

Article II.—ZIMMERMANN'S 'ZOOLOGIÆ GEOGRAPHICÆ' AND 'GEOGRAPHISCHE GESCHICHTE' CONSIDERED IN THEIR RELATION TO MAMMALIAN NOMENCLATURE.

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There seems to be a difference of opinion as to whether Zimmermann's 'Zoologiæ Geographicæ'¹ is citable as an authority in questions of nomenclature. Most systematic mammalogists appear to have ignored it altogether, but recently Mr. C. I. Forsyth Major has taken it as authority for a name applied to a West Indian species of Muridæ,² where he cites "*Castor piloris* Zimmermann, Zool. Geogr. 509 (1777)," for the animal named *Mus pilorides* by Desmarest in 1826.

Zimmermann's two works, the 'Zoologiæ Geographicæ' and the 'Geographische Geschichte,' are constructed on nearly the same general plan; the first is in Latin, the other in German. The latter, however, is not merely a German translation of the first, but an essentially different work.³

Zimmermann was one of the best mammalogists of his time, as regards his familiarity with the literature of the subject, and discriminating and conservative,—far more so than many of his contemporaries and successors. But as regards nomenclatural form he was not a model, even for his day, in this respect falling behind his contemporary Schreber, and being much more lax than Pallas and Erxleben. In both works Zimmermann, although binomial as regards technical names, often employed vernacular names only, for genera as well as species, even when defining them by a formal diagnosis; while in the case of species he was apt to cite the names given by previous writers as these authors used them, regardless of whether the generic element of the name conformed

¹ The full title is as follows:

Specimen | Zoologiæ Geographicæ, | Quadrupedum | domicilia et migrationes | sistens. Dedit, Tabulamque Mundi Zoographica[m] adjunxit | Eberh. Aug. Guiljelm. Zimmermann, | Professor Mathes. et Phys. Collegii | Carolini Brunsvicensis | — | [=quotation from Pliny, 3 lines]—| Lugduni Batavorum, | Apud Theodorum Haak, et Socios. | MDCCLXXVII.—1 volume, 4to, pp. xxiv + 686, and map.

² Ann. and Mag. Nat. Hist. (7), VII, Feb., 1901, p. 206.

³ "Auf diese Weise ist dies gegenwärtige Buch allerdings eine Originalschrift, die mit dem lateinischen nur einen gleichen Plan hat."—Zimmermann, Geogr. Gesch., I, Vorrede, [p. ii].

or not with his own genera. In both works, but especially in the 'Geographische Geschichte,' he employed, when using technical nomenclature, the binomial method in due form, and in each work named a number of species supposed by him to be new, in a perfectly citable manner.

The greater part of the second volume of the 'Geographische Geschichte' is devoted to a 'Verzeichniss aller bekannten Quadrupeden,' in which, following Pennant, he divided the Quadrupeds into four 'orders' (some of them with subdivisions), 44 genera, and 388 species (consecutively numbered from 1 to 388), with a large number of additional forms entered as "Unbestimmtere Arten." His treatment is thus taxonomically methodical. In the earlier work he followed closely the arrangement of Linnæus as given in the twelfth edition of the 'Systema Naturæ.'

In his later work he singularly ignores the new names he gave in his earlier work, adopting those of Erxleben instead of his own, even where Erxleben's names are of the same date, and in general following closely the nomenclature of Pallas and Erxleben.

While the 'Geographische Geschichte' has been cited by many subsequent systematic writers, especially by J. B. Fischer in his 'Synopsis Mammalium,' and the new names adopted when having priority, the 'Zoologiæ Geographicæ' has been as uniformly neglected, although careful scrutiny shows that both are equally entitled to recognition. In the 'Zoologiæ' rather more new names were given than in the later work, but when not synonyms of earlier names they in most cases conflict with names given by Erxleben in his 'Systema Regni Animalis,' with the result that Erxleben's names have been adopted while Zimmermann's have been overlooked. Fortunately for science, both authors often gave the same name to the same species, so that the uncertainty relates to the citation of the authority for the name rather than to the name itself. The explanation of this coincidence in names is generally obvious, the species having been based on the same sources of information, which in most cases suggested the names bestowed independently by the two authors.

As evidence that the two works were issued simultaneously, in addition to the date they each bear, neither author cites the other, while Zimmermann in his second and later work not only cites Erxleben constantly, but adopts his nomenclature, even, as already said, where it conflicts with that of the 'Zoologia Geographicae.' Besides, both authors cite Schreber's 'Säugethiere' to about the same point.

In deciding what names are to be construed in a vernacular sense and what in a technical sense, in the case of the 'Zoologiae,' great aid is rendered by Zimmermann's index to the work, which appears to have been prepared with care, and which apparently clearly distinguishes whether a name is employed in a vernacular or in a technically nomenclatural sense. Further aid is furnished by the key to his map.

The 'Zoologiae Geographicae' is divided into four chapters, each treating of different aspects of the general subject. Chapter III is systematic and corresponds to the 'Verzeichniss' portion of Volume II of the 'Geographische Geschichte,' although some new names are given in other parts of the work.

Following is a list of the new binomial names appearing in both of Zimmermann's works, with their recognized equivalents. Those in current use, or entitled to adoption, are distinguished by being printed in heavy-faced type.

I. 'ZOOLOGIÆ GEOGRAPHICÆ.'

Dama virginiana (pp. 351 (in text) and 532, index, and map)=[*Cervus dama*] *americanus* *Erxleben*, 1777 (if Erxleben's name be citable) =*Cervus virginianus* *Boddaert*, 1784. As shown by Zimmermann's *Geogr. Gesch.*, II, 1780, p. 129, the name is adopted from Ray, and is based on Lawson and Pennant. (See further remarks on this question below, p. 18).

Bos gnou (p. 372)=*Antilope gnou* *Zimmermann*, 1780 (*Geogr. Gesch.*, II, p. 102)=*Connochetes gnou* (*Zimm.*).

Viverra fossana (p. 385, footnote); indexed as *Fossana*. =*Viverra fossa* *Schreber*, pl. CXIV, 1776 (plate name).

Vespertilio canadensis (p. 457)=*Vespertilio borealis* *Müller*, 1776=*Vespertilio noveboracensis* *Erxleben*, whose name Zimmermann adopts in *Geogr. Gesch.*, II, 1780, p. 418.

Dasypus duodecim-cingulus (p. 467)=*Dasypus duodecimcinctus* *Schreber*, 1776 (plate name).

- Tigris fulva* (p. 479) = *Felis concolor* Linn.
Tigris jaguarete (p. 480; indexed only as *jaguarete*) = *Felis nigra* Erxleben, 1777, whose name Zimmermann adopted in 1780.
Viverra izquepatl (p. 483) = *Viverra vulpecula* Erxleben, 1777 = *Viverra memphitis* Linn.
Viverra chinche (p. 484) = *Viverra mephitis* Schreber, 1776 (not *Viverra memphitis* Linn.).
Lutra brasiliensis (p. 485) = *Lutra brasiliensis* Zimmermann, 1780.
Mustela voang-shire (p. 487) = *Mustela galera* Erxleben, 1777.
Mustela javanica (p. 488) = *Mustela javanica* Zimmermann, 1780 = ?
Herpestes javanica E. Geoffroy, 1812.
Mustela quoll (p. 489) = ?
Ursus albus (p. 489) = *Ursus maritimus* Phipps, 1774.
Talpa flava (p. 496) = *Talpa europæa*, γ *flavescens* Erxleben, 1777 = *Sorex aquaticus* Linn.
Talpa caudata (p. 497) = *Talpa longicaudata* Erxleben, 1777 = *Sorex aquaticus* Linn.
Talpa fusca (p. 497) = *Talpa fusca* Kerr, 1792 = *Sorex aquaticus* Linn.
Talpa rubra (p. 497) = *Talpa rubra* Erxleben, 1777.
Sorex brasiliensis (p. 508) = *Sorex americanus* Müller, 1776 = *Sorex brasiliensis* Erxleben, 1777 = *Peromys americanus* (Müller).
Cavia javensis (p. 507) = *Mus leporinus* Linn.
Cavia akouchi (p. 508) = *Cavia acouchy* Erxleben, 1777.
Sciurus purpureus (p. 518) = *Sciurus indicus* Erxleben, 1777.
Sciurus versicolor (p. 520) = *Sciurus variegatus* Erxleben, 1777.
Sciurus mexicanus (p. 521) = *Sciurus mexicanus* Erxleben, 1777.
Yerboa gigantea (p. 526) = *Jaculus giganteus* Erxleben, 1777 = *Macropus giganteus* (Zimm.) auct.
Moschus meminna (p. 530) = *Moschus meminna* Erxleben, 1777 = *Tragulus meminna* (Erxl.).
Tragulus surinamensis (p. 530) = *Moschus americanus* Erxleben, 1777.
Cervus porcinus (p. 532); usually attributed to Zimmermann at 1780.
Cervus (vel potius) *Capreolus mexicanus* (p. 533) = *Cervus mexicanus* Gmelin, 1788. Referred by Zimmermann in 1780 to *Cervus bezoarticus* Linn. 1758, which has in part the same original basis (Hernandez) as *Cervus mexicanus* Gmelin.¹

¹ *Cervus bezoarticus* Linn. was based on the "Mazama" of Hernandez, or rather on Hernandez's "Cap. XIV. De Mazama, seu Cervus" collectively and not on any particular species of the several treated under this caption, and is thus in such a way composite as to be beyond satisfactory restriction by the process of elimination, and is further complicated by references to South American species of deer mentioned by Marcgrave and Piso. The name is therefore unavailable in nomenclature, and cannot properly be assigned to the South Brazilian and Paraguayan *Cervus campestris* F. Cuvier, as has recently been done by Lydekker (*Deer of All Lands*, 1898, p. 287). *Cervus mexicanus*, of both Zimmermann and Gmelin, was based on Pennant's "Mexican Deer" (including Pennant's citations). Pennant's first reference is to the Tuethlmacama of Hernandez, which Hernandez says was also called Berendo by the natives of Mexico. This animal, under both these names, is commonly and apparently correctly

- Antilope leucopus (p. 541)=Antilope pictus Pallas, 1777=Antilope tragocamelus PALLAS, 1776=Boselaphus tragocamelus (Pall.).
 Antilope tzeiran (p. 543)=Antilope gutturosa Pallas, 1777=Gazella gutturosa (Pall.).
 Antilope koba (p. 545)=Antilope koba Erxleben, 1777=?Antilope korrigum Ogilby, 1836.
Mus oeconomus (p. 668)=Mus oeconomus Pallas, 1778=Microtus oeconomus (Zimm.).

The Piloris, or Rat musqué of Rochefort, and the Potto are omitted from the above list as not being binominally named.

In addition to the above list of specific names there are four superspecific names which require consideration in reference to their tenability as designations for genera. These are *Marmotta* (p. 509), *Jerboa* (p. 522), *Dama* (p. 532), and *Capreolus* (p. 533).¹

In treating of the *Mures* Zimmermann divided the genus *Mus* into two sections, "A. *Marmotta*," and "B. *Mures proprie sic dicti*." Under *Marmotta* he placed three species only, namely, (1) *Mus marmota* Linn., (2) *Mus monax* Linn., and (3) *Mus citellus* Linn., all Sciuromorphs. Under the second section he placed 26 species, all Murine except No. 26, the *Sciurus striatus* Linn.

To this extent his classification is an improvement on that of Linnæus. It is also to be noted that his use of *Marmotta* for a superspecific group carries back the name from Blumenbach (1799) to a date (1777) three years prior to the introduction of *Arctomys* (Schreber, 1780) for practically the same group.

Jerboa, named on page 522, and accompanied by a formal diagnosis, includes five species of which the first three are Dipodine, the first being *Mus jaculus* Linn. *Jerboa* is almost the exact equivalent of *Jaculus* Erxleben, of the same date, even to the inclusion of the Giant Kangaroo (*Macropus*) by both authors. The constituents of the two are found, on

identified with the Mexican form of the Pronghorn (*Antilocapra americana*). As Pennant's description scarcely applies at all to this animal, but is a vague conglomeration of references to various species of deer, with a figure of malformed antlers from an unknown locality, the name *Cervus mexicanus* of Zimmermann and Gmelin is clearly untenable in nomenclature.

¹ See below for remarks on *Dama* and *Capreolus*.
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analysis, to differ in the inclusion by Zimmermann of the Tarsier, which is omitted by Erxleben. *Jerboa* also is practically equivalent to *Yerboa* of Forster, 1778, and of *Dipus* Schreber, 1782, the type by elimination being in each case the same, *Mus jaculus* Linn.

Of the 33 new specific names published in the 'Zoologiæ Geographicæ,' four of the accepted names are accredited to Zimmermann's later 'Geographische Geschichte' and one to Pallas;¹ 17 (including a number of Zimmermann-Erxleben names) are synonyms of earlier names given by Schreber, Müller, Pallas, and Phipps, and three others are not identifiable. The remaining eight names are of even date with names given by Erxleben to the same species, five of them being identical with Erxleben's names and three different.

The question now arises, What is to be done with the rival tenable Zimmermann-Erxleben names? A comparison of the two works shows that in each case they have practically the same basis, the same date, and equal claims to recognition. As Erxleben's names have long been current, while Zimmermann's have been overlooked, there is no reason for now giving Zimmermann preference over Erxleben, except where Erxleben's names are of doubtful tenability, as in the case of the Virginia Deer considered below. This disposes of the case of *Jerboa* vs. *Jaculus*, as well as the rival specific names.

Some of Zimmermann's other names, however, seem to call for special remark, namely, his *Dama virginiana* and his "Piloris," as well as his use of the names *Dama* and *Capreolus*.

DAMA VIRGINIANA Zimmermann.

Zimmermann, in treating of the Virginia Deer of Pennant in Section VII of his Cap. II (p. 351), claims its specific distinctness from *Cervus dama* of Linnæus, and refers to it in the body of the text as "*dama virginiana*," in possibly a non-nomenclatural sense; but in Section X of Cap. III, where in § III (pp. 531-535) he treats systematically the genus "*Cervus* Linn.," and

¹ These five names do not include the case of *Dama virginiana*, which is specially considered below.

divides the genus into two sections, "a. *Cornibus palmatis*," and "β. *Cornibus teretibus*," placing *Cervus alce*, *C. tarandus*, and *C. dama* in the first division and *Dama virginiana* and the other deer then known in the second division, the name *Dama virginiana* is published in proper binomial form, and is based exclusively on the "Virginian Deer" of Pennant (Synopsis, 1771, p. 51, pl. ix, fig. 2). It appears also in the index as a technical binomial name, and on his map, where in the 'Notarum' it stands as *Dama virginiana*, and is engraved on the map (over what is now western Pennsylvania) as *Dama virg.* He also employs it in his later 'Geographische Geschichte' (Vol. II, 1780, p. 129), where it is credited to Ray. Thus the long-current specific name for the Virginia Deer is carried back from Boddaert (1784) to Zimmermann (1777). That it should take precedence over Erxleben's "Differtne vere *americanus* uti Pennanto videtur?" (Syst. Regni Anim., 1777, p. 312), which some recent writers have brought into question as the earliest available specific name for the Virginia Deer, is beyond reasonable challenge. As I have claimed (Am. Nat., XXXIV, 1900, p. 318), Erxleben did not name, nor did he intend to name, the Virginia Deer in this interrogative phrase. Even Zimmermann in his 'Verzeichniss,' where he so scrupulously adopted all of Erxleben's names, even at the sacrifice of his own of even date with Erxleben's, did not cite Erxleben in this connection, for the evident reason that he did not consider that Erxleben had named the animal.

What, now, is the status of *Dama* as used consistently and repeatedly by Zimmermann, as the generic designation of the Virginia Deer? If tenable from Zimmermann it would long antedate *Odocoileus*, and all other generic names applied to the Virginia Deer and its allies. Other now current generic names have quite as slight a basis; and any author who would take *americanus* from Erxleben as the specific name of the Virginia Deer could not very consistently reject *Dama* as the generic name of the group. As shown above, Zimmermann evidently used *Dama* in a generic sense, with intent, for the Virginia Deer; even those who may question his intention

in the matter must admit that his use of it fulfills the nomenclatural requirements of the case. It therefore seems as necessary to accept *Dama* in place of *Odocoileus* as it does to reject *americanus* Erxleben for the specific name of the Virginia Deer, which should evidently stand as *Dama virginiana* Zimmermann.

Taking as a basis Miller and Rehn's recent list of the *Odocoileus* group (Proc. Boston Soc. Nat. Hist., Vol. XXX, No. 1, pp. 14-17, Dec., 1901), and including recent additions, the North American forms of the genus, under the above and a few other changes of nomenclature, will stand (adopting an alphabetic sequence) as follows:

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|--------------------------------------|------------------------------------|
| 1. <i>Dama acapulcensis</i> (Caton). | 15. <i>Dama leucura</i> (Doug.). |
| 2. " <i>cerrosensis</i> (Merriam). | 16. " lichtensteini , nom. |
| 3. " <i>columbiana</i> (Rich.). | nov. ¹ |
| 4. " <i>c. schaphiotus</i> (Merr.). | 17. " <i>nelsoni</i> (Merr.). |
| 5. " <i>c. sitkensis</i> (Merr.). | 18. " <i>thomasi</i> (Merr.). |
| 6. " <i>costaricensis</i> (Miller). | 19. " <i>tolteca</i> (Sauss.). |
| 7. " <i>couesi</i> (C. and Y.). | 20. " <i>truei</i> (Merr.). |
| 8. " <i>crooki</i> (Mearns). | 21. " <i>virginiana</i> Zimm. |
| 9. " <i>hemionus</i> (Raf.). | 22. " <i>v. borealis</i> (Miller). |
| 10. " <i>h. californica</i> (Caton). | 23. " <i>v. louisianæ</i> (G. M. |
| 11. " <i>h. cana</i> (Merr.). | Allen). |
| 12. " <i>h. eremica</i> (Mearns). | 24. " <i>v. macroura</i> (Raf.). |
| 13. " <i>h. peninsulæ</i> (Lyd.). | 25. " <i>v. osceola</i> (Bangs). |
| 14. " <i>h. virgulta</i> (Hallock). | 26. " <i>v. texensis</i> (Mearns). |

In this connection the use of the name *Capreolus*, in a generic sense, for *Cervus mexicanus* Gmelin et auct., also requires mention, as there is no doubt of its pertinence to the *Odocoileus* group. As, however, it occurs one page later than *Dama* in Zimmermann's work, it must give place to *Dama*, although suggested as a preferable substitute for *Cervus* for Pennant's Mexican Deer. It is also untenable on account of its exclusive relation to an unidentifiable and therefore invalid species. (See footnote to p. 16.)

PILORIS, OR THE RAT MUSQUÉ OF ROCHFERT.

As noted at the beginning of this article, Mr. Forsyth Major has ascribed the name "*Castor piloris*" to Zimmer-

¹ = *Cervus mexicanus* Lichtenstein, but not *Cervus mexicanus* of Zimmermann nor Gmelin. Lichtenstein's name being preoccupied, his *Cervus mexicanus* may be called *Dama lichtensteini*.

mann. That Zimmermann did not name the animal *Castor piloris*, but simply called it "Piloris," in a non-technical sense, is evident from his index where it is entered as Piloris, and not as *Castor piloris*, and from his general method of using names in Cap. III of the 'Zoologiæ Geographica.' Besides, in the 'Geographische Geschichte' (II, p. 360) he refers the Rat musqué of Rochefort to *Mus pilorides* Pallas. If the name *Mus pilorides* given to this animal by Desmarest in 1826 is preoccupied by *Mus pilorides* Pallas, 1786, as seems to be the case, the proper name of the Rat musqué, or Piloris, will be *Mus desmaresti* of Fischer, 1829, = *Megalomys desmaresti* (Fischer), or *Oryzomys desmaresti* (Fischer) for those who believe, with Mr. Forsyth Major, that *Megalomys* is not separable from *Oryzomys*.

II. THE 'GEOGRAPHISCHE GESCHICHTE.'

During the interval of three years between the publication of the 'Zoologiæ Geographica' and Vol. II of the 'Geographische Geschichte' quite a number of new mammals were indicated in the works of travellers and other non-technical writers to which Zimmermann gave names in his later work. It is also to be noted that he displayed superior astuteness over Erxleben in separating several species not recognized by the latter. His discrimination is further evinced through his treatment of many forms as "Unbestimmtere Arten," which he merely enumerated without either naming or giving them numbers.

The species newly named or renamed in the present work (all in Vol. II except the last) appear to be the following, in the order of their position in the work. Those at present recognized in nomenclature are indicated by heavy type.

Bos moschatus (Vol. II, p. 86) = *Ovibos moschatus* (Zimm.).

Cervus muntjak (p. 131) = *Cervulus muntjak* (Zimm.).

Tapir anta (p. 154) = *Hippopotamus terrestris* Linn. = *Tapirus terrestris* (Linn.).

Simia madarogaster (p. 176) = *Simia maimon* Linn.

Papio æthiops (p. 180) = ?; not *Simia æthiops* Linn.

Cercopithecus kephalopterus (p. 185) = *Semnopithecus cephalopterus* (Zimm.) auct.

Cercopithecus mulatta (p. 195) = ?

Simia porcaria (p. 197) = ?; probably not *Simia porcaria Hasselquist*, 1762.

Cebus polykomos (II, p. 202, III, p. 272) = *Colobus polykomos* (Zimm.); the name is usually ascribed to "Schreber" or Illiger.

Lemur lori (p. 211) = *Nycticebus tardigradus* (Linn.).

Didelphis karkinophaga (p. 226).

Didelphis kenguru (p. 231) = *Yerboa gigantea* Zimm., 1777 = *Macropus giganteus* (Zimm.) auct.

Canis zerda (p. 247) = *Fennecus zerda* (Zimm.).

Viverra manguste (p. 286) = *Viverra ichneumon* Linn.

Latra [misprint for *Lutra*] **minima** (p. 317) = *Chironectes minima* (Zimm.).

Cavia patagonum (p. 328) = *Cavia patagonica* Shaw, 1801 = *Dolichotis patagona* (Zimm.).

Sciurus inauris (p. 344) = *Myoxus inauris* Zimmermann, III, 1783, 275, based on Earless Dormouse, Pennant, II, p. 426 = ? *Myoxus africanus* Shaw, 1801 = ? *Myoxus capensis* F. Cuvier, 1829.

Myoxus chrysurus (p. 352) = *Loncheres chrysurus* (Zimm.) = *Echimys cristatus* Desm., 1817.

Dipus hudsonius (p. 358) = *Zapus hudsonius* (Zimm.).

Sorex minutissimus (p. 385) = *Sorex minimus* Linn.

Sorex surinamensis (p. 386) = *Surinamische Spitzmaus* of Schreber = *Sorex surinamensis* Gmelin, 1788 = *Peramys breviceaudatus* (Erxl.).

Erinaceus tendrac (p. 393) = *Ericulus setosus* (Schreber, 1778), plate name.

Erinaceus tanrec (p. 394) = *Centetes ecaudatus* (Schreber, 1778), plate name.

Manati gigas (p. 426) = *Rhytina gigas* (Zimm.). The generic name *Manati* is of even date with *Manatus* Storr.

Antilope marsupialis (p. 427) = *Antilope euchore* Zimmermann (ex Forster MS.), Geog. Gesch. III, 1783, 269 = *Antidorcas marsupialis* (Zimm.). As the authors of 'The Book of Antelopes' (Vol. III, 1897-98, p. 58) freely admit, the name *marsupialis* has three years' priority over *euchore*, however unfortunate the fact.

Phoca fasciata (III, 1783, p. 277) = *Histiophoca fasciata* (Zimm.).

Of Zimmermann's 26 new names 12 are in current use, and one other clearly has priority; of the remaining 13, three are not readily identifiable, and the remaining 10 are synonyms of earlier names given by Linnæus, Schreber, and Erxleben. Thus 23 of Zimmermann's 26 new names are identifiable—a pretty favorable commentary on the character of his work and standing as a naturalist.