).

Von A. Tasnádi-Kubacska.

(Budapest, Magyar Nemzeti Múzeum).

An krankhaft verändertem Extremitätenknochen-Material aus Ungarn sind von der anatomisch einfachsten Form der Entzündung der Gelenke an bis zu deren höchstgradigsten Erkrankungen zahlreiche Fälle zu beobachten. Den abwechslungsreichen anatomischen Veränderungen entspricht eine ebenso große Abwechslung der Ursachen, welche die vorgenannten hervorbrachten. Die Ergründung der Ursachen ist im Falle der von ihren Weichteilen entblößten Knochenreste noch viel schwieriger, als in der tierärztlichen Praxis. Ein Teil der Gelenksentzündungen ist auch an den fossilen Extremitätenknochen nachweisbar traumatischen Ursprunges. Es versteht sich von selbst, daß die Wirkungen, welche zu Brüchen der Extremitätenknochen führten, in der gleichen Weise auch in den Gelenkskapseln Brüche und Verrenkungen etc. verursachen konnten. Es sind uns zahlreiche Überbeine und Fälle von Exostosis ligamentosa bekannt, die größtenteils ebenfalls für traumatische Einwirkungen sprechen. So kam z. B. aus der Felsnische des Remete-Berges (bei Budapest) die Phalanx eines *Vulpes* zum Vorschein (Kgl. Ungarische Geol. Anstalt), an dessen distalem Ende im Umkreis der Bandgruben und an den Haftungsstellen der Bänder Knochenneubildungen sitzen. Es sind dies nichts anderes, als durch traumatische Wirkungen hervorgebrachte Überbeine und periostitische Auflagerungen (siehe Tafel XVI, Fig. 4). Dasselbe ist auch bei der Phalanx des oberpliozänen *Vulpes* sp. der Fall, der von Beremend (Ungarn) in die Sammlung des Magyar Nemzeti Múzeum (Ungarisches National

Museum) gelangte (Inv. No T 439; Taf. XVI, Fig. 3). Desgleichen sind auch die von LAMBRECHT am Tarsometatarsus des Pilisszántóer plistozänen *Lagopus mutus* beobachteten runden Exostosen nicht anderes, als derartige Überbeine traumatischen Ursprunges (3). Auf traumatische Wirkungen ist schließlich auch die am proximalen Ende des Metapodiums einer Felide von Lynxgröße sichtbare Ankylose zurückzuführen, durch welche das proximale Ende des Metapodiums mit dem darüber befindlichen karpalen Knöchelchen vereinigt und dann das ganze durch einen starken periostitischen Knochenmantel überwuchert wurde (Tafel XV, Fig. 3). Dieser Fund gelangte aus der oberpliozänen Fauna von Gombaszög (Oberungarn) in die Sammlung des Magyar Nemzeti Múzeum.

Es gibt aber ausgestorbene Arten, bei denen infolge spezieller Umstände andere Ursachen, z. B. infektionsartige Erkrankungen die Oberhand erlangen konnten. Einen solchen, dem Anscheine nach mit der Entwicklung und den Veränderungen der Lebensbedingungen der Art zusammenhängenden, speziellen Fall werde ich bei der Besprechung der krankhaften Metapodien des Höhlenbären noch eingehend erörtern (1).

Eines steht fest: die Erkrankungen der Gelenke größerer fossiler Extremitätenknochen verraten sowohl im Anfangsstadium, wie auch in der am meisten vorgeschrittenen Phase sehr wenig in Bezug auf die Ursache. Man kann die pathologischen anatomischen Veränderungen genau feststellen, auf die Ursachen jedoch höchstens auf Grund rezenter Analogien schließen. Ich bilde hier die durch Arthritis und Osteomyelitis deformierte Ulna eines oberpliozänen Talpiden ab (Proximales Fragment aus Csarnóta, Kom. Baranya, Ungarn). Die Ursache dieser Erkrankung kann nicht eruiert werden (Taf. XV, Fig. 2). Oder betrachten wir die aus der Mussolini-Höhle (in der Nähe von Eger, Ungarn) stammende Tibia des Höhlenbären, deren proximale Gelenkfläche die Spuren schwerer Arthritis deformans und Arthritis errosiva, wahrscheinlich mit beginnenden osteomyelitischen Prozessen verbunden, zur Schau trägt. Die als Gelenk dienende Fläche der Fibula ist unversehrt, im Umkreis derselben sitzen jedoch große Exostosen. Die proximale Epiphyse ist vollständig zerstört und an ihrer Stelle ein aus entzündlichen Knochenauflagerungen, kleinen Fistelgängen bestehender, grubiger, löcheriger Krankheitsherd ausgebildet. Das proximale Ende erlitt z. T. eine starke Verdickung als Folge von Periostitis ossificans.

Schmale Fistelgänge durchziehen die Markräume. Das Korpus und das distale Ende zeigen äußerlich keine Spuren der Krankheit (Taf. XV, Fig. 1 a—b). Dieser Fall konnte ebenso gut von einem infracapsularen Bruch, wie durch eine von innen kommende infectiöse Krankheit verursacht werden.

Verletzung als Ursache ist deshalb zu vermuten, weil am Kniegelenk des Höhlenbären die Spuren ähnlicher entzündlicher Prozesse besonders häufig zu beobachten sind, und sowohl aus dem ungarischen Material, wie aus der ausländischen Literatur zahlreiche Fälle bekannt sind, wo gerade das Kniegelenk durch sicher nachweisbare starke traumatische Wirkungen betroffen wurde. Deshalb sind diese pathologischen Veränderungen entweder an der proximalen Gelenkfläche der Tibia (z. B. Taf. XV, Fig. 5 a—b; Höhlenbär; Igric-Höhle, Ungarn), oder am distalen Ende des Os femoris (z. B. Taf. XVI, Fig. 1 a—b; Höhlenbär, Igric-Höhle; Magyar Nemzeti Múzeum) zu beobachten. Das hier abgebildete Femur ist im gleichen vorgeschrittenen Stadium, wie die vorhin vorgeführte Tibia aus der Mussolini-Höhle. Die Tibia aus der Igric-Höhle trägt jedoch einen minder schwierigen Fall zur Schau. An den Gelenksflächen der letzteren ist nur die blos stellenweis entblößte Spongiosa sichtbar, als Zeichen dafür, daß im Laufe der Krankheit der Knorpel bereits im Verfall begriffen war. Auch in den beiden letzteren Fällen sind die Spuren der Krankheit nur unmittelbar an den proximalen, bezw. distalen Enden der Knochen sichtbar.

Wie vorhin erwähnt, kennen wir eine ganze Reihe von Beispielen dafür, daß die Gelenke der hinteren Extremitäten von schweren traumatischen Wirkungen betroffen wurden. Ich möchte hier nur einige eklatante Beispiele führen. Als erstes erwähne ich die aus der Szeleta Höhle gesammelte Tibia eines Höhlenbären, bei der die Fraktur nicht nur das Korpus betraf, sondern auch die proximale Gelenkfläche durchschnitt und sogar das Tuberkulum intercondyloideum laterale abbrach (2. Pag. 24, Taf. II, Fig. 1 a—c). Als zweites Beispiel bringe ich hier das linke Femur des Höhlenbären aus der Igric-Höhle (Taf. XVI, Fig. 8, Kgl. Ung. Geologische Anstalt) über den KORMOS folgendes schreibt: Der in Rede stehende Knochen stammt in Anbetracht seiner prächtigen Entwicklung von einem alten Exemplar her. Auffallend ist die Kürze des Schenkels (d. h. des Korpus), da er bloß 37 cm lang ist, dem Exemplar gegen-

über, das von ebendort stammend auf der gleichen Entwicklungsstufe 50 cm mißt. Die Ursache der Verkürzung ist die Hemmung der Entwicklung, die im Jugendalter des Tieres durch einen, die Fossa patellaris durchkreuzenden Knochensprung herbeigeführt wurde (6).

Die Spur der breiten Fissur mit abgerundeten Rändern ist noch deutlich sichtbar, obzwar die Verschmelzung bereits vollständig ist (Taf. XVI, Fig. 8). Ringsherum an den beiden Condyli, besonders aber am äußeren sind viele Exostosen und durch Wucherung des Knochengewebes entstandene Auflagerungen sichtbar.[1]

Das dritte Beispiel für eine, die Gelenke betreffende traumatische Knochenverletzung liefert das gleichfalls aus der Igric-Höhle stammende Femur von *Hyaena spealea* (M. N. Múzeum), dessen Caput femoris unmittelbar über dem Hals abgebrochen und nach einer geringen Dislokation, rund herum mit ein wenig Kallus beinahe in der ursprünglichen Lage verheilt ist.

Die Häufigkeit der Verletzungen des Kniegelenkes beweisen auch die häufigen schweren Veränderungen der proximalen Enden der Fibulae. Diese bestehen meist in periostitischen Verdickungen und parostitischen Exostosen. Die proximalen Enden der Fibulae sind dort, wo sie das Gelenk mit der Tibia bilden, buchstäblich zerrieben und der Vertiefung eines Löffels ähnlich verkrüppelt, durch Parostitis ossificans stark vergrößert und entstellt (Taf. XV, Fig. 7 und Taf. XVI, Fig. 3). Die schwersten Fälle sind wahrscheinlich dadurch zustande gekommen, daß die Fibula infolge traumatischer Wirkungen ihren festen Gelenksverband mit der Tibia verlor, daß die ewigen Bewegungen die Ankylosis der beiden Knochen nicht zuließen und der Kopf der Fibula eben infolge dieser Bewegungen schließlich zugrunde ging.

Unvergleichlich seltener beobachtete ich arthritische Spuren an den Gelenksflächen der Tibia oder des Femur anderer Arten, so z. B. in einem Fall an der proximalen Epiphyse einer Tibia der

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[1] Hier möchte ich einschalten, dass aus dem ungarischen Material noch ein zweites Beispiel für das Zurückbleiben des Extremitätenknochens in der Entwicklung bekannt ist, nämlich der Tarsometatarsus von *Lagopus albus* Keys. et Blas. aus dem Plistozän der Felsnische von Pilisszántó in Ungarn, der von Lambrecht beschrieben wurde (5). Die Länge des normalen Knochens bewegt sich zwischen 37.5—42 mm, jene des zurückgebliebenen beträgt 29 mm. Die Ursache der Hemmung ist gänzlich unbekannt.

Höhlenhyäne (Taf. XV, Fig. 4, Igric-Höhle; M. N. Múzeum), in einem zweiten an der distalen Gelenkfläche des Femur derselben Species (Taf. XV, Fig. 6; Igric-Höhle; M. N. Múzeum, Inv. No U 887). Ein typischer Fall von Arthritis deformans ist am distalen Ende des Humerus eines plistozänen Höhlenwolfes mit Periostitis und Parostitis ossificans kombiniert festzustellen. An der defekten Gelenkfläche verlaufen tiefe Schliffrinnen und Reibungsfurchen, als Zeichen dafür, daß die Gelenke trotz der Erkrankung eine gewisse Beweglichkeit beibehielten. Hier wurde also der Knorpel durch die Bewegungen zerrieben und die Reibung setzte sich auf dem entblößten Knochen fort (Taf. XVI. Fig. 2; Igric-Höhle; M. N. Múzeum Inv. No T 283).

Die Spuren einer solchen Reibung sind auch noch an der Gelenkfläche der Tibia eines Höhlenbären sichtbar, wo nicht nur die Spongiosa zum Vorschein kam, sondern der Rand der geriebenen Fläche glänzend poliert wurde (Szeleta-Höhle, Ungarn; Kgl. Ung. Geol. Anst., Inv. No Ob 3944).

Ähnliche Gelenkserkrankungen sind auch an den kleinsten Tieren anzutreffen. So weisen z. B. die proximalen Gelenkflächen und die Bandgruben des Metapodium eines *Lepus* (?) die Spuren der Periostitis und Parostitis ossificans auf (Peskő-Höhle, Ungarn; postglazial). An der einen Seite kam Ankylose mit dem benachbarten Metapodium zustande. Am proximalen Gelenk sind nicht nur die Spuren der Arthritis zu konstatieren, sondern auch ein beginnender osteomyelitischer Prozess, indem von der Gelenkfläche kleinere Fistelgänge in das Innere des Knochens führen. An der proximalen Gelenkfläche eines anderen, vom selben Ort stammenden Exemplares münden mehrere Fistelgänge, durch welche die Sonde in das Innere des Korpus eingeführt werden kann (Beginnende Osteomyelitis).

Die Kenntnis der letzteren bekräftigt nur die Ansicht, daß die gleichen Krankheiten bei den verschiedensten Tiergruppen im wesentlichen den gleichen Verlauf zeigen.

Außer den Gelenkserkrankungen begegnet man natürlich an den fossilen Extremitätenknochen aus Ungarn noch zahlreichen anderen Krankheiten. So z. B. kommt als Folge von Brüchen entstan-

dene Osteomyelitis mit Ankylosis verbunden vor.[2] Aus den postglazialen Schichten der Peskő-Höhle (Ungarn) kam die 18 mm lange Ulna eines Nagers zum Vorschein, die mit dem Radius ankylosierte. Die Ankylose erstreckte sich beinahe auf die ganze Länge der beiden Knochen. Sowohl die Ulna, wie auch der Radius sind stark angeschwollen und zeigen starke Spuren des als Folge der schweren Osteomyelitis aufgetretenen nekrotischen Prozesses. Beide Knochen wurden durch Frakturen betroffen (Taf. XVI, Fig. 6). Ein schönes Beispiel der mit Periostitis ossificans verbundenen Osteomyelitis bietet der Tarsometatarsus eines *Lagopus albus*, der aus dem Plistozän der Pilisszántóer Felsnische (Ungarn) in die Kgl. Ungarische Geologische Anstalt gelangte. Aus dem Markkanal führt ein Fistelgang an die Oberfläche des Korpus (5).

Doch gehört auch die Rachitis nicht zu den Seltenheiten. Ein demonstratives Beispiel hierfür bietet die rachitische Fibula des Höhlenbären (Taf. XVI, Fig. 7; Igric-Höhle; M. N. Múzeum, Inv. No T 335). (Vergl. auch die von SCHMERLING, PIERAGNOLI und BREUER erwähnten rachitischen Reste: 3, 7, 4). Zu den rachitischen Resten ist schließlich auch der stark verbogene Tarsometatarsus eines *Lagopus albus* zu zählen, den LAMBRECHT aus der Pilisszántóer Felsnische ohne nähere Angabe der Krankheit erwähnt (5).

*

Das hier besprochene Material habe ich aus den Sammlungen der mineralogisch-paläontologischen Abteilung des Ungarischen National-Museums (Magyar Nemzeti múzeum) in Budapest und der Kgl. Ung. Geolog. Anstalt (Budapest) ausgewählt. Die Erlaubnis zur Bearbeitung des letzteren Materiales, sowie die photographischen Aufnahmen verdanke ich Herrn Direktor L. v. LÓCZY; die photographischen Aufnahmen des Materials aus der Sammlung des Ungarischen National Museums, Herrn Direktor V. ZSIVNY.

Literatur.

1. KUBACSKA A., Pathologisch veränderte Metapodien und Phalangen plistozäner Raubsäugetiere. Palaebiologica, 1935. — 2. KUBACSKA A., Palaeobiologische Untersuchungen aus Ungarn. Knochenbrüche. Geologica Hungarica, Ser. Palaeonto-

[2] Über die Brüche berichtete ich bereits an anderer Stelle (2).

logica, Fasc. 10, 1932. — 3. SCHMERLING M., Description des ossements fossiles... Bull. Soc. Géol. de France, Vol. VII, p. 51, 1833. — 4. BREUER R., Brieflich in EHRENBERG K.—SICKENBERG O., Eine plistozäne Höhlenfauna.... Palaeobiologica, Vol. III, p. 303, 1929. — 5. LAMBRECHT K.—KORMOS T., Die Felsnische Pilisszántó, Jahrbuch der Kgl. Ungarischen Geol. R. A, XXIII, p. 333, 1916. — 6. KORMOS T., Über krankhafte Veränderungen an fossilen Knochen. Állattani Közlemények, Vol. XIV, p. 248, 1915. — 7. PIERAGNOLI L., Ossa pathologiche nella Grotta di Equi in Lunigiana. Palaeontographia Italica, XXV, 1919.

Erklärung der Tafeln.

TAFEL XV.

Krankhaft veränderte, fossile Extremitätenknochen aus Ungarn. Eigentum der Mineralogisch-Paläontologischen Abteilung des Magyar Nemzeti Múzeum's (Fig. 2—6.), bezw. der Kgl. Ungarischen Geolog. Anstalt (Fig. 1. und 7).

Fig. 1. a. b. *Ursus spelaeus* ROSENM. Tibia mit zerstörter Epiphyse. Plistozän. Mussolini-Höhle in Ungarn. *b* = proximale Epiphyse, von oben gesehen.

Fig. 2. Talpidae. Ulna aus Csarnóta in Ungarn. Oberpliozän. Arthritis und Osteomyelitis. Vergrößert.

Fig. 3. Felidae. Metapodium aus Gombaszög in Ungarn. Ober-Pliozän. Ankylosis mit periostitischem Knochenmantel.

Fig. 4. *Hyaena spelaea* GOLDF. Proximales Ende der Tibia. Plistozän. Igric-Höhle in Ungarn. Arthritis deformans.

Fig. 5. a. b. *Ursus spelaeus* ROSENM. Proximales Ende der Tibia. Plistozän. Igric-Höhle in Ungarn. Arthritis deformans.

Fig. 6. *Hyaena spelaea* GOLDF. Distales Ende des Femur. Plistozän. Igric-Höhle in Ungarn. Arthritis deformans.

Fig. 7. *Ursus spelaeus* ROSENM. Fibula mit zerriebener Gelenkfläche. Plistozän. Igric-Höhle in Ungarn.

TAFEL XVI.

Krankhaft veränderte, fossile Extremitätenknochen aus Ungarn. Eigentum der Mineralogisch-Paläontologischen Abteilung des Magyar Nemzeti Múzeum's (Fig. 1—3. und 5—7.), bezw. der Kgl. Geolog. Anstalt (Fig. 4 und 8—9).

Fig. 1. a. b. *Ursus spelaeus* ROSENM. Distales Ende des Femur mit Arthritis deformans. Plistozän. Igric-Höhle in Ungarn.

Fig. 2. *Canis lupus* L. foss. Distale Gelenkfläche des Humerus mit Arthritis. (Mit deutlich sichtbaren Reibungsfurchen.) Plistozän. Igric-Höhle in Ungarn.

Fig. 3. *Ursus spelaeus* ROSENM. Fibula mit zerriebener Gelenkfläche. Plistozän. Igric-Höhle in Ungarn.

Fig. 4. *Vulpes* sp. Phalanx mit traumatischen Überbein. Postglazial. Felsnische am Remete-Berg bei Budapest.

Fig. 5. *Vulpes* sp. Phalanx mit traumatischen Überbeinen. Ober-Pliozän. Beremend in Ungarn.

Fig. 6. Nager. Ulna Mit Radius. Postglazial. Peskő-Höhle in Ungarn. (Ankylosis und Osteomyelitis als Folge eines Bruches beider Knochen).

Fig. 7. *Ursus spelaeus* ROSENM. Rachitische Fibula. Plistozän. Igric-Höhle in Ungarn.

Fig. 8. *Ursus spelaeus* ROSENM. Distale Gelenksfläche des Femur mit Spuren von Bruchverheilung. Plistozän. Igric-Höhle in Ungarn.

Fig. 9. *Ursus spelaeus* ROSENM. Radius, infolge einer Verletzung verkrümmt und verkürzt. Plistozän. Igric-Höhle in Ungarn.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS MINERALOGICA, GEOLOGICA, PALAEONTOLOGICA.

DIE MOLLUSKEN- UND WIRBELTIERFAUNA DES PLISTOZÄN UND OBER-PLIOZÄN VON GOMBASZÖG.

(Mit 2 Textabbildungen).

Von A. Tasnádi-Kubacska und L. Soós.

I. Fundstelle und Literatur. Die Fundortsverhältnisse der Plistozän- und Ober-Pliozänfauna. Die Fauna des Plistozän.

Von A. Tasnádi-Kubacska.

Im Szepes-Gömörer Erzgebirge in Oberungarn, ungefähr 1 km südlich der an der Eisenbahnlinie Pelsőc-Rozsnyó liegenden Station Gombaszög betreibt die Rimamurány-Salgótarjáner Eisenwerk-A. G. einen mächtigen Kalksteinbruch. Der Steinbruch liegt am rechten Ufer des Sajó-Flusses, unmittelbar neben der Eisenbahnlinie, dort wo sich das Sajó-Tal plötzlich zu einem mit tertiären Ablagerungen ausgefüllten Becken erweitert. Der helle, graulichweiße oder rötliche Triaskalkstein wird im Tagbau in Terrassen abgebaut. Im Kalkstein selbst wurden bisher bei den Abbauarbeiten keine Versteinerungen gefunden. Aus den mit Terra-rossa ähnlichem Material gefüllten Spalten und Aushöhlungen des Kalksteines kamen dagegen stellenweis zahlreiche Fossilien ans Tageslicht. Einen kleinen Teil dieser Fossilien bearbeitete 1931 Privatdozent Dr. Šuf aus Přibram (1). Seitdem wurde aber eine ganze Reihe neuer Funde gemacht, die nebst meinen persönlichen Beobachtungen an den Fundstellen die bisherigen Resultate in neue Beleuchtung stellten und auch für die Faunenverhältnisse ganz Europas von größerer Bedeutung sein dürften. Diese Umstände veranlaßten mich die Funde von Gombaszög eingehend zu bearbeiten und in erster Linie die in die Literatur eingeschlichenen Irrtümer über die Fundortsverhältnisse endgültig zu beseitigen.

Aufrichtigsten Dank schulde ich der Generaldirektion der Rimamurány-Salgótarjáner A. G. für die mir bei der Untersuchung der Fundstellen gewährte Unterstützung, sodann Herrn Direktor S. Müller für seine stets opferbereite und selbstlose Hilfe. Ferner

danke ich an dieser Stelle Herrn Oberinspektor Béla Lázár, dem Betriebsleiter des Steinbruches für seine unermüdliche und liebenswürdige Hilfsbereitschaft. Schließlich bin ich auch noch Herrn Chemiker Dr. L. v. Zombory für die von ihm ausgeführte chemische Analyse zu großem Danke verpflichtet.

*

Die von Dr. Šuf aus Gombaszög festgestellte Fauna setzt sich aus folgenden Arten zusammen:

Rhinoceros etruscus Falc.
Equus caballus robustus Pomel.
Cervus elaphus L.
Cervus capreolus L.
Bison priscus Boj.
Ursus spelaeus Blumb.
Elephas sp.
Helix lapicida L.
Campylea cf. *Čapeki* Petrb.

Über den Ursprung dieser Fauna, deren Zusammensetzung sehr merkwürdig anmutet, stellt Šuf folgendes fest: Alle Gombaszöger Fossilien liegen ganz sicher nicht an primärer Fundstelle, sondern sind zweifelsohne vom Wasser zusammengeschwemmt worden. An einer weiteren Stelle schreibt er: Soweit aus dem Grade der Erhaltung hervorgeht, handelt es sich um ein Material, das von verschiedenen Orten und vielleicht sogar aus verschiedenen stratigraphischen Horizonten zusammengetragen wurde.

In der Tat zeigt die von Dr. Šuf gegebene Faunenliste auf den ersten Blick, daß es sich nur um eine Vermischung von Fossilien ganz verschiedener geologischer Zeitalter handeln kann. Diese Vermischung wurde durch das Zusammentragen des an verschiedenen Punkten, ohne Auseinanderhaltung der Fundstellen gesammelten Materiales verursacht. Durch diese Tatsache wurde Dr. Šuf bei seinen Schlußfolgerungen verwirrt und wagte es auch nicht, das vollkommen zusammengewürfelte Material zu trennen und auf verschiedene Zeitalter zu verteilen. Aus diesem Grunde hat er auch diese Fauna ins Plistozän (Diluvium) verlegt, was ganz klar aus dem Titel seiner Arbeit und auch aus der entschiedenen Feststellung, die er seiner Faunenliste vorausschickt, hervorgeht. Im Gegensatz dazu stellt er aber am Ende seiner Arbeit fest, daß *Equus caballus robustus* für das Präplistozän charakteristisch ist, während *Rhinoceros etruscus* vom oberen Pliozän bis ins ältere Plistozän hinein lebte. Nach seiner Ansicht sind auch rein tertiäre Horizonte zu er-

warten, da der Gombaszöger Fundort nur 15 km vom Rozsnyóer Neogen-Gürtel entfernt liegt.

Die von Dr. Šuf veröffentlichte Faunenliste setzt sich ohne jeden Zweifel aus Arten zusammen, die zwei scharf von einander trennbaren Zeitaltern angehören. Das eine ist durch das Auftreten von *Rhinoceros etruscus* mit absoluter Sicherheit als oberes Pliozän charakterisiert.[1] Die übrigen Vertreter der Faunenliste von Šuf stellen dagegen tatsächlich Vertreter des Plistozän dar *(Ursus spelaeus, Bison priscus).* Es ist aber sehr wahrscheinlich, daß einige von diesen noch einer gründlichen Revision bedürfen (z. B. die Schnecken, *Cervus elaphus* und *Equus caballus robustus).* Auch ist es sehr leicht möglich, daß ein Teil von ihnen aus den oberen Pliozänschichten stammte und bei den Einsammlungen mit den plistozänen Funden vermischt wurde. Ich war in der günstigen Lage, Dr. Šuf's Originalmaterial zu überprüfen und bin zu der festen, jeden Zweifel ausschließenden Überzeugung gekommen, daß die einzelnen Stücke aus den verschiedensten Schichten zusammengetragen worden sind. Als Beweis dafür führe ich nur folgendes an: Die Überreste von *R. etruscus*, die Zahnbruchstücke von *Elephas* sp., die Reste von *Equus* und die Unterkieferbruchstücke des als *Cervus elaphus* bestimmten Tieres sind alle hellfarbig mit rötlichen Terra-rossa-Flecken und weisen noch teilweise anklebende Terra-rossa-Reste auf. Die sicher aus dem Plistozän stammenden Fossilien sind demgegenüber dunkel gefärbt, mit anklebenden Resten von braunem Höhlenlehm. In Erwägung aller dieser Tatsachen stütze ich mich bei meinen folgenden Ausführungen ausschließlich auf die von mir selbst gesammelten Fossilien, deren stratigraphische Lagerung ich für ausschlaggebend betrachte.

*

Überreste von Mollusken und Vertebraten fand ich blos in den beiden untersten Horizonten des Steinbruches: in dem untersten (mit 0. bezeichneten) und in dem unmittelbar darüber liegenden

[1] *R. etruscus* kommt im Plistozän nicht mehr vor. Dort, wo diese Art in typischer Plistozänfauna gefunden wurde (wie z. B. im vorliegenden Falle, in der durch die Höhlenbärenfunde charakterisierten Fauna von Gombaszög), handelte es sich entweder um eine sekundäre Vermischung der Fossilien, oder aber um eine fehlerhafte Determination (so hält z. B. J. Brandt *R. antiquitatis* für identisch mit *R. etruscus*, 2).

(mit I. bezeichneten). (Textabb. 1. zeigt die Anordnung der einzelnen Fundstellen). Die mit Terra-rossa ausgefüllten Spalten und Klüfte der übrigen Horizonte waren alle fossilienfrei.

Die mit 1. bezeichnete Fundstelle im Horizont 0. stellt eine kleinere Höhle im Kalkstein dar, die mit rötlichem Lehm ausgefüllt ist. An dieser Fundstelle wurden insgesamt ein Wiederkäuerzahn, 2. Zahnbruchstücke von *Rhinoceros etruscus* und ein Gliedmaßenfragment gefunden.

Fundort 2. im Horizont 0. war eine größere Höhlung im Kalkstein, ausgefüllt mit fein zerriebener, rötlicher Lehmerde. An dieser Stelle fand ich gut erhaltene Reste von Insektenfressern und Nagetieren, einen Wiederkäuerzahn und schließlich noch Schneckengehäuse (siehe bei Soós).

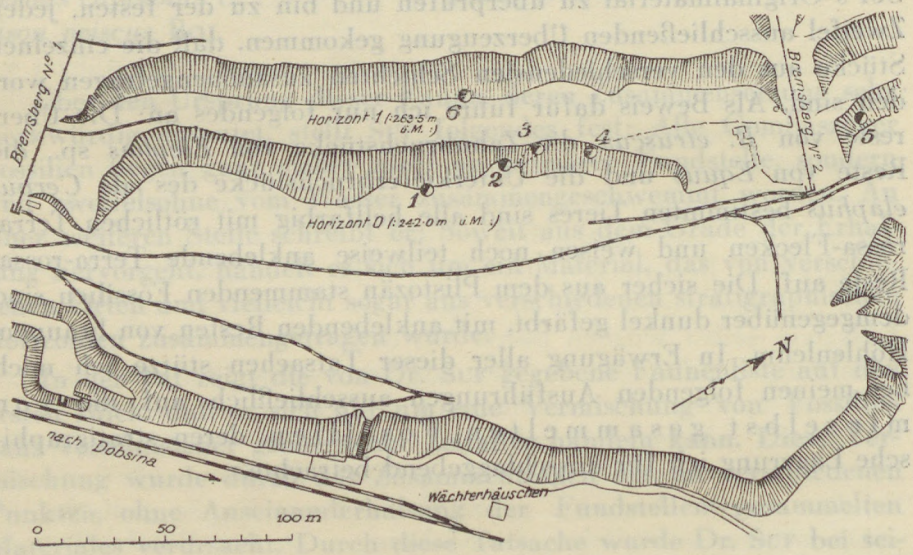

Abb. 1. Situationsplan der Horizonte 0. und I. des Kalksteinbruches bei Gombaszög.

Den größten Teil der bisher gesammelten Fossilien fand ich mit Hilfe der Herren Oberingenieur Béla Lázár und Vorarbeiter D. Széga am Fundort 3. im Horizont 0. Hier konnte ich Gehäuse von *Helix pomatia* (siehe bei Soós) und die später zu beschreibende Wirbeltierfauna des oberen Pliozän bergen. Der Fundort (auf Textabb. 2 mit × bezeichnet) ist eine 1—2 m breite und mehrere m hohe Spalte im Kalkstein, die in einer Länge von ungef. 10 m mit rot-

braunem Lehm ausgefüllt war. Die hier gefundenen Knochen sind weiß, manchmal mit rötlichen Flecken bedeckt und es läßt sich an ihnen absolut nicht nachweisen, daß sie vom Wasser von weither zusammengeschwemmt worden wären, da die Unterkiefer, die empfindlichen Zahnreihen und dünnen Röhrenknochen unverletzt erhalten geblieben sind. Die Abwetzug der Fossilienreste entstand übrigens nicht durch ihre Zerstückelung und Abbruch der Ecken, sondern sie wurden durch das ständig durchsickernde Niederschlagswasser gelöst. Dementsprechend nahm die Masse der Knochen und Zähne, die ursprüngliche Gestalt beibehaltend, auffallend gleichmäßig, unter Entstehung glatter Oberflächen ab. Über der knochenhaltigen Lehmschicht befindet sich eine harte Kalktropfsteinbank und darüber eine ausgesprochene Tropfsteinhöhle. Diese Verhältnisse bilden einen Beweis dafür, daß das Wasser seinen Weg in dieser Richtung in stärkerem Ausmaße erst nach dem Entstehen der knochenenthaltenden Schichten nahm. Dieser verstärkte Einbruch von Niederschlagswasser erfolgte nach dem oberen Pliozän, aller Wahrscheinlichkeit nach erst im Plistozän. Dafür sprechen besonders die gänzlich fossilfreien, rötlichen Lehmmassen, die in den Höhlungen des Kalksteines gewaltige Nester bilden. Dieser Lehm enthält nach der Analyse von Dr. László Zombory 70.83% Kalziumkarbonat. Die Gesamtanalyse ergab folgende Werte:

SiO_2	11.45
TiO_2	0.76
Al_2O_3	9.94
Fe_2O_3	2.75
MnO	in Spuren
CaO	40.38
CO_2	31.14
CO_2-Verlust beim Glühen	4.07
	100.49

Es handelt sich daher um eine rote Lehmart (pliozäne Terra-rossa), die von dem später durchsickernden Wasser mit $CaCO_3$ imprägniert wurde.[2]

[2] Im Gegensatz zu diesen Funden wiesen Proben, die einzelnen, größeren Nestern entnommen wurden, folgende Zusammensetzung auf, die normalem, rotem Lehm entspricht: $SiO_2 = 45.10$, $Al_2O_3 = 30.70$, $CaO = 1.27$, $MgO = 0.86$, $CO_2 = 0$, $Fe_2O_3 = 10.65$ und gebundenes Wasser = 10.80. Diese Daten sind einer amtlichen Analyse der Rimamurány-Salgótarjáner A.-G. entnommen.

Wir sehen daher, daß die Oberpliozänfauna, die aus den durch Tropfsteinschichten bedeckten Lehmmassen der Fundstelle 3. des Horizontes 0. zum Vorschein kam, einheitlich ist und nicht mit später hinzugekommenen Faunenelementen vermengt werden konnte. Dort, wo das durchsickernde Wasser einen leichteren Weg fand, also im Vorderteil der Höhle und entlang der Felswände, vereinigte der Tropfstein die Fossilien stellenweise zu wahren Knochenbreccien.

Fundstelle 4 im Horizont 0. (auf Textabb. 2 mit ×× bezeichnet) enthält ausschließlich plistozäne Fauna. Diese Fundstelle war ein Hohlraum von Saalgröße im Kalkstein, dessen Boden eine hellbraune Lehmschicht mit Kalksteinbruchstücken bedeckte. Diese Lehmschicht enthält nur wenige Knochen. Darauf folgte eine kalktuffige Tropfsteinschicht und auf diese rötlich-bräunlicher Lehm mit vielen

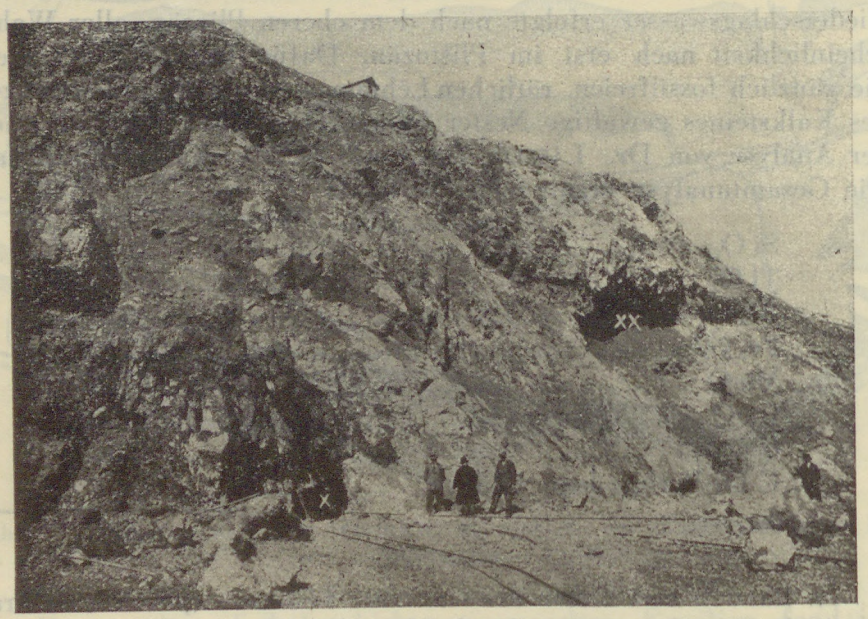

Abb. 2. Der Kalksteinbruch bei Gombaszög.

Knochenresten. Diese Schichtfolge wurde zuoberst von einer knochenfreien, groben Schuttschichte bedeckt. In den knochenreichen Lagen hatten sich stellenweise wahre Knochenbreccien herausgebildet, bestehend aus Überresten des Höhlenbären mit tropfstein-

kalktuffigem Bindemittel fest verkittet. (Vergl. die Tropfsteinbank der Fundstelle 3. über den oberen Pliozänschichten).

Fundstelle 5., die letzte des Horizontes 0., ist die Ausfüllung einer Spalte in ungef. 10 m Höhe, von der ich selbst nur mehr Spuren feststellen konnte. Hier fand sich eine Schneckenbreccie, die aus rotem Lehm und Tropfstein mit gut erhaltenen Schneckengehäusen bestand (siehe bei Soós).

Fundstelle 6., die einzige im Horizont I., ergab nur einige Knochen kleiner Säuger. Diese Fundstelle ist die direkte Fortsetzung der Fundstelle 2. im Horizont 0. mit Nagerüberresten und ist wie diese mit einer ähnlichen Terra-rossa Masse ausgefüllt.

*

Überreste aus dem Plistozän konnte ich also ausschließlich aus Fundstelle 4. im Horizont 0. sammeln. Die von hier stammenden Reste gehören zu 90% *Ursus spelaeus* Rosenm. an. Aus den Knochenbreccien konnten zahnlose Mandibelbruchstücke und mehrere einzelne Zähne dieser Art freigemacht werden. Die Augenzähne weisen die normalen Ausmaße auf. Die Länge eines Canin mit stark abgenützer Spitze und geöffneter Pulpakammer betrug 9.50 cm. Die Krone eines rechten M_2 war 42 mm lang, die eines linken M_1 25 mm. Das Längenausmaß der Krone eines M_3 sinist. war 30 mm, eines der rechten Seite 31 mm. Bei den meisten dieser Zähne war die Kaufläche stark abgenutzt. Die Ausmaße der Zähne stimmen also ganz gut mit dem bisher bekannten allgemeinen Zahnschema des *Ursus spelaeus* überein. Die Krone des einzigen vollständigen P_4 sinist. ist 16 mm lang. Para-, Hypo- und Metacon sind gut ausgebildet, dagegen fehlt der Protocon. Außer diesen Zähnen wurden noch eine Anzahl stark abgenützter Incisivi gefunden.

Die Untersuchung des typischen Os priapi, von Hals- Rücken- und Lendenwirbeln, Bruchstücken von Humerus, Ulna, Femur, Tibia und Fibula, ferner von Calcaneus, Cuneiforme, Astragalus und von zahlreichen Metapodien ermöglichten die einwandfreie Feststellung, daß alle diese Bruchstücke echten *Ursus spelaeus*-Exemplaren zuzurechnen sind.

Das zweite aus den hier gefundenen Überresten bestimmbare Raubtier war *Hyaena spelaea* Goldf.

An dieser Fundstelle sammelte ich außerdem noch ein Bruch-

stück eines Mahlzahnes von *Rhinoceros* sp. und einige nicht näher bestimmbare Überreste von Wiederkäuern.

Alle diese Überreste zeigen demnach das normale Bild der Waldfauna des Plistozän, ohne jeden besonderen, von der Norm abweichenden Charakterzug.

Dagegen läßt sich aus der Fauna des Fundortes 3. im Horizont 0. schon jetzt ein inniger Zusammenhang mit der aus Siebenbürgen und Südungarn bekannten Oberpliozänfauna feststellen. Darauf weisen die Überreste folgender Arten hin: *Epimachairodus hungaricus* KRETZ., eine kleinere Löwenart, und zwei weitere Feliden, ein kleinerer und ein größerer Canide, ferner Füchse, ein Dachs, eine riesige Hyäne, kleine, in die *arvernensis-etruscus* Gruppe gehörenden Bären, *Rhinoceros etruscus*, ein Riesenpferd, Rehe, *Cervus-* und *Alces*-Arten, ein Riesen-Wildschwein, *Trogontherium*, *Castor*, *Hystrix* u. s. w.

Diese Faunen-Gesellschaft lebte in Gegenden, in denen die Tierwelt der Gebirgswälder mit der von Ebenen oder breiten Flußtälern in Berührung kommen konnte. Das sich in das Kalksteinplateau senkende Tal (bezw. Klamm) des Sajó-Flusses war im oberen Pliozän bereits vorhanden, die Fundortsverhältnisse weisen sogar darauf hin, daß der Wasserspiegel des Flusses schon damals unter dem Niveau lag, in welchem wir heute die Überreste finden (242 m über dem Meeresspiegel). Der Höhenunterschied zwischen der mit 0. bezeichneten Abbauterrasse und dem Überschwemmungsgebiet des Fluss beträgt 14 m, das heißt, das Wasser fließt heute 14 m unter dem Fundorte. Daß die Tiere in der unmittelbaren Umgebung der heutigen Fundstelle lebten und daß nicht das Wasser ihre Überreste von weither brachte, beweisen unter anderem die unvorstellbar großen Mengen der von Hyänen, aber auch von anderen Raubtieren zernagten Knochen und das häufige Auftreten der Biberarten. Die Erklärung für die große Menge der Überreste finden wir aber darin, daß die Pflanzenfresser von allen Seiten in die Umgebung der heutigen Fossilienstätte zur Tränke kamen, da hier das Wasser nicht mehr so reissend war, wie weiter oben im Gebirge, andererseits aber noch nicht so ausgebreitet und versumpft, wie weiter unten in dem sich stark erweiternden Tale. Es ist weiter selbstverständlich, daß bei solchen Trinkstellen Raubtiere auf Opfer lauerten und daß dann die Regenwässer die Überreste der gerissenen Tiere gemeinsam mit den dort zugrunde gegangenen Raubtieren in die Kalksteinrisse hinein-

schwemmten. Als möglich ist auch anzunehmen, daß Hyänen, Wölfe oder Bären Körperteile in die Höhlen oder in ihre zwischen den Felsen befindlichen Lager einschleppten.

Literatur.

1. Šuf J., La faune quaternaire de Gombasek aux environs de Roznava en Slovaquie. Praha, 1931.
2. Brandt J., Versuch einer Monographie der Tichorhinen Nashörner. Mem. de l'Académie imp. des sc. de St Pétersb. 7 Série, 24. vol. Nr. 4.

II. Die Molluskenfauna.

Von L. Soós.

Dr. A. Tasnádi-Kubacska sammelte mit seiner als Oberpliozän sich erwiesenen Säugetierfauna auch eine aus 10 Arten bestehende Molluskenfauna. Da 9 Arten noch heute leben, können dieselben bei der Bestimmung des Zeitalters nicht in Betracht kommen. Es befindet sich aber unter ihnen eine, nach meinem Urteil neue, weiter unten beschriebene Art. Diese Art weist darauf hin, daß die ganze Fauna eine ältere ist, da sie mit keinem Mitglied der jetzigen Karpathenfauna in Verbindung gebracht werden kann, sondern ihre Verwandten unter den südlicheren, in den südöstlichen Alpen, den Dinariden und den Appenninen lebenden Arten gesucht werden müssen. Die Fauna verdient trotz ihrer Kleinheit eine besondere Aufmerksamkeit, weil sie mit wertvollen Daten und aus dem Oberpliozän bisher noch nicht bekannten, neuen Vorkommnissen unsere Kenntnisse über die ungarische oberpliozäne, durch die Faunen von Süttő, Brassó und Püspökfürdő vertretene Molluskenfauna bereichert.

Wenn wir die Schneckenfauna mit der gleichaltrigen Säugetierfauna vergleichen, dann wird die von mir schon bei einer anderen Gelegenheit festgestellte Tatsache wieder klar, daß nämlich die Säugetierfauna seit dem Pliozän sich in einem viel schnelleren Tempo umgewandelt hat, als die Molluskenfauna. Die erstere besteht nämlich aus lauter ausgestorbenen Arten, wogegen die Molluskenfauna auch in diesem Falle bis 90% aus rezenten Arten zusammengesetzt ist. Bis die viel beweglicheren und den ungünstigen Umständen scheinbar viel leichter ausweichenden Säuger die großen Klimaänderungen nicht, bezw. blos in veränderten Form überleben konnten, überlebten die viel mehr zum Boden gebundenen Schnecken dieselbe

unverändert, welcher Umstand erstens für ihre größere ökologische Valenz spricht, und zweitens beweist, daß die Schneckenarten im allgemeinen viel konservativer, zäher und langlebiger sind.

Über die Arten berichte ich im folgenden:

1. *Abida frumentum* Drap. Selten, blos ein einziges, unvollständiges Exemplar. Die Art kommt schon im oberen Pontikum von Ócs vor. Fundstelle: 2.

2. *Cochlodina* sp.? *(? laminata* Mont.). Blos ein unvollständiges Exemplar. Die Mündung ist nicht erhalten, sondern nur die oberen 8 Umgänge, weshalb es nicht mit Sicherheit zu bestimmen ist. Nach größter Wahrscheinlichkeit ist es mit der *laminata* Mont. identisch, doch könnte auch *Parreyssi* Rm. in Betracht kommen. Zu welcher Art es auch gehören mag, ist dieser Fund sehr wertvoll, da *Cochlodina* vor dem Plistozän sehr selten ist. Wie aus Wenz' Katalog ersichtlich, kennen wir blos die Art *Cochlodina Berthaudi* Mich. aus dem französischen Mittelpliozän von Hautrive (Plaisancien), und *C. prolaminata* Sacco aus dem oberitalenischen Oberpliozän (Villafranchiano). Fundstelle: 2.

3. *Oxychilus glaber* Fér. Es kam nur ein unvollständiges Exemplar dieser Art zum Vorschein, konnte aber aus dem Grundmaterial nicht befreit werden. Trotzdem konnte es mit Sicherheit bestimmt werden. Ein wichtiges Vorkommen, da bisher aus unserem Pliozän diese Art noch nicht bekannt war. Fundstelle: 5.

4. *Eulota fruticum* Müll. 12 typische Exemplare. Diese, im Plistozän in ganz Mitteleuropa verbreitete Art kennen wir aus vorplistozänen Schichten nur aus der Fauna von Süttő, doch kommt sie nicht unter den Arten der Faunen von Brassó und Püspökfürdő vor, die beide älter sind als die vorgenannte. Doch ist sie aus dem englischen Red Crag bekannt, also aus dem obersten Pliozän. Fundstelle: 2 und 3.

5. *Monacha vicina* Rm. Auch sehr selten, blos zwei Exemplare; das eine ist nur ein unwichtiges Bruchstück, während vom anderen fast der ganze letzte Umgang mit der Öffnung erhalten geblieben ist. Wir kannten diese Art schon aus der Fauna von Brassó. Fundstelle: 2. und 3.

6. *Euomphalia strigella* Drap. Selten, nur ein unvollständiges Exemplar. Sie kommt auch in den Faunen von Brassó und Süttő vor. Fundstelle 2. oder 3.

7. *Helicigona goemoerensis* n. sp. Ein sehr wichtiges Mitglied der Molluskengesellschaft ist diese *Helicigona*-Art, die aber nur in drei unvollständigen Exemplaren gefunden wurde, so daß ich nur eine lückenhafte Beschreibung von ihr geben kann. Diese ist die einzige Art, die der jetzigen Fauna des Gebietes fremd ist und deren Verwandte viel weiter südlich, in den Ostalpen und den Dinariden, in der Reihe der größeren *Helicigona*-Arten zu suchen sind. Auf Grund der gefundenen Bruchstücke kann ich sie folgend beschreiben: Ungefähr so groß wie die *H. planospira* Lam.; das kleinste Exemplar hat 3 Umgänge bei einem Durchmesser von 14.5 mm, das mittlere ungef. 3¾ Umg. bei 16 mm Durchm., das größte, und seither, leider, ganz zertrümmerte besaß ein Durchmesser von 18 mm; das flache Gewinde erinnert auch an *H. planospira;* die Umgänge wachsen langsam und regelmäßig, Nabel anscheinend mittelgroß; die runzelig-gestreifte Schale war mit Haaren bedeckt, deren Spuren in Gestalt von kleinen Grübchen gut zu sehen sind. Fundstelle: 2. und 3.

8. *Helicigona (Drobacia) banatica* Rm. Die aufgefundenen 4 typischen Exemplare stimmen mit den rezenten vollkommen überein. Die Art kommt heute nur in den Ost- und Südkarpathen von Mármaros bis zu dem Bánság-Gebirge vor, während sie im Plistozän eine viel größere Verbreitung hatte.

9. *Helicigona (Helicigona) lapicida* L. Diese in Mittel- und Westeuropa weitverbreitete Art kommt meines Wissens nach nirgends in Ungarn vor, obzwar nach einigen zweifelhaften und der Bestätigung harrenden Angaben sie bei Appony, Ghymes und Selmecbánya vorkommen soll. Prof. Dr. E. Dudich suchte sie auf diesem Gebiet mehrmals, aber ohne Erfolg. Auch war sie im fossilen Zustand unbekannt. Umso bemerkenswerter ist es, daß sie jetzt in dem Gombaszöger Material in solchen Massen vorkommt, daß sie eine wahre Schneckenbreccie bildet. Aber eben da sie so breccienartig vorkommt, ist ihr Erhaltungszustand ziemlich schlecht, und ich konnte aus dem Material kein einziges vollständiges Exemplar herauspräparieren. Dieses Vorkommen ist auch deshalb wichtig, weil sie aus den vorplistozänen Schichten bisher noch nicht mit Sicherheit festgestellt wurde und in der Literatur nur ein zweifelhaftes Vorkommen aus den mittelpliozänen Schichten Südfrankreichs (Plaisancien) angegeben ist. Die Gombaszöger sind also die einzigen bisher mit Sicherheit festgestellten tertiären Exemplare. Sie stimmen

mit den rezenten gut überein und weichen von diesen nur in ihrer Skulptur ab, indem die grobe Körnelung ihrer Schale auf der unteren Seite, hinter der Mündung sehr stark ist und außerdem sich mit grober Spiralskulptur kombiniert. Fundstelle: 2, 3. und 5.

10. *Helix pomatia* L. Es kamen 3 unvollständige Exemplare der Art vor, doch genügten diese, um festzustellen, daß sie vom allgemeinen Typus der *pomatia* nicht abweichen. Gombaszög ist schon die dritte, mir bekannte präglaziale Fundstelle der Art, da sie bereits aus der älteren Fauna von Brassó und aus der jüngeren Süttőer Fauna bekannt geworden ist. Fundstelle: 3.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS MINERALOGICA, GEOLOGICA, PALAEONTOLOGICA.

TROGONTHERIUM CUVIERI FISCHER VON PÜSPÖKFÜRDŐ, NEBST EINER BEMERKUNG ÜBER DIE CASTORIDEN VON CHINA.

(Mit 3 Textabbildungen).

Von Dr. A. SCHREUDER (Amsterdam).

Herr Dr. T. KORMOS (Budapest) hat mir die von ihm und Prof. Dr. M. TÓTH in den letzten Jahren am Somlyóberg bei Püspökfürdő (an der nordwestlichen Grenze des heutigen Rumäniens) gesammelten Reste eines großen Nagers zur Bearbeitung anvertraut, wofür ich ihm zu verbindlichsten Dank verpflichtet bin. Schon im Jahre 1914 hat er in seiner Faunaliste dieses Fundortes (S. 562) „*Castor?* oder *Trogontherium?* (ein Schneidezahn-Fragment)" bezüglich eines dem geologischen Institut der Universität in Budapest angehörigen Stückes erwähnt. Daß es sich um *Trogontherium* handelte, davon war der Verfasser aber in seiner späteren Arbeit (1930 S. 44) schon überzeugt, indem die deutsche Übersetzung folgenderweise lautet: „Die unter *Castor?* oder *Trogontherium?* erwähnten Biberreste gehören ganz sicher zur letzteren Gattung, sind aber spezifisch noch nicht bestimmt." Und auf S. 57 findet man dann auch „*Castor?*" unter den aus der provisorischen Liste (1914) zu streichenden Gattungen. Es freut mich, nach der Untersuchung der mir anvertrauten Reste seine Meinung bestätigen zu können, daß es sich tatsächlich um *Trogontherium* handelt, und zwar um *Trogontherium Cuvieri* FISCHER.

Die vorliegenden Reste von Püspökfürdő sind Eigentum Dr. KORMOS' und bestehen aus zwei Backenzähnen (einem Prämolar und einem Molar) und einem Nagezahn-Fragment. Alle drei sind hellgelblich gefärbt und etwas beschädigt. Der Prämolar (Abb. 1) ist ein rechter oberer und so jung, daß die Kronfläche an ihrer hinteren Spitze noch nicht ganz in die Ebene der Kauflächen gelangt, also dort nicht angeschliffen ist. Die Kaufläche zeigt noch viel Ähnlichkeit mit derjenigen des Bibers. Es sind nämlich alle äußeren sowie die einzige innere Schmelzfalte nach der Peripherie der Krone hin noch offen (Abb. 1 a). Daß sich diese Schmelz-

einbuchtungen aber bald in Schmelzinseln auf der Kaufläche verwandeln würden und somit der *Trogontherium*-Charakter des Zahnes unzweifelhaft feststeht, zeigt ein Blick auf die Außenseite (Abb. 1c) wo die Kürze der Rinnen sofort auffält. Die Rinne, welche auf der Innenseite die einzige dort auftretende Schmelzeinbuchtung andeutet, ist zwar einige Millimeter länger, reicht doch nicht bis zur Hälfte der Zahnhöhe. Auf der hinteren Spitze der Kronfläche ist noch eine kleine Schmelzfalte zu sehen. Diese vierte äußere Falte würde bald zu einer winzigen Insel isoliert werden und bei etwas weiter geschrittener Abnutzung ganz verschwinden.

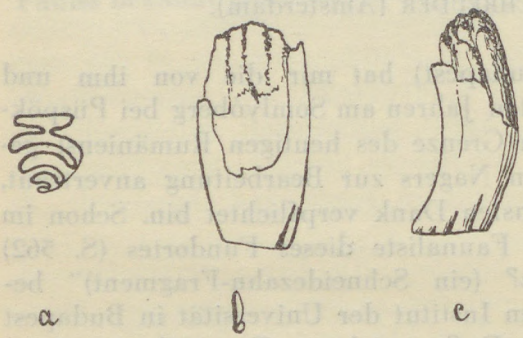

Abb. 1. *Trogontherium Cuvieri*, Püspökfürdő. P^4 dext. a = Kaufläche, b = vorn, c = außen. 1:1.

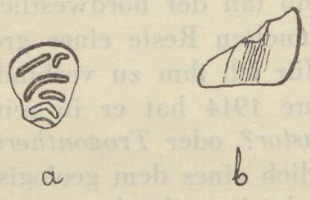

Abb. 2. *Trogontherium Cuvieri*, Püspökfürdő. M^3 sin., a = Kaufläche, b = Innenseite. 1:1.

Die Pulpahöhle des Zahnes ist wahrscheinlich noch teilweise offen gewesen; die hineinragenden vier Schmelzfalten (Joche) aber sind schon geschlossen. Die wulstige Oberfläche ihrer Enden ist durch die starke Beschädigung der Schmelz-Außenwand, gut wahrzunehmen. Obschon so junge obere Prämolaren von *Trogontherium Cuvieri* FISCHER noch nicht bekannt sind, belehren uns die Abmessungen, daß ein Zahn dieses großen Nagers vorliegt und nicht etwa einer von *Conodontes Boisvillettii* LAUGEL. Bei diesem findet sich auf den gleich jungen Prämolaren genau die eben umschriebene Zeichnung auf der Kaufläche und die sonstigen Merkmale; der Schädel aber zeigt typische Unterschiede.

Breite und Länge der Kronfläche, parallel und senkrecht zur Richtung der Schmelzfalten gemessen, betragen 9.1 mm und 9.8 mm. Die Länge ist also größer als die Breite; mit zunehmendem Alter werden diese Verhältnisse umgekehrt. Der größte Breitendurchmesser des ganzen Zahnes beträgt 15.3 mm. Dieser Prämolar erweist sich somit als der größte jetzt bekannte, beträgt doch die maximale

Breite (die bei älteren Zähnen, wie begreiflich, mit der Breite der Kaufläche zusammenfällt, oder, weil der Zahn etwas schief von innen nach außen steht, diese noch übertrifft) an den alten Prämolaren in den Kiefern von Mosbach und von Hessler 14.3 und 14.5 mm: bei dem jungen Exemplar von China (ZDANSKY, 1928) 13.5 mm. Bei den vielen isolierten oberen Prämolaren von *Conodontes* von Tegelen ist dieses Maß höchtens 13.6 mm, bei demjenigen von Copford (NEWTON, 1916) 12.7 mm. Auch die Höhe des Zahnes übertrifft alle bis jetzt bekannten Maße; der Abstand zwischen dem Unterende der vorderen Falte auf der Innenseite und dem Unterende der Schmelzjoche im Inneren des Zahnes beträgt nämlich 26.5 mm; an dem Prämolar von Copford 24.5 mm (gemessen an Abb. c, auf S. 323 der NEWTON-schen Notiz).

Der andere Backenzahn (Abb. 2) ist ein alter hinterster Molar aus dem linken Oberkiefer. Die Wurzeln sind abgebrochen. Die Kaufläche hat eine konische Form und zeigt vorn die eine innere Schmelzfalte zu einer langen Insel isoliert und in deren Verlängerung eine kurze gebogene Insel, welche von der vordersten äußeren Schmelzfalte herrührt. Auch die vier anderen äußeren Schmelzfalten sind bei der vorliegenden weit fortgeschrittenen Abnutzung zu Inseln isoliert. Die hinterste ist winzig und wie die hintere Spitze des Zahnes, beschädigt. Die davor gelegene Insel ist fast ganz ausgefallen; das Loch zeigt noch die geknickte Form dieser Schlinge. Die Längen- und Breitenmaßen der Kaufläche senkrecht und parallel zur Inselrichtung betragen 11.5 mm und 9.2 mm, und stimmen also am meisten mit denjenigen am M^3 des Kiefers von Mosbach überein, die 11.7 und 9.3 mm sind. Vorn ist der Zahn noch 10.1 mm hoch, wird aber nach rückwärts niedriger.

Das Bruchstück eines linken unteren Nagezahnes (Abb. 3) ist nur am vorderen Ende unbeschädigt. Es zeigt auf seiner Oberfläche die typische Struktur, die schon von NEWTON (1882) hervorgehoben wurde, nämlich eine Granulierung des Schmelzteiles, während das nicht vom Schmelz bedeckte Dentin sich sehr fein quergerieft erscheint. Die stark konvexe Schmelzplatte ist am Zahn von Püspökfürdő orange gefärbt; auf der Außenseite des Zahnes ist sie jedoch großenteils elfenbeinfarbig, wie das Dentin und so ist die Grenze zwischen beiden Substanzen dort nur durch die soeben genannte Oberflächenstruktur erkennbar.

Die äußere Dentinfläche ist schwach konkav und zeigt eine deutliche Längsrinne, die innere ist flach. Die Schmelzplatte trägt eine Anzahl (ungefähr sechs) sehr seichte Längsfurchen.

Die größte Breite der Schmelzplatte ist 11.8 mm; der größte Durchmesser des Zahnes 13.0 mm. Das erstere Maß beträgt bei den Inzisiven von Mosbach maximal 12.7 mm; an denen von Tegelen maximal 11 mm. Die konvexe Seite des Zahnes ist Kreisbogenförmig, einem Diameter von 150 mm entsprechend. Auch dies stimmt mit dem Befund an den Mosbacher Inzisiven überein, wo ich Maße von 166, 154 und 140 mm gefunden habe; an den vielen Nagezähnen von *Conodontes* von Tegelen beträgt dieser Kreisdurchmesser höchstens 120 mm. Die Usurfläche ist 23.7 mm lang; dieses Maß ist individuell sehr variabel.

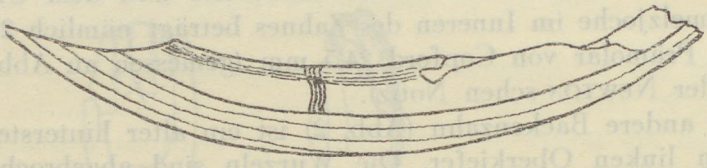

Abb. 3. *Trogontherium Cuvieri*, Püspökfürdő.
I inf. sin., Außenseite. 1:1.

Wie sich zeigte, stimmen die Reste von Püspökfürdő vollkommen, sowohl in ihrer Form wie in ihren Abmessungen, mit denen von *Trogontherium Cuvieri* F., wie sie von Mosbach bekannt sind, überein. Da von der weiten Strecke zwischen diesem Ort und Taganrok an der Küste des Asowschen Meeres noch kein *Trogontherium* bekannt war, sind diese Reste der „Präglazialfauna von Püspökfürdő" jedenfalls wertvolle Dokumente.

Was die Gestalt dieser Castoriden betrifft, möchte ich abermals betonen, daß diese keinenfalls „gewaltig" (Kormos, 1930, S. 18) gewesen ist. Die Größe der Gliedmassen übertrifft die eines kräftigen Elbe-Bibers nicht; Femur und Humerus sind bedeutend kleiner und der ganze Bau des Skelettes ist eleganter als derjenige von *Castor*. Der Gehirnteil des Schädels ist bei beiden auch ungefähr gleich. Nur sind beim *Trogontherium* der Kieferteil des Schädels und der Hinterfuß bedeutend großer. Das Nagevermögen des Tieres ist gewiß „gewaltig" gewesen.

Der Name Riesen-Biber (Giant Beaver, Newton) ist diesem ausgestorbenen Tiere deshalb gegeben worden, weil man den Kopf mit dem starken Gebiß zuerst gekannt hat. Seinem amerikanischen Zeitgenossen *Castoroides* aber gebührt dieser Name weit besser, denn seine Gestalt war für ein Nagetier wirklich erstaunlich groß und kam der eines braunen Bäres gleich. Das Körpergewicht wird das achtfache des Bibergewichtes gewesen sein (Moore, 1890).

Die Angabe der zeitlichen und räumlichen Verbreitung von *Trogontherium* meine ich hier weglassen zu können, da ich diese ausführlich in der Monographie der Art erörtert habe (1929, 1931). Auch betreffs der Literatur möge auf dieselbe verwiesen werden. Die Fauna von Püspökfürdő gehört nach KORMOS (1930, S. 60) mit der von Beremend und von Villány (Kalkberg) der unteren und mittleren Stufe des englischen Cromerian an (Norwich-Weybourne and Shelly Crag). In diesen Schichten kommen die Wühlmausarten *Mimomys pliocaenicus* F. M. und *M. Newtoni* F. M. vor, die in der oberen Stufe des Cromerian (Upper Freshwater Bed) und in Villány (Nagyharsányberg) schon ausgestorben sind. Auch die Fauna aus den Tonen von Tegelen an der Maas, in der niederländischen Provinz Limburg, enthält beide obengenannten alten Wühlmausarten und ist dem unteren bis mittleren Cromerian einzureihen. Dieser Ton überlagert mächtige Sand- und Schotterschichten und wird von fast allen Autoren (cf. BERNSEN, 1927 und die dort zitierte Literatur) als zur ersten Interglazialperiode (Günz-Mindel) gehörig betrachtet. Das Landeis hat nur einmal während seiner größten Ausdehnung (Rissglazial, TESCH, 1928) die Niederlande zum Teil bedeckt, nämlich ungefähr nördlich der Linie Nymwegen—Haarlem; die Gegend von Tegelen hat es niemals erreicht.

Die Knochenbreccie von Püspökfürdő, der die *Trogontherium*-Reste entstammen, wird von MÉHELY (1914) auch zur ersten interglazialen Periode gerechnet, KORMOS (1930) aber betont die präglaziale Entstehung dieser Ablagerungen; eine warme Interglazialzeit (welche sowohl die Fauna von Tegelen, wie diejenigen von Püspökfürdő voraussetzen würden) nimmt er nicht an, doch betont er den oberpliozänen Charakter dieser Tiergesellschaften. Wenn man aber die Grenze zwischen Pliozän und Plistozän nicht vor die erste Vereisung, sondern vor die zweite legt, so können die Faunen oberpliozän und doch interglazial sein. Es ist auch nicht unmöglich, daß beide Faunen gleichen Alters sind, — die von Püspökfürdő aber präglazial gewesen ist, während gegen Norden, wie in Tegelen, sich bereits Glazialablagerungen gebildet hatten, weil die Eiszeit sich hier früher bemerkbar machte.

Nach dem Abschluß dieser Notize sind neue *Trogontherium*-Funde in Choukoutien (an der Localität des *Sinanthropus*) und in Tangshan von YOUNG (1934) beschrieben und sehr deutlich abgebildet worden. Es zeigt sich, daß auch hier das starke Gebiß

von *Trogontherium Cuvieri* FISCHER vorliegt, wie es von Taganrok, Mosbach, Püspökfürdő, etc. bekannt ist.

In derselben Publikation zählt YOUNG unter den fossilen Castoriden in China drei *Chalicomys*-Arten auf: *Ch. Anderssoni* SCHLOSSER, *Ch. Broilii* TEILHARD und YOUNG, und *Ch. Zdanskyi* YOUNG. Durch die dort angegebenen Merkmale sind die beiden letzten Arten meines Erachtens nicht genügend begründet. Von *Ch. Zdanskyi* sind nur zwei Unterkiefer, von *Ch. Broilii* nur der Schädel bekannt, und diese Reste sind an derselben unterpliozänen Localität gesammelt worden. *Ch. Zdanskyi* soll größer sein, als die beiden anderen Arten und die Schmelzfalten der Zähne sind gegabelt. Den Wert des letzgenannten Merkmales habe ich schon früher (1931, p. 170) betont, und wenn man bedenkt, daß die Länge der unteren Zahnreihen bei den Castoriden immer größer ist als die der oberen (bei *Castor* 10%) dann fallen die Maße ganz in die Variationsbreite einer Art. Zudem gibt SCHLOSSER (1924) an: „the size is very variable in *Ch. Anderssoni*". Es liegt dann auch kein Grund vor die Art *Ch. Zdanskyi* beizubehalten. YOUNG schreibt selber, daß *Ch. Zdanskyi* „possibly identical" ist mit *Ch. Broilii.*

Doch auch die letzte Art (TEILH. und YOUNG 1931) ist nicht genügend begründet und auch dieser Schädel kann ohne Schwierigkeit zu *Ch. Anderssoni* gereiht werden. Die sie, nach YOUNG, von der letztgenannten Art unterscheidenden Kennzeichen (16—20) können doch, wenn sie überhaupt anwesend sind, durch das jugendliche Alter der von SCHLOSSER abgebildeten Zähne und das weiter fortgeschrittene des *Broilii*-Schädels erklärt werden. Als erstes Merkmal (16) wird das Alternieren der inneren Schmelzfalte mit der vorderen äußeren bei den oberen Zähnen von *Ch. Anderssoni* genannt, wo dagegen bei *Ch. Broilii* diese Falten opponieren. SCHLOSSER's Abbildungen (Taf. II, Fig. 24 und 28) aber zeigen das deutliche Opponieren der Falten fast aller oberen Zähnen der erstgennanten Art. Für das zweite Merkmal (17) gilt dasselbe: in den oberen Zähnen von beiden Arten, *Anderssoni* und *Broilii,* ist die mittlere äußere Falte nach hinten umgebogen. Das dritte Merkmal (18) beruht wieder auf der schon oben genannten Gabelung und Merkmal „forepart of teeth rounded" (19) gilt ja für die oberen Zähne aller Castoriden. Das letzte Merkmal (20), daß bei *Ch. Broilii* M^3 mehr reduziert sein sollte, ist aus der Figur nicht zu ersehen und wird nicht weiter erklärt. Ich meine also, daß keine Gründe angeführt sind, die der Vereinigung der drei chinesischen *Chalicomys*-Arten im Wege stehen können.

SCHLOSSER's Genusnamen *Chalicomys* hat YOUNG (1934, p. 56) in *Sinocastor* umgeändert, aber auch hier ist kein Beweis für dessen Notwendigkeit geliefert. Die chinesische Gattung soll größer sein, als die europäische und die Hypsodontie stärker; dazu kommt bei der erstgenannten eine Fossa masseterica vor. Manche obermiozänen *Chalicomys (Steneofiber)*-Arten sind aber bedeutened größer, als die geologisch älteren Formen die YOUNG offenbar vor Augen gestanden sind. Von *Steneofiber Depéreti* MAYET gibt STEHLIN (1925) als Kron-Länge des unteren Praemolars 12 mm an und fügt hinzu, daß eine solche Größe für mittelmiozäne *Steneofiber*-Arten *(St. Jaegeri)* nicht auffallend ist. Diese Größe steht der der chinesischen Gattung nicht nach, ebensowenig wie der Grad der Hypsodontie. Eine Fossa masseterica ist bezeichnend für alle Castoridae.

Auf Grund zwei junge untere Praemolaren von Choukoutien ist die Gattung *Castor* wiederum in die fossile Fauna von China eingeführt. Auch diese Zähne können ohne Beschwerde zu *Chalicomys Anderssoni* zugezählt werden. Zwar sind sie etwas kleiner als das von SCHLOSSER (1924, Tab. II, Fig. 23) abgebildete Exemplar, aber wie gesagt schwankt die Größe sehr bei dieser Art und die Schmelzzeichnung auf der Kaufläche ändert sich mit der Abtragung.

Es wäre zu wünschen, daß YOUNG die Gattungsnamen *Castor* und *Sinocastor,* ebenso wie die Artbezeichnungen *Zdanskyi* und *Broilii* für die chinesischen Formen widerrufe, weil sie nicht genügend gerechtfertig sind. Möglicherweise liegt hier ein analoger Fall vor wie derjenige der europäischen *Chalicomys (Steneofiber)*-Formen, die sich vom Oligozän an über das ganze Miozän hindurch bis ins Unterpliozän vorfinden, und nicht als deutlich getrennte Arten voneinander unterscheiden werden können (STEHLIN, 1925, p. 25). In China stammt die älteste bekannte Form SCHLOSSER's *Chal. Anderssoni* aus dem Unterpliozän; die von YOUNG beschriebenen „Arten" lebten im Mittelpliozän und die zwei „*Castor*"-Zähne sind vom Alter des *Sinanthropus* und *Trogontherium.* In jüngeren Ablagerungen wurden keine Castoriden mehr angetroffen; *Castor fiber* ist östlich von der Lena, Baikalsee und Altai-Gebirge nicht nachgewiesen.

Wahrscheinlich stammt die chinesische *Chalicomys* von einer der großen mio-pliozänen europäischen Formen ab, und ist im Unterplistozän ausgestorben, während die europäische Gattung sich in Europa zu *Castor fiber* entwickelt hat.

Mit Recht meint YOUNG, daß *Chalicomys* näher zum Biber steht, als zu *Trogontherium*. Der schöne *Chalicomys*-Schädel von Shansi, genau von derselben Größe wie ein Biberschädel aus dem holländischen Moor, zeigt dies sehr deutlich. Die für *Castor* so bezeichnende tiefe Aushöhlung des Basioccipetale ist hier nur wenig kürzer. Dem *Trogontherium Cuvieri* geht diese Fossa völlig ab (cf. SCHREUDER 1929. Taf. II und III, und 1931 Fig. 1) und diese Art steht so sehr entfernt von der *Chalicomys—Castor*-Gruppe, vor allem durch das für Simplicidentata merkwürdige calcaneo-fibular Gelenk, daß WEBER (1928, II, p. 276) über „das einer eigenem Familie angehörige *Trogontherium*" spricht.

Verzeichnis der angefürten Literatur.

BERNSTEN J. J. A., 1927: The Geology of the Teglian Clay and its fossil remains of Rhinoceros. Diss. Amsterdam, 108 S., 12. Taf. — KORMOS T., 1914: Über die Resultate meiner Ausgrabungen im Jahre 1913. Jahresber. Ung. Geol. Reichsanst, 1913, S. 559—604, 24 Textabb. — 1930: Beiträge zur Präglazialfauna des Somlyóberges bei Püspökfürdő. Állattani Közlem. 27, S. 40—62. — 1931a. Über eine neu entdeckte Forestbed-Fauna in Dalmatien, Palaeobiologica, 4, S. 113—136, 7 Abb. — 1931b: Oberpliozäne Wühlmäuse von Senèze (Haute Loire) und Val d'Arno (Toscana). Abh. Schweiz. Pal. Ges., 51, S. 1—14. 12 Abb. — MÉHELY L. VON 1914: Fibrinae Hungariae. Die tertiären und quartären wurzelzähnigen Wühlmäuse Ungarns. Ann. Mus. Hung. 12, S. 171. u. f. — MOORE J., 1890: Concerning a skeleton of the Great Fossil Beaver, Castoroides Ohioensis. Journ. Cincinn. Soc. Nat. Hist., 13, p. 138—169. — NEWTON E. T., 1882: The Vertebrata of the Forest Bed Series of Norfolk and Suffolk. Mem. Geol. Survey Un. Kingdom, p. 68, pl. XI, fig. 1a. — 1916: Trogontherium from the Pleistocene of Copford, Essex. Geol. Mag. 6, Vol. III, p. 322, — SCHLOSSER M., 1924: Tertiary Vertebrates from Mongolia. Palaeont. Sinica, C, 1 (1), p. 22—27, pl. II. — SCHREUDER A., 1929: Conodontes (Trogontherium) and Castor from the Teglian Clay compared with Castoridae from other localities. Arch. Mus. Teyler, Serie III, 6, p. 99—319, 16 plates, 16 figs. — 1931: Conodontes, Trogontherium and the other Castoridae. Pal. Zeitschr. 13, p. 148—176, 6 figs. — STEHLIN H. G., 1925: Catalogue des Ossements de Mammifères Tertiaires de la collection Bourgeois. Bull. Soc. Hist. Nat. et Anthr. Loir et Cher, 18, p. 18. — TEILHARD DE CHARDIN P., and C. C. YOUNG, 1931: Fossil Mammals from the Late Cenozoic of Northern China. Pal. Sin. C. 9, (1), p. 4—8, pl. I. — TESCH P., 1928: La séparation stratigraphique pliocène-plistocène en Europe. C. R. Réun. géol. internat., p. 183—188. — WEBER MAX, 1928: Die Säugetiere. Einführung in die Anatomie und Systematik der recenten und fossilen Mammalia. Bd. I—II. Jena. — YOUNG CHIEN C., 1927: Fossile Nagetiere aus Nord-China Pal. Sin. C, 5 (3), Taf, 1, 4 und 5, — 1934: On the Insectivora, Chiroptera, Rodentia and Primates other than Sinanthropus from Locality 1 at Choukoutien. Pal. Sin. C, 8. (3). — ZDANSKY OTTO, 1928: Die Säugetiere der Quartärfauna von Chou-K'ou-Tien. Pal. Sin. C, 5 (4), S. 52, Taf. V, Abb. 3.

XXIX. ANNALES MUSEI NATIONALIS HUNGARICI. 1933.
PARS MINERALOGICA, GEOLOGICA, PALAEONTOLOGICA.

DIE FISCHRESTE AUS DEM BUDAER (OFNER) MERGEL DES GELLÉRTHEGY (BLOCKSBERGES) BEI BUDAPEST.

(Mit 6 Abb. im Text).

Von WILHELM WEILER (Worms).

Die vorliegende Arbeit bildet die Fortsetzung meiner Untersuchungen an ungarischen fossilen Fischen. Das hier beschriebene Material stammt aus dem Magyar Nemzeti Múzeum in Budapest, nur der als ? *Serranus budensis* erwähnte Fisch befindet sich im Wiener Naturhistorischen Museum, und wurde mir bereits früher, bei der Bearbeitung der Fische von Eger und des Kisceller Tones von Herrn Geh. Hofrat Prof. Dr. FR. X. SCHAFFER zum Vergleich zur Verfügung gestellt (WEILER, 1933).

Bereits HECKEL hat aus dem Budaer Mergel des Gellérthegy einen Fisch als *Smerdis budensis* beschrieben (1836), der von mir später (1933) zu den Serraniden gestellt wurde. Vielleicht stammt auch der von ihm als *Lepidopus brevispondylus* bezeichnete Rest aus dem Budaer Mergel, da er von ihm erwähnt, daß er „im weißen dünnblättrigen Kalkmergel in der Gegend von Ofen" gefunden wurde.

Über den geologischen Aufbau des Gellérthegy findet man Aufschluß in der Arbeit von SCHAFARZIK (1902) und SCHAFARZIK—VENDL (1929).

Für die freundliche Überlassung des Materials, welches aus der Nähe des Eisenbahn-Tunnels des Gellérthegy stammt, bin ich Herrn Dr. V. ZSIVNY, Direktor der Mineralogisch-Paläontologischen Abteilung des Magyar Nemzeti Múzeum zu verbindlichstem Dank verpflichtet. Ganz besonderer Dank aber gebührt Herrn Dr. A. TASNÁDI-KUBACSKA, Budapest, für die Bereitwilligkeit, mit der er mich jederzeit unterstützte. Auch Herrn Dr. FR. BERCKHEMER, Stuttgart, bin ich zu herzlichem Dank verpflichtet für die freundliche Überlassung von rezentem Vergleichsmaterial.

Beschreibender Teil.

1. *Clupea longimana* (Heck.).

Von dieser Art liegen 18 mehr oder weniger gut erhaltene Exemplare vor, die in Körperproportionen, Bau und Stellung der Flossen, Wirbelzahl usw. vollkommen mit den von anderen Fundorten beschriebenen Vertretern von *Clupea longimana* übereinstimmen. Neben Jugendformen kommen auch größere Individuen vor, deren Gesamtlänge bis zu 12 cm betragen haben mag.

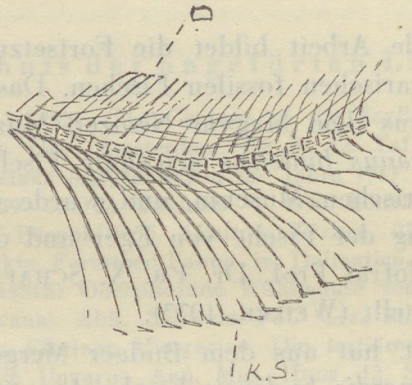

Abb. 1. *Clupea* sp. D = Dorsalis; K. S. = Kielschuppen. 1:1.

2. *Clupea* sp. (Abb. 1).

Neben der eben beschriebenen Heringsart lebte in den Gewässern des Meeres, in dem der Budaer Mergel zum Absatz kam, noch eine weitere, die leider nur durch ein sehr unvollständiges Bruchstück vertreten ist. Es zeigt noch gerade die Stelle, wo Rumpf- und Schwanzabschnitt in einander übergehen. Die langen Rippen, von denen die letzten an kräftigen Parapophysen sitzen, reichen bis zu den gut ausgebildeten Kielschuppen. Ebenfalls lang, dabei aber ziemlich schmächtig sind die neuralen Dornfortsätze. Von der Dorsalis sind lediglich einige Träger erhalten. Gräten über und unter der Wirbelsäule reichlich entwickelt. Schuppen fehlen vollständig. waren demnach bereits vor der Einbettung abgefallen.

Eine artliche Bestimmung dieses Clupeidenrestes ist unmöglich.

3. ? *Serranus budensis* (Heck.).

Diese Art wurde bereits von Heckel (1836) beschrieben. Seine Angaben sind jedoch in einigen Punkten ungenau, wie die Nachprüfung des Originals ergab. Die anatomischen Verhältnisse stimmen vielmehr mit der von mir 1933 gegebenen Schilderung dieser Art überein.

?Serranus budensis scheint in den Budaer Mergeln selten zu sein, da nur 1 Exemplar daraus bekannt wurde. Auch hierbei handelt es sich um eine Jugendform, was die sichere Bestimmung sehr erschwert. Zweifellos gehört die Art zu den Serraniden, doch scheint mir die Zugehörigkeit zur Gattung *Serranus* i. e. S. noch nicht einwandfrei bewiesen, weshalb ich die Gattungsbezeichnung mit einem Fragezeichen versehe.

4. Familie **Serranidae** (Abb. 2.).

Hierher gehört ein kleiner unvollständig erhaltener Fisch von schätzungsweise 100 mm Gesamtlänge (ohne Caudalis).

Der Schädel ist derart zerdrückt, daß er die Oberseite zeigt.

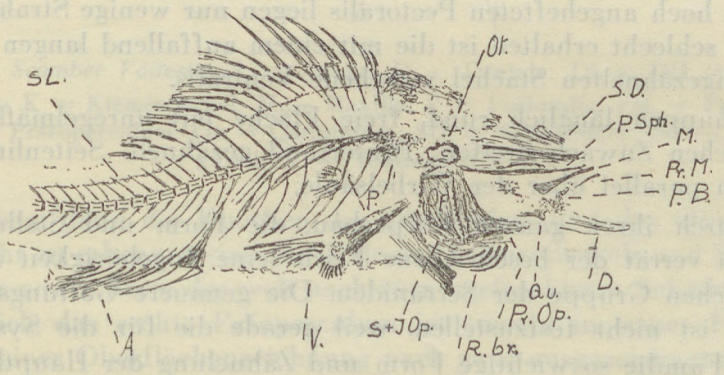

Abb. 2. Fam. Serranidae. A. = Analis; D. = Dentale; M. = Maxille; Op = Operculum; Ot. = Otolith; P. = Pectoralis; P. B. = Palatinalbogen; Pr. M. = Prämaxille; Pr. Op. = Präoperculum; P. Sph. = Parasphenoid; QU. = Quadratum; R. br. = Kiemenhautstrahlen; S. D. = Schädeldach; S+IOp. = Inter- u. Suboperculum; SL. = Seitenlinie; V. = Ventralis. 1:1.

Unter den Schädelknochen sind z. T. noch recht gut erkennbar Maxillare, Intermaxillare, Parasphenoid, Dentale, Quadratum, Operculum (mit mindestens einem, sich auf der Oberfläche als Kamm fortsetzenden Stachel am Hinterrand) und Praeoperculum. Der Hin-

terrand des Praeoperculums war mit feinen Zähnchen versehen, von denen noch die 5 unteren erhalten sind. Leider ist der ganze Unterrand zusamt der Umbiegungsstelle in den aufsteigenden Ast des Vordeckels zerstört, so daß sich die systematisch wichtige Beschaffenheit dieser Gegend nicht mehr feststellen läßt. Auch der über und hinter dem Parasphenoid gelegene rechte Otolith hat derart gelitten, daß man ihn systematisch ebenfalls nicht mehr verwerten kann.

Die Wirbelsäule setzt sich aus einer unbekannten Anzahl von Abdominal- und mindestens 14 Caudalwirbeln zusammen. Erstere tragen 8—9 Paar Rippen von mäßiger Größe.

Über dem Hinterrand des Kiemendeckels beginnt die I. Dorsalis. Sie enthält 7 oberflächlich glatte Stacheln, die nach rückwärts allmählich größer werden. Der zweite Abschnitt der Rückenflosse enthält 14 Strahlen, einshließlich des ersten Stachels. Unter dem 7. Strahl der D. II. oder unter dem Vorderende des dritten Caudalwirbels fängt die Analis an. Vor ihr, aber nicht von ihr getrennt, stehen 3 außerordentlich kräftige Stacheln, unter denen der erste der kleinste, der zweite der dickste, und der dritte der längste ist. Die Zahl der gegliederten und geteilten Strahlen beträgt 7. Von der seitlich hoch angehefteten Pectoralis liegen nur wenige Strahlen vor, ebenso schlecht erhalten ist die mit einem auffallend langen glatten und ungezähnelten Stachel versehene Ventralis.

Schuppen länglich rund, freie Fläche mit unregelmäßig konzentrischen Zuwachsstreifen; Hinterrand gezähnelt. Seitenlinie dem Rücken parallel über der Wirbelsäule.

Durch ihren ganzen Körperbau, die Form und Stellung der Flossen verrät der beschriebene Fisch seine Zugehörigkeit zur formenreichen Gruppe der Serraniden. Die genauere Gattungszugehörigkeit ist nicht festzustellen, weil gerade die für die Systematik dieser Familie so wichtige Form und Zähnelung der Hauptknochen des Kiemendeckels in unserem Fall nicht mehr erhalten sind. Von den anscheinend nahe verwandten Gattung *Priacanthus*, von der fossile Vertreter aus dem Oligozän des Kaukasus beschrieben wurden (Bogacew, 1933), unterscheidet sich die ungarische Form durch den Mangel des großen, an seinen Rändern gezähnelten Stachels am Winkel des Präoperculums, außerdem durch den ebenfalls glatten Ventralstachel, der bei *Priacanthus* am Hinterrand mit rückwärts schauenden Zähnchen versehen ist. Vielleicht stellt unsere Art eine neue Gattung vor, die vor allem durch die verhältnismäßig kleine Anzahl von Dorsalstacheln gekennzeichnet ist. Sie stimmt darin gut

mit Perciden *(Lates)* überein, hat aber im übrigen ganz anderen Flossenbau.

5. *Scomber Voitestii* Pauca (Abb. 3).

Es liegt der Abdruck eines schätzungsweise 14—15 cm langen Fisches vor. Die Kopfknochen sind schlecht erhalten und großenteils infolge weitgehender Mazeration vor der Einbettung verlagert. Einigermaßen gut erhalten sind die beiden Dentalia mit Spuren kleiner

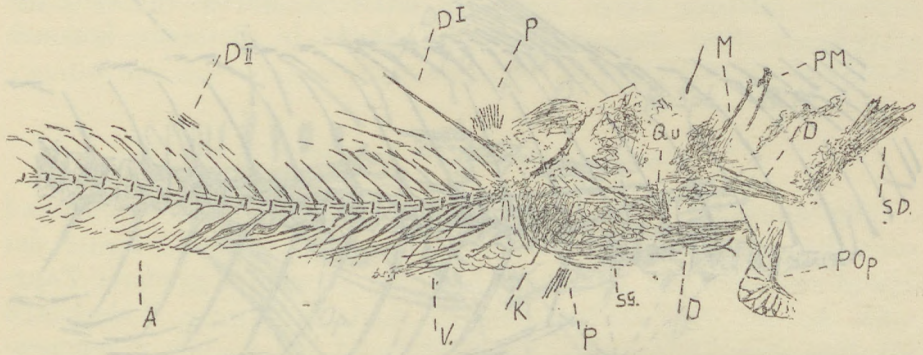

Abb. 3. *Scomber Voitestii.* A = Analis; D = Dentale; DI u. DII = I. u. II. Dorsalis; K = Kiemendeckel; M = Maxille; P = Pectoralis; PM. = Prämaxille; POp. = Praeoperculum; Qu = Qaudratum; SD. = Schädeldach; SG. = Schultergürtel; V = Ventralis. Ca. 1:1.

Zähnchen, dann die Knochen des Oberkiefers und das Quadratum. Schlecht zu erkennen sind die Teile des Kiemendeckels und Schultergürtels, sowie Reste des weit nach vorn verfrachteten Schädeldaches. Lediglich das rechte Präoperculum ist sowohl in seiner Form als auch seiner Oberflächenzeichnung nach ganz ausgezeichnet erhalten. Man sieht noch sehr klar die von der Umbiegungsstelle des vertikalen Astes in den horizontalen radial ausgehenden oberflächlichen Streifen, deren mittleren sich kurz bevor sie den Hinterrand des Präoperculums erreichen in zwei Äste aufspalten.

Die Wirbelsäule enthält schätzungsweise 13 Rumpf-Wirbel, außerdem noch 10 erhaltene im Schwanzabschnitt. Alle sind sehr schlank, länger als hoch. Die vordersten Hämapophysen sind abgeplattet.

Die Rückenflosse ist mäßig erhalten. Man erkennt noch die Reste von 8—9 dünnen Stacheln, deren Länge nach rückwärts all-

mählich abnimmt. Vier Wirbellängen hinter diesem ersten Abschnitt folgt die zweite Rückenflosse, deren Strahlen fast ganz fehlen. Sie endete mit einigen Flösschen. Unter dem dritten Caudalwirbel beginnt die Analis, von der außer einigen Strahlen noch mindestens 15 Träger vorhanden sind.

Beide Brustflossen sind stark verlagert und mäßig erhalten. Auch die Bauchflossen sind undeutlich, die Anzahl ihrer Strahlen daher nicht zu ermitteln.

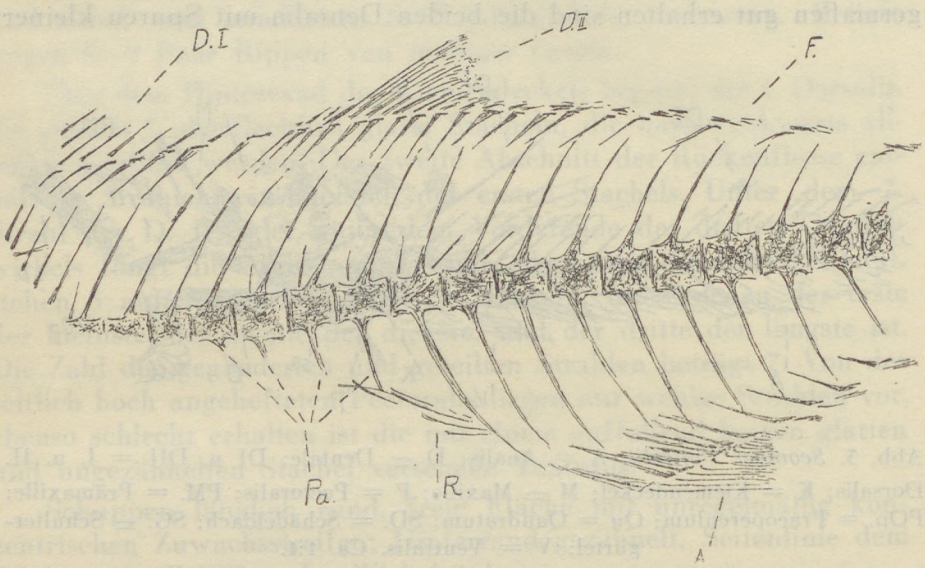

Abb. 4. ? *Sarda* sp. ? A = Analis; D.I u. D.II = Dorsalis I. u. II.; F = Flösschen; Pa. = Parapophysen; R. = Rippen. Ca. 1:1.

Der ganze Körper ist mit kreisrunden winzigen Schuppen bedeckt, die an der Bauchseite zwischen Kopf und Ventralis etwas vergrößert sind.

Der beschriebene Fisch unterscheidet sich in keinem Punkt von der als *Scomber Voitești* aus den Menilitschiefern der Karpathen (Paucă, 1933) bzw. von Eger (Weiler, 1933) beschriebenen Art.

6. ? *Sarda* sp. (Abb. 4).

Das erhaltene Bruchstück zeigt die obere Hälfte der Abdominal- und die vordere Hälfte der Caudalregion.

Die Wirbel sind nur wenig verlängert. Die hintersten abdominalen tragen gut entwickelte Parapophysen mit kleinen Rippen. Zwischen den Basen der neuralen Dornfortsätze liegen kurze Gräten.

Von der DI sind noch 9 verhältnismäßig schwache Stacheln vorhanden, die nach rückwärts allmählich kürzer werden. Nach den Trägern zu urteilen enthielt die fast ohne Zwischenraum folgende

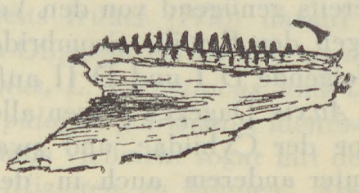

Abb. 5. *Lepidopus glarisianus.* Dentale. 1:1.

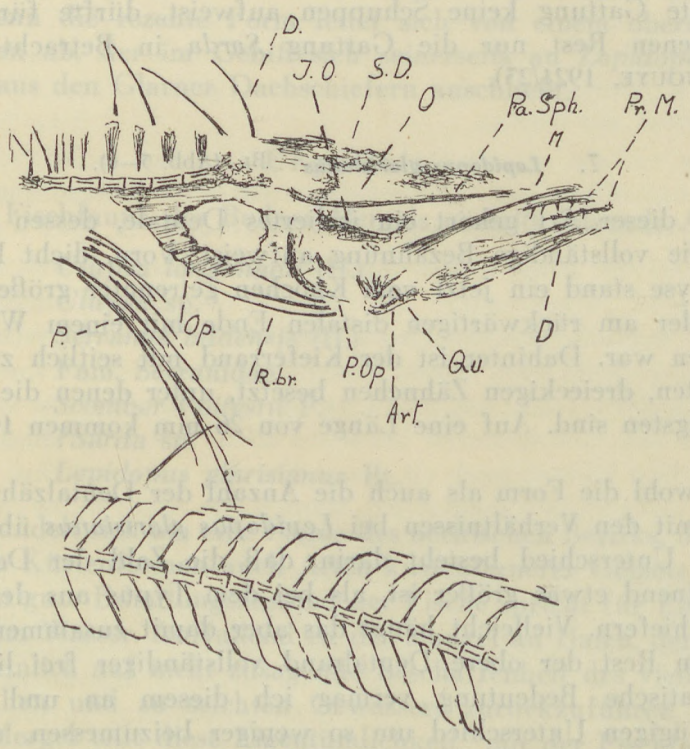

Abb. 6. Lepidopus glarisianus. Art. = Articulare; D = Dentale; D. = Dorsalis; I. O = Infraorbitalia; M = Maxille; O = Orbita; Op. = Operculum; P. = Pectoralis; Pa. Sph. = Parasphenoid; P. Op. = Praeoperculum; Pr. M. = Prämaxille; Qu. = Quadratum; R. br. = Kiementstrahlen; S. D = Schädeldach. 1:1.

DII einen Stachel und 13 Strahlen, auf die noch eine kleinere Anzahl von Flösschen folgte. Senkrecht unter dem Hinterrand des 4. Caudalwirbels beginnt die Analis, die schätzungsweise 1 Dtzd.

Strahlen sowie einige sich anschließende Flösschen enthielt. Die Schuppen sind winzig und nirgends vergrößert.

Durch das zuletzt angeführte Merkmal unterscheidet sich der beschriebene Rest bereits genügend von den Vertretern der Plecostei unter den Angehörigen der Familie Scombridae, durch die unmittelbar aufeinander folgende D I und D II außerdem von den Gattungen *Scomber* und *Auxis*. Dagegen passen alle feststellbaren Merkmale gut zur Gruppe der Cybiidae, und zwar besteht die größte Übereinstimmung (unter anderem auch in der Lage der Analis) mit den Gattungen *Sarda* und *Gymnosarda*. Da aber die zuletztgenannte Gattung keine Schuppen aufweist, dürfte für den beschriebenen Rest nur die Gattung *Sarda* in Betracht kommen (KISHINOUYE, 1921/23).

7. *Lepidopus glarisianus* BL. (Abb. 5—6).

Zu dieser Art gehört ein isoliertes Dentale, dessen Oberrand noch die vollständige Bezahnung aufweist. Vorn, dicht hinter der Symphyse stand ein jetzt vom Knochen getrennter größerer Fangzahn, der am rückwärtigen distalen Ende mit einem Widerhaken versehen war. Dahinter ist der Kieferrand mit seitlich zusammengepreßten, dreieckigen Zähnchen besetzt, unter denen die mittleren am längsten sind. Auf eine Länge von 26 mm kommen 16 Lateralzähne.

Sowohl die Form als auch die Anzahl der Dentalzähne stimmt völlig mit den Verhältnissen bei *Lepidopus glarisianus* überein. Ein kleiner Unterschied besteht darin, daß die Zahl der Dentalzähne anscheinend etwas größer ist, als bei dem Typus aus den Glarner Dachschiefern. Vielleicht hängt das aber damit zusammen, daß bei unserem Rest der obere Dentalrand vollständiger frei liegt. Eine systematische Bedeutung vermag ich diesem an und für sich geringfügigen Unterschied um so weniger beizumessen, als PAUCĂ (1933) aus den Meniliten der Karpathen einen *Lepidopus glarisianus* beschreibt, der, was die Dentalbezahnung betrifft, genau in der Mitte steht zwischen der Glarner und der Budaer Art.

Außer dem soeben erwähnten Rest hat der Budaer Mergel noch vereinzelte Fangzähne und Bruchstücke aus der Caudalgegend von Fischen geliefert, die höchstwahrscheinlich ebenfalls zu *Lepidopus glarisianus* zu stellen sind. Ein darunter befindlicher Abdruck ist besonders erwähnenswert, weil bei ihm, wie man trotz des fehlenden Zwischenstückes erkennen kann, das Vorderende zusamt dem

Kopf hakenartig auf den Schwanzabschnitt zurückgebogen ist (Abb. 6). Eine eingehende Beschreibung des Stückes erübrigt sich mit einem Hinweis auf die der Zeichnung beigebenen Erläuterung.

PAUCĂ hat bereits früher (1930) darauf hingewiesen, daß die aus dem Karpathen-Oligozän als *Lepidopus dubius, L. leptospondylus, L. brevispondylus, L. carpathicus* und *L. Guilaumei* beschriebenen Arten mit *Lepidopus glarisianus* identisch seien. PAUCĂ glaubt weiterhin *L. glarisianus* vielleicht sogar mit der rezenten Art *Lepidopus argenteus* identifizieren zu können. Aber bereits ARAMBOURG (1927) hat gezeigt, daß beide Arten scharf von einander zu trennen sind. Denn die rezente Form leitet sich von einem obermiozänen Vorfahren ab, der im Gebiß sich seinerseits an *Lepidopus brevicaudus* aus den Glarner Dachschiefern anschließt.

Ergebnis.

Die Fischfauna des Budaer Mergels umfaßt folgende Arten:

Clupea longimana (H.)
Clupea sp.
Serranus budensis (H.)
Fam. Serranidae
Scomber Voitestii P.
?Sarda sp.
Lepidopus glarisianus BL.

Es handelt sich um eine Fauna des neritischen Bezirks, die neben typischen Küstenformen auch Arten küstenfernerer Gebiete enthält. Der meist gute Erhaltungszustand der Fische spricht für Einbettung in ruhigem Wasser. Auffallend ist der Mangel an Haien, der höchstwahrscheinlich auf nicht zusagende Beschaffenheit des vielleicht zu küstennahen und zu seichten Gewässers zurückzuführen ist. Der Budaer Mergel teilt diese Eigentümlichkeit mit der Fischfauna der Dachschiefer des Kantons Glarus und der Menilitschiefer der Karpathen und des Kaukasus, unter denen mindestens die zuletzt genannten sich in absoluter Küstennähe und in sehr seichten Gewässern gebildet haben.

Der Budaer Mergel gilt heute fast allgemein als unteroligozäne Ablagerung (vergl. z. B. SCHAFARZIK, 1904, und SCHAFARZIK—VENDL, 1929). Dem entspricht auch die weitgehende Übereinstimmung seiner Fischfauna mit der aus den Meniliten von Eger (WEILER, 1933), die sich an der Grenze Unter—Mitteloligozän gebildet haben. Beide

Ablagerungen haben folgende Arten gemeinsam: *Clupea longimana, ?Serranus budensis, Scomber Voitești,* das sind nicht weniger als

Die Fischfauna des Budaer Mergels hat auch noch eine gewisse Bedeutung für die Gliederung der Menilitschiefer. PAUCĂ (1931 u. 1933) hält die Menilite aus Mähren und von Suslănești (Rumänien) nach ihrer Fischfauna für mitteloligozän. Sie haben aber folgende Arten mit dem Budaer Mergel gemeinsam:

Namen d. Art	Budaer Mergel	Mähren	Suslănesti
Clupea longimana	+	+	+
?Serranus budensis	+	+	+
Scomber Voitești	+	+[1]	+
Lepidopus glarisianus	+	+	+

Ein unteroligozänes Alter ist daher für diese Ablagerungen nicht so ohne weiteres abzulehnen.

Sowohl die Menilite von Eger als auch Mährens und der Karpathen sind Ablagerungen in einem ganz küstennahen Meeresabschnitt mit sehr labilen Lebensverhältnissen. Dafür sprechen nicht nur die nie fehlenden Reste von Landpflanzen und Landwirbeltieren, sondern auch die z. T. gut erhaltenen Skelette von Süßwasserfischen. Die letzteren brauchen nicht alle eingeschwemmt zu sein, sondern können auch als Anzeichen für gelegentliches Schwanken des Salzgehaltes angesehen werden, da Cypriniden (um diese handelt es sich ausschließlich) auch im Brackwasser gedeihen. Bemerkenswert ist, daß die Gewässer der Menilitmeere zu einem sehr hohen Prozentsatz nur von Jungfischen bewohnt wurden. Nach Erreichung eines gewissen Alters sagte ihnen ihr seitheriger Lebensbezirk nicht mehr zu, und sie wanderten nach den küstenferneren und tieferen Gründen ab. Allzuweit davon entfernt dürfen wir aber die neuen Wohnplätze nicht suchen. Es wäre sonst nicht zu verstehen, daß ausgesprochene Tiefseeformen, wie z. B. die Stomiatiden, an manchen Stellen nicht selten in den Menilitschiefern gefunden werden.

Vergleichen wir die Budaer Individuen ihrem Lebensalter nach mit den Vertretern aus den Menilitschiefern, so erweisen sie sich fast durchweg als etwas lebensälter. Ausgesprochene Jugendformen treten nur unter den Clupeiden auf, die kleinen Serraniden

[1] Von PAUCĂ als *Thynnus Krambergeri* n. sp. bezeichnet.

gehören anscheinend zu den allergrößten Seltenheiten. Man gewinnt daraus den Eindruck, daß die unteroligozäne Fischfauna des Budaer Mergels einen, wenn auch kleinen Ausschnitt jener neritischen Fauna darstellt, deren Jugendstadien z. T. das Meer der Menilitschiefer mit seinen ganz eigenartigen Lebensverhältnisse besiedelte.

Zusammenfassung.

1. Die Fischfauna des Budaer Mergels gehört dem neritischen Meeresbezirk an.
2. Mit der Fischfauna der Glarner Schiefer und der Menilitschiefer der Karpathen und des Kaukasus teilt sie den auffallenden Mangel an Haien, der auf nicht zusagende Lebensbedingungen zurückgeführt wird.
3. Die Fischfauna spricht durch Übereinstimmung mit der von Eger für ein unteroligozänes Alter des Budaer Mergels.
4. Da auch enge artliche Verbindungen mit der Fauna der Menilitschiefer bestehen, ist für diese ein ebenfalls unteroligozänes Alter wohl möglich.
5. Sehr wahrscheinlich stellt die Fischfauna des Budaer Mergels einen Ausschnitt jener neritischen Fauna vor, deren Jugendformen die seichten, absolut landnahen Gewässer der Menilitmeere besiedelten.

Verzeichnis der angeführten Schriften.

ARAMBOURG, 1927: Les Poissons fossiles D'Oran. Matériaux pour la carte géologique de l'Algérie. I. Série. Paléontologie. 1927. — BOGAČEW, 1933: Materialü po isutscheniju tretitschnoi ichtiofaunü kawkasa. Trudü Aserbajdschanskawo issledowateljskogo instituta (AsNII). Geologitscheskij Otdel. *15*. 1933. — HECKEL, 1856: Beiträge zur Kenntnis der fossilen Fische Oesterreichs. Denkschr. k. Ak. Wien, m. n. Kl. — KISHINOUYE, 1921/23: Contributions to the comparative study of the socalled Scombroid fishes. Journ. Coll. Agriculture Imp. Univ. Tokyo. *8*. — PAUCĂ, 1930: Revision der fossilen Lepidopus- und Capros-Arten. Ac. Roumaine. Bull. Scientif. — PAUČA, 1931: Zwei Fischfaunen aus den oligozänen Menilitschiefern von Mähren. Ann. Naturh. Museums Wien. 46. — PAUCĂ, 1933: Die fossile Fauna und Flora aus dem Oligozän von Suslanesti- Muscel in Rumänien. Annarul Inst. Geol. al Romăniei. 16. — PAUCĂ, 1934: Quelques remarques biologiques sur les faunes ichthyologiques oligocènes des Carpates. Ac. Roumaine. Bull. Scientif. 16. — SCHAFARZIK, 1902: Die Umgebung von Budapest und Szt. Endre. Budapest. — SCHAFARZIK F., VENDL A., 1929: Geológiai kirándulások Budapest környékén. Geolog. Anst., Budapest. (Nur ungarisch). — WEILER, 1933: Zwei oligozäne Fischfaunen aus dem Königreich Ungarn. Geol. Hungarica. Series Palaeontologica. Budapest.





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Sec. R. Etheridge. Jr.
phot. A. Lehoczky.

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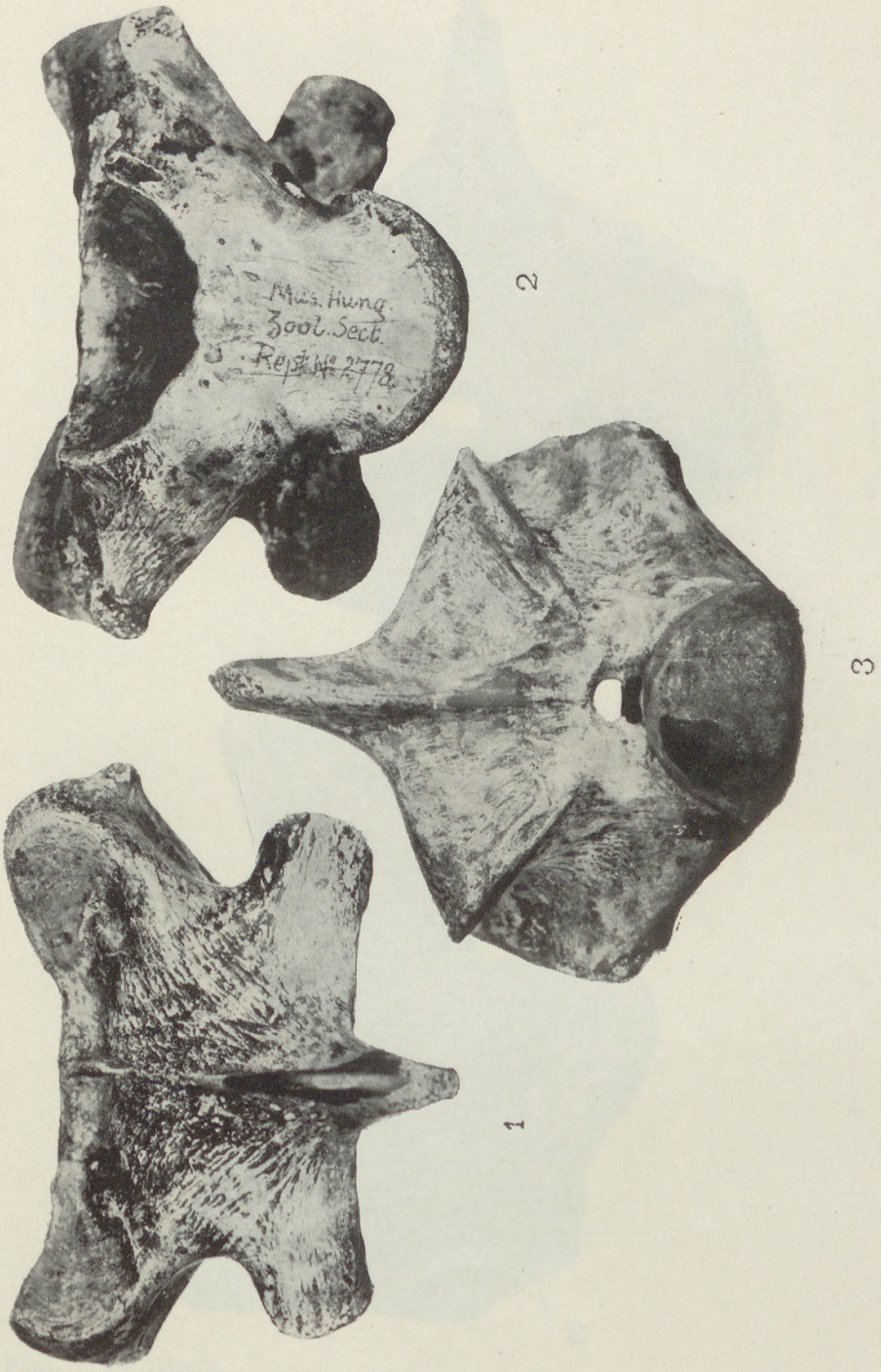

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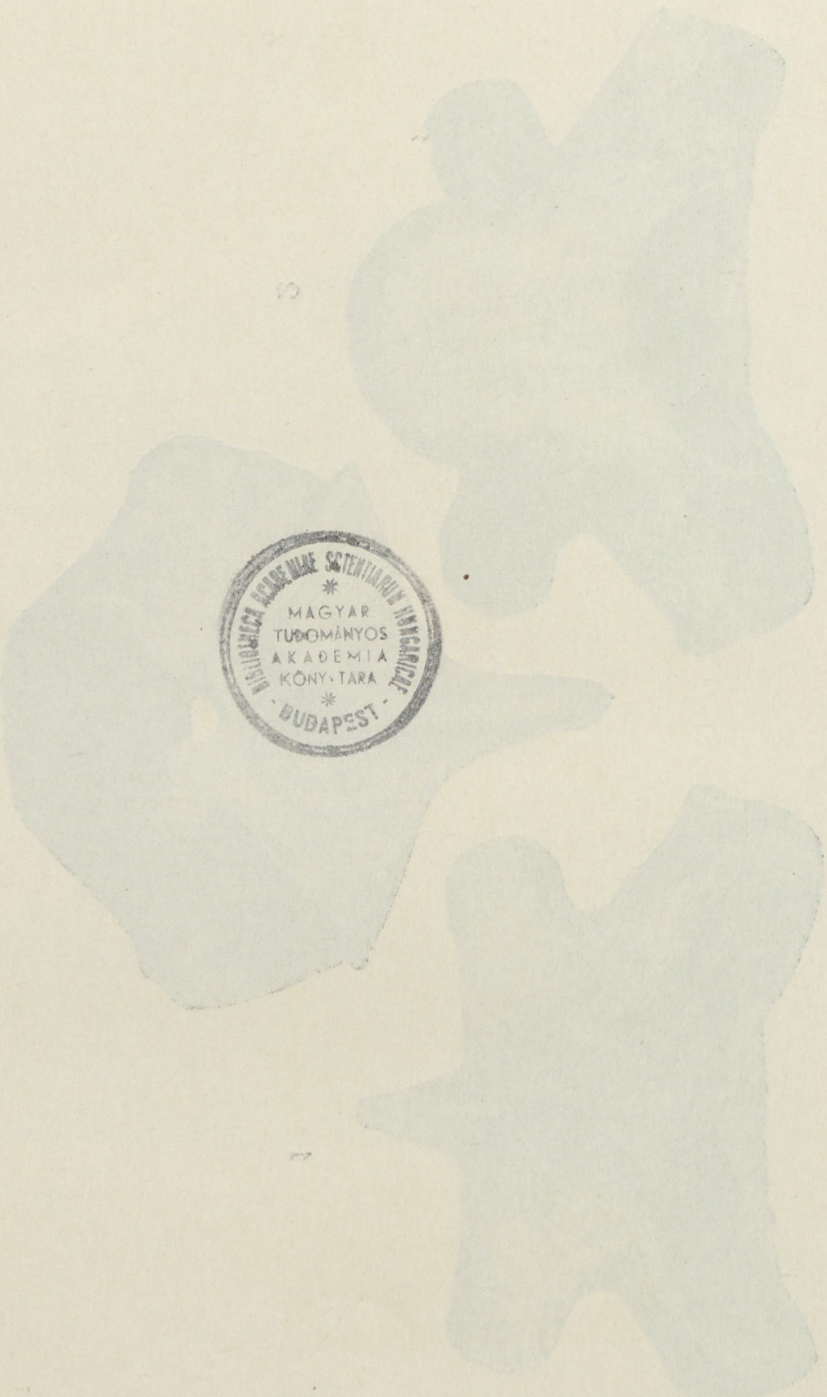
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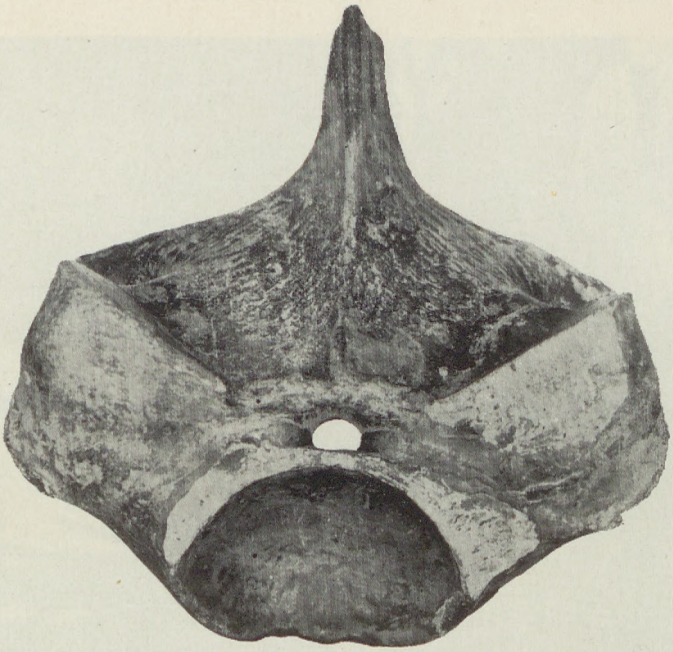

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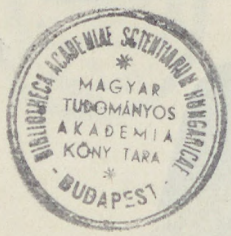
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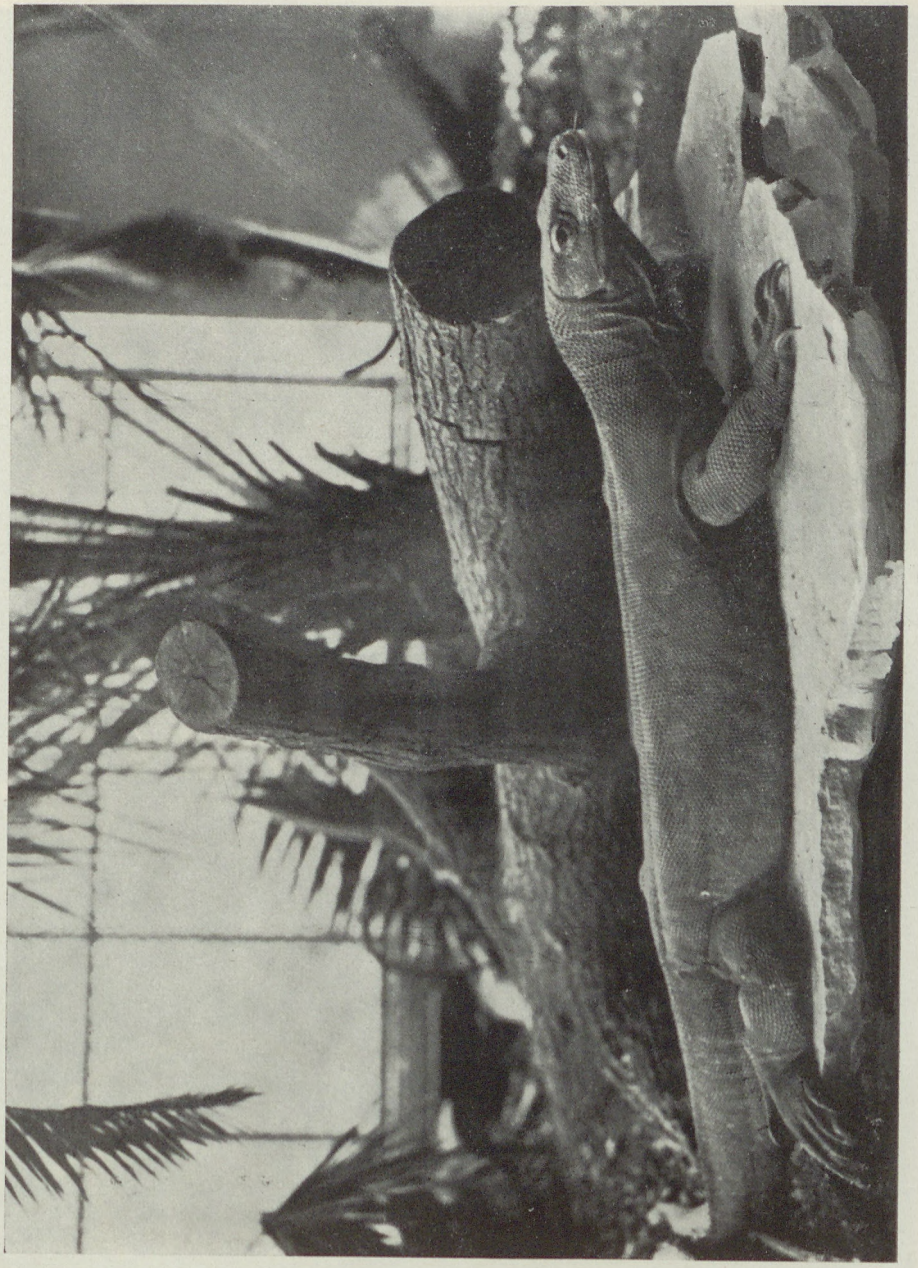

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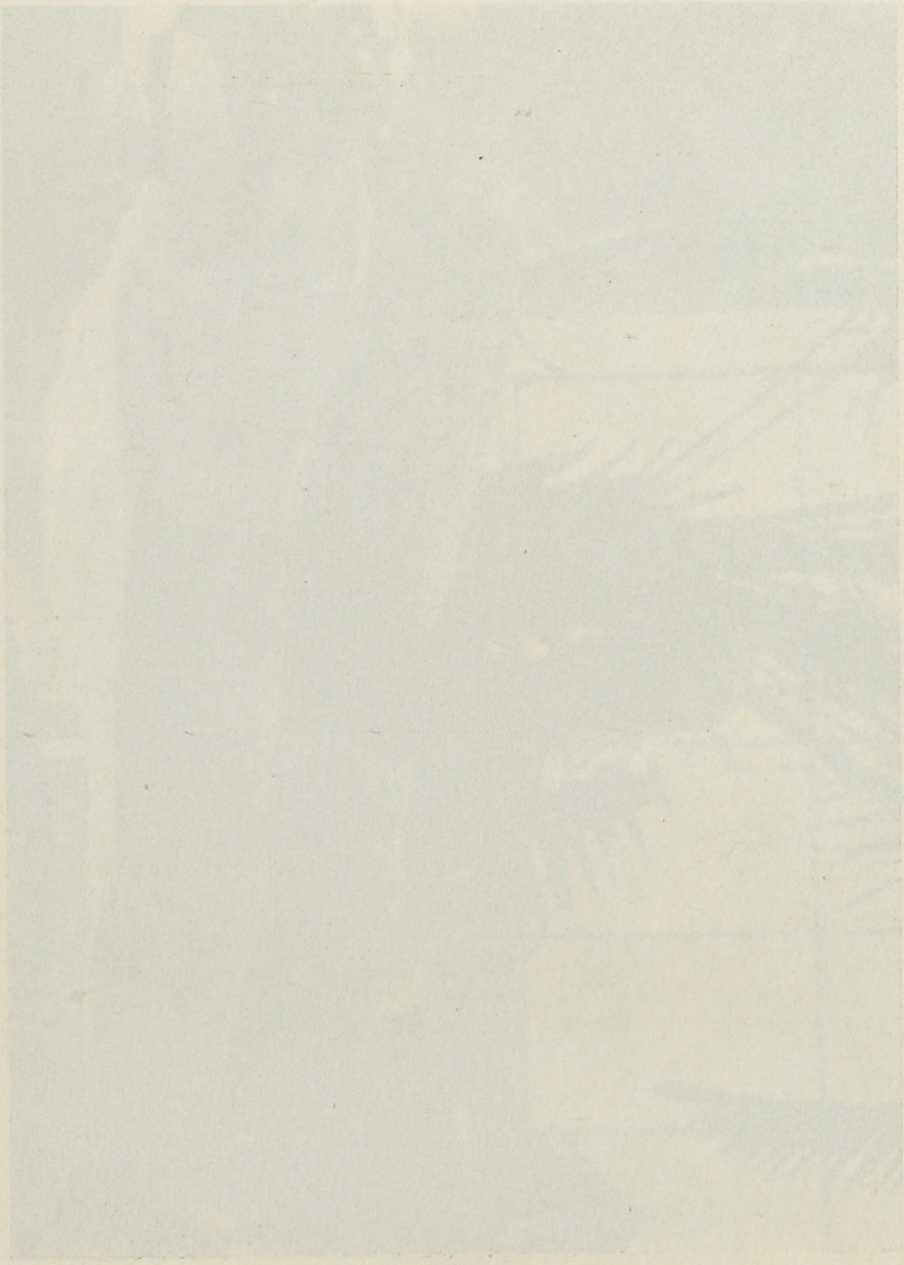

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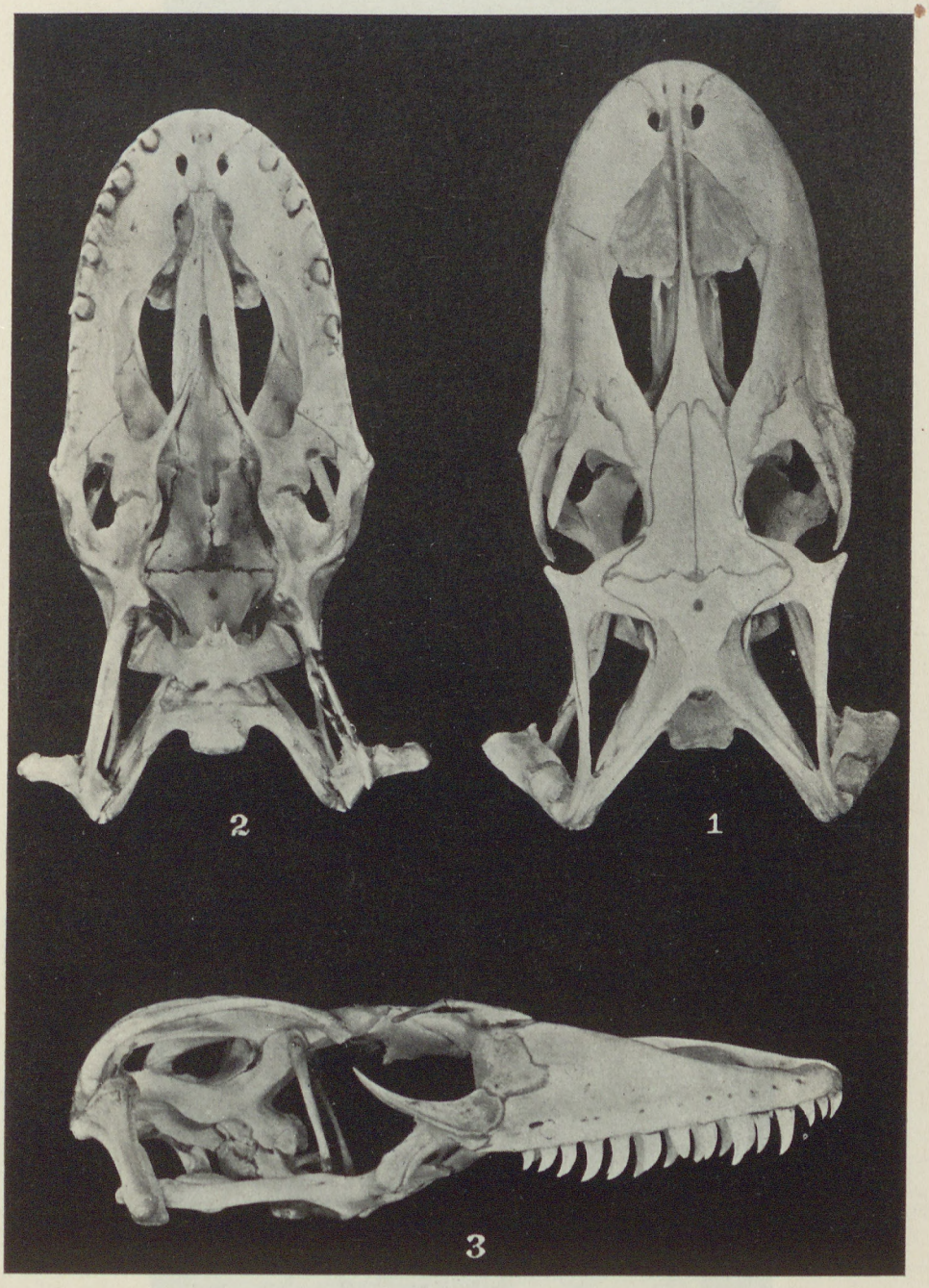

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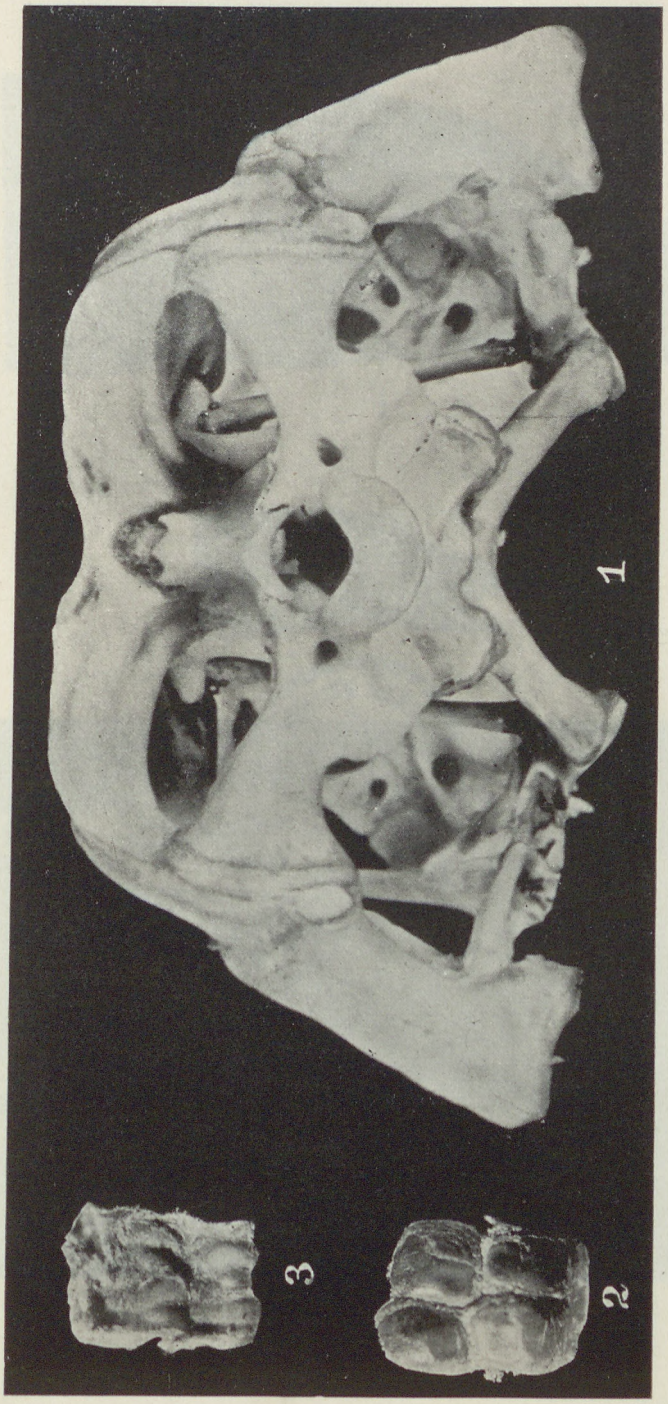

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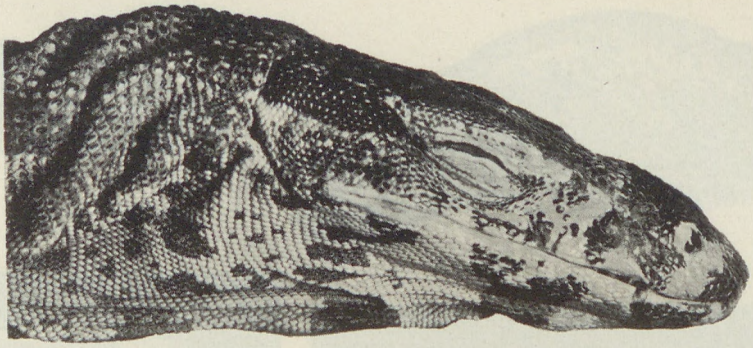

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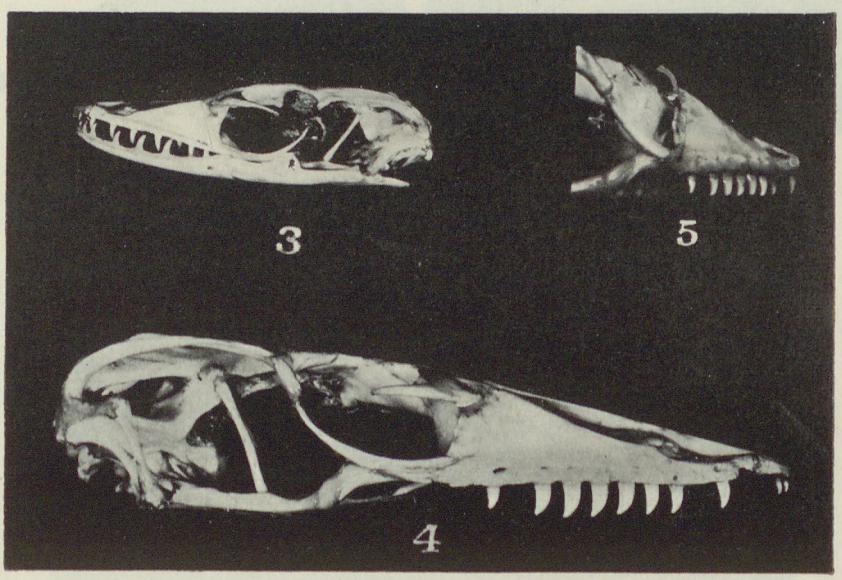







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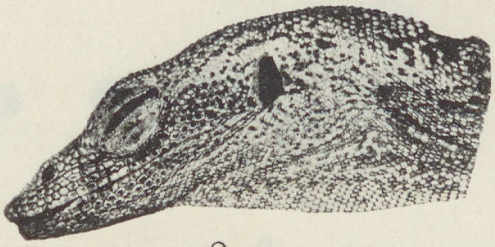

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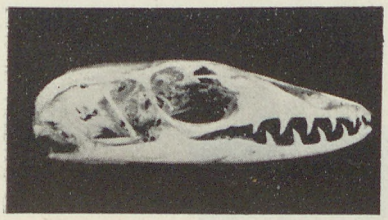

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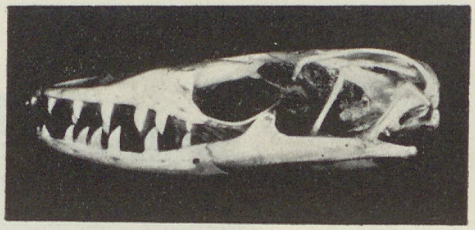

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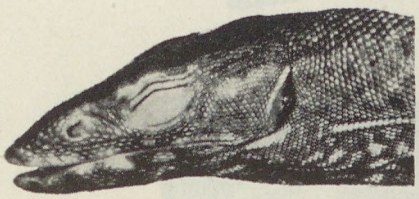

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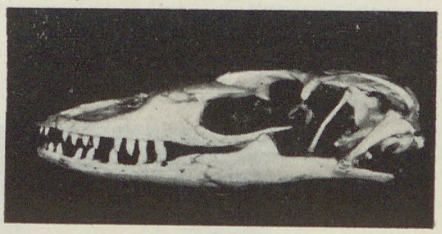

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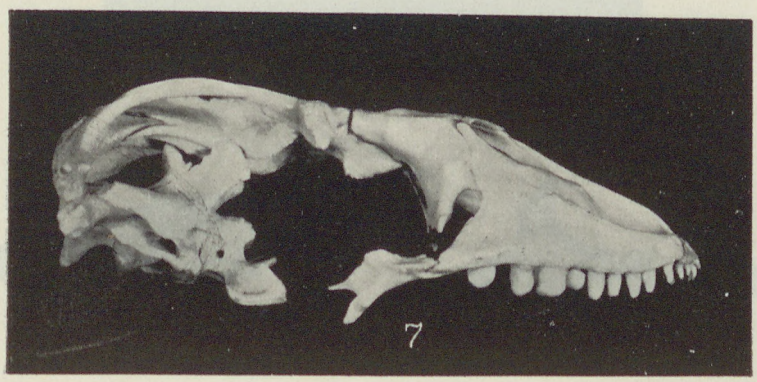

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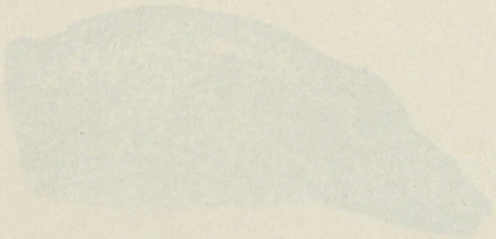

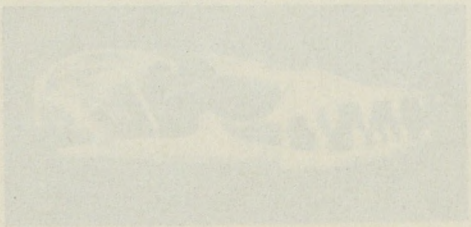

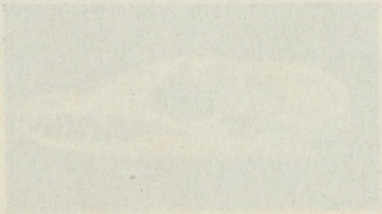

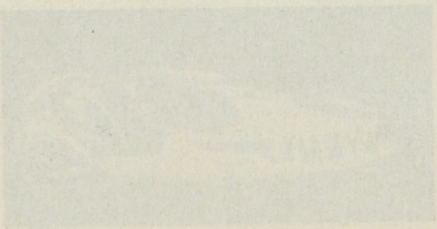

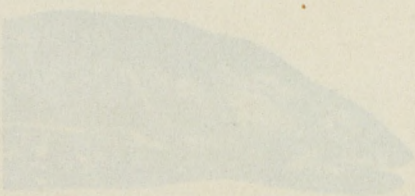

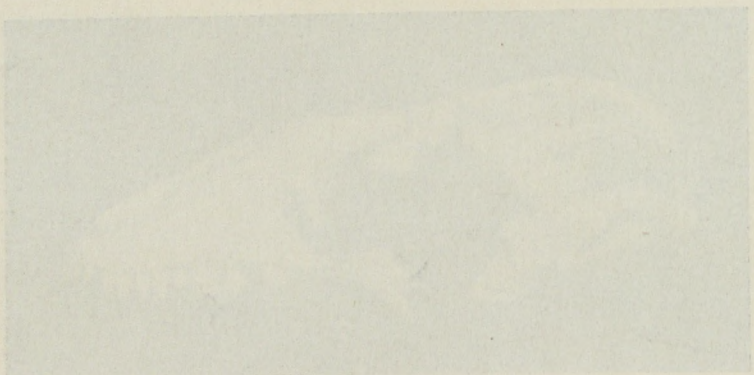

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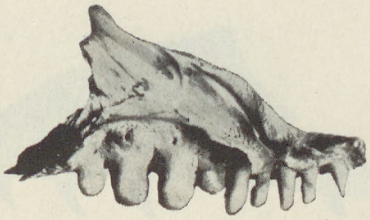

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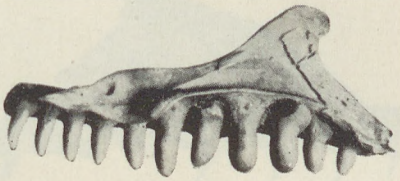

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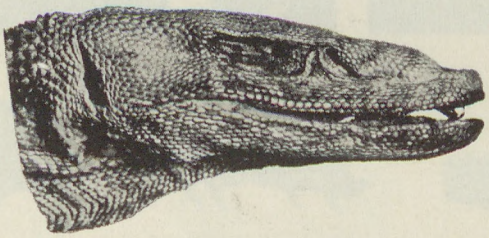

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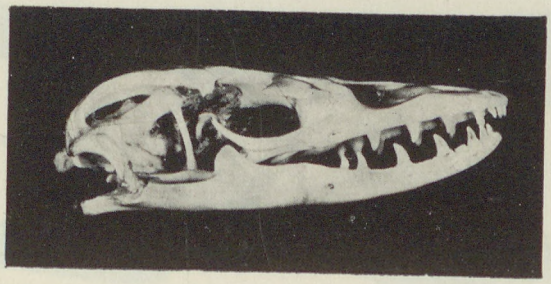

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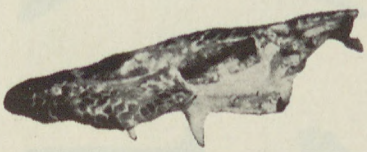

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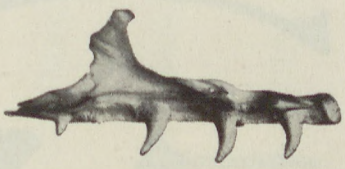

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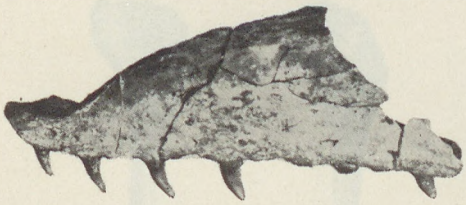

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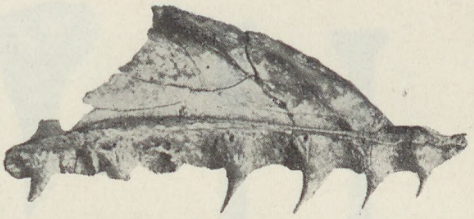

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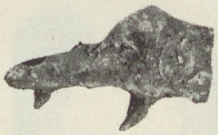

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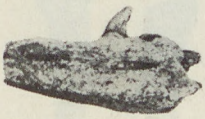

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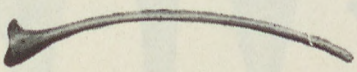

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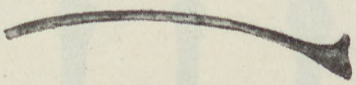

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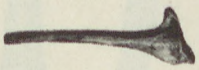

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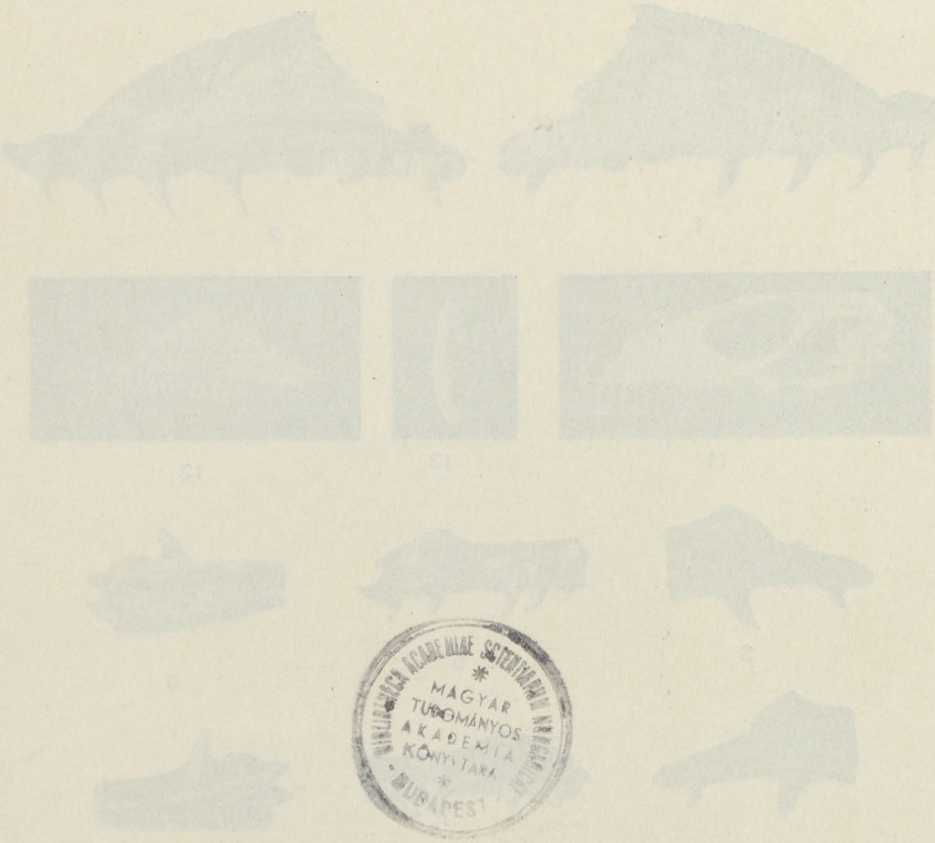

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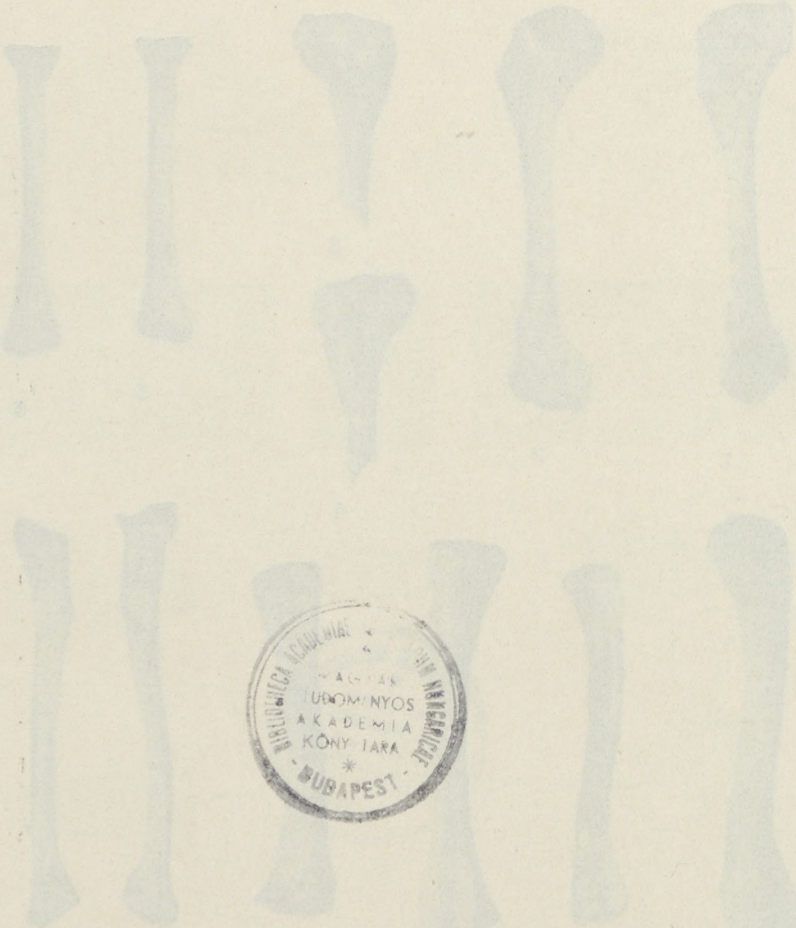

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Del. Dr. A. Pongrácz.

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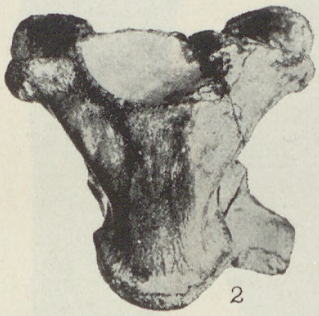

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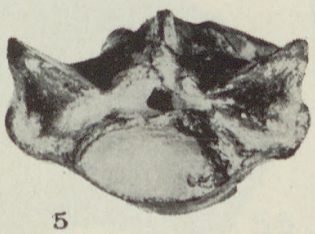

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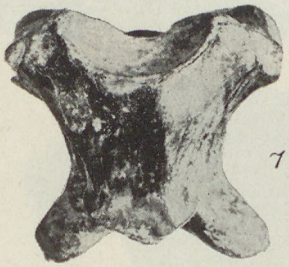

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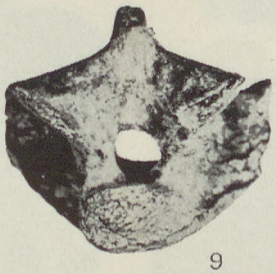

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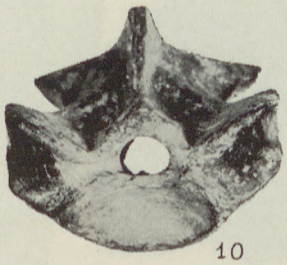

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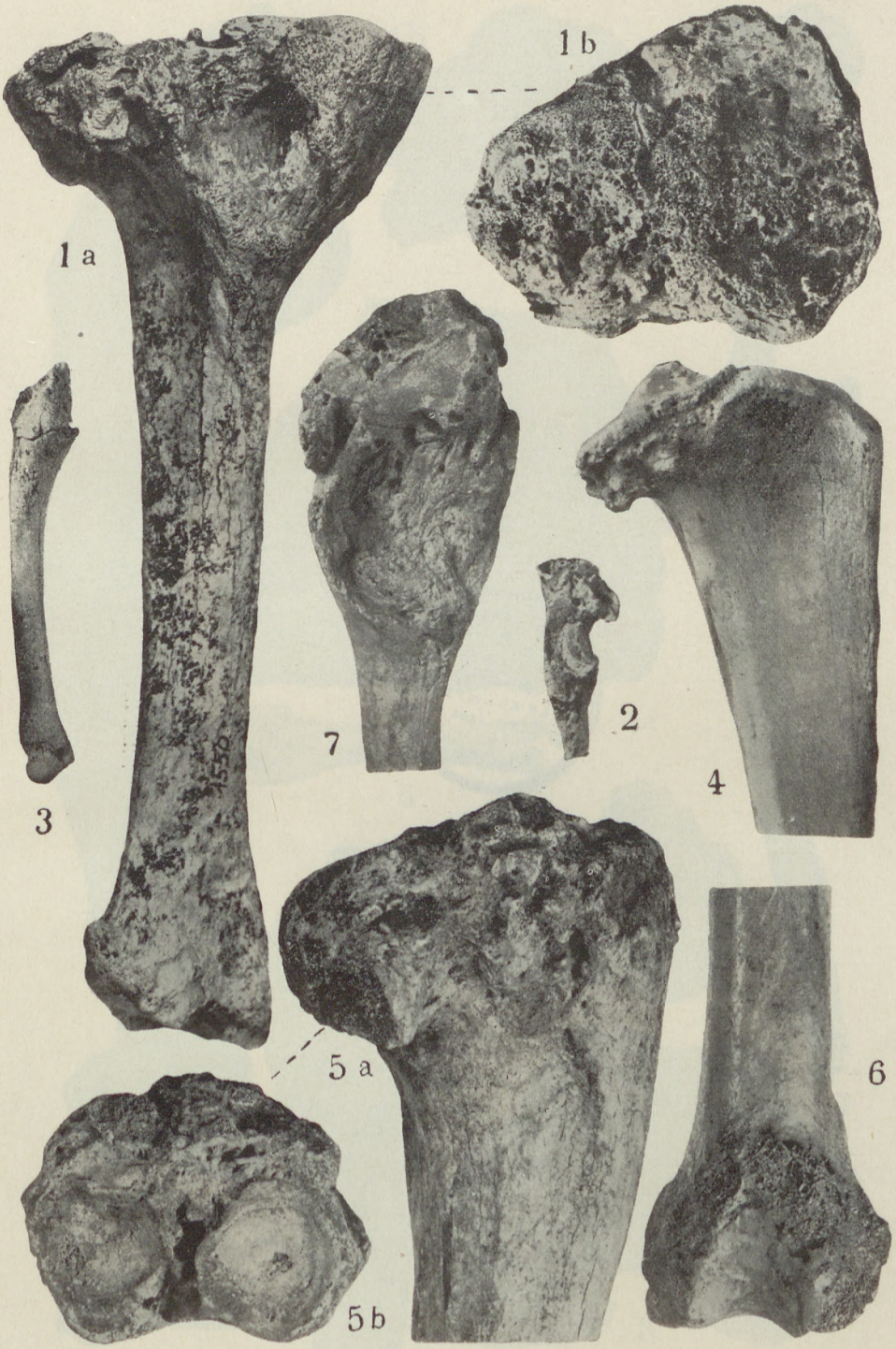

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Phot. T. Dömök.



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Von naturwissentschaftlichen Werken aus dem Verlag des Ung. Nat. Museums sind noch vorrätig und können bei der Direction der Zoologischen Abteilung des Ungarischen National-Museums (Budapest, 80.) bestellt werden:

Les volumes d'histoire naturelle suivants publiés par le Muséum National Hongrois sont en vente chez la Direction de la Section Zoologique du Muséum National Hongrois (Budapest, 80.)

Of the volumes of natural history published by the Hungarian National Museum the following ones to be had of the Director of the Department of Zoology (Budapest, 80.):

Természetrajzi Füzetek.

Vol. V (1881) — XIX (1896) . . . . . à 23 Pengő.
Vol. XXI (1898) — XXV (1902) . . . . . „ 35 „
Vezeték. — Index (I—X, 1877—1886) . . . . „ 10 „

Annales hist.-nat. Musei Nationalis Hungarici.

Vol. II—XXIX. 1904—1935 . . . . . à 35 Pengő.

Archivum Balatonicum a Statione Biologica Balatonica Musei Nationalis Hungarici editum.

Vol. I (1926—27) . . . . . 30 Pengő.

Archivum Zoologicum. Vol. I (1909—1910) . . . . 23 Pengő.

J. Frivaldszky: Aves Hungariae. Budapest, 1891 . . 10 Pengő.