1886. Beddard, Report on the Isopoda, collected by H. M. S. Challenger.
1897. Benedict, Arcturidae in the U. S. National Museum. Proceedings of the Biological Soc. Washington.
1899. Richardson, Isopods of Pacific coast of N. America. Proceedings of the U. S. National Museum. XXI.
1902. Hodgson, Crustacea, Report on the collections of Natural History made in the antarctic regions during the voyage of the »Southern Cross«.

7. The type-species of certain genera of parasitic Flagellates, particularly Grassi's genera of 1879 and 1881.

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eingeg. 21. August 1902.

In a recent study of the literature of the parasitic flagellates of man and animale, considerable difficulty was experienced in following the generic synonymy because authors had failed to designate types for the new genera they proposed. Two papers in particular presented confusion, namely, Grassi's important publications of 1879 and 1881. In order to have a definite basis for certain species with which I was dealing, it became necessary to establish types for the genera in question, and the results are herewith published.

The type-species of *Cimaenomonas*, 1881.

Grassi (1881, p. 141, 154—160) proposed this genus with the diagnosis: "Con un flagello quasi costantemente rivolto all' indietro ed agitantesi sulla superficie del corpo, in modo di far nascere l'idea di un orlo ondeggiante, o d'una serie di ciglia vibratili." While he mentions several forms as belonging here, he gives only one, namely, *C. batrachorum* (Perty), as a binomial. This species should be taken as type, as it is clear that he had this form particularly in mind. His figures clearly show that he was dealing with either a *Tricomonas* Donné, 1837 or a *Trichomastix* Blochmann, 1884. Blochmann has placed this parasite in the genus *Tricomonas* where it is retained by Doflein, 1901. Bütschli (1884) also takes *Cimaenomonas* as a synonym of *Tricomonas*, and authors generally look upon *Tricomonas batrachorum* Perty as a *Tricomonas* (see Stein's, 1878, figures).

The type-species of *Dicercomonas* and *Monomorphus*, 1879.

Grassi (1879, p. 446, 448) proposed the genus *Dicercomonas*, 1879. [not Diesing 1856], with the diagnosis "a coda bifida" and divided the group into two subgenera, as follows: *Monomorphus*, 1879, "si presenta sotto una sol forma"; only, hence type species, *M. ranarum*, with "*Hexamita ranarum* Duj." [= *Hexamita intestinalis* Dujardin] as

definite synonym, and with reference to Stein's (1878) figures. This species he retained in 1881 as *Dicercomonas intestinalis* (Dujardin).

Dimorphus Grassi, 1879 [not *Dimorphus* Haller, 1878, arachnoid; not *Dimorpha* Jur., 1807, hymenopteron; Gray, 1840, mollusks; Hodgs., 1841, birds], with *Dimorphus muris* as only, hence type species. This form he eliminated in 1881 as *Megastoma entericum* [= *Lamblia duodenalis*].

Thus, by the process of elimination, *Hexamita intestinalis* Dujardin becomes type of *Dicercomonas* in addition to serving as type for *Monomorphus*.

The type-species of *Megastoma*, 1881.

This genus is based upon *Dimorphus muris*, hence takes this species (= *Lamblia duodenalis*) as type.

The type-species of *Monocercomonas* Grassi, 1879.

Grassi (1879, p. 446—448) proposed the genus *Monocercomonas* with the subgenera: *Monocercomonas*, *Trichomonas*, *Retortamonas*, and *Schedoacercomonas*, not designating a type and not including in his list of species any previously designated type-species. It is thus clear that the type of *Monocercomonas* can best be determined by selecting one of the species of the subgenus *Monocercomonas*. These species are:

1) *Monocercomonas hominis*. Grassi's figures in 1881 show that he had *Tricomonas confusa* Stiles (*Trichomonas intestinalis* Leuckart (name not available]) in mind.
2) *Monocercomonas caviae*. *Trichomonas caviae* Davaine is given as a doubtful synonym, but in 1881 Grassi refers to his own observations, together with *Trichomonas caviae*, under the genus *Cimaenomonas* = *Tricomonas*.
3) *Monocercomonas coronellae*, with *Cercomonas colubrorum* as a doubtful synonym. *M. coronellae* and *M. hominis* are the only original species of *Monocercomonas* which he retains in this genus in 1881.
4) *Monocercomonas anatis*, to which he refers in 1881 as a *Cimaenomonas* = *Tricomonas*.
5) *Monocercomonas batrachorum*, with he transferred in 1881 to the genus *Cimaenomonas*, giving *Trichomonas batrachorum* Perty as definite synonym = *Tricomonas*.
6) *Monocercomonas muris*, to which he refers in 1881 as a *Cimaenomonas* = *Tricomonas*.
7) *Monocercomonas lacertae viridis*, to which he refers in 1881 as *Heteromita lacertae*.

Thus, five species were eliminated by Grassi in 1881, leaving

only *M. hominis* and *M. coronellae*. The former is a *Tricomonas*, to which genus it has been transferred by several authors. This leaves *M. coronellae* as type of *Monocercomonas*.

This ruling by elimination agrees with the action taken by Doflein (1901) in placing this species in *Monocercomonas*.

The type-species of *Monomita*, 1881.

This genus is based upon *Cercomonas muscae-domesticae* Stein, which Kent (1880) took as type of the genus *Herpetomonas* 1880.

The type-species of *Retortamonas*, 1879, and *Plagiomonas*, 1881.

A number of recent authors retain Grassi's (1881) genus *Plagiomonas*, which he based upon the single (hence type) species *P. gryllotalpae*, and to which he gave the diagnosis "In forma di una sorta; estremità posteriore affilata e semplice", while his figures in 1881 show that the anterior extremity possesses two flagella, similar to the condition found in *Bodo*. Doflein (1901) in fact, transfers the species to *Bodo*.

The generic name *Plagiomonas* is not valid, even if the genus is recognized as distinct, for Grassi in 1879 proposed the genus *Retortamonas* with thiss ame species (*gryllotalpae*) as only, hence type, species.

The type-species of *Schedoacercomonas* Grassi, 1879.

Grassi (1879, p. 446, 448) originally placed here the following species:

1) *Schedoacercomonas gryllotalpae*, which he transferred in 1881 to *Monocercomonas* as *M. insectorum*.
2) *Schedoacercomonas melolonthae*, which he transferred in 1881 to *Monocercomonas* as *M. insectorum*.
3) *Schedoacercomonas caviae*, of which I have failed to find a later mention.
4) *Schedoacercomonas muscae-domesticae*, with *Cercomonas muscae-domesticae* as definite synonym. Kent (1880) made this species type of *Herpetomonas*, and Grassi based upon it the genus *Monomita*, 1881.

Thus, *S. caviae* remains type by elimination, and unfortunately Grassi gave no specific characters for this form. *Schedoacercomonas* therefore rests simply upon the short diagnosis "quasi senza coda", with type in the guinea pig, as indicated by the name *caviae*.

Types of other genera of parasitic flagellates.

In order to settle the question of type-species for certain other genera of parasitic flagellates, attention may be directed to the following:

Asthmatos Salisbury, 1875. Only original, hence, type species, *A. ciliaris* = *Homo sapiens.*

Bacterioidomonas Künstler, 1884. Type species, *B. sporifera.*

Bactroidomonas Künstler, 1884. Contracted form of *Bacterioidomonas* Künstler, hence takes same species as type.

Bodo Ehrenberg, 1832. Type in doubt. Perhaps *Bodo saltans.*

The designation of the type species of *Bodo* is attended with some difficulty. Ehrenberg (1832, p. 38) gives *Bodo* as a new genus, without a distinct diagnosis, but under the headings "*Monadina*" "b) *caudata*", as follows: "*Bodo*, nov. gen., *Monas punctum* Gleichen, 4 species". He further mentions (p. 54) *Bodo* as one of the new genera, »als Frucht dieser Reise«, and states that the same or congeneric species were found in Berlin; then (p. 62) he gives

"*Bodo didymus*, n. g. Catharinenburg . . 1/800—5/600'''
- *viridis*, al. sp. Smeinogorsk . . . . . 1/500'''
- *vorticellaris*, al. sp. Catharinenburg. . . . 1/100''';"

further (p. 67) "*Bodo viridis*, nov. gen.", and (p. 69) "*Bodo didymus*, n. g., *Bodo vorticellaris* al. sp.".

In a second paper Ehrenberg (1832, p. 65) defines *Bodo* as follows: »Körper rund oder länglich, wie Monaden, aber geschwänzt; ohne Augen«. Five species are mentioned and described, namely, *B. vorticellaris* (in Siberia), *B. didymus* (in Siberia), *B. saltans* (in Berlin), *B. viridis* (in Siberia) and *B. socialis* (in Berlin and in Detershagen in Mecklenburg).

Later, Ehrenberg (1838) states that the genus was proposed in 1830 [not published until 1832] for four species, and that in 1831 [not published until 1832] a fifth species *B. socialis* was added, while in his bibliographic references he mentions only three species (*B. vorticellaris*, *B. didymus* and *B. viridis*) for 1830. It would appear therefore that *B. saltans* was the fourth species he had in mind in 1830. Gleichen's *Monas punctum* is not accessible to me, but as Ehrenberg refers to this form in 1832, it is possible that this is what he named *Bodo saltans* in his second paper. In 1838, he adds the species *B. grandis*, *B. intestinalis* and *B. ranarum.*

Diesing (1850, p. 44) proposed the subgenus *Eubodo* to contain Ehrenberg's species *Bodo vorticellaris*, *B. didymus*, *B. saltans* and *B. viridis* and referred *B. intestinalis* and *B. ranarum* to the subgenus *Bodo* (*Cercomonas*). Stein (1878, pl. 2) includes in *Bodo*, *B. saltans* Ehrenberg and several other organisms of later date, but he does not designate a type. Kent (1880) places *Bodo saltans* in the genus *Diplomastix* and takes *Bodo intestinalis* as type of the genus *Bodo*, which

he places near *Cercomonas*. *B. intestinalis* 1838 can not, of course, be taken as type of *Bodo* 1832.

Bütschli (1884) states that there are five or six species in this genus; he figures three species, none of them Ehrenberg's originals, and fails to designate a type. Ludwig (1886) mentions only *Bodo caudatus* (Dujardin), but this is not an original species, hence can not hold as type.

Under these circumstances, especially since I can not obtain Gleichen's reference to *Monas punctum*, the determination of the type is attended with uncertainly. If *Monas punctum* is identical with *Bodo saltans*, I should be inclined to take that as type, especially in view of Stein's (1878) work.

Cercomonas Dujardin, 1841. Nine original species. No author appears to have designated a type until Kent (1880) proposed *C. typicus*, 1880, as such. This designation is clearly inadmissible, as Kent's species was not contained in the original genus. From the work of Stein (1878) and Bütschli (1884) it is probable that either *C. longicauda* or *C. crassicauda* should serve as type. Possibly Ludwig's (1886) work could be interpreted as a selection of *C. crassicauda*.

Ciliaris Salisbury, 1868. Only original, hence type, species, *C. bicaudalis*.

Costia Leclerq, 1890. Only original, hence type, species, *C. necator* (Henneguy).

Cryptobia Leidy, 1846. Only original, hence type, species, *C. helicis*.

Cryptoicus Leidy, 1847. *Cryptobia*, 1846, renamed, hence takes same type as *Cryptobia*.

Cystomonas R. Blanchard, 1885. Type species, "*Bodo urinarius* Künstler, 1893".

Dimorpha Senn, 1901 [not Jur., 1807, hymenopteron; not Gray, 1840, mollusk; not Hodgs., 1841, bird]. For *Dimorphus* Grassi, hence, type, *Dimorphus muris*.

Haematomonas Mitrophanow, 1883. Two original species. *H. cobitis* here designated as type.

Hemotomonas Blanchard, 1888, for *Haematomonas*. H ce type species, *Haematomonas cobitis*.

Herpetomonas Kent, 1880. *H. muscae-domesticae* (Stein, 1878) designated by Kent as type.

Hexamita Dujardin, 1841. Three original species. Type, *H. inflata*.

Hexamitus Bütschli, 1884. For *Hexamita* Dujardin, 1841, hence, type, *H. inflata.*

Isomita Diesing, 1850. Type, probably *Monas Dunalii.*

Lamblia R. Blanchard, 1888. Type *L. intestinalis* = *L. duodenalis.*

Megastoma Schneidemühl, 1898. Misprint for *Megastoma* Grassi, 1881, hence type, *M. entericum* = *Lamblia duodenalis.*

Monas Müller, 1773. Three original species: *M. termo* and *M. lens* eliminated by Diesing, 1850, to *Monas* (*Mastichemonas*), and *M. mica* placed by Diesing, 1850, in the typical subgenus *Monas* (*Eumonas*). Accordingly, unless some author earlier than 1850 has made some other disposition, it appears that *M. mica* must be taken as the type by elimination.

Both Kent (1880) and Bütschli (1884) appear to have overlooked this fact. Kent (1880, p. 233—234) inferentially designated *Monas Dallingeri* Kent, 1880, as type of *Monas*; he transferred *M. termo* to *Oikomonas* and *M. lens* to *Heteromita.*

Monadacomonas R. Leuckart, 1886. Probably a lapsus for *Monocercomonas.*

Ovomonas Hartwig, 1901. Only, hence type, species, *O. flagellatum coli.*

Paramecioides Grassi, 1881. Only, hence type, species, *P. costatum* = *Trypanosoma rotatorium.*

Paramecioides Laveran & Mesnil, 1901, for *Paramecioides.* Takes *Paramecioides costatum* as type.

Polymastix Bütschli, 1884. Only original, hence type, species, *P. melolonthae* (Grassi, 1881).

Saenolophus Leuckart, 1863. Only original, hence type species, *S. Eberthi* (Leuckart, 1864).

Trichomas Neumann, 1892. Misprint for *Trichomonas* 1838, hence, type species *Trichomonas vaginalis.*

Trichomastix Blochmann, 1884 (not Vollenhoven, 1878, hymenopteron). Only original, hence type species, *T. lacertae.*

Trichomastyx Railliet, 1893. For *Trichomastix* Blochmann, 1884, hence type, *T. lacertae.*

Trichomonas Ehrenberg, 1838. For *Tricomonas*, 1837, hence type, *T. vaginalis.*

Trichomonus Veterinarian, Lond., 1899. For *Trichomonas*, 1838, hence type, *T. vaginalis.*

Tricomonas Donné, 1837. Only original, hence type species, *T. vaginalis.*

Tripanosoma Lanessan, 1882, for *Trypanosoma.* Takes *Trypanosoma rotatorium* as type.

Triponomonas Balbiani, 1888, a confusion between *Trypanomonas* and *Trichomonas*, takes same type as *Trypanomonas* (*Trypanomonas cobitis*).

Tryanosoma Doflein, 1901, misprint for *Trypanosoma*. Takes *Trypanosoma rotatorium* as type.

Trypanomonas Danilewsky, 1885. Contains type of an older genus, *Trypanomonas ranarum* = *Trypanosoma rotatorium*, hence takes this same species as type.

Trypanosoma Gruby, 1843. Only original, hence type, species, *Trypanosoma sanguinis* = *Try. rotatorium*.

Trypanosome Buffard & Schneider, 1900, for *Trypanosoma*. Takes *Trypanosoma rotatorium* as type.

Trypanosomes Laveran, 1895, for *Trypanosoma*. Takes *Trypanosoma rotatorium* as type.

Trypanosomum Chauvrat, 1896, for *Trypanosoma*. Takes *Trypanosoma rotatorium* as type.

Undulina Lankester, 1871. Only original (hence type) species, *U. ranarum* = *Trypanosoma rotatorium*.

II. Mittheilungen aus Museen, Instituten etc.

1. Erste Versammlung nordischer Naturforscher und Ärzte in Helsingfors 7.—12. Juli 1902.

eingeg. 24. Juli 1902.

Section VI. Zoologie.

Montag den 7. Juli. Herr Prof. J. A. Palmén (Helsingfors) begrüßte die Mitglieder der Section. Als Schriftführer wurden gewählt: für Skandinavien Dr. L. A. Jägerskiöld (Upsala), für Rußland Dr. G. Koschewnikow (Moskau), für Finland Mag. A. Luther (Helsingfors).

Dienstag den 8. Juli. Vorsitzender Herr Dr. V. Bianchi (St. Petersburg). Vorträge der Herren Dr. L. Ribbing (Stockholm) über die Homodynamie der Extremitäten bei höheren Vertebraten, Dr. Erik Nordenskiöld (Helsingfors), Demonstration eines im Besitz des Entomologischen Museums in Helsingfors befindlichen, reich illustrierten Manuscripts über die Acariden, welches im Anfang des vorigen Jahrhunderts von dem Gutsbesitzer Frans Diedrik Wasastjerna verfaßt ist, Cand. mag. C. With (Kopenhagen) über eine interessante Acaride, Prof. O. M. Reuter (Helsingfors) über die Gesetzmäßigkeit im Abändern der Zeichnungen bei Hemipteren und ihre Bedeutung für die Systematik.

Mittwoch den 9. Juli. Vorsitzender Herr Prof. W. Leche (Stockholm). Vorträge der Herren Dr. L. A. Jägerskiöld (Upsala) über das Excretionsorgan der Nematoden und Dr. K. M. Levander (Helsingfors) über die Zusammensetzung des Zooplanktons im Finnischen Meerbusen.