



**British Museum (Natural History).**

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"Catalogue of Fresh-water Fishes of  
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paper.*



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Fishes

June 20

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CATALOGUE

OF THE

FRESH-WATER FISHES OF AFRICA

IN THE

BRITISH MUSEUM

(NATURAL HISTORY).

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VOLUME I.

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BY

GEORGE ALBERT BOULENGER, F.R.S.

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## PREFACE.

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THE scope of the present work, which will probably consist of three volumes, is sufficiently indicated by the Author's Introduction. The first volume contains an account of the Selachii, Crossopterygii, and Dipneusti, which together comprise but a small fraction of the total number of species; and of the Teleostean Suborder Malacopterygii and part of the Ostariophysii. The first of these Suborders includes the Mormyridæ as its most important constituent so far as the African fresh-water Fauna is concerned, while the second contains the large Families Characinidæ, Cyprinidæ, and Siluridæ.

The greater part of the Cyprinidæ, as well as the whole of the Siluridæ, will be dealt with in Volume II.

The explorations of the Congo by the Government of the late Congo Free State and the Nile by the Egyptian Government, the ichthyological results of which have been worked out by the author of this Catalogue, have resulted in a large addition to the number of fresh-water fishes known to occur in the respective districts. To the action taken by the two Governments, and to the labours of the individuals who have been concerned in the collection and preservation of the specimens referred to, the possibility of preparing this Catalogue has been mainly due.

SIDNEY F. HARMER,  
*Keeper of Zoology.*

BRITISH MUSEUM (NATURAL HISTORY),  
LONDON.  
March, 1909.





## INTRODUCTION.

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THE past decade has been productive of an enormous increase in our knowledge of the Fresh-water Fishes of Africa. The explorations of the Congo and the Nile, undertaken at considerable expense by the Governments of the late Congo Free State and of Egypt, and of the great lakes of Central Africa, initiated in this country, have resulted in the discovery and description of an unexpectedly large number of generic and specific forms, types of most of which are deposited in the Natural History Museum.

At the same time, concurrently with the study of the many thousands of specimens collected on the above-mentioned surveys, every effort was made to increase our acquaintance with the fishes of other parts of Africa, with results which are sufficiently apparent from the present Catalogue, intended to form three volumes, which, it is hoped, will afford a sound basis for the discussion of problems of distribution. Much remains to be done, however, in many parts of Africa; and no better incentive could be given to further progress on the part of collectors, as well as of students at home, than the compilation of such a simple handbook, containing a complete list of the specimens preserved in this great ichthyological collection, together with concise descriptions of and keys to the genera and species and text-figures of most of the latter.

The greater number of these figures are reproduced, by permission, from the 'Annales du Musée du Congo,' the 'Fishes of the Nile,' the 'Transactions' and 'Proceedings' of the Zoological Society of London, and the 'Annals and Magazine of Natural History,' in which works the new species were described by Dr. Günther and by myself. Other figures are reproduced from the publications of Drs. Peters, Steindachner,

Gray, Ayres, Day, Sauvage, and Pellegrin. In most cases when no figures had been given, or when the figures were unsatisfactory, original drawings have been prepared by Mr. J. Green and Mr. A. H. Searle. Whenever a figure is reproduced from a previous publication, the source has been indicated. The initials A. M. C. refer to the quarto plates of the 'Annales du Musée du Congo,' F. N. to those of the 'Fishes of the Nile.'

In making use of the descriptions and keys as drawn up in this work, it should be borne in mind that the fins are not included in the total length or greatest depth, whilst in the indication of the total length of the largest specimen examined, which follows the description of every species, the fish is measured from the end of the snout to the extremity of the middle rays of the caudal fin; by depth of the caudal peduncle, *i. e.* the free part of the caudal part of the body between the bases of the dorsal or anal and caudal fins, is meant the least depth, whilst the length is that of the muscular part only, the root of the caudal rays being usually covered with scales. By length of the dorsal and anal fins is meant the basal length. The abbreviations used in the fin and scale formulæ are too well known to all who work at fishes to need explanation here; I will only observe that when both Roman and Arabic numerals are used to denote the number of dorsal or anal rays, the former refer to the simple or to the spinous rays, and the latter to the soft, branched rays, the last of which is usually cleft to the base, and that the interpolation of a comma between the numerals indicates discontinuity in the fins.

G. A. BOULENGER.

ZOOLOGICAL DEPARTMENT,  
25th February, 1909.

# SYSTEMATIC INDEX.

| <p>Subclass <b>SELACHII.</b></p> <p>Ord. I. PLAGIOSTOMI.</p> <p>Subord. I. PLEUROTREMI.</p> <p style="padding-left: 20px;">Fam. 1. CARCHARIIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: right; font-weight: normal;">Page</th> </tr> </thead> <tbody> <tr> <td>1. <i>Carcharias, Cuv.</i> . . . . .</td> <td style="text-align: right;">2</td> </tr> <tr> <td>    1. <i>zambesensis, Peters</i> . . . . .</td> <td style="text-align: right;">2</td> </tr> </tbody> </table> <p>Subord. II. HYPOTREMI.</p> <p style="padding-left: 20px;">Fam. 1. PRISTIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 80%;">1. <i>Pristis, Lath.</i> . . . . .</td> <td style="text-align: right;">3</td> </tr> <tr> <td>    1. <i>perroteti, M. &amp; H.</i> . . . . .</td> <td style="text-align: right;">3</td> </tr> </tbody> </table> <p>Subclass <b>TELEOSTOMI.</b></p> <p>Ord. I. CROSSOPTERYGII.</p> <p>Subord. I. CLADISTIA.</p> <p style="padding-left: 20px;">Fam. 1. POLYPTERIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 80%;">1. <i>Polypterus, Geoffr.</i> . . . . .</td> <td style="text-align: right;">5</td> </tr> <tr> <td>    1. <i>bichir, Geoffr.</i> . . . . .</td> <td style="text-align: right;">6</td> </tr> <tr> <td>    2. <i>lapradii, Sldr.</i> . . . . .</td> <td style="text-align: right;">7</td> </tr> <tr> <td>    3. <i>congicus, Blgr.</i> . . . . .</td> <td style="text-align: right;">9</td> </tr> <tr> <td>    4. <i>endlicheri, Heck.</i> . . . . .</td> <td style="text-align: right;">10</td> </tr> <tr> <td>    5. <i>weeksii, Blgr.</i> . . . . .</td> <td style="text-align: right;">11</td> </tr> <tr> <td>    6. <i>ornatipinnis, Blgr.</i> . . . . .</td> <td style="text-align: right;">12</td> </tr> <tr> <td>    7. <i>delhezi, Blgr.</i> . . . . .</td> <td style="text-align: right;">13</td> </tr> <tr> <td>    8. <i>senegalus, Cuv.</i> . . . . .</td> <td style="text-align: right;">14</td> </tr> <tr> <td>    9. <i>palmas, Ayres.</i> . . . . .</td> <td style="text-align: right;">16</td> </tr> <tr> <td>    10. <i>retropinnis, Vaill.</i> . . . . .</td> <td style="text-align: right;">17</td> </tr> <tr> <td>2. <i>Calamichthys, J. A. Smith</i> . . . . .</td> <td style="text-align: right;">17</td> </tr> <tr> <td>    1. <i>calabaricus, J. A. Smith</i> . . . . .</td> <td style="text-align: right;">18</td> </tr> </tbody> </table> |      | Page | 1. <i>Carcharias, Cuv.</i> . . . . . | 2 | 1. <i>zambesensis, Peters</i> . . . . . | 2 | 1. <i>Pristis, Lath.</i> . . . . . | 3 | 1. <i>perroteti, M. &amp; H.</i> . . . . . | 3 | 1. <i>Polypterus, Geoffr.</i> . . . . . | 5 | 1. <i>bichir, Geoffr.</i> . . . . . | 6 | 2. <i>lapradii, Sldr.</i> . . . . . | 7 | 3. <i>congicus, Blgr.</i> . . . . . | 9 | 4. <i>endlicheri, Heck.</i> . . . . . | 10 | 5. <i>weeksii, Blgr.</i> . . . . . | 11 | 6. <i>ornatipinnis, Blgr.</i> . . . . . | 12 | 7. <i>delhezi, Blgr.</i> . . . . . | 13 | 8. <i>senegalus, Cuv.</i> . . . . . | 14 | 9. <i>palmas, Ayres.</i> . . . . . | 16 | 10. <i>retropinnis, Vaill.</i> . . . . . | 17 | 2. <i>Calamichthys, J. A. Smith</i> . . . . . | 17 | 1. <i>calabaricus, J. A. Smith</i> . . . . . | 18 | <p>Ord. II. DIPNEUSTI.</p> <p>Fam. 1. LEPIDOSIRENIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: right; font-weight: normal;">Page</th> </tr> </thead> <tbody> <tr> <td>1. <i>Protopterus, Owen</i> . . . . .</td> <td style="text-align: right;">19</td> </tr> <tr> <td>    1. <i>annectens, Owen</i> . . . . .</td> <td style="text-align: right;">20</td> </tr> <tr> <td>    2. <i>æthiopicus, Heck.</i> . . . . .</td> <td style="text-align: right;">21</td> </tr> <tr> <td>    3. <i>dolloi, Blgr.</i> . . . . .</td> <td style="text-align: right;">22</td> </tr> </tbody> </table> <p>Ord. III. TELEOSTEI.</p> <p>Subord. I. MALACOPTERYGII.</p> <p style="padding-left: 20px;">Fam. 1. ELOPIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 80%;">1. <i>Elops, L.</i> . . . . .</td> <td style="text-align: right;">25</td> </tr> <tr> <td>    1. <i>saurus, L.</i> . . . . .</td> <td style="text-align: right;">25</td> </tr> <tr> <td>    2. <i>lacerta, C. &amp; V.</i> . . . . .</td> <td style="text-align: right;">26</td> </tr> <tr> <td>2. <i>Megalops, Lacep.</i> . . . . .</td> <td style="text-align: right;">27</td> </tr> <tr> <td>    1. <i>cyprinoides, Bröuss.</i> . . . . .</td> <td style="text-align: right;">28</td> </tr> </tbody> </table> <p style="padding-left: 20px;">Fam. 2. MORMYRIDÆ.</p> <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 80%;">1. <i>Mormyrops, J. Müll.</i> . . . . .</td> <td style="text-align: right;">30</td> </tr> <tr> <td>    1. <i>deliciosus, Leach.</i> . . . . .</td> <td style="text-align: right;">32</td> </tr> <tr> <td>    2. <i>anguilloides, L.</i> . . . . .</td> <td style="text-align: right;">34</td> </tr> <tr> <td>    3. <i>longiceps, Gthr.</i> . . . . .</td> <td style="text-align: right;">35</td> </tr> <tr> <td>    4. <i>breviceps, Sldr.</i> . . . . .</td> <td style="text-align: right;">36</td> </tr> <tr> <td>    5. <i>engystoma, Blgr.</i> . . . . .</td> <td style="text-align: right;">36</td> </tr> <tr> <td>    6. <i>parvus, Blgr.</i> . . . . .</td> <td style="text-align: right;">37</td> </tr> <tr> <td>    7. <i>masuianus, Blgr.</i> . . . . .</td> <td style="text-align: right;">38</td> </tr> <tr> <td>    8. <i>sirenoides, Blgr.</i> . . . . .</td> <td style="text-align: right;">39</td> </tr> <tr> <td>    9. <i>zanclirostris, Gthr.</i> . . . . .</td> <td style="text-align: right;">40</td> </tr> <tr> <td>    10. <i>boulengeri, Pellegr.</i> . . . . .</td> <td style="text-align: right;">40</td> </tr> <tr> <td>    11. <i>curtus, Blgr.</i> . . . . .</td> <td style="text-align: right;">41</td> </tr> <tr> <td>    12. <i>lineolatus, Blgr.</i> . . . . .</td> <td style="text-align: right;">42</td> </tr> <tr> <td>    13. <i>nigricans, Blgr.</i> . . . . .</td> <td style="text-align: right;">43</td> </tr> </tbody> </table> |  | Page | 1. <i>Protopterus, Owen</i> . . . . . | 19 | 1. <i>annectens, Owen</i> . . . . . | 20 | 2. <i>æthiopicus, Heck.</i> . . . . . | 21 | 3. <i>dolloi, Blgr.</i> . . . . . | 22 | 1. <i>Elops, L.</i> . . . . . | 25 | 1. <i>saurus, L.</i> . . . . . | 25 | 2. <i>lacerta, C. &amp; V.</i> . . . . . | 26 | 2. <i>Megalops, Lacep.</i> . . . . . | 27 | 1. <i>cyprinoides, Bröuss.</i> . . . . . | 28 | 1. <i>Mormyrops, J. Müll.</i> . . . . . | 30 | 1. <i>deliciosus, Leach.</i> . . . . . | 32 | 2. <i>anguilloides, L.</i> . . . . . | 34 | 3. <i>longiceps, Gthr.</i> . . . . . | 35 | 4. <i>breviceps, Sldr.</i> . . . . . | 36 | 5. <i>engystoma, Blgr.</i> . . . . . | 36 | 6. <i>parvus, Blgr.</i> . . . . . | 37 | 7. <i>masuianus, Blgr.</i> . . . . . | 38 | 8. <i>sirenoides, Blgr.</i> . . . . . | 39 | 9. <i>zanclirostris, Gthr.</i> . . . . . | 40 | 10. <i>boulengeri, Pellegr.</i> . . . . . | 40 | 11. <i>curtus, Blgr.</i> . . . . . | 41 | 12. <i>lineolatus, Blgr.</i> . . . . . | 42 | 13. <i>nigricans, Blgr.</i> . . . . . | 43 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|--------------------------------------|---|-----------------------------------------|---|------------------------------------|---|--------------------------------------------|---|-----------------------------------------|---|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---------------------------------------|----|------------------------------------|----|-----------------------------------------|----|------------------------------------|----|-------------------------------------|----|------------------------------------|----|------------------------------------------|----|-----------------------------------------------|----|----------------------------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Page |      |                                      |   |                                         |   |                                    |   |                                            |   |                                         |   |                                     |   |                                     |   |                                     |   |                                       |    |                                    |    |                                         |    |            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                            |    |                                           |    |                                    |    |                                        |    |                                       |    |
| 1. <i>Carcharias, Cuv.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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                            |    |                                           |    |                                    |    |                                        |    |                                       |    |
| 1. <i>zambesensis, Peters</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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                            |    |                                           |    |                                    |    |                                        |    |                                       |    |
| 1. <i>Pristis, Lath.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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                            |    |                                           |    |                                    |    |                                        |    |                                       |    |
| 1. <i>perroteti, M. &amp; H.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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                            |    |                                           |    |                                    |    |                                        |    |                                       |    |
| 1. <i>Polypterus, Geoffr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 1. <i>bichir, Geoffr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 2. <i>lapradii, Sldr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 3. <i>congicus, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 4. <i>endlicheri, Heck.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 5. <i>weeksii, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 6. <i>ornatipinnis, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 7. <i>delhezi, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 8. <i>senegalus, Cuv.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 9. <i>palmas, Ayres.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 10. <i>retropinnis, Vaill.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 2. <i>Calamichthys, J. A. Smith</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 1. <i>calabaricus, J. A. 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| 1. <i>Protopterus, Owen</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 1. <i>annectens, Owen</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| 2. <i>æthiopicus, Heck.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 3. <i>dolloi, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 1. <i>Elops, L.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| 1. <i>saurus, L.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| 2. <i>lacerta, C. &amp; V.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 2. <i>Megalops, Lacep.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 1. <i>cyprinoides, Bröuss.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 1. <i>Mormyrops, J. Müll.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 1. <i>deliciosus, Leach.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 2. <i>anguilloides, L.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 3. <i>longiceps, Gthr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 4. <i>breviceps, Sldr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 5. <i>engystoma, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 6. <i>parvus, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 7. <i>masuianus, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 8. <i>sirenoides, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 9. <i>zanclirostris, Gthr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 10. <i>boulengeri, Pellegr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| 11. <i>curtus, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| 12. <i>lineolatus, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 13. <i>nigricans, Blgr.</i> . . . . .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 43   |      |                                      |   |                                         |   |                                    |   |                                            |   |                                         |   |                                     |   |                                     |   |                                     |   |                                       |    |                                    |    |                                         |    |                                    |    |                                     |    |                                    |    |                                          |    |                                               |    |                                              |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |      |                                       |    |                                     |    |                                       |    |                                   |    |                               |    |                                |    |                                          |    |                                      |    |                                          |    |                                         |    |                                        |    |                                      |    |                                      |    |                                      |    |                                      |    |                                   |    |                                      |    |                                       |    |                                          |    |                                           |    |                                    |    |                                        |    |                                       |    |

|                                            | Page |                                                | Page |
|--------------------------------------------|------|------------------------------------------------|------|
| 1. Mormyrops ( <i>con.</i> )               |      | 5. Stomatorhinus ( <i>con.</i> )               |      |
| 14. microstoma, <i>Blgr.</i> . . . . .     | 44   | 2. walkeri, <i>Gthr.</i> . . . . .             | 88   |
| 15. mariæ, <i>Schilth.</i> . . . . .       | 44   | 3. humilior, <i>Blgr.</i> . . . . .            | 89   |
| 16. attenuatus, <i>Blgr.</i> . . . . .     | 45   | 4. corneti, <i>Blgr.</i> . . . . .             | 90   |
| 17. furcidents, <i>Pellegr.</i> . . . . .  | 46   | 5. polylepis, <i>Blgr.</i> . . . . .           | 91   |
| 2. Petrocephalus, <i>Marcus.</i> . . . . . | 47   | 6. microps, <i>Blgr.</i> . . . . .             | 92   |
| 1. bane, <i>Lacep.</i> . . . . .           | 48   | 6. Myomyrus, <i>Blgr.</i> . . . . .            | 92   |
| 2. sauvagii, <i>Blgr.</i> . . . . .        | 49   | 1. macrodon, <i>Blgr.</i> . . . . .            | 93   |
| 3. ansorgii, <i>Blgr.</i> . . . . .        | 51   | 7. Gnathonemus, <i>Gill</i> . . . . .          | 94   |
| 4. ballayi, <i>Sauv.</i> . . . . .         | 52   | 1. moorii, <i>Gthr.</i> . . . . .              | 96   |
| 5. sinus, <i>Saw.</i> . . . . .            | 53   | 2. lambouri, <i>Pellegr.</i> . . . . .         | 97   |
| 6. bovei, <i>C. &amp; V.</i> . . . . .     | 54   | 3. schilthuisiæ, <i>Blgr.</i> . . . . .        | 98   |
| 7. keatingii, <i>Blgr.</i> . . . . .       | 55   | 4. petersii, <i>Gthr.</i> . . . . .            | 99   |
| 8. stuhlmanni, <i>Blgr.</i> . . . . .      | 56   | 5. longibarbis, <i>Hilg.</i> . . . . .         | 100  |
| 9. catostoma, <i>Gthr.</i> . . . . .       | 57   | 6. niger, <i>Gthr.</i> . . . . .               | 101  |
| 10. gliroides, <i>Vincig.</i> . . . . .    | 58   | 7. leopoldianus, <i>Blgr.</i> . . . . .        | 102  |
| 11. degeni, <i>Blgr.</i> . . . . .         | 58   | 8. friteli, <i>Pellegr.</i> . . . . .          | 103  |
| 3. Isichthys, <i>Gill</i> . . . . .        | 59   | 9. bentleyi, <i>Blgr.</i> . . . . .            | 103  |
| 1. henryi, <i>Gill</i> . . . . .           | 59   | 10. livingstonii, <i>Blgr.</i> . . . . .       | 104  |
| 4. Marcusenius, <i>Gill</i> . . . . .      | 60   | 11. bruyerii, <i>Pellegr.</i> . . . . .        | 105  |
| 1. nigripinnis, <i>Blgr.</i> . . . . .     | 63   | 12. montei, <i>Gthr.</i> . . . . .             | 105  |
| 2. pulverulentus, <i>Blgr.</i> . . . . .   | 63   | 13. mento, <i>Blgr.</i> . . . . .              | 106  |
| 3. marchii, <i>Saw.</i> . . . . .          | 64   | 14. stanleyanus, <i>Blgr.</i> . . . . .        | 107  |
| 4. kingsleyæ, <i>Gthr.</i> . . . . .       | 65   | 15. senegalensis, <i>Stdr.</i> . . . . .       | 108  |
| 5. sphecodes, <i>Saw.</i> . . . . .        | 66   | 16. angolensis, <i>Blgr.</i> . . . . .         | 109  |
| 6. brachistius, <i>Gill</i> . . . . .      | 67   | 17. cyprinoides, <i>L.</i> . . . . .           | 110  |
| 7. longianalis, <i>Blgr.</i> . . . . .     | 69   | 18. macrolepidotus, <i>Peters</i> . . . . .    | 112  |
| 8. lhuysii, <i>Stdr.</i> . . . . .         | 70   | 19. pictus, <i>Marcus.</i> . . . . .           | 113  |
| 9. adpersus, <i>Gthr.</i> . . . . .        | 70   | 20. gilli, <i>Blgr.</i> . . . . .              | 114  |
| 10. weeksii, <i>Blgr.</i> . . . . .        | 71   | 21. kutuensis, <i>Blgr.</i> . . . . .          | 115  |
| 11. batesii, <i>Blgr.</i> . . . . .        | 72   | 22. ussheri, <i>Gthr.</i> . . . . .            | 116  |
| 12. ansorgii, <i>Blgr.</i> . . . . .       | 73   | 23. greshoffi, <i>Schilth.</i> . . . . .       | 117  |
| 13. pauciradiatus, <i>Stdr.</i> . . . . .  | 74   | 24. abadii, <i>Blgr.</i> . . . . .             | 118  |
| 14. nigricans, <i>Blgr.</i> . . . . .      | 75   | 25. tamandua, <i>Gthr.</i> . . . . .           | 118  |
| 15. isidori, <i>C. &amp; V.</i> . . . . .  | 75   | 26. mirus, <i>Blgr.</i> . . . . .              | 119  |
| 16. castor, <i>Pappenh.</i> . . . . .      | 77   | 27. elephas, <i>Blgr.</i> . . . . .            | 120  |
| 17. harringtoni, <i>Blgr.</i> . . . . .    | 78   | 28. rhynchophorus, <i>Blgr.</i> . . . . .      | 121  |
| 18. tumifrons, <i>Blgr.</i> . . . . .      | 79   | 29. ibis, <i>Blgr.</i> . . . . .               | 122  |
| 19. plagiostomus, <i>Blgr.</i> . . . . .   | 80   | 30. curvirostris, <i>Blgr.</i> . . . . .       | 123  |
| 20. discorhynchus, <i>Peters</i> . . . . . | 81   | 31. numenius, <i>Blgr.</i> . . . . .           | 124  |
| 21. petherici, <i>Blgr.</i> . . . . .      | 82   | 8. Genyomyrus, <i>Blgr.</i> . . . . .          | 125  |
| 22. budgetti, <i>Blgr.</i> . . . . .       | 83   | 1. donnyi, <i>Blgr.</i> . . . . .              | 125  |
| 23. macrops, <i>Blgr.</i> . . . . .        | 84   | 9. Mormyrus, <i>L.</i> . . . . .               | 126  |
| 24. psittacus, <i>Blgr.</i> . . . . .      | 85   | 1. hasselquistii, <i>C. &amp; V.</i> . . . . . | 128  |
| 25. wilverthi, <i>Blgr.</i> . . . . .      | 86   | 2. anchiætæ, <i>Guim.</i> . . . . .            | 129  |
| 5. Stomatorhinus, <i>Blgr.</i> . . . . .   | 87   | 3. macrophthalmus, <i>Gthr.</i> . . . . .      | 130  |
| 1. puncticulatus, <i>Blgr.</i> . . . . .   | 88   | 4. ovis, <i>Blgr.</i> . . . . .                | 131  |

|                                         |      |
|-----------------------------------------|------|
| 9. Mormyrus ( <i>con.</i> )             | Page |
| 5. caballus, <i>Blgr.</i> .....         | 132  |
| 6. tapirus, <i>Pappenh.</i> .....       | 133  |
| 7. tenuirostris, <i>Peters</i> .....    | 134  |
| 8. kannume, <i>Forsk.</i> .....         | 134  |
| 9. caschive, <i>L.</i> .....            | 136  |
| 10. niloticus, <i>Bl.-Schn.</i> .....   | 137  |
| 11. bozasi, <i>Pellegr.</i> .....       | 138  |
| 12. longirostris, <i>Peters</i> .....   | 139  |
| 13. rume, <i>C. &amp; V.</i> .....      | 140  |
| 14. proboscirostris, <i>Blgr.</i> ..... | 141  |
| 10. Hyperopisus, <i>Gill</i> .....      | 142  |
| 1. bebe, <i>Lacep.</i> .....            | 142  |
| 11. Gymnarchus, <i>Cuv.</i> .....       | 144  |
| 1. niloticus, <i>Cuv.</i> .....         | 144  |

Fam. 3. NOTOPTERIDÆ.

|                                    |     |
|------------------------------------|-----|
| 1. Notopterus, <i>Lacep.</i> ..... | 146 |
| 1. afer, <i>Gthr.</i> .....        | 146 |
| 2. Xenomystus, <i>Gthr.</i> .....  | 147 |
| 1. nigri, <i>Gthr.</i> .....       | 147 |

Fam. 4. OSTEOGLOSSIDÆ.

|                                    |     |
|------------------------------------|-----|
| 1. Heterotis, <i>Ehrenb.</i> ..... | 149 |
| 1. niloticus, <i>Ehrenb.</i> ..... | 149 |

Fam. 5. PANTODONTIDÆ.

|                                   |     |
|-----------------------------------|-----|
| 1. Pantodon, <i>Peters</i> .....  | 151 |
| 1. buchholzi, <i>Peters</i> ..... | 151 |

Fam. 6. CLUPEIDÆ.

|                                      |     |
|--------------------------------------|-----|
| 1. Clupea, <i>L.</i> .....           | 153 |
| 1. finta, <i>Cuv.</i> .....          | 154 |
| 2. Pellonula, <i>Gthr.</i> .....     | 155 |
| 1. vorax, <i>Gthr.</i> .....         | 156 |
| 2. miodon, <i>Blgr.</i> .....        | 157 |
| 3. obtusirostris, <i>Blgr.</i> ..... | 158 |
| 4. acutirostris, <i>Blgr.</i> .....  | 159 |
| 3. Odaxothrissa, <i>Blgr.</i> .....  | 160 |
| 1. losera, <i>Blgr.</i> .....        | 160 |
| 4. Microthrissa, <i>Blgr.</i> .....  | 161 |
| 1. royauxi, <i>Blgr.</i> .....       | 161 |
| 5. Ilisha, <i>Gray</i> .....         | 162 |
| 1. indica, <i>Swains.</i> .....      | 163 |
| 6. Chanos, <i>Lacep.</i> .....       | 164 |
| 1. salmoneus, <i>Forst.</i> .....    | 164 |

|                             |      |
|-----------------------------|------|
|                             | Page |
| Fam. 7. SALMONIDÆ.          |      |
| 1. Salmo, <i>Art.</i> ..... | 166  |
| 1. trutta, <i>L.</i> .....  | 166  |

Fam. 8. PHRACTOLÆMIDÆ.

|                                     |     |
|-------------------------------------|-----|
| 1. Phractolæmus, <i>Blgr.</i> ..... | 168 |
| 1. ansorgii, <i>Blgr.</i> .....     | 168 |

Fam. 9. KNERIIDÆ.

|                                             |     |
|---------------------------------------------|-----|
| 1. Kneria, <i>Stdr.</i> .....               | 169 |
| 1. angolensis, <i>Stdr.</i> .....           | 170 |
| 2. spekii, <i>Gthr.</i> .....               | 171 |
| 3. cameronensis, <i>Blgr.</i> .....         | 171 |
| 2. Xenopomathichthys, <i>Pellegr.</i> ..... | 172 |
| 1. auriculatus, <i>Pellegr.</i> .....       | 172 |

Fam. 10. CROMERIIDÆ.

|                                 |     |
|---------------------------------|-----|
| 1. Cromeria, <i>Blgr.</i> ..... | 173 |
| 1. nilotica, <i>Blgr.</i> ..... | 173 |

Subord. II. OSTARIOPHYSI.

Fam. 1. CHARACINIDÆ.

|                                       |     |
|---------------------------------------|-----|
| 1. Sarcodaces, <i>Gthr.</i> .....     | 177 |
| 1. odoë, <i>Bl.</i> .....             | 177 |
| 2. Hydrocyon, <i>Cuv.</i> .....       | 179 |
| 1. forskalii, <i>Cuv.</i> .....       | 180 |
| 2. lineatus, <i>Blcr.</i> .....       | 182 |
| 3. vittiger, <i>Blgr.</i> .....       | 184 |
| 4. goliath, <i>Blgr.</i> .....        | 184 |
| 5. brevis, <i>Gthr.</i> .....         | 186 |
| 3. Bryconæthiops, <i>Gthr.</i> .....  | 187 |
| 1. microstoma, <i>Gthr.</i> .....     | 188 |
| 2. yseuxi, <i>Blgr.</i> .....         | 189 |
| 4. Alestes, <i>M. &amp; T.</i> .....  | 190 |
| 1. dentex, <i>L.</i> .....            | 193 |
| 2. baremose, <i>Joann.</i> .....      | 195 |
| 3. macrophthalmus, <i>Gthr.</i> ..... | 197 |
| 4. liebrechtsii, <i>Blgr.</i> .....   | 198 |
| 5. stuhlmanni, <i>Pfeff.</i> .....    | 199 |
| 6. sadleri, <i>Blgr.</i> .....        | 200 |
| 7. tholloni, <i>Pellegr.</i> .....    | 201 |
| 8. intermedius, <i>Blgr.</i> .....    | 201 |
| 9. longipinnis, <i>Stdr.</i> .....    | 202 |
| 10. chaperi, <i>Saw.</i> .....        | 203 |

- |                                                          | Page |                                                       | Page |
|----------------------------------------------------------|------|-------------------------------------------------------|------|
| 4. <i>Alestes</i> ( <i>con.</i> ).                       |      | 10. <i>Phago</i> ( <i>con.</i> ).                     |      |
| 11. <i>lateralis</i> , <i>Blgr.</i> . . . . .            | 204  | 2. <i>intermedius</i> , <i>Blgr.</i> . . . . .        | 247  |
| 12. <i>nurse</i> , <i>Rüpp.</i> . . . . .                | 205  | 3. <i>boulengeri</i> , <i>Schilth.</i> . . . . .      | 248  |
| 13. <i>affinis</i> , <i>Gthr.</i> . . . . .              | 208  | 11. <i>Neoborus</i> , <i>Blgr.</i> . . . . .          | 249  |
| 14. <i>imberi</i> , <i>Peters</i> . . . . .              | 209  | 1. <i>ornatus</i> , <i>Blgr.</i> . . . . .            | 250  |
| 15. <i>humilis</i> , <i>Blgr.</i> . . . . .              | 211  | 2. <i>quadri-lineatus</i> , <i>Pellegr.</i> . . . . . | 251  |
| 16. <i>kingsleyæ</i> , <i>Gthr.</i> . . . . .            | 212  | 12. <i>Ichthyoborus</i> , <i>Gthr.</i> . . . . .      | 251  |
| 17. <i>bimaculatus</i> , <i>Blgr.</i> . . . . .          | 213  | 1. <i>besse</i> , <i>Joann.</i> . . . . .             | 251  |
| 18. <i>tæniurus</i> , <i>Gthr.</i> . . . . .             | 214  | 13. <i>Hemistichodus</i> , <i>Pellegr.</i> . . . . .  | 253  |
| 19. <i>opisthotænia</i> , <i>Blgr.</i> . . . . .         | 215  | 1. <i>vailanti</i> , <i>Pellegr.</i> . . . . .        | 253  |
| 20. <i>poptæ</i> , <i>Pellegr.</i> . . . . .             | 216  | 14. <i>Nannæthiops</i> , <i>Gthr.</i> . . . . .       | 254  |
| 21. <i>macrolepidotus</i> , <i>C. &amp; V.</i> . . . . . | 217  | 1. <i>unitæniatus</i> , <i>Gthr.</i> . . . . .        | 254  |
| 22. <i>rhodopleura</i> , <i>Blgr.</i> . . . . .          | 218  | 15. <i>Neolebias</i> , <i>Stdr.</i> . . . . .         | 256  |
| 23. <i>grandisquamis</i> , <i>Blgr.</i> . . . . .        | 220  | 1. <i>unifasciatus</i> , <i>Stdr.</i> . . . . .       | 256  |
| 24. <i>batesii</i> , <i>Blgr.</i> . . . . .              | 221  | 2. <i>trilineatus</i> , <i>Blgr.</i> . . . . .        | 257  |
| 25. <i>brevis</i> , <i>Blgr.</i> . . . . .               | 222  | 16. <i>Distichodus</i> , <i>M. &amp; T.</i> . . . . . | 258  |
| 5. <i>Micralestes</i> , <i>Blgr.</i> . . . . .           | 223  | 1. <i>affinis</i> , <i>Gthr.</i> . . . . .            | 260  |
| 1. <i>acutidens</i> , <i>Peters</i> . . . . .            | 224  | 2. <i>altus</i> , <i>Blgr.</i> . . . . .              | 261  |
| 2. <i>stormsi</i> , <i>Blgr.</i> . . . . .               | 225  | 3. <i>noboli</i> , <i>Blgr.</i> . . . . .             | 262  |
| 3. <i>humilis</i> , <i>Blgr.</i> . . . . .               | 226  | 4. <i>notospilus</i> , <i>Gthr.</i> . . . . .         | 262  |
| 4. <i>holargyreus</i> , <i>Gthr.</i> . . . . .           | 227  | 5. <i>hypostomatus</i> , <i>Pellegr.</i> . . . . .    | 264  |
| 5. <i>urotænia</i> , <i>Blgr.</i> . . . . .              | 228  | 6. <i>maculatus</i> , <i>Blgr.</i> . . . . .          | 264  |
| 6. <i>interruptus</i> , <i>Blgr.</i> . . . . .           | 229  | 7. <i>petersii</i> , <i>Pfeff.</i> . . . . .          | 265  |
| 7. <i>altus</i> , <i>Blgr.</i> . . . . .                 | 230  | 8. <i>antonii</i> , <i>Schilth.</i> . . . . .         | 266  |
| 6. <i>Petersius</i> , <i>Hilg.</i> . . . . .             | 231  | 9. <i>atroventralis</i> , <i>Blgr.</i> . . . . .      | 267  |
| 1. <i>modestus</i> , <i>Blgr.</i> . . . . .              | 232  | 10. <i>mossambicus</i> , <i>Peters</i> . . . . .      | 268  |
| 2. <i>hilgendorfi</i> , <i>Blgr.</i> . . . . .           | 232  | 11. <i>fasciolatus</i> , <i>Blgr.</i> . . . . .       | 270  |
| 3. <i>conserialis</i> , <i>Hilg.</i> . . . . .           | 233  | 12. <i>engycephalus</i> , <i>Gthr.</i> . . . . .      | 271  |
| 4. <i>tangensis</i> , <i>Lönnb.</i> . . . . .            | 234  | 13. <i>brevipinnis</i> , <i>Gthr.</i> . . . . .       | 272  |
| 5. <i>leopoldianus</i> , <i>Blgr.</i> . . . . .          | 235  | 14. <i>niloticus</i> , <i>L.</i> . . . . .            | 273  |
| 6. <i>brumpti</i> , <i>Pellegr.</i> . . . . .            | 235  | 15. <i>rostratus</i> , <i>Gthr.</i> . . . . .         | 275  |
| 7. <i>caudalis</i> , <i>Blgr.</i> . . . . .              | 236  | 16. <i>sexfasciatus</i> , <i>Blgr.</i> . . . . .      | 276  |
| 8. <i>pulcher</i> , <i>Blgr.</i> . . . . .               | 237  | 17. <i>lusosso</i> , <i>Schilth.</i> . . . . .        | 277  |
| 9. <i>major</i> , <i>Blgr.</i> . . . . .                 | 237  | 17. <i>Nannocharax</i> , <i>Gthr.</i> . . . . .       | 279  |
| 10. <i>spilopterus</i> , <i>Blgr.</i> . . . . .          | 239  | 1. <i>brevis</i> , <i>Blgr.</i> . . . . .             | 280  |
| 11. <i>woosnami</i> , <i>Blgr.</i> . . . . .             | 239  | 2. <i>parvus</i> , <i>Pellegr.</i> . . . . .          | 281  |
| 12. <i>occidentalis</i> , <i>Gthr.</i> . . . . .         | 240  | 3. <i>fasciatus</i> , <i>Gthr.</i> . . . . .          | 281  |
| 7. <i>Eugnathichthys</i> , <i>Blgr.</i> . . . . .        | 241  | 4. <i>intermedius</i> , <i>Blgr.</i> . . . . .        | 282  |
| 1. <i>eetveldii</i> , <i>Blgr.</i> . . . . .             | 241  | 5. <i>niloticus</i> , <i>Joann.</i> . . . . .         | 283  |
| 2. <i>macroterolepis</i> , <i>Blgr.</i> . . . . .        | 243  | 6. <i>elongatus</i> , <i>Blgr.</i> . . . . .          | 284  |
| 8. <i>Paraphago</i> , <i>Blgr.</i> . . . . .             | 244  | 7. <i>ocellicauda</i> , <i>Blgr.</i> . . . . .        | 285  |
| 1. <i>rostratus</i> , <i>Blgr.</i> . . . . .             | 244  | 8. <i>tænia</i> , <i>Blgr.</i> . . . . .              | 286  |
| 9. <i>Mesoborus</i> , <i>Pellegr.</i> . . . . .          | 245  | 9. <i>dimidiatus</i> , <i>Pellegr.</i> . . . . .      | 286  |
| 1. <i>crocodilus</i> , <i>Pellegr.</i> . . . . .         | 245  | 18. <i>Xenocharax</i> , <i>Gthr.</i> . . . . .        | 287  |
| 10. <i>Phago</i> , <i>Gthr.</i> . . . . .                | 246  | 1. <i>spilurus</i> , <i>Gthr.</i> . . . . .           | 287  |
| 1. <i>loricatus</i> , <i>Gthr.</i> . . . . .             | 247  | 2. <i>crassus</i> , <i>Pellegr.</i> . . . . .         | 288  |

|                                                 | Page |
|-------------------------------------------------|------|
| 19. <i>Citharidium</i> , <i>Blgr.</i> . . . . . | 289  |
| 1. <i>ansorgii</i> , <i>Blgr.</i> . . . . .     | 289  |
| 20. <i>Citharinus</i> , <i>Cuv.</i> . . . . .   | 290  |
| 1. <i>citharus</i> , <i>Geoffr.</i> . . . . .   | 291  |
| 2. <i>congius</i> , <i>Blgr.</i> . . . . .      | 293  |
| 3. <i>macrolepis</i> , <i>Blgr.</i> . . . . .   | 294  |
| 4. <i>latus</i> , <i>M. &amp; T.</i> . . . . .  | 295  |
| 5. <i>gibbosus</i> , <i>Blgr.</i> . . . . .     | 297  |

Fam. 2. CYPRINIDÆ.

|                                                                |     |
|----------------------------------------------------------------|-----|
| 1. <i>Labeo</i> , <i>Cuv.</i> . . . . .                        | 300 |
| 1. <i>niloticus</i> , <i>Forsk.</i> . . . . .                  | 304 |
| 2. <i>horie</i> , <i>Heck.</i> . . . . .                       | 306 |
| 3. <i>senegalensis</i> , <i>C. &amp; V.</i> . . . . .          | 308 |
| 4. <i>altivelis</i> , <i>Peters</i> . . . . .                  | 309 |
| 5. <i>weeksii</i> , <i>Blgr.</i> . . . . .                     | 310 |
| 6. <i>lineatus</i> , <i>Blgr.</i> . . . . .                    | 311 |
| 7. <i>rosæ</i> , <i>Stdr.</i> . . . . .                        | 312 |
| 8. <i>mesops</i> , <i>Gthr.</i> . . . . .                      | 313 |
| 9. <i>ruddi</i> , <i>Blgr.</i> . . . . .                       | 314 |
| 10. <i>velifer</i> , <i>Blgr.</i> . . . . .                    | 315 |
| 11. <i>longipinnis</i> , <i>Blgr.</i> . . . . .                | 316 |
| 12. <i>coubie</i> , <i>Rüpp.</i> . . . . .                     | 317 |
| 13. <i>congoro</i> , <i>Peters</i> . . . . .                   | 319 |
| 14. <i>neumannii</i> , <i>Blgr.</i> . . . . .                  | 320 |
| 15. <i>gregorii</i> , <i>Gthr.</i> . . . . .                   | 321 |
| 16. <i>darlingi</i> , <i>Blgr.</i> . . . . .                   | 321 |
| 17. <i>victorianus</i> , <i>Blgr.</i> . . . . .                | 322 |
| 18. <i>fuelleborni</i> , <i>Hilg. &amp; Pappenh.</i> . . . . . | 323 |
| 19. <i>brachypoma</i> , <i>Gthr.</i> . . . . .                 | 324 |
| 20. <i>macrostoma</i> , <i>Blgr.</i> . . . . .                 | 325 |

|                                                    |      |
|----------------------------------------------------|------|
| 1. <i>Labeo</i> ( <i>con.</i> ).                   | Page |
| 21. <i>cyclorhynchus</i> , <i>Blgr.</i> . . . . .  | 326  |
| 22. <i>falcipinnis</i> , <i>Blgr.</i> . . . . .    | 327  |
| 23. <i>kirkii</i> , <i>Blgr.</i> . . . . .         | 328  |
| 24. <i>forskalii</i> , <i>Rüpp.</i> . . . . .      | 329  |
| 25. <i>cylindricus</i> , <i>Peters</i> . . . . .   | 331  |
| 26. <i>nasus</i> , <i>Blgr.</i> . . . . .          | 333  |
| 27. <i>greenii</i> , <i>Blgr.</i> . . . . .        | 334  |
| 28. <i>lukulæ</i> , <i>Blgr.</i> . . . . .         | 335  |
| 29. <i>annectens</i> , <i>Blgr.</i> . . . . .      | 336  |
| 30. <i>chariensis</i> , <i>Pellegr.</i> . . . . .  | 337  |
| 31. <i>parvus</i> , <i>Blgr.</i> . . . . .         | 337  |
| 32. <i>obscurus</i> , <i>Pellegr.</i> . . . . .    | 338  |
| 33. <i>umbratus</i> , <i>A. Smith</i> . . . . .    | 339  |
| 34. <i>capensis</i> , <i>A. Smith</i> . . . . .    | 340  |
| 35. <i>ansorgii</i> , <i>Blgr.</i> . . . . .       | 341  |
| 36. <i>barbatus</i> , <i>Blgr.</i> . . . . .       | 342  |
| 2. <i>Discognathus</i> , <i>Heck.</i> . . . . .    | 343  |
| 1. <i>dembeensis</i> , <i>Rüpp.</i> . . . . .      | 345  |
| 2. <i>johnstonii</i> , <i>Blgr.</i> . . . . .      | 346  |
| 3. <i>vinciguerræ</i> , <i>Blgr.</i> . . . . .     | 347  |
| 4. <i>makiensis</i> , <i>Blgr.</i> . . . . .       | 348  |
| 5. <i>blanfordii</i> , <i>Blgr.</i> . . . . .      | 349  |
| 6. <i>hindii</i> , <i>Blgr.</i> . . . . .          | 350  |
| 7. <i>quadrinaculatus</i> , <i>Rüpp.</i> . . . . . | 351  |
| 3. <i>Varicorhinus</i> , <i>Rüpp.</i> . . . . .    | 352  |
| 1. <i>ansorgii</i> , <i>Blgr.</i> . . . . .        | 353  |
| 2. <i>brucii</i> , <i>Blgr.</i> . . . . .          | 354  |
| 3. <i>tornieri</i> , <i>Stdr.</i> . . . . .        | 355  |
| 4. <i>beso</i> , <i>Rüpp.</i> . . . . .            | 356  |
| 5. <i>maroccanus</i> , <i>Gthr.</i> . . . . .      | 357  |
| 6. <i>tanganicæ</i> , <i>Blgr.</i> . . . . .       | 358  |

(To be continued in second volume.)





# CATALOGUE

OF

## AFRICAN FRESH-WATER FISHES.

---

### Subclass **SELACHII.**

✓ Skeleton cartilaginous, no membrane bones; jaws present. Exoskeleton of dermal denticles, structurally identical with teeth. Males with paired intromittent organs (mixopterygia) attached to the ventral fins.

### Order I. **PLAGIOSTOMI.**

Several (5-7) gill-clefts opening directly to the exterior. Pterygoquadrate distinct from the cranium.

### Suborder I. **PLEUROTREMI.**

Gill-openings lateral, the last in front of or above the base of the pectoral fin.

### Fam. 1. **CARCHARIIDÆ.**

Mouth inferior. Eye with a nictitating membrane; spiracles small or absent; 5 gill-openings, one or two above the base of the pectoral fin. Two dorsal fins and one anal; caudal fin usually of the well-marked heterocercal type.

## 1. CARCHARIAS.

Cuvier, Règne Anim. ii. p. 125 (1817); Müll. & Henle, Plagiost. p. 27 (1841);  
A. Dum. Hist. Poiss. i. p. 341 (1865); Günth. Cat. Fish. viii. p. 357 (1870).

Mouth crescentic; teeth with a single sharp cusp. No spiracles. First dorsal fin opposite to the space between pectorals and ventrals; a pit at the root of the tail.

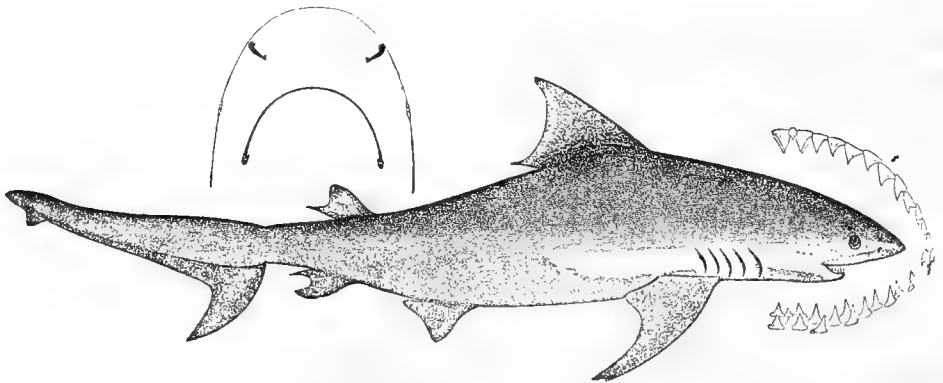
Temperate and tropical seas. One species from the Zambesi.

## 1. CARCHARIAS ZAMBESENSIS.

*Carcharias (Prionodon) zambezensis*, Peters, Mon. Berl. Ac. 1852, p. 276, and  
Reise Mossamb. iv. p. 7, pl. i. fig. 2 (1868).

Snout very short, with rounded horizontal outline. Anterior border of mouth on a line with anterior border of eye. Teeth  $\frac{27}{25}$ , finely serrated, upper triangular, with the outer border a little concave, lower much narrower; a small, non-serrated median tooth. Two gill-openings above the pectoral. Anterior dorsal just behind base of pectoral; second

Fig. 1.

*Carcharias zambezensis*.

Type, after Peters (Reise Mossamb.).  $\frac{1}{6}$ .

dorsal a little anterior to, and of the same size as, anal, which is more distant from vent than from caudal. Ventral a little nearer caudal than pectoral. Caudal as long as distance from end of snout to dorsal. Brownish grey, belly yellowish white.

Total length 760 millim.

Zambesi, 120 miles from the coast.—Type in Berlin Museum.

## Suborder II. HYPOTREMI.

Gill-openings ventral, below the base of the pectoral fin.

## Fam. 1. PRISTIDÆ.

Mouth inferior. Snout produced into a long flat lamina armed with a series of strong teeth along each edge. No nictitating membrane; spiracles present, large; 5 gill-openings. Body moderately depressed, elongate. Two dorsal fins, no anal; caudal of the heterocercal type.

## 1. PRISTIS.

Latham, Tr. Linn. Soc. ii. 1794, p. 276; Müll. & Henle, Plagiost. p. 105 (1841);  
A. Dum. Hist. Poiss. i. p. 471 (1865); Günth. Cat. Fish. viii. p. 436 (1870).

Mouth transverse, nearly straight; teeth minute, obtuse, pavement-like. First dorsal fin opposite or close to the base of the ventrals.

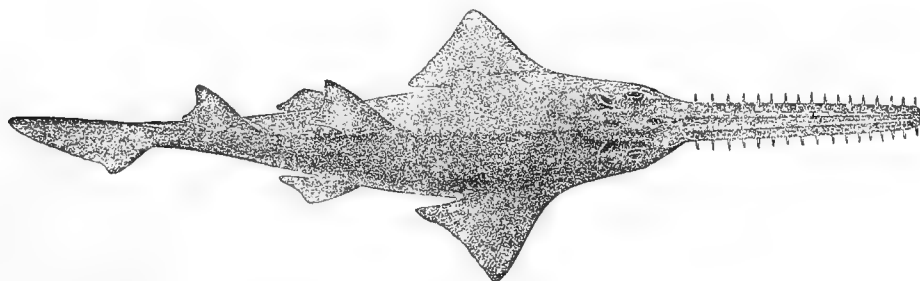
Seas of the temperate and tropical regions, some species ascending rivers.

## 1. PRISTIS PERROTETI.

Müll. & Henle, t. c. p. 108; A. Dum. t. c. p. 474; Peters, Reise Mossamb. iv. p. 9  
(1868); Günth. t. c. p. 436; Day, Fish. Ind. p. 729, pl. exci. fig. 1 (1878).

17-21 pairs of rostral teeth, not trenchant behind, and distant from one another. First dorsal originating in advance of ventrals, second not

Fig. 2.

*Pristis perroteti.*

Indian Ocean, after Day (Fish. Ind.).  $\frac{1}{3}$ .

much smaller. Root of pectoral in advance of first gill-opening. A small lower caudal lobe. Uniform greyish. Reaches a length of 3 metres.

Tropical seas, entering rivers. Ascends the Zambesi and the Shiré and probably other African rivers.—Type in Paris Museum.

- |                                     |          |                      |
|-------------------------------------|----------|----------------------|
| 1, 2. Saws of half-grown specimens. | Zambesi. | Sir J. Kirk (P.).    |
| 3. Hgr.                             | Gambia.  | Sir A. Moloney (P.). |

### Subclass **TELEOSTOMI.**

Skeleton more or less ossified; membrane bones present; jaws present. Exoskeleton of scales or bony plates. No mixopterygia.

### Order I. **CROSSOPTERYGII.**

Paired fins, at least the pectorals, lobate, with an endoskeletal axis fringed with dermal rays. Mandibular arch suspended from the upper segment of the hyoid or hyomandibular arch (hyostylic skull); no supraoccipital bone; splenial present. Bulb of aorta muscular, with several rows of valves.

### Suborder I. **CLADISTIA.**

Pectoral fin tribasal. Nostrils on upper surface of snout.

### Fam. 1. **POLYPTERIDÆ.**

Body covered with rhombic bony scales with enamel-like coating. Dorsal fin formed of a series of spines with one or several articulated rays supporting a membrane, forming detached finlets. Head covered with bony plates; maxillary bone bordering the eye; a spiracle, covered by a bony valve, on each side of the top of the head. Branchiostegal rays replaced by a pair of large bony plates between the mandibular rami. Young with an external opercular gill. Vent opening far back. Vertebral column ossified, diphyccercal. Air-bladder double, with pneumatic duct communicating with the ventral side of the œsophagus.

Two genera, both African :—

- |                                |                                              |
|--------------------------------|----------------------------------------------|
| Ventral fins present . . . . . | 1. <i>Polypterus</i> , Geoffr., p. 5.        |
| No ventral fins . . . . .      | 2. <i>Calamichthys</i> , J. A. Smith, p. 17. |

## 1. POLYPTERUS.

Geoffr. Ann. Mus. Paris, i. 1802, p. 57; A. Dum. Hist. Poiss. ii. p. 391 (1870); Günth. Cat. Fish. vii. p. 326 (1870); Bouleng. Poiss. Bass. Congo, p. 20 (1901), and Fish. Nile, p. 2 (1907).

Body more or less elongate, not serpentiform; spines of the dorsal fin bearing two or more articulated rays; ventral fins present; suboperculum well developed; teeth small, conical.

Nile and Tropical Africa.

*Synopsis of the Species.*

- I. Mandible projecting slightly beyond the snout; suboperculum much larger than the eye; pectoral extending as far as first dorsal spine, or beyond; 11-18 dorsal spines; 11-15 scales between occiput and first dorsal spine.
- A. 60-70 scales along the body, 46-54 round the middle.
- D. XIV-XVIII; interorbital region slightly convex,  $1\frac{2}{3}$  (young) to  $2\frac{3}{4}$  diameters of eye; 63-70 scales in longitudinal series . . . . . 1. *P. bichir*, Geoffr., p. 6.
- D. XIII-XV; interorbital region quite flat, 2 (young) to  $3\frac{1}{2}$  diameters of eye; 60-68 scales in longitudinal series . . . . . 2. *P. lapradii*, Stdr., p. 7.
- B. 50-59 scales along the body.
- D. XII-XIV; interorbital region flat, not more than 3 diameters of eye; usually a small azygous shield between the nasals, in the adult; 46-52 scales round middle of body . . . . . 3. *P. conqicus*, Blgr., p. 9.
- D. XI-XIV; interorbital region flat or slightly concave, 2 (young) to  $3\frac{2}{3}$  diameters of eye; no azygous shield on the snout; 42-46 scales round middle of body . . . . . 4. *P. endlicheri*, Heck., p. 10.
- II. Both jaws equal in front, or snout projecting beyond mandible; suboperculum not much larger, or even smaller than the eye; 5-11 dorsal spines.
- A. 60-65 scales along the body, 42-46 round the middle; pectoral widely separated from first dorsal spine; interorbital region flat or slightly convex, 3 diameters of eye in adult; 22-26 scales between occiput and first dorsal spine.
- D. IX-X; body strongly depressed; 44-46 scales round middle of body . . . . . 5. *P. weeksii*, Blgr., p. 11.
- D. X-XI; body feebly depressed, subcylindrical; 42 scales round middle of body . . . . . 6. *P. ornatipinnis*, Blgr., p. 12.

B. 52-61 scales along the body, 32-40 round the middle ; interorbital region convex, not more than 2 diameters of eye.

1. Pectoral reaching or nearly reaching first dorsal spine.

D. X-XI ; 56 scales in longitudinal series, 38 round middle of body, 14-17 between occiput and first dorsal spine . . . . . 7. *P. delhezi*, Blgr., p. 13.

2. Pectoral widely separated from first dorsal spine.

D. VIII-XI ; 53-61 scales in longitudinal series, 34-40 round middle of body, 15-20 between occiput and first dorsal spine . . . . . 8. *P. senegalus*, Cuv., p. 14.

D. V-IX ; 52-56 scales in longitudinal series, 36-40 round middle of body, 23-26 between occiput and first dorsal spine . . . . . 9. *P. palmas*, Ayres, p. 16.

D. VI-VII ; 58-59 scales in longitudinal series, 32-36 round middle of body, 35-37 between occiput and first dorsal spine . . . . . 10. *P. retropinnis*, Vaill., p. 17.

### 1. POLYPTERUS BICHR.

Geoffr. Ann. du Mus. i. 1802, p. 57, pl. v., and Descr. Egypte, Poiss. p. 4, pl. iii. (1809) ; Guichen. Mag. Zool. 1839, Poiss. p. 10 ; Günth. Petherick's Trav. ii. p. 267 (1869) ; A. Dum. Hist. Poiss. ii. p. 391, pl. xxiii. fig. 1 (1870) ; Schweinf. Herz. Afr. i. p. 253, fig. (1874) ; Steind. Denkschr. Ak. Wien, xlv. 1882, p. 52, pls. viii. & ix. fig. 1 ; Bouleng. Ann. & Mag. N. H. (7) ii. 1898, p. 417 ; S. Flower, Proc. Zool. Soc. 1900, p. 968 ; Werner, Zool. Jahrb., Syst. xxi. 1904, p. 271, and Sitzb. Ak. Wien, cxv. i. 1906, p. 1118 ; Bouleng. Fish. Nile, p. 5, pl. i. (1907).

*Polypterus bichir*, part., Günth. Cat. Fish. viii. p. 326 (1870).

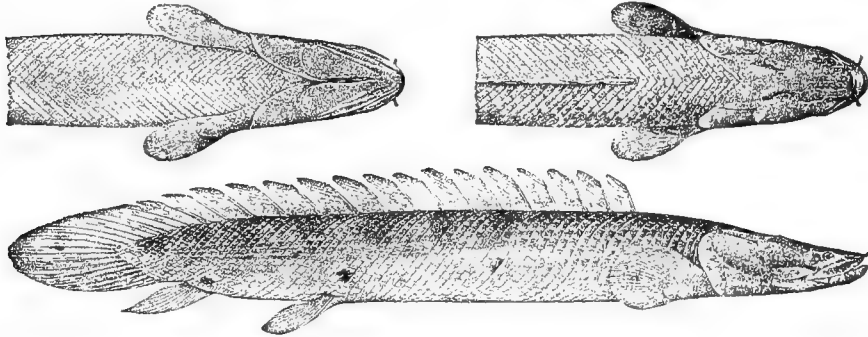
Head twice or nearly twice as long as broad, rather strongly flattened, its length  $4\frac{1}{4}$  to  $5\frac{2}{3}$  times in total length, with supero-lateral eyes and slightly convex interorbital region ; lower jaw projecting slightly beyond upper ; length of snout 5 to 7 times in length of the head ; eye  $8\frac{1}{2}$  (young) to 13 times in length of the head,  $1\frac{2}{3}$  (young) to  $2\frac{4}{5}$  times in interocular width ; latter less than distance between eye and spiracle ; nasal bones in contact on the median line in the adult ; a series of 4 to 7 shields between postorbital and spiracular shields ; suboperculum much larger than eye. Dorsal fin with XIV-XVIII spines ; spines overlapping when folded down. Anal 11-15. Pectoral reaching beyond vertical of first dorsal spine. 63-70 scales in a longitudinal series, 11-15 between occiput and first dorsal spine, 46-54 round middle of body. Greyish or greenish olive above, the young with 10-13 cross-bars on the back and 2 or 3 stripes along the sides of a darker shade, these

markings becoming more indistinct or disappearing in the adult; a few scattered black spots sometimes present; paired fins with more or less distinct transverse streaks or series of spots, the other fins without spots; belly yellow.

Total length 720 millim.

Nile, Lake Rudolf, Chad Basin.—Types in Paris Museum.

Fig. 3.



*Polypterus bichir*.

Nile Delta (F. N.).  $\frac{1}{4}$ .

|                     |                            |                                               |
|---------------------|----------------------------|-----------------------------------------------|
| 1-3. Yg.            | Near Damietta.             | Dr. J. C. Mitchell (P.).                      |
| 4-5. Ad.            | Mansurah, Damietta Nile.   | N. R. Harrington, Esq.,<br>and Dr. Hunt (E.). |
| 6. Ad., stffd.      | Cairo.                     | Dr. Rüppell (C.).                             |
| 7. Hgr.             | Near Cairo.                | L. Loat, Esq. (C.).                           |
| 8. Ad.              | Kawa, White Nile.          | "                                             |
| 9-12. Hgr. & yg.    | Goz abu Gumah, White Nile. | "                                             |
| 13-14. Yg.          | Gharb-el-Aish, "           | "                                             |
| 15-24. Ad. & hgr.   | Fashoda, "                 | "                                             |
| 25. Hgr., skel.     | " "                        | "                                             |
| 26. Ad.             | Near Kerro, "              | "                                             |
| 27. Ad.             | Mouth of Lake No, "        | "                                             |
| 28. Ad.             | Bahr-el-Gebel.             | Capt. S. Flower (P.).                         |
| 29, 30. Ad., stffd. | Nile.                      |                                               |

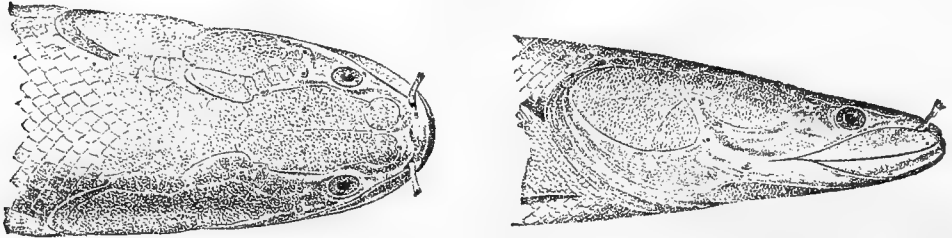
## 2. POLYPTERUS LAPRADII.

Steind. Sitzb. Ak. Wien, lix. i. 1869, p. 103, pl. i. figs. 1 & 2, and pl. ii. figs. 1 & 2; Bouleng. Ann. & Mag. N. H. (7) ii. 1898, p. 418; Budgett, Proc. Cambr. Philos. Soc. x. 1900, p. 236; Bouleng. Proc. Zool. Soc. 1902, i. p. 123, pl. x. figs. 1 & 2.

Head rather strongly depressed,  $1\frac{2}{3}$  to  $2\frac{1}{5}$  times as long as broad, its

length  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length; lower jaw projecting a little beyond snout; eye supero-lateral, its diameter 8 (young) to 12 times in length of head, 2 to  $3\frac{1}{2}$  times in width of interorbital region, which is quite flat and not less than the distance from eye to spiracle; all head-shields paired; a series of 4 to 6 shields between postorbital and

Fig. 4.

*Polypterus lapradii.*

Head of type, after Steindachner (Sitzb. Ak. Wien, 1869).  $\frac{1}{2}$ .

spiracular shields; suboperculum much larger than eye. Dorsal with XIII–XV spines, anterior more or less overlapping when folded. Anal 11–15. Pectoral reaching vertical of first dorsal spine, or a little beyond. 60–68 scales in a longitudinal series, 11–13 between occipital and first dorsal spine, 46–52 round middle of body. Yellowish or pale olive, with dark stripes and more or less distinct cross-bars; fins with dark spots or streaks.

Total length 740 millim.

Senegal, Gambia, Niger.—Types in Vienna Museum.

|                         |                         |                                 |
|-------------------------|-------------------------|---------------------------------|
| 1. Ad., stffd.          | Senegal.                |                                 |
| 2. Ad.                  | St. Louis, Senegal.     | M. P. Delhez (C.).              |
| 3–10. Ad. & hgr.        | Kaëdi, Senegal.         | "                               |
| 11. Hgr., stffd.        | Gambia.                 | P. Whitfield, Esq. (P.).        |
| 12. Hgr.                | "                       | J. S. Budgett, Esq. (P.).       |
| 13. Ad.                 | "                       | Capt. Vipan (P.).               |
| 14. Yg.                 | Abo, Lower Niger.       | Dr. W. J. Ansorge (C.).         |
| 15–17. Yg.              | Assay, "                | "                               |
| 18, 19. Hgr.            | Niger.                  | Mr. J. T. Dalton (C.).          |
| 20–26. Ad., hgr., & yg. | "                       | W. A. Forbes, Esq. (P.).        |
| 27. Ad., skel.          | "                       | "                               |
| 28. Hgr.                | Benue River, N. of Ibi. | H. L. Norton Traill, Esq. (C.). |

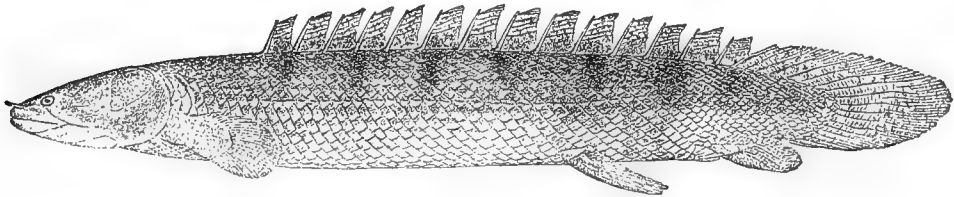
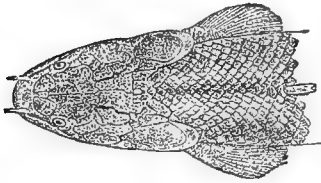


## 3. POLYPTERUS CONGICUS.

Bouleng. Ann. & Mag. N. H. (7) ii. 1898, p. 418, Ann. Mus. Congo, Zool. i. pl. xxx. fig. 1 (1899), Poiss. Bass. Congo, p. 22 (1901), Proc. Zool. Soc. 1902, i. p. 123, pl. xi. fig. 1, and Tr. Zool. Soc. xvi. 1901, p. 142, and xvii. 1906, p. 544.

Head rather depressed,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as broad, its length 4 to 5 times in total length; lower jaw projecting a little beyond snout; eye supero-lateral, its diameter 8 (young) to 12 times in length of head,  $1\frac{2}{3}$  to 3 times in width of interorbital region, which is flat; nasal shields usually separated, in the adult, by a small azygous shield; a series of 4 or 5 shields between postorbital and spiracular shields; suboperculum much larger than eye. Dorsal with XII–XIV

Fig. 5.

*Polypterus congicus*. Type.  $\frac{1}{6}$ .

spines, anterior more or less overlapping when folded. Anal 12–15. Pectoral reaching vertical of first dorsal spine, or beyond. 55–59 scales in a longitudinal series, 11–15 between occiput and first dorsal spine, 46–52 round middle of body. Olive above, yellowish beneath; 6 to 8 more or less regular blackish narrow transverse bands on the body; fins spotted or mottled with blackish.

Total length 720 millim.

Congo, Lake Tanganyika.

|               |                               |                            |
|---------------|-------------------------------|----------------------------|
| 1. Ad., type. | Stanley Falls.                | Rev. W. H. Bentley (C.).   |
| 2. Yg.        | New Antwerp, Upper Congo.     | Capt. Wilverth (C.).       |
| 3. Yg.        | Bolobo, Upper Congo.          | Rev. G. Grenfell (P.).     |
| 4. Yg.        | Bangala Country, Upper Congo. | M. De Meuse (C.).          |
| 5. Ad.        | Upper Congo.                  | Brussels University.       |
| 6–9. Ad.      | Kalambo, L. Tanganyika.       | Prof. J. E. S. Moore (C.). |
| 10. Ad.       | Kituta, „                     | Dr. W. A. Cunningham (C.). |

## 4. POLYPTERUS ENDLICHERI.

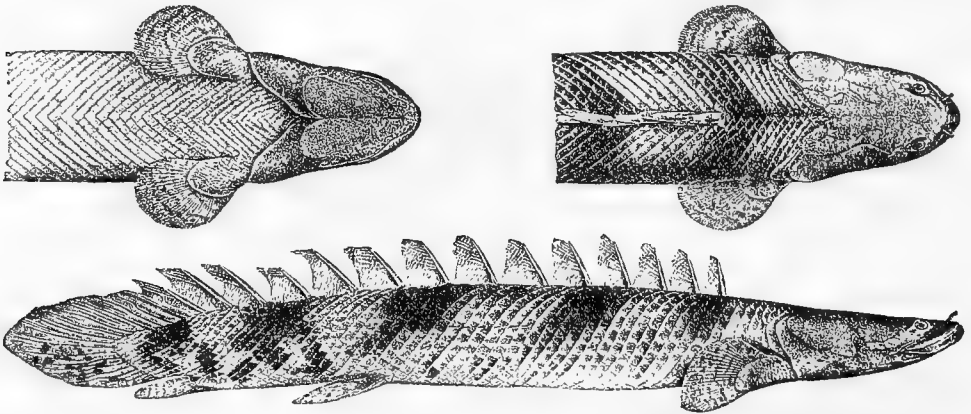
Heckel, *Russegger's Reise Egypt.* iii. p. 310, pl. xxii. fig. 1 (1849); A. Dum. *Hist. Poiss.* ii. p. 393, pl. xxiii. fig. 3 (1870); Steind. *Denkschr. Ak. Wien*, xlv. 1882, p. 52, pls. viii. & ix. fig. 2; Bouleng. *Ann. & Mag. N. H.* (7) ii. 1898, p. 418, and *Proc. Zool. Soc.* 1902, i. p. 124, pl. xi. fig. 2; Werner, *Zool. Jahrb., Syst.* xxi. 1904, p. 271, and *Sitzb. Ak. Wien*, cxv. i. 1906, p. 1118; Bouleng. *Fish. Nile*, p. 9, pl. ii. (1907).

*Polypterus senegalensis*, part., Günth. *Petherick's Trav.* ii. p. 268 (1869).

*Polypterus bichir*, part., Günth. *Cat. Fish.* viii. p. 326 (1870).

Body more or less distinctly flattened, at least in front. Head  $1\frac{1}{2}$  to  $1\frac{4}{5}$  times as long as broad,  $4\frac{2}{5}$  to  $5\frac{2}{5}$  times in total length, much flattened, with supero-lateral eyes and flat or slightly concave interorbital region;

Fig. 6.



*Polypterus endlicheri.*  
White Nile (F. N.).  $\frac{1}{5}$ .

lower jaw projecting slightly beyond upper; length of snout 5 to 7 times in length of head; eye 9 (young) to 15 times in length of head,  $2\frac{1}{6}$  (young) to  $3\frac{2}{3}$  times in the interocular width; latter more than distance between eye and spiracle; nasal bones in contact on the median line in the adult; a series of 4 to 6 shields between postorbital and spiracular shields; suboperculum much larger than eye. Dorsal with XI–XIV spines, anterior not or but feebly overlapping when folded. Anal 15–18. Pectoral reaching to or beyond vertical of first dorsal spine. 50–58 scales in a longitudinal series, 11–15 between occiput and first dorsal spine, 42–46 round middle of body. Grey or greyish olive above; 4 to 6 more or less regular broad blackish bands across the back; on the

sides these bands are directed backwards, or break up into branches or detached spots; lips and fins with blackish spots, these usually forming transverse lines on the pectorals and ventrals, and oblique wavy lines or vermiculations on the dorsal; belly white.

Total length 630 millim.

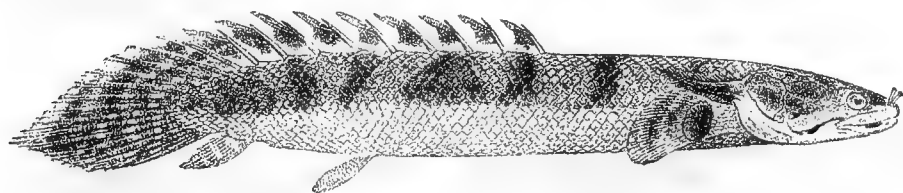
White Nile, Bahr-el-Gebel, Lake Chad, Niger.—Type in Vienna Museum.

|                                   |                           |                           |
|-----------------------------------|---------------------------|---------------------------|
| 1. Ad., stffd.                    | Khartum.                  | J. Petherick, Esq. (C.).  |
| 2. Hgr.                           | "                         | "                         |
| 3-4. Ad. & yg.                    | Shederah, near Omdurman.  | L. Loat, Esq. (C.).       |
| 5. Yg.                            | Goz Shebesha, White Nile. | "                         |
| 6. Ad.                            | Near Kawa, "              | "                         |
| 7. Ad., skel.                     | " "                       | "                         |
| 8. Ad.                            | Goz abu Gumah, "          | "                         |
| 9. Ad.                            | Fashoda, "                | "                         |
| 10. Ad.                           | Mouth of Lake No, "       | "                         |
| 11. Ad.                           | Gondokoro, Bahr-el-Gebel. | "                         |
| 12. Hgr.                          | Lake Chad.                | Capt. G. B. Gosling (P.). |
| 13. Yg.                           | Agberi, Lower Niger.      | Dr. W. J. Ansorge (C.).   |
| 14, 15, 16. Ad. & hgr.,<br>stffd. | Niger.                    | Mr. J. T. Dalton (C.).    |

#### 5. POLYPTERUS WEEKSII.

Bouleng. Ann. & Mag. N. H. (7) ii. 1898, p. 419, Poiss. Bass. Congo, p. 24 (1901), and Proc. Zool. Soc. 1902, ii. p. 124, pl. x. fig. 4.

Fig. 7.



*Polypterus weeksii.*

Young, type (P. Z. S. 1902).  $\frac{2}{3}$ .

Body depressed. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad,  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length, much flattened, with supero-lateral eyes and flat interorbital region; snout projecting slightly beyond the lower jaw; eye 7 (young) to  $9\frac{1}{2}$  times in length of head,  $2\frac{1}{2}$  to 3 times in interorbital width; a small azygous shield may be present between the nasals in the adult; a series of 3 or 4 shields between postorbital and spiracular

shields; suboperculum a little smaller or a little larger than eye. Dorsal with IX–X spines, not overlapping when folded. Anal 10–11. Pectoral widely separated from first dorsal spine. 60–65 scales in a longitudinal series, 22–26 between occiput and first dorsal spine, 44–46 round middle of body. Olive above, yellowish beneath; 7 or 8 blackish bars on the back, bifurcating on the lower part of the sides; fins spotted, marbled, or irregularly barred with blackish; young with a black spot on the membrane behind each dorsal spine.

Total length 380 millim.

Upper Congo, Katanga.

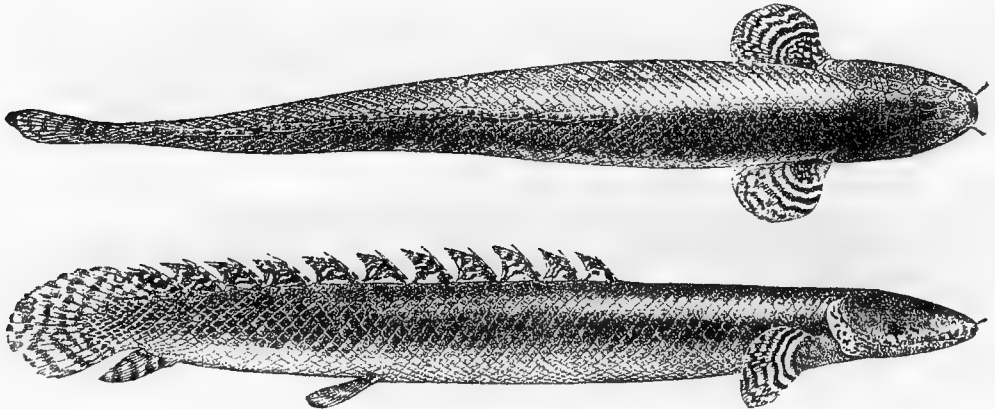
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|---------------|-----------|------------------------|
| 1. Yg., Type. | Monsembe. | Rev. J. H. Weeks (P.). |
| 2. Ad.        | ”         | ”                      |

#### 6. POLYPTERUS ORNATIPINNIS.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 23, pl. vii. fig. 1 (1902), and Ann. & Mag. N. H. (7) xvi. 1905, p. 641.

Head and body less depressed than in the preceding. Head  $1\frac{1}{2}$  times as long as broad, 6 times in total length; snout projecting very slightly

Fig. 8.



*Polypterus ornatipinnis.*

Type (A. M. C.).  $\frac{1}{3}$ .

beyond lower jaw; eye lateral,  $8\frac{1}{2}$  times in length of head, 3 times in width of interorbital region, which is slightly convex; all head-shields paired; a series of 4 shields between postorbital and spiracular shields; suboperculum slightly larger than eye. Dorsal with X–XI spines, not

overlapping when folded. Anal 15. Pectoral widely separated from first dorsal spine. 62-63 scales in a longitudinal series, 24-25 between occiput and first dorsal spine, 42 round middle of body. Olive above, with ill-defined light spots, whitish beneath; lips and gill-membrane spotted with black; dorsal fin spotted with black; pectorals, ventrals, anal, and caudal barred with black.

Total length 370 millim.

Upper Congo (Monsembe and Kassai River).

1. Type.

Monsembe.

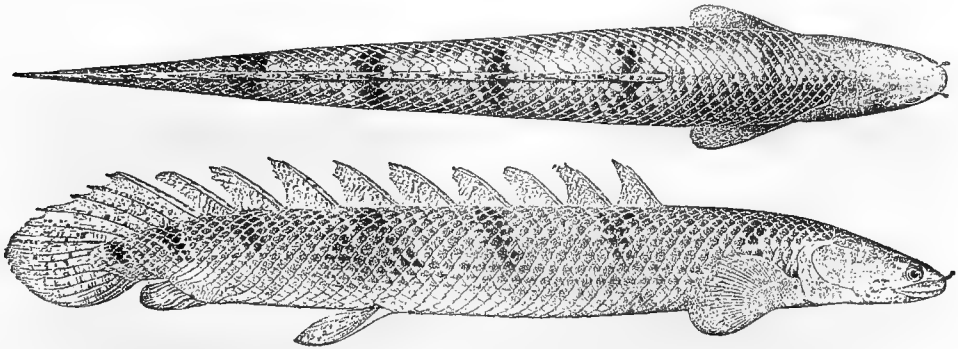
Rev. J. H. Weeks (P.).

#### 7. POLYPTERUS DELHEZI.

Bouleng. Ann. Mus. Congo, Zool. i. p. 61, pl. xxx. fig. 2 (1899), and Poiss. Bass. Congo, p. 23 (1901); Pellegr. Bull. Mus. Paris, 1904, p. 310.

Body feebly compressed, subcylindrical. Head  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times as long as broad,  $5\frac{1}{2}$  to 6 times in total length, with lateral eyes and feebly convex interorbital region; jaws equal in front; eye  $7\frac{1}{2}$  times in length of head,  $1\frac{1}{3}$  times in interorbital width; head-shields all paired; a series of 3 shields between postorbital and spiracular shields; suboperculum as large as eye, or a little larger. Dorsal with X-XI spines, not

Fig. 9.



*Polypterus delhezi.*

Type (A. M. C.).  $\frac{2}{5}$ .

overlapping when folded. Anal 11. Pectoral reaching or not quite reaching vertical of first dorsal spine. 56 scales in a longitudinal series, 14-17 between occiput and first dorsal spine, 38 round middle of body. Brownish above, whitish beneath; 7 black transverse bands on the back; fins mottled with dark brown.

Total length 340 millim.

Upper Congo (Lake Leopold II. and New Antwerp); Shari.—Type in Congo Museum, Tervueren.

1. One of the types.

New Antwerp.

Capt. Wilverth (C).

### 8. POLYPTERUS SENEGALUS.

Cuvier, Règne Anim. 2nd ed. p. 330 (1829), and Règne Anim. Illustr., Poiss. pl. cv. fig. 2 (1836); Guichen. Mag. de Zool. 1839, Poiss. p. 11, pl. i.; Steind. Sitzb. Ak. Wien, lix. i. 1869, p. 106, pl. i. figs. 3-5; A. Dum. Hist. Poiss. ii. p. 394 (1870); Steind. Denkchr. Ak. Wien, xlv. 1882, p. 52, pls. viii. & ix. fig. 2; Bouleng. Ann. & Mag. N. H. (7) ii. 1898, p. 419; Budgett, Proc. Camb. Philos. Soc. x. 1900, p. 236; Bouleng. Proc. Zool. Soc. 1902, i. p. 124, pl. xi. fig. 3; Werner, Zool. Jahrb., Syst. xxi. 1904, p. 271, and Sitzb. Ak. Wien, cxv. i. 1906, p. 1119, pl. i. fig. 1; Bouleng. Fish. Nile, p. 11, pl. iii. (1907).

*Polypterus senegalensis*, part., Günth. Petherick's Trav. ii. p. 268 (1869).

*Polypterus arnaudii*, A. Dum. t. c. pl. xxiii. fig. 2.

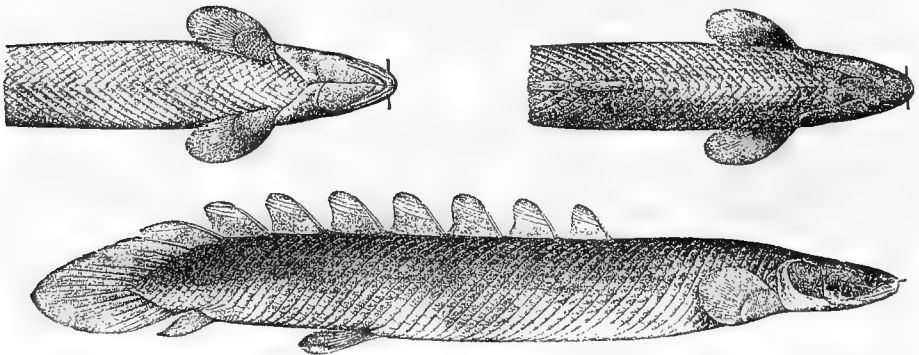
*Polypterus bichir*, part., Günth. Cat. Fish. viii. p. 326 (1870).

*Polypterus senegalensis*, Steinl. Sitzb. Ak. Wien, lxi. i. 1870, p. 718.

*Polypterus bichir* (non Geoffr.), Günth. Proc. Zool. Soc. 1896, p. 218.

Body cylindrical or slightly compressed. Head  $1\frac{3}{5}$  to 2 times as long as broad,  $5\frac{3}{4}$  to 7 times in total length, with lateral eyes and convex interorbital region; snout projecting slightly beyond lower jaw; eye 5 (young) to 8 times in length of head,  $1\frac{1}{2}$  (young) to  $2\frac{1}{3}$  times in inter-

Fig. 10.



*Polypterus senegalus*.

From Khartum (F. N.).  $\frac{1}{3}$ .

orbital width; head-shields all paired; a series of 2 or 3 (rarely 4) shields between postorbital and spiracular shields; suboperculum as large as or smaller than eye. Dorsal with VIII-XI spines, more or less widely separated from each other when folded. Anal 14-17. Pectoral

not reaching vertical of first dorsal spine. 53-61 scales in a longitudinal series, 15-20 between occiput and first dorsal spine, 34-40 round middle of body. Very young conspicuously marked with dark longitudinal bands, but all markings disappearing at an early age, the adult being uniformly grey, olive, or green above, white or yellow beneath; fins immaculate.

Total length 420 millim.

White Nile, southwards to Lake Albert, Lake Rudolf, Lake Chad, Senegal, Gambia, Niger.—Type in Paris Museum.

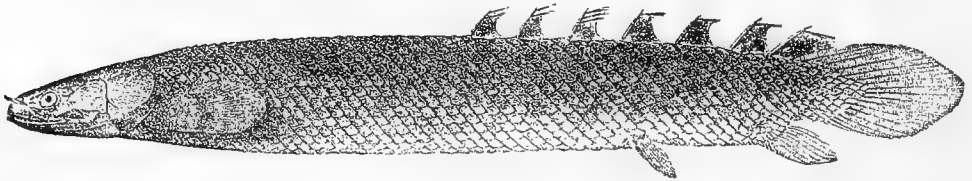
|                                   |                                  |                                                     |
|-----------------------------------|----------------------------------|-----------------------------------------------------|
| 1-5. Ad.                          | Khartum.                         | J. Petherick, Esq. (C.).                            |
| 6-9. Hgr.                         | Goz abu Gumah, White Nile.       | L. Loat, Esq. (C.).                                 |
| 10-11. Hgr.                       | Kaka, "                          | "                                                   |
| 12-21. Hgr. & yg.                 | Gharb-el-Aish, "                 | "                                                   |
| 22-36. Ad. & hgr.                 | Fashoda, "                       | "                                                   |
| 37. Ad., skel.                    | " "                              | "                                                   |
| 38. Ad.                           | Tewfikyeh, "                     | "                                                   |
| 39-40. Ad.                        | Tonga, "                         | "                                                   |
| 41-43. Ad. & yg.                  | Polkom, Baro R. (Sobat).         | Mr. P. C. Zaphiro (C.);<br>W.N.McMillan, Esq. (P.). |
| 44. Hgr. & yg.                    | Bahr-el-Zaraf.                   | Capt. S. Flower (P.).                               |
| 45-46, 47-48. Ad.,<br>hgr., & yg. | Mouth of Lake No, White Nile.    | L. Loat, Esq. (C.).                                 |
| 49. Hgr. & yg.                    | Bahr-el-Ghazal.                  | Capt. S. Flower (P.).                               |
| 50-51. Ad.                        | Bahr-el-Gebel.                   | "                                                   |
| 52. Ad.                           | Kerro, Bahr-el-Gebel.            | L. Loat, Esq. (C.).                                 |
| 53-60. Ad. & hgr.                 | Gondokoro, "                     | "                                                   |
| 61. Ad.                           | Butyaba, Lake Albert.            | J. S. Budgett, Esq. (P.).                           |
| 62-64. Ad.                        | Galeba, N.E. end of Lake Rudolf. | Mr. P. C. Zaphiro (C.);<br>W.N.McMillan, Esq. (P.). |
| 65. Ad.                           | Lake Chad.                       | Capt. G. B. Gosling (P.).                           |
| 66. Ad.                           | Senegal.                         |                                                     |
| 67-69. Ad. & hgr.                 | Kaédi, Senegal.                  | M. P. Delhez (C.).                                  |
| 70. Ad.                           | McCarthy Id., Gambia.            | J. S. Budgett, Esq. (P.).                           |
| 71-73. Hgr.                       | Gambia.                          | Mr. J. T. Dalton (C.).                              |
| 74-78. Hgr. & yg.                 | Niger.                           | "                                                   |
| 79-84. Ad. & hgr.                 | "                                | W. A. Forbes, Esq. (P.).                            |
| 85. Ad.                           | Mureji, Upper Niger.             | J. S. Budgett, Esq. (P.).                           |
| 86-91. Yg.                        | Abo, Lower Niger.                | Dr. W. J. Ansorge (C.).                             |
| 92-93. Yg.                        | Assay, "                         | "                                                   |
| 94-96. Yg.                        | " "                              | J. S. Budgett, Esq. (P.).                           |
| 97. Ad.                           | Benue R., near Ibi.              | H. N. Norton Traill, Esq. (C.).                     |

## 9. POLYPTERUS PALMAS.

Ayres, Proc. Bost. Soc. N. H. iii. 1850, p. 181, and Bost. Journ. N. H. vi. 1850, p. 241, pl. vi. ; Bouleng. Ann. & Mag. N. H. (5) xix. 1887, p. 148 ; Steind. Notes Leyd. Mus. xvi. 1894, p. 92 ; Bouleng. Ann. & Mag. N. H. (6) xvii. 1896, p. 310, (7) ii. 1898, p. 420, Poiss. Bass. Congo, p. 25 (1901), Ann. Mus. Congo, Zool. ii. p. 19 (1902), and Proc. Zool. Soc. 1902, ii. p. 125, pl. xi. fig. 4. *Polypterus bichir*, part., Günth. Cat. Fish. viii. p. 327 (1870). *Polypterus büttikoferi*, Steind. Notes Leyd. Mus. xiii. 1891, p. 179.

Body feebly depressed, subcylindrical. Head  $1\frac{2}{3}$  to 2 times as long as broad,  $4\frac{1}{2}$  to  $5\frac{2}{3}$  times in total length, with lateral eyes and convex interorbital region ; snout projecting beyond lower jaw ; eye 5 (young) to 7 times in length of head, 1 to 2 times in interorbital width ; head-shields all paired ; a series of 2 to 4 shields between postorbital and spiracular shields ; suboperculum not larger than eye. Dorsal with V-IX spines, anterior widely separated when folded. Anal 12-15. Pectoral widely separated from first dorsal spine. 52-56 scales in a longitudinal series, 23-26 between occiput and first dorsal spine, 36-40

Fig. 11.

*Polypterus palmas.*

Type, after Ayres (Bost. Journ. 1850).  $\frac{1}{2}$ .

round middle of body. Greyish or brownish above, yellowish beneath ; young with numerous dark bars on the back and marblings, or a dark network enclosing round yellowish spots, on the sides ; these markings may become indistinct in the adult ; fins spotted or mottled with blackish ; a more or less distinct large oval blackish spot on the muscular part of the pectoral fin.

Total length 300 millim.

Sierra Leone, Liberia, Congo.—Type in Boston Museum.

|                      |                        |                          |
|----------------------|------------------------|--------------------------|
| 1. Ad.               | Sierra Leone.          |                          |
| 2. Hgr.              | Lower Congo.           | M. F. Hens (C.).         |
| 3, 4, 5-7. Ad. & yg. | Monsembe, Upper Congo. | Rev. J. H. Weeks (P.).   |
| 8. Ad., skel.        | Bolobo,            ,,  | Rev. G. Grenfell (P.).   |
| 9. Ad.               | Stanley Falls.         | Rev. W. H. Bentley (C.). |
| 10. Ad.              | Upper Congo.           | Brussels University.     |

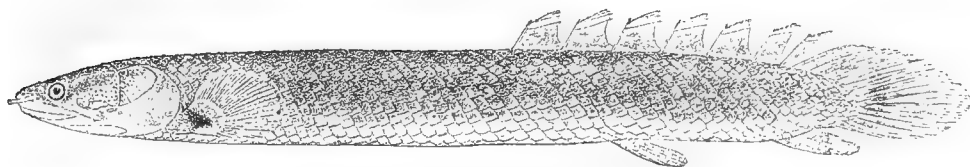


## 10. POLYPTERUS RETROPINNIS.

Vaillant, Bull. Mus. Paris, 1899, p. 219; Bouleng. Poiss. Bass. Congo, p. 26 (1901).

Body subcylindrical. Head  $1\frac{2}{3}$  times as long as broad,  $5\frac{3}{4}$  to  $6\frac{1}{2}$  times in total length, with lateral eyes and convex interorbital region; snout projecting beyond lower jaw; eye  $6\frac{1}{2}$  to 8 times in length of head, 2 to  $2\frac{1}{3}$  times in interorbital width; head-shields all paired; suboperculum smaller than eye. Dorsal with VI–VII spines, widely separated when folded. Anal 12–15. Pectoral widely separated from first dorsal spine. 58–59 scales in a longitudinal series, 35–37 between occiput and first dorsal spine, 32–36 round middle of body. Olive-grey above, whitish beneath; more or less distinct darker cross-bands on the back; a black

Fig. 12.

*Polypterus retropinnis.*

Type (in Paris Museum).  $\frac{2}{3}$ .

spot sometimes present on the membrane behind each dorsal spine; more or less distinct dark streaks across rayed part of pectoral fin, and a large black spot on its muscular part.

Total length 230 millim.

Alima River, Upper Congo —Types in Paris Museum.

- |                      |          |                       |
|----------------------|----------|-----------------------|
| 1. One of the types. | Alima R. | M. J. de Brazza (C.); |
|                      |          | Paris Museum (E).     |

## 2. CALAMICHTHYS.

*Erpetoichthys* (non Swainson), J. A. Smith, Proc. Phys. Soc. Edinb. 1865, p. 273.

*Calamoichthys*, J. A. Smith, Proc. R. Soc. Edinb. v. 1866, p. 655; A. Dum.

Hist. Poiss. ii. p. 397 (1870); Günth. Cat. Fish. viii. p. 327 (1870); Bouleng.

Poiss. Bass. Congo, p. 27 (1901).

Body much elongate, cylindrical, serpentiform. Spines of dorsal fin supporting a single articulated ray. No ventral fins. Suboperculum very small or absent. Teeth small, conical.

West Africa.

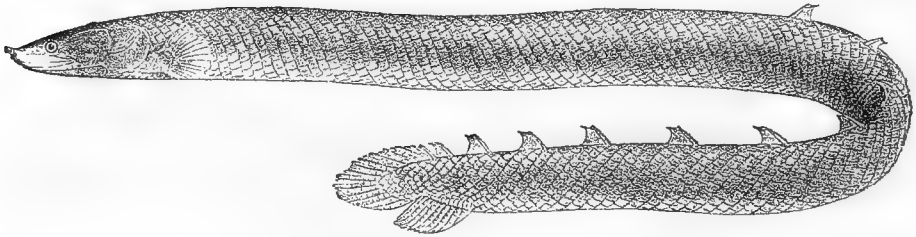
## 1. CALAMICHTHYS CALABARICUS.

*Erpetoichthys calabarius*, J. A. Smith, Proc. Phys. Soc. Edinb. 1865, p. 278.

*Calamoichthys calabarius*, J. A. Smith, Proc. R. Soc. Edinb. v. 1866, p. 656, and Tr. R. Soc. Edinb. xxiv. 1866, p. 457, pls. xxxi. & xxxii. ; A. Dum. Hist. Poiss. ii. p. 397, pl. xxiv. fig. 1 (1870); Günth. Cat. Fish. viii. p. 328 (1870); Traquair, Journ. Geol. Soc. Ireland, (2) ii. 1871, p. 249; Clemens, Anat. Hefte, v. i. 1894, p. 16, pl. ix. figs. 7 & 8; Bouleng. Poiss. Bass. Congo, p. 27 (1901), and Proc. Zool. Soc. 1901, i. p. 4; Werner, Zool. Jahrb., Syst. xxi. 1904, p. 272.

Head small, feebly depressed,  $1\frac{2}{3}$  to 2 times as long as broad, its length 11 to 14 times in total length; snout projecting a little beyond lower jaw; eye lateral,  $7\frac{1}{2}$  to  $8\frac{1}{2}$  times in length of head, twice in interorbital width. Dorsal with VII–XIII widely separated short spines. Anal

Fig. 13.



*Calamichthys calabarius*.  
Niger Delta.  $\frac{2}{3}$ .

9–14. 106–114 scales in a longitudinal series, 30–34 round middle of body. Uniform olive-brown above, yellowish beneath; a large blackish spot on the pectoral fin.

Total length 370 millim.

Niger Delta, Old Calabar, Cameroon, Chiloango.—The types do not appear to have been preserved.

|                  |                         |                              |
|------------------|-------------------------|------------------------------|
| 1–2. Ad.         | Niger Delta.            | A. Millson, Esq. (P.).       |
| 3. Ad., skel.    | ”                       | ”                            |
| 4. Ad.           | Sapelle, Niger Delta.   | Dr. W. J. Ansorge (C.).      |
| 5–6. Ad.         | Creektown, Old Calabar. | Rev. A. Robb (C.).           |
| 7–10. Ad. & hgr. | Cameroon.               | D. G. Rutherford, Esq. (C.). |
| 11. Ad.          | Mouth of Chiloango.     | H. J. Duggan, Esq. (C.).     |
| 12–13. Ad.       | West Africa.            |                              |

## Order II. DIPNEUSTI.

Paired fins lobate, or reduced to an endoskeletal axis. Upper segment of the mandibular arch confluent with the skull (autostylic skull); no supraoccipital bone; splenial present. Bulb of aorta muscular, with several rows of valves. Lungs present.

Fam. 1. LEPIDOSIRENIDÆ.

Body elongate, covered with thin cycloid scales. Dorsal and anal fins formed of very numerous fine rays. Paired fins reduced to a slender segmented axis with or without a unilateral fringe. Dentition consisting of sharp ridges of dentine covered with enamel and continuous with the vomerine, palatopterygoid, and splenial bones. Nostrils under the upper lip, concealed when the mouth is closed. Young with external gills. Lungs paired, elongate, attenuate posteriorly.

Two genera: *Protopterus* in Africa, and *Lepidosiren* in South America.

1. PROTOPTERUS.

Owen, Proc. Linn. Soc. 1839, p. 27; Peters, Reise Mossamb. iv. p. 2 (1868); A. Dum. Hist. Poiss. ii. p. 469 (1870); Günth. Cat. Fish. viii. p. 322 (1870); A. Schneid. Zool. Anz. 1886, p. 524; Bouleng. Poiss. Bass. Congo, p. 32 (1901), and Fish. Nile, p. 19 (1907).

*Protomelus*, Hogg, Ann. & Mag. N. H. vii. 1841, p. 359.

*Rhinocryptis*, Peters, Mon. Berl. Ac. 1844, p. 414.

Body subcylindrical, more or less elongate, with pointed tail, at the end of which the elongate dorsal and anal fins meet. Limbs slender, styliform; a more or less developed dermal fringe, with very thin rays, at least on the fore limb. Six branchial arches and five branchial clefts. External gills often distinct, especially in the young. Scales small, thin. Vent lateral.

Tropical Africa.

*Synopsis of the Species.*

- Length of head  $3\frac{1}{2}$ – $4\frac{1}{2}$  times in distance from snout to vent; dorsal originating nearer occiput than vent; 40–50 scales in longitudinal series to above vent; 34–36 pairs of ribs . . . . . 1. *annectens*, Ow., p. 20.
- Length of head  $3\frac{2}{3}$  to 5 times in distance from snout to vent; dorsal fin originating at equal distance from occiput and vent, or nearer latter; 55–70 scales in longitudinal series to above vent; 35–41 pairs of ribs . . . . . 2. *P. æthiopicus*, Heck., p. 21.
- Length of head 5 to 6 times in distance from snout to vent; dorsal fin originating much nearer vent than occiput; 86–91 scales in longitudinal series to above vent; 54 pairs of ribs . . . . . 3. *P. dolloi*, Blgr., p. 22.

## 1. PROTOPTERUS ANNECTENS.

*Lepidosiren annectens*, Owen, Proc. Linn. Soc. 1839, p. 27, and Tr. Linn. Soc. xviii. 1841, p. 327, pls. xxiii.—xxvii.; Gray, Proc. Zool. Soc. 1856, p. 342, pl. xi.

*Protopterus anquilliformis*, Owen, Tr. Linn. Soc. t. c. p. 332; Peters, Reise Mossamb. iv. p. 3, pl. i. fig. 1 (1868).

*Rhinocryptis amphibia*, Peters, Mon. Berl. Ac. 1844, p. 414.

*Protopterus annectens*, Jardine, Ann. & Mag. N. H. vii. 1841, p. 21; Gray, Cat. Batr. Grad. p. 62 (1850); Lankester, Tr. Zool. Soc. xiv. 1896, p. 11, pl. ii. fig. 2; Bouleng. Poiss. Bass. Congo, p. 36 (1901), and Proc. Zool. Soc. 1902, ii. p. 325, pl. xxviii. fig. 1.

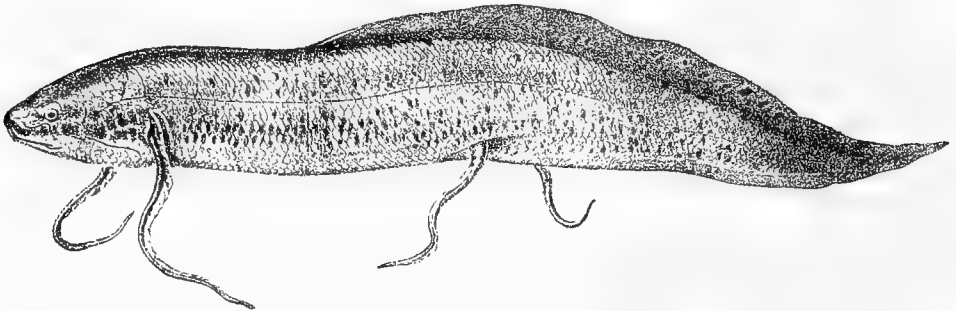
*Protopterus rhinocryptis*, Gray, l. c. p. 63.

*Protopterus annectens*, part., A. Dum. Hist. Poiss. ii. p. 470 (1870); Günth. Cat. Fish. viii. p. 322 (1870); A. Schneid. Zool. Anz. 1886, p. 524, and Zool. Beitr. ii. 1887, p. 98.

*Protopterus amphibiis*, A. Schneid. ll. cc.

Depth of body  $6\frac{1}{2}$  to  $8\frac{1}{2}$  times in total length. Length of head  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in distance from end of snout to vent; snout broadly rounded, about  $\frac{1}{4}$  length of head; eye small, its diameter 8 to 12 times in length

Fig. 14.

*Protopterus annectens*.Gambia, after Gray (P. Z. S. 1856).  $\frac{1}{3}$ .

of head (in half-grown and adult),  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in interocular width. 34 to 36 pairs of ribs. Dorsal originating nearer occiput than vent. Fore limb longer than hind limb and provided with a well-developed, often strong fringe; hind limb with a more or less distinct or rudimentary fringe. 40 to 50 scales in a longitudinal series from gill-opening to above vent, 36 to 40 round middle of body. Grey-brown or olive above, lighter beneath, with or without round blackish spots; lines of sensory canals brown or black.

Total length 650 millim.

West Africa, from the Senegal to the Niger, Chad Basin, East Africa, as far south as the Zambesi.—Type in Museum of Royal College of Surgeons.

|                       |                                            |                           |
|-----------------------|--------------------------------------------|---------------------------|
| 1. Hgr.               | Gambia.                                    | Sir R. Owen (P.).         |
| 2, 3. Ad., stffed.    | „                                          | Crystal Palace Co. (P.).  |
| 4-7. Hgr.             | „                                          | Lord Derby (P.).          |
| 8, 9. Ad. & yg.       | „                                          | J. S. Budgett, Esq. (P.). |
| 10, 11. Ad. & yg.     | „                                          | Capt. Vipan (P.).         |
| 12. Skel.             | „                                          | „                         |
| 13. Skull.            | „                                          | „                         |
| 14-16. Hgr.           | „                                          | „                         |
| 17-19. Cocoons.       | Sierra Leone.                              | Col. Hill (P.).           |
| 20-21. Yg.            | Agberi, S. Nigeria.                        | Dr. W. J. Ansorge (C.).   |
| 22. Yg.               | Assay, „                                   | „                         |
| 23, 24, 25. Ad. & yg. | „ „                                        | J. S. Budgett, Esq. (P.). |
| 26. Yg.               | Tidal Creek, Mkonumbi,<br>Brit. E. Africa. | Dr. J. W. Gregory (P.).   |
| 27-29. Hgr. & yg.     | Zanzibar Coast (?).                        | Sir J. Kirk (P.).         |
| 30, 31. Ad.           | Mozambique.                                | „                         |
| 32. Ad.               | Chiromo, Shiré R.                          | R. MacDonald, Esq. (P.).  |

## 2. PROTOPTERUS ÆTHIOPICUS.

*Protopterus æthiopicus*, Heckel, Sitzb. Ak. Wien, vii. 1851, p. 685; Marno, Zool. Gart. xiv. 1873, p. 441; Bouleng. Poiss. Bass. Congo, p. 36 (1901), and Proc. Zool. Soc. 1901, ii. p. 158; Moore, Tanganyika Problem, p. 152, fig. (1902); Bouleng. Trans. Zool. Soc. xvii. 1906, p. 544; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1121; Bouleng. Fish. Nile, p. 19, pl. iv. (1907).

*Lepidosiren arnaudii*, Casteln. Anim. Nouv. Amér. Sud, p. 105 (1855).

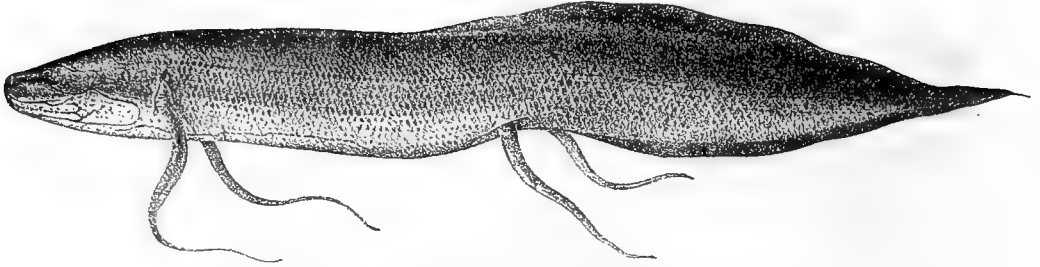
*Lepidosiren annectens* (non Owen), Gray, Ann. & Mag. N. H. (3) v. 1860, p. 70; McDonnell, Nat. Hist. Rev. vii. 1860, p. 94; Baker, Albert Nyanza, ii. p. 131 (1866); Günth. Petherick's Trav. ii. p. 268 (1869).

*Protopterus annectens*, Hartmann, Nat. Skizze Nilländ. p. 202 (1865).

*Protopterus annectens*, part., A. Dum. Hist. Poiss. ii. p. 470 (1870); Günth. Cat. Fish. viii. p. 322 (1870); A. Schneid. Zool. Beitr. ii. 1887, p. 98.

Depth of body 7 to  $9\frac{1}{2}$  times in the total length. Length of head  $3\frac{2}{5}$  to 5 times in distance from end of snout to vent; snout broadly rounded,  $\frac{1}{4}$  to  $\frac{1}{5}$  length of head; eye very small, its diameter 10 to 20 times in length of head (in half-grown and adult), 3 to 5 times in interocular width. 35-41 pairs of ribs. Dorsal fin originating at equal distance from occiput and from vent, or nearer latter. Fore limb the longer and provided with a well-developed fringe; no fringe on the hind limb. 55 to 70 scales in a longitudinal series from gill-opening to above the vent, 40 to 50 round middle of body. Grey or olive-brown to blackish above, yellowish white or pinkish beneath, more or less spotted or speckled with black; lines of sensory canals brown or black.

Fig. 15.

*Protopterus aethiopicus.*Lake Albert Edward (F. N.).  $\frac{1}{5}$ .

Total length 1380 millim.

From the Eastern Sudan to the borders of Lake Tanganyika.—Type in Vienna Museum.

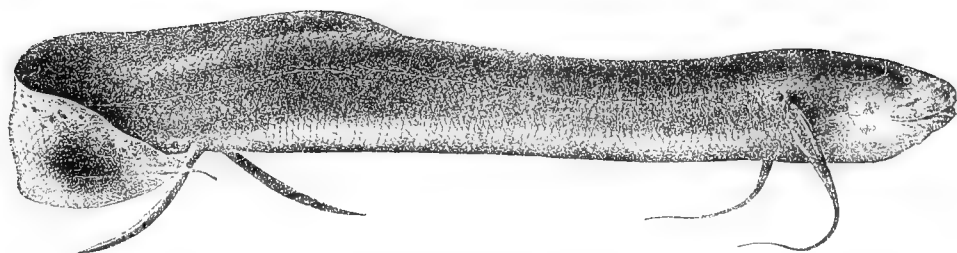
|                        |                                            |                                                       |
|------------------------|--------------------------------------------|-------------------------------------------------------|
| 1. Ad., stffd.         | Mouth of White Nile (?).                   |                                                       |
| 2. Yg.                 | Wadelai, Albertine Nile.                   | Emin Pasha (P.).                                      |
| 3-4. Ad.               | Lake Albert Edward.                        | Prof. J. E. S. Moore (C.).                            |
| 5. Skull.              | "                                          | Scott Elliot, Esq. (P.).                              |
| 6-13. Ad., hgr., & yg. | Entebbe, Lake Victoria.                    | Mr. E. Degen (C.).                                    |
| 14, 15. Ad., stffd.    | Lake Victoria.                             | Mr. W. G. Doggett (C.);<br>Sir Harry Johnston (P.).   |
| 16, 17. Ad. & yg.      | "                                          | "                                                     |
| 18. Ad., skin.         | "                                          | Mr. W. G. Doggett (C.);<br>Col. Delmé Radcliffe (P.). |
| 19. Skel.              | "                                          | "                                                     |
| 20. Ad.                | Kakonde R., south end of<br>L. Tanganyika. | Dr. W. A. Cunnington<br>(C.).                         |

## 3. PROTOPTERUS DOLLOI.

Bouleng. Ann. Mus. Congo, Zool. i. p. 155, pl. lvi. (1900), and Poiss. Bass. Congo, p. 37 (1901).

Depth of body  $11\frac{1}{2}$  to 12 times in total length. Length of head 5 to 6 times in distance from end of snout to vent; snout broadly rounded, more than  $\frac{1}{4}$  length of head; eye very small, its diameter 15 to 19 times in length of head, 4 to 6 times in interocular width (in half-grown and adult). 54 pairs of ribs. Dorsal originating much nearer vent than occiput. Fore limb longer than the hind limb and provided with a well-developed fringe; hind limb without or with a very rudimentary fringe. 86-91 scales in a longitudinal series from gill-opening to above vent, 40-44 round middle of body. Olive-brown above, with round black spots, or uniform blackish above and whitish beneath; lines of sensory canals lighter than ground-colour.

Fig. 16.



*Protopterus dolloi.*  
Type (A. M. C.).  $\frac{1}{5}$ .

Total length 830 millim.

Congo, Gaboon.—Types in Congo Museum, Tervueren.

- |                            |                          |                         |
|----------------------------|--------------------------|-------------------------|
| 1. Hgr., one of the types. | New Antwerp, Upp. Congo. | Capt. Wilverth (C.).    |
| 2. Ad.                     | Monsembe, Upp. Congo.    | Rev. J. H. Weeks (P.).  |
| 3. Ad.                     | Lower Congo.             | M. De Meuse (C.).       |
| 4. Yg.                     | Banzville, Ubanghi.      | Capt. Royaux (C.).      |
| 5. Hgr.                    | Komadekke, Ogowe.        | Dr. W. J. Ansorge (C.). |

### Order III. TELEOSTEI.

Paired fins with the basis reduced to a series of dermal bones bearing the rays, without endoskeletal elements. Skull hyostylic; supraoccipital bone present, splenial absent. Heart without muscular bulbus aortæ, or with the bulb much reduced and with a single row (exceptionally two rows) of valves.

#### Suborder I. MALACOPTERYGII.

Air-bladder, if present, communicating with the digestive tract by a duct. Pectoral arch suspended from the skull; mesocoracoid arch present. Fins without spines, the ventrals abdominal, if present. Anterior vertebræ distinct, without Weberian ossicles.

#### *Synopsis of the Families.*

- I. An intergular bone, between the rami of the mandible; over 20 branchiostegal rays; ventral fins with 10–16 rays. . . . . 1. ELOPIDÆ, p. 24.
- II. No intergular bone; not more than 20 branchiostegal rays.
  - A. Supraoccipital bone separated from the frontals by the parietals; suboperculum small or absent; ventral fins with not more than 7 rays.
    1. Ribs mostly sessile; pectoral fins folding against the sides of the body and movable upwards.

- Præmaxillary single; a very large supratemporal bone; symplectic absent; opercular bones hidden under the skin; gill-opening narrow . . . . . 2. MORMYRIDÆ, p. 29.
- Præmaxillary paired; supratemporal bone small; symplectic present; belly with a double bony serrature . . . . . 3. NOTOPTERIDÆ, p. 145.
2. Ribs inserted on parapophyses; pectoral fins folding against belly, like the ventrals.
- Præmaxillary paired; interoperculum and suboperculum present; ventral fins distant from the pectorals . . . . . 4. OSTEOGLOSSIDÆ, p. 148.
- Præmaxillary single; interoperculum and suboperculum absent; ventral fins near the pectorals . . . . . 5. PANTODONTIDÆ, p. 151.
- B. Supraoccipital in contact with the frontals; suboperculum and interoperculum well developed.
1. Gill-openings wide; body covered with scales; mouth not protractile.
- Postclavicle on outer side of clavicle; no adipose dorsal fin . . . . . 6. CLUPEIDÆ, p. 153.
- Postclavicle on inner side of clavicle; an adipose dorsal fin . . . . . 7. SALMONIDÆ, p. 165.
2. Gill-openings narrow.
- Body covered with scales; interoperculum enormous, covering the gular region; mouth very protractile, superior . . . . . 8. PHRACTOLÆMIDÆ, p. 167.
- Body scaly; mouth not protractile, inferior . . . . . 9. KNERIDÆ, p. 169.
- Body naked; mouth not protractile, inferior; symplectic absent . . . . . 10. CROMERIIDÆ, p. 173.

### Fam. 1. ELOPIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries, the latter much developed; parietal bones forming a median suture above the supraoccipital, or separating it from the frontals; symplectic present; interoperculum and suboperculum well developed; an intergular or sublingual bone, between the rami of the mandible. Pharyngeal teeth. Branchiostegal rays very numerous (more than 20). Gill-openings wide. Ribs mostly sessile, behind a parapophysis; epineurals, no epipleurals. Pectoral fins inserted very low down, folding like the ventrals. Ventral fins with 10 to 16 rays.

Two genera, of wide distribution in tropical and subtropical seas:—

- Scales small; dorsal a little longer than anal . . . . . 1. *Elops*, L., p. 25.
- Scales large; dorsal a little shorter than anal, with the last ray much produced . . . . . 2. *Megalops*, Lacep., p. 27.



## 1. ELOPS.

Linn. Syst. Nat. i. p. 518 (1766); Günth. Cat. Fish. vii. p. 469 (1868); Bleek. Atlas Ichth. vi. p. 84 (1872); Bouleng. Poiss. Bass. Congo, p. 47 (1901).

Body elongate, moderately compressed. Scales small; lateral line straight, with simple tubes. Mouth very large, the præmaxillary and maxillary with bands of small villiform teeth; similar teeth on the vomer, palatines, pterygoids, parasphenoid, and tongue. Dorsal fin above the ventrals, a little shorter than the anal, these fins folding in a scaly sheath. Ventral fins with 15 or 16 rays. A scaly process above the base of the pectoral and another above the ventral. Branchiostegal rays 24 to 35. Pseudobranchiæ well developed. Vertebræ 62 or more.

Tropical and subtropical seas, entering rivers.

The two species are easily distinguished by the following formulæ:—

D. 22–25; A. 14–17; Sc. 100–110  $\frac{11-13}{16-18}$ ; Br.

28–35 . . . . . 1. *E. saurus*, L., p. 25.

D. 18–21; A. 17–18; Sc. 74–83  $\frac{8-10}{10-12}$ ; Br.

24–26 . . . . . 2. *E. lacerta*, C. & V., p. 26.

## 1. ELOPS SAURUS.

Linn. Syst. Nat. i. p. 518 (1766); Bloch, Ausl. Fische, viii. p. 153, pl. cccxciii. fig. 1 (1794); Cuv. & Val. Hist. Poiss. xix. p. 365 (1846); Günth. Cat. Fish. vii. p. 470 (1868); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 571; Kleinz. Verh. zool.-bot. Ges. Wien, xxi. 1871, p. 603; Bleek. Atl. Ichth. vi. p. 84, pl. cclviii. fig. 3 (1872); Day, Fish. Ind. p. 649, pl. cxlvi. fig. 1 (1878); Sauv. Hist. Madag., Poiss. p. 497, pl. xlix. B. fig. 4 (1891); Jord. & Everm. Fish. N. Amer. i. p. 410 (1896).

*Argentina carolina*, Linn. t. c. p. 519.

*Argentina machnata*, Forsk. Descr. Anim. p. 68 (1775).

*Mugilomorus anna-carolina*, Lacep. Hist. Poiss. v. p. 397 (1803).

*Elops inermis*, Mitchell, Tr. Lit. Phil. Soc. N. Y. i. 1815, p. 445.

*Elops machnata*, Rüpp. N. Wirbelth., Fisch. pp. 80 & 84 (1835); Richards. Voy. Ereb. & Terr., Fish. p. 59, pl. xxxvi. figs. 3–5 (1846); Schleg. Faun. Japon., Poiss. p. 241, pl. cix. fig. 2 (1850); Playf. & Günth. Fish. Zanzib. p. 121, fig. (1866).

*Elops indicus*, Swains. Nat. Hist. ii. p. 292 (1839).

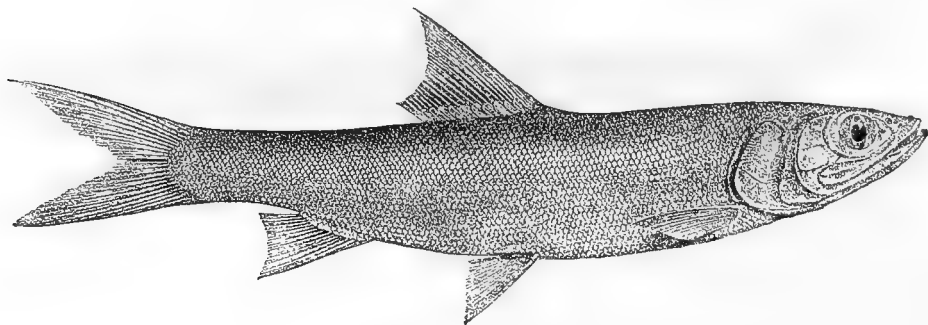
*Elops capensis*, A. Smith, Ill. Zool. S. Afr., Fish. pl. vii. (1840); Casteln. Mém. Poiss. Afr. Austr. p. 67 (1861).

*Elops purpurascens*, Richards. Ichth. China, p. 311 (1846).

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Eye 4 to 5 times in length of head, as long as or a little shorter than snout, equal to interorbital width; lower jaw not or but scarcely

projecting beyond upper; maxillary extending far beyond posterior border of eye. Branchiostegal rays 28–35. Gill-rakers not longer than gill-filaments, 14 or 15 on lower part of anterior arch. Dorsal 22–25,

Fig. 17.

*Elops saurus.*

Indian Ocean, after Day (Fish. Ind.).  $\frac{1}{3}$ .

originating above ventral. Anal 14–17. Scales 100–110  $\frac{11-13}{16-18}$ , 9–10 between lateral line and scaly process above ventral, 28 round caudal peduncle. Uniform silvery.

Total length 400 millim.

Tropical and subtropical seas. Ascending rivers of Tropical and South Africa.—Type in Linnean Society, London.

|                      |                     |                       |
|----------------------|---------------------|-----------------------|
| 1–3. Ad. & yg.       | St. Louis, Senegal. | M. P. Delhez (C.).    |
| 4, 5. Stffd. & skin. | Zanzibar.           | Sir L. Playfair (C.). |
| 6, 7. Skins.         | East Africa.        | Sir J. Kirk (P.).     |
| 8. Stffd.            | Cape of Good Hope.  | Sir A. Smith (P.).    |

## 2. ELOPS LACERTA.

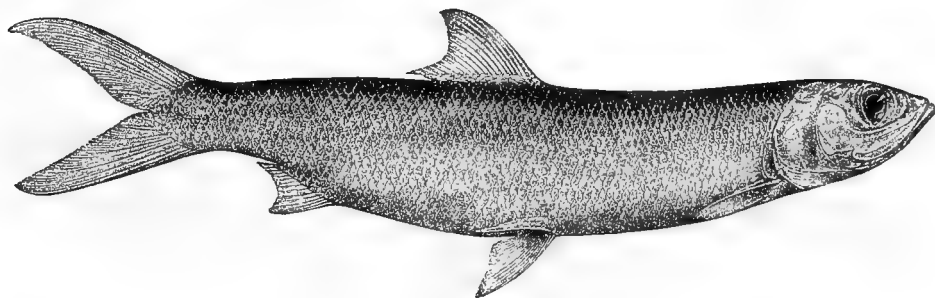
Cuv. & Val. Hist. Poiss. xix. p. 301, pl. cccclxxv. (1846); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 571; Bouleng. Poiss. Bass. Congo, p. 47 (1901).

*Elops congicus*, Bouleng. Ann. Mus. Congo, Zool. i. p. 21, pl. x. fig. 1 (1898).

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{3}$  times in total length, length of head 4 to  $4\frac{3}{4}$  times. Eye 4 times in length of head, as long as snout, a little more than interorbital width; lower jaw projecting beyond upper; maxillary extending a little beyond posterior border of eye. Branchiostegal rays 24–26. Gill-rakers longer than branchial filaments, 17–19 on lower part of anterior arch. Dorsal 18–21, originating a little behind first ray of ventral. Anal 18–21. Scales 74–83  $\frac{8-10}{10-12}$ , 6–7 between lateral line and

scaly process above ventral, 20–22 round caudal peduncle. Silvery, blackish or bluish on the back; dorsal, and sometimes also anal, with a blackish distal spot.

Fig. 18.

*Elops lacerta.*Congo (A. M. C.).  $\frac{1}{5}$ .

Total length 560 millim.

Ascending rivers of West Africa. — Type, in Paris Museum, examined.

|                 |                     |                           |
|-----------------|---------------------|---------------------------|
| 1–4. Hgr. & yg. | St. Louis, Senegal. | M. P. Delhez (C.).        |
| 5–6. Ad.        | Gambia.             | J. S. Budgett, Esq. (C.). |
| 7. Skel.        | ”                   | ”                         |
| 8. Hgr.         | Benito River.       | G. L. Bates, Esq. (C.).   |
| 9. Yg.          | Gaboon.             |                           |
| 10. Ad.         | Banana, Congo.      | M. P. Delhez (C.).        |

## 2. MEGALOPS.

Lacep. Hist. Poiss. v. p. 289 (1803); Günth. Cat. Fish. vii. p. 471 (1868);

Bleek. Atl. Ichth. vi. p. 85 (1872).

Tarpon, Jord. & Everm. Fish. N. Amer. i. p. 409 (1896).

Body moderately elongate, strongly compressed. Scales large, thick; lateral line straight, with branched tubes. Mouth very large, the præmaxillary and maxillary with bands of small villiform teeth; similar teeth on the vomer, palatines, pterygoids, and tongue. Dorsal fin inserted above or a little behind the ventrals, a little longer than the anal, its last ray more or less produced. Ventral fins with 10 or 11 rays. A scaly process above the base of the pectoral and another above the ventral. Branchiostegal rays 22 to 26. No pseudobranchiæ.

Tropical seas, entering rivers. One species from the Atlantic, another from the Indian Ocean and the south-western parts of the Pacific.

## 1. MEGALOPS CYPRINOIDES.

*Clupea cyprinoides*, Brousson. Ichthyol. pl. ix. (1782).

*Megalops filamentosus*, Lacep. Hist. Poiss. v. p. 290, pl. xiii. fig. 3 (1803);  
Bleek. Nederl. Tijdschr. Dierk. iii. 1866, p. 286, and Atl. Ichth. vi. p. 86,  
pl. cclxxiii. fig. 1 (1872).

*Cyprinodon cundinga*, Ham. Buchan. Fish. Ganges, p. 254 (1822).

*Megalops setipinnis*, Richards. Ann. N. H. xi. 1843, p. 493.

*Megalops curtifilis*, Richards. Ichth. China, p. 310 (1846).

*Megalops indicus*, Cuv. & Val. Hist. Poiss. xix. p. 388, pl. ccccexlii. (1846);  
Bleek. Verh. Bat. Gen. xxiv. 1852, no. 7, p. 15.

*Elops cundinga*, Cantor, Cat. Mal. Fish. p. 289 (1850).

*Megalops macrophthalmus*, Bleek. Verh. Bat. Gen. xxiv. 1852, no. 7, p. 15.

*Megalops macropterus*, Bleek. Nederl. Tijdschr. Dierk. iii. 1866, p. 284, and  
Atl. t. c. p. 85, pl. cclxxiii. fig. 2.

*Megalops kundinga*, Bleek. tt. cc. pp. 288, 87, pl. cclxxiv. fig. 1.

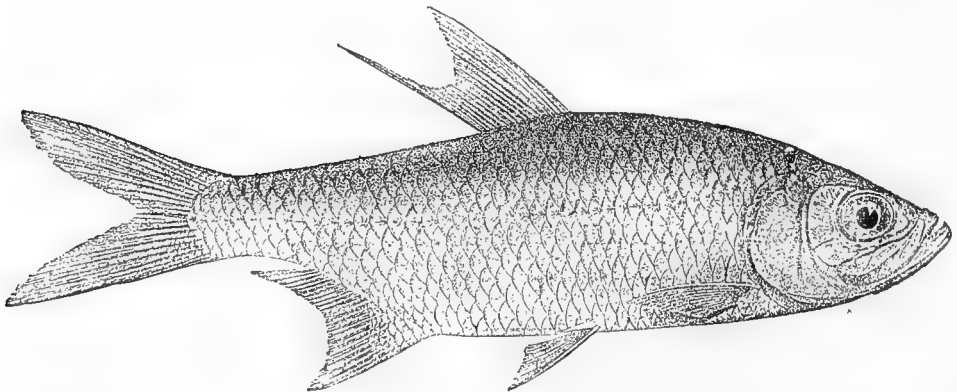
*Megalops cyprinoides*, Bleek. t. c. p. 290; Günth. Cat. Fish. vii. p. 471 (1868);  
Bleek. Atl. t. c. p. 87, pl. cclxx. fig. 4; Day, Fish. Ind. p. 650, pl. clix.  
fig. 3 (1878); Sauv. Hist. Madag., Poiss. p. 497, pl. xlix. A. fig. 3 (1891);  
Pfeffer, Thierw. O.-Afr., Fische, p. 70 (1896).

*Megalops oligolepis*, Bleek. t. c. p. 292.

*Elops apalike*, Day, Fish. Malab. p. 228 (1865).

*Elops cyprinoides*, Playf. & Günth. Fish. Zanzib. p. 122 (1866); Peters, Reise  
Mossamb. iv. p. 92 (1868).

Fig. 19.

*Megalops cyprinoides*.Indian Ocean, after Day (Fish. Ind.).  $\frac{1}{2}$ .

Depth of body equal to or a little greater than length of head, 3 to 4 times in total length. Eye  $2\frac{3}{5}$  to  $3\frac{1}{2}$  times in length of head, greater than length of snout or interorbital width; lower jaw projecting beyond upper; maxillary extending to below posterior border of eye or a little beyond. Gill-rakers at least as long as gill-filaments, 25-35 on lower part of anterior arch. Dorsal 17-20, originating above base of ventral.

Anal 24-28. Scales 37-42  $\frac{5-6}{7-8}$ , 4-5 between lateral line and scaly process above ventral, 12-14 round caudal peduncle. Silvery, bluish green on the back.

Total length 350 millim.

From the East Coast of Africa to Australia and Polynesia; often found in fresh water near the coast, or ascending rivers.

|          |                            |                         |
|----------|----------------------------|-------------------------|
| 1. Hgr.  | Zanzibar.                  | Sir L. Playfair (C.).   |
| 2. Skin. | "                          | "                       |
| 3. Skin. | Shiré River.               | Sir J. Kirk (P.).       |
| 4. Hgr.  | Rodriguez, in fresh water. | G. Gulliver, Esq. (P.). |

## Fam. 2. MORMYRIDÆ.

Margin of the upper jaw formed by the single præmaxillary and the maxillaries, the latter articulated above the former to the mesethmoid; parietal bones separating the supraoccipital from the frontals; a large hole on each side of the skull, between the squamosal, the epiotic, and the exoccipital, covered by a large, thin, bony plate (the supratemporal); symplectic absent; suboperculum small and hidden under the operculum, or absent. No pharyngeal teeth. Opercular bones hidden under the skin; gill-openings narrow. Anterior ribs sessile; epineurals, no epipleurals. Pectoral fins directed upwards. Ventral fins with 6 or 7 rays. Air-bladder communicating with the ear.

Curious-looking, highly aberrant fishes, very variable in the form of the head and body and in the extent of the vertical fins. Mouth often very small; teeth usually present on the parasphenoid, working against a similar patch on the tongue; eye covered over by skin, or at least without free border, sometimes very indistinct; scales small, cycloid; branchiostegal rays 4 to 8.

Nile and fresh waters of Tropical Africa.

### *Synopsis of the Genera.*

I. MORMYRIDÆ.—Ventral, anal, and caudal fins present; teeth on the parasphenoid and on the tongue.

A. Anal fin  $\frac{3}{8}$  to twice the length of the dorsal.

1. Teeth in jaws in a single series.

a. Teeth on the entire edge of both jaws, 10-36 in each jaw.

Mouth terminal or subinferior; nostrils distant

from each other and remote from the eye;

body more or less elongate . . . . . 1. *Mormyrops*, J. Müll., p. 30.

Mouth inferior, below the eyes; nostrils close

together, close to the eye; body short . . . 2. *Petrocephalus*, Marcus., p. 47.

- b. Teeth only in the middle of the jaws, 3-10 in each jaw.
- α. Body much elongate; ventral fin nearer anal than pectoral.  
Mouth subinferior; dorsal fin a little longer than anal. . . . . 3. *Isichthys*, Gill, p. 59.
- β. Body short or more or less elongate; ventral fin equally distant from pectoral and anal or nearer the former.  
Mouth inferior or subinferior, below level of eye; teeth moderate or small; posterior nostril remote from mouth . . . . . 4. *Marcusenius*, Gill, p. 60.  
Mouth inferior or subinferior; teeth small; posterior (lower) nostril close to mouth . . . . . 5. *Stomatorhinus*, Blgr., p. 87.  
Mouth inferior; upper teeth small, conical, median pair of mandibular teeth very large, incisor-like; dorsal much longer than anal. . . . . 6. *Myomyrus*, Blgr., p. 92.  
Mouth terminal; dorsal and anal equal or subequal in length . . . . . 7. *Gnathonemus*, Gill, p. 94.
2. Teeth in jaws disposed in several rows forming villiform bands; dorsal and anal fins nearly equally developed . . . . . 8. *Genyomyrus*, Blgr., p. 125.
- B. Anal fin less than half the length of the dorsal.  
Mouth terminal . . . . . 9. *Mormyrus*, L., p. 126.
- C. Anal fin more than five times the length of the dorsal.  
Mouth terminal; palate and tongue with a pavement of large spheroid teeth . . . . . 10. *Hyperopisus*, Gill, p. 142.
- II. GYMNARCHINÆ.—Ventral, anal, and caudal fins absent; no teeth on the parasphenoid and tongue; body eel-shaped . . . . . 11. *Gymnarchus*, Cuv., p. 144.

### 1. MORMYROPS.

- Mormyrus*, part., Linn. Syst. Nat. i. p. 522 (1766).  
*Mormyrops*, part., J. Müll. Arch. f. Nat. 1843, p. 324; Günth. Cat. Fish. vi. p. 223 (1866).  
*Mormyrops*, Gill, Proc. Ac. Philad. 1862, p. 139; Peters, Reise Mossamb. iv. p. 88 (1868); Bouleng. Proc. Zool. Soc. 1898, p. 780, Poiss. Bass. Congo, p. 56 (1901), and Fish. Nile, p. 29 (1907).  
*Oxymormyrus*, Bleek. Versl. Ak. Amsterd. (2) viii. 1874, p. 367.

Teeth in the jaws conical, truncate, or notched, forming a single complete series on the entire edge of both jaws (10-36 in each); minute conical teeth on the parasphenoid and on the tongue; mouth terminal or subinferior. Nostrils moderately far apart, remote from the eye. Body more or less elongate; ventral fins equally distant from

the pectorals and from the anal, or nearer the former. Anal fin longer than the dorsal. Vertebræ 56-62 (21-24+31-39).

Nile and Tropical Africa.

*Synopsis of the Species.*

- I. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{4}$  to  $\frac{1}{2}$  length of head.
- A. 20-36 teeth in each jaw ; lat. l. 85-96.
- D. 21-27 ; A. 40-51 ; 14-18 scales round caudal peduncle ; depth of body  $5-6\frac{1}{2}$  times in total length ; head nearly twice as long as deep . . . . . 1. *M. deliciosus*, Leach, p. 32.
- D. 25-28 ; A. 39-42 ; 20 scales round caudal peduncle ; depth of body  $5-6\frac{1}{2}$  times in total length ; head nearly twice as long as deep . . . . . 2. *M. anguilloides*, L., p. 34.
- D. 26-29 ; A. 39-45 ; 14 scales round caudal peduncle ; depth of body  $6\frac{1}{3}-7$  times in total length ; head more than twice as long as deep . . . . . 3. *M. longiceps*, Gthr., p. 35.
- D. 26 ; A. 43 ; depth of body  $7\frac{2}{3}$  times in total length ; head nearly twice as long as deep . . . . . 4. *M. breviceps*, Stdr., p. 36.
- B. 10-16 teeth in each jaw.
1. Snout short, not prolonged into a tube.
- a. D. 19-22 ; A. 33-37 ; head nearly twice as long as deep ; depth of body  $6\frac{1}{2}-7\frac{1}{2}$  times in total length.
- L. l. 80-93 ; 16 scales round caudal peduncle . . . . . 5. *M. engystoma*, Blgr., p. 36.
- L. l. 70-76 ; 12 scales round caudal peduncle . . . . . 6. *M. parvus*, Blgr., p. 37.
- b. D. 29-32 ; A. 40-47 ; L. l. 90-95 ; 16-18 scales round caudal peduncle ; head not twice as long as deep.
- Depth of body 6 times in total length ; 7th or 8th ray of anal corresponding to first of dorsal . . . . . 7. *M. masuianus*, Blgr., p. 38.
- Depth of body  $6\frac{1}{2}-8$  times in total length ; 13th or 14th ray of anal corresponding to first of dorsal . . . . . 8. *M. sirenoides*, Blgr., p. 39.
2. Snout much produced, tubiform, straight or slightly curved ; A. 34-39.
- D. 19-21 ; L. l. 70-74 ; 10-12 scales round caudal peduncle ; head  $2\frac{1}{2}-2\frac{3}{4}$  times as long as deep . . . . . 9. *M. zanclirostris*, Gthr., p. 40.
- D. 17 ; L. l. 63-70 ; 8 scales round caudal peduncle ; head  $3-3\frac{1}{2}$  times as long as deep . . . . . 10. *M. boulengeri*, Pellegr., p. 40.

II. Caudal peduncle not or but little longer than deep,  $\frac{1}{6}$  to  $\frac{1}{3}$  length of head.

- A. 16-28 teeth in each jaw ; D. 24-32 ; head not twice as long as deep.
- D. 24-25 ; A. 40-43 ; L. l. 62-67 ; 16 scales  
round caudal peduncle ; depth of body  
4-4 $\frac{1}{2}$  times in total length . . . . . 11. *M. curtus*, Blgr., p. 41.
- D. 29-32 ; A. 46-50 ; L. l. 80-90 ; 16-18 scales  
round caudal peduncle ; depth of body 5-6  
times in total length . . . . . 12. *M. lineolatus*, Blgr., p. 42.
- D. 24-25 ; A. 38-41 ; L. l. 54-58 ; 12 scales  
round caudal peduncle ; depth of body  
5-5 $\frac{1}{2}$  times in total length . . . . . 13. *M. nigricans*, Blgr., p. 43.
- B. 12-20 teeth in each jaw ; D. 33-45 ; head nearly twice as long as deep.
1. Teeth truncate.
- D. 45 ; A. 70 ; L. l. 102 ; 14 scales round  
caudal peduncle ; depth of body 6 $\frac{3}{4}$  times  
in total length . . . . . 14. *M. microstoma*, Blgr., p. 44.
- D. 34-39 ; A. 47-59 ; L. l. 100-106 ; 22-24  
scales round caudal peduncle ; depth of  
body 5 $\frac{1}{2}$ -7 times in total length . . . . . 15. *M. mariæ*, Schilth., p. 44.
- D. 41-43 ; A. 63-64 ; L. l. 90-95 ; 16 scales  
round caudal peduncle ; depth of body  
8-8 $\frac{1}{2}$  times in total length . . . . . 16. *M. attenuatus*, Blgr., p. 45.
2. Teeth bicuspid, deeply forked.
- D. 33-35 ; A. 55-61 ; L. l. 90-95 ; 14 scales  
round caudal peduncle ; depth of body 7 $\frac{1}{2}$   
times in total length . . . . . 17. *M. furcidens*, Pellegr., p. 46.

### 1. MORMYROPS DELICIOSUS.

*Oxyrhynchus deliciosus*, Leach, in Tuckey, Exped. R. Zaire, p. 410 (1818).

*Mormyrus tuckeyi*, Cuv. & Val. Hist. Poiss. xix. p. 263 (1846).

*Mormyrus zambanenje*, Peters, Mon. Berl. Ac. 1852, p. 275 ; Günth. Proc. Zool. Soc. 1896, p. 224.

*Mormyrops tuckeyi*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14.

*Mormyrops deliciosus*, Günth. Cat. Fish. vi. p. 224 (1866) ; Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 555, pl. v. fig. 1 ; Perugia, Ann. Mus. Genova, (2) x. 1892, p. 976 ; Steind. Notes Leyd. Mus. xvi. 1894, p. 65 ; Bouleng. Proc. Zool. Soc. 1898, p. 782, and Poiss. Bass. Congo, p. 58 (1901) ; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 341.

*Mormyrops zambanenje*, Günth. l. c.

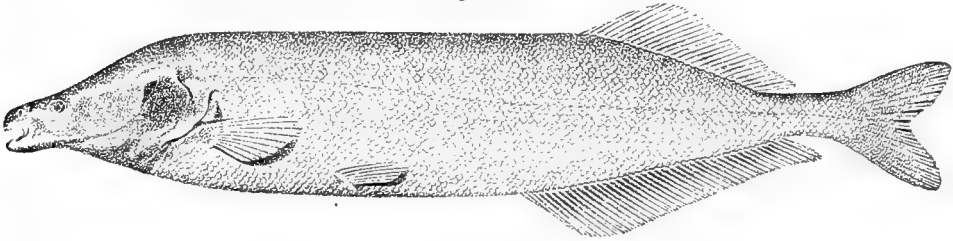
*Mormyrus (Mormyrops) zambanenje*, Peters, Reise Mossamb. iv. p. 88, pl. xv. fig. 2 (1868).

*Mormyrus (Mormyrops) swanenburgi*, Schilthuis, Tijds. Nederl. Dierk. Ver. (2) iii. 1891, p. 91.



Depth of body 5 to  $6\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times. Head nearly twice as long as deep, upper profile slightly concave; snout rounded; jaws equal; width of mouth nearly equal to length of snout; teeth truncate or conical in the adult, more or less distinctly notched in the young, 24 to 36 in each jaw; eye small, in anterior third of the head, its diameter 2 (young) to 4 times in length of snout or in interocular width. Dorsal 21–27,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of anal, originating 2 to  $2\frac{1}{2}$  times as far from end of snout as from

Fig. 20.

*Mormyrops deliciosus.*Senegal, after Steindachner (*l. c.*).  $\frac{1}{3}$ .

base of caudal. Anal 40–51, originating considerably in advance of dorsal (its 12th to 16th ray corresponding to the first dorsal ray), and a little nearer head than root of caudal. Pectoral rounded,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head, ventral  $\frac{1}{4}$  to  $\frac{1}{3}$ . Caudal rather small, densely scaled, with rounded lobes. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{3}$  to  $\frac{1}{2}$  length of head. 85–100 scales in lateral line,  $\frac{15-18}{18-22}$  in transverse series on body, 22–26 in transverse series between dorsal and anal, 14–18 round caudal peduncle. Brownish or olive above, silvery beneath.

Total length 1500 millim.

Senegal, Gambia, Niger, Chad Basin, Congo, Zambezi, L. Nyassa, Webi Shebeli and Juba.

|                    |                                            |                           |
|--------------------|--------------------------------------------|---------------------------|
| 1–3, 4. Ad. & hgr. | Gambia.                                    | J. S. Budgett, Esq. (P.). |
| 5. Ad., stffd.     | Niger.                                     | Mr. J. T. Dalton (C.).    |
| 6. Hgr.            | "                                          | "                         |
| 7. Ad.             | Jebba, Upper Niger.                        | Capt. G. F. Abadie (P.).  |
| 8. Ad.             | Mureji, "                                  | J. S. Budgett, Esq. (P.). |
| 9–11. Yg.          | Assay, Lower Niger.                        | Dr. W. J. Ansorge (P.).   |
| 12–13. Yg.         | Agberi, "                                  | "                         |
| 14. Yg.            | West Africa.                               |                           |
| 15. Yg.            | Fort Lamy, Shari River.                    | Capt. G. B. Gosling (P.). |
| 16–17. Hgr.        | Libi River (Congo System),<br>S. Cameroon. | G. L. Bates, Esq. (C.).   |

|                                              |                             |                            |
|----------------------------------------------|-----------------------------|----------------------------|
| 18. Ad., stffd. (Type.)                      | Lower Congo.                | Tuckey Expedition.         |
| 19. Hgr.                                     | "                           | M. F. Hens (C.).           |
| 20. Ad.                                      | Boma, Lower Congo.          | M. P. Delhez (C.).         |
| 21. Hgr., skel.                              | "                           | "                          |
| 22. Ad.                                      | Leopoldville, Stanley Pool. | "                          |
| 23. Yg. (Type of<br><i>M. swanenburgi</i> .) | Kinshassa, "                | M. A. Greshoff (C.).       |
| 24. Hgr.                                     | Kutu, Lake Leopold II.      | M. P. Delhez (C.).         |
| 25-27. Hgr. & yg.                            | Monsembe, Upper Congo.      | Rev. J. H. Weeks (P.).     |
| 28. Yg.                                      | Uerre, Congo.               | M. De Bauw (C.).           |
| 29. Yg.                                      | Banzville, Ubānghi.         | Capt. Royaux (C.).         |
| 30. Ad.                                      | Geladi, Webi Shebeli.       | Dr. Donaldson Smith (C.).  |
| 31. Ad.                                      | Lake Nyassa.                | Capt. E. L. Rhoades (P.).  |
| 32. Yg.                                      | "                           | J. A. Williams, Esq. (C.). |

## 2. MORMYROPS ANGUILLOIDES.

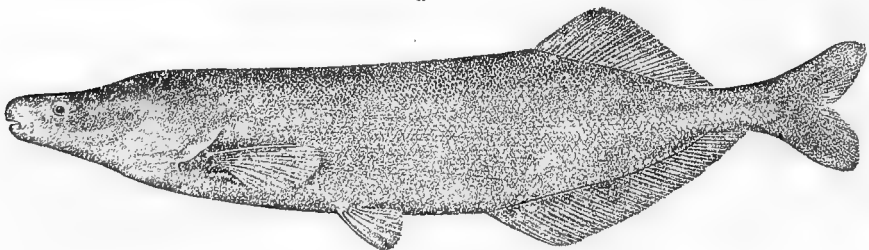
*Mormyrus anguilloides*, Linn. Mus. Ad. Frid. ii. p. 110 (1764), and Syst. Nat. i. p. 522 (1766); I. Geoffr. Descr. Egypte, Poiss. p. 274, pl. vii. fig. 2 (1827); Rifaud, Voy. Egypte, pl. clxxxviii. fig. 2 (1836); Cuv. & Val. Hist. Poiss. xix. p. 258 (1846); Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 132; Günth. Petherick's Trav. ii. p. 257 (1869).

*Mormyrus dendera*, Lacep. Hist. Poiss. v. p. 621 (1803).

*Mormyrops anguilloides*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14; Günth. Cat. Fish. vi. p. 233 (1866); Bouleng. Proc. Zool. Soc. 1898, p. 782, and Fish. Nile, p. 29, pl. v. fig. 1 (1907).

*Marcusenius anguilloides*, Gill, Proc. Ac. Philad. 1862, p. 444.

Fig. 21.

*Mormyrops anguilloides*.Sanhur (F. N.).  $\frac{1}{2}$ .

Depth of body 5 to  $6\frac{1}{2}$  times in total length, length of head 4 times. Head once and  $\frac{2}{3}$  to nearly twice as long as deep, upper profile slightly concave; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head, scarcely projecting beyond mouth; width of mouth nearly equal to or less than length of snout; teeth more or less distinctly notched, 20 to 24 in each jaw; eye small, in anterior third of the head, its diameter  $2\frac{1}{2}$  to 3 times in

length of snout, 2 to 3 times in interocular width. Dorsal 25-28,  $\frac{3}{5}$  to  $\frac{2}{3}$  length of anal, originating 2 to  $2\frac{1}{4}$  times as far from end of snout as from root of caudal. Anal 39-42, originating considerably in advance of dorsal, its 10th to 12th ray corresponding to first of latter, and at equal distance from head and root of caudal. Pectoral rounded or very obtusely pointed,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. Caudal rather small, with rounded lobes, greater part covered with scales. Caudal peduncle about twice as long as deep,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head. 87-96 scales in lateral line,  $\frac{16-20}{22-28}$  in transverse series on body,  $\frac{14-16}{12-14}$  in transverse series between dorsal and anal, 20 round caudal peduncle. Olive or greyish brown above, whitish beneath, sometimes dotted all over with black.

Total length 310 millim.

Lower Nile.

|                   |                          |                          |
|-------------------|--------------------------|--------------------------|
| 1. Ad.            | Nile.                    | Dr. Rüppell (C.).        |
| 2. Ad., skel.     | "                        | "                        |
| 3. Ad.            | Lower Nile.              | J. Petherick, Esq. (C.). |
| 4. Hgr.           | Nile near Cairo.         | Capt. S. Flower (P.).    |
| 5-7. Hgr.         | Beni Souef.              | L. Loat, Esq. (C.).      |
| 8-10. Ad. & hgr.  | Sanhur, near Beni Souef. | "                        |
| 11-12. Ad. & hgr. | Luxor.                   | "                        |
| 13. Hgr.          | Assuan.                  | "                        |

### 3. MORMYROPS LONGICEPS.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 117; Bouleng. Proc. Zool. Soc. 1898, p. 783.

*Mormyrus longiceps*, Günth. Proc. Zool. Soc. 1899, p. 731.

Depth of body  $6\frac{1}{3}$  to 7 times in total length, length of head 4 times. Head a little more than twice as long as deep, upper profile nearly straight, declivous; snout rounded, nearly  $\frac{1}{5}$  length of head, slightly projecting beyond mouth, the width of which equals length of snout and once and  $\frac{1}{2}$  interocular width; teeth feebly notched,  $\frac{24-26}{22-24}$ ; eye small, in anterior third of head, its diameter twice in length of snout, once and  $\frac{1}{2}$  in interocular width. Dorsal 26-29, about  $\frac{3}{5}$  or  $\frac{2}{3}$  length of anal, originating twice as far from end of snout as from base of caudal. Anal 39-45, originating considerably in advance of dorsal and a little nearer head than root of caudal. Pectoral rounded, a little more than  $\frac{1}{2}$  length of head. Caudal rather small, densely scaled, with rounded lobes. Caudal peduncle twice as long as deep,  $\frac{2}{5}$  length of head. 86-90 scales in lateral line,  $\frac{14}{20}$  in transverse series on body, 21 in

transverse series between dorsal and anal, 14 round caudal peduncle. Uniform brown, lighter beneath.

Total length 330 millim.

Gold Coast.—The type specimen, from Bossumprah River, which should be in the Liverpool Museum, could not be found by Dr. H. O. Forbes, to whom I applied for information respecting it.

1. Ad. Kotschwah River. R. B. N. Walker, Esq. (P.).

#### 4. MORMYROPS BREVICEPS.

Steind. Notes Leyd. Mus. xvi. 1894, p. 66, pl. i. fig. 2.

Depth of body  $7\frac{2}{3}$  times in total length, length of head  $5\frac{1}{2}$  times. Head nearly twice as long as deep, upper profile slightly concave; snout rounded, upper jaw a little longer than lower; teeth truncate or slightly notched, 20 in each jaw; eye small, its diameter  $\frac{1}{2}$  length of snout. Dorsal 26,  $\frac{2}{3}$  length of anal, originating considerably nearer base of caudal than head. Anal 43, originating considerably in advance of dorsal (its 13th ray corresponding to first dorsal), and a little nearer head than base of caudal. Pectoral a little more than  $\frac{1}{2}$  length of head. Caudal rather small, with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  length of head. 90 scales in lateral line.

Total length 355 millim.

S. Paul R., Liberia.—Type in Leyden Museum.

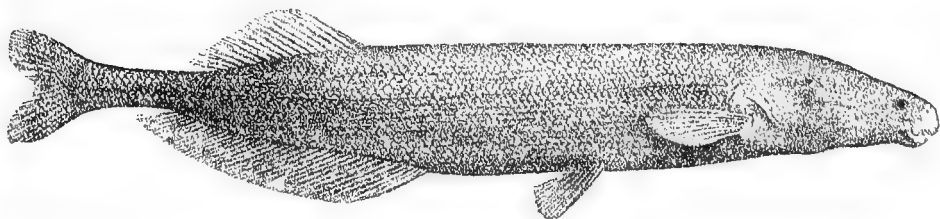
#### 5. MORMYROPS ENGYSTOMA.

Pouleng. Ann. Mus. Congo, Zool. i. p. 3, pl. i. fig. 1 (1898), Proc. Zool. Soc. 1898, p. 784, and Poiss. Bass. Congo, p. 60 (1901).

Depth of body 7 to  $7\frac{1}{2}$  times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head nearly twice as long as deep, with straight, declivous upper profile; snout rounded, projecting a little beyond mouth, the width of which equals hardly  $\frac{2}{3}$  length of snout; teeth notched, 12 in each jaw; eye very small, in anterior third of head, its diameter 3 times in length of snout,  $2\frac{1}{2}$  to 3 times in interocular width. Dorsal 19–20,  $\frac{1}{2}$  length of anal, originating twice as far from end of snout as from base of caudal. Anal 35–37, originating considerably in advance of dorsal (9th ray corresponding to first dorsal) and at equal distance from head and from base of caudal. Pectoral rounded,  $\frac{2}{3}$  length of head. Caudal rather small, scaled at the base, with rounded lobes. Caudal

peduncle 2 to  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. 80-93 scales in lateral line,  $\frac{12-13}{20-22}$  in transverse series on body, 18-19 in transverse series between dorsal and anal, 16 round caudal peduncle. Pale brown, dotted with blackish.

Fig. 22.

*Mormyrops engystoma.*Type (A. M. C.).  $\frac{5}{6}$ .

Total length 145 millim.

Lower Congo.—Types in Congo Museum, Tervueren.

1-2. Two of the types.

Matadi.

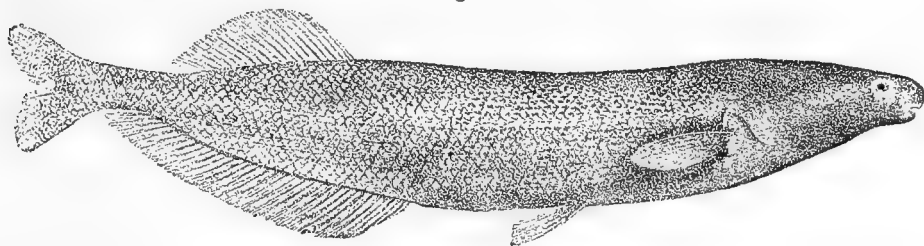
Capt. Wilverth (C.).

#### 6. MORMYROPS PARVUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 65, pl. xxxi. fig. 2 (1899), and Poiss. Bass. Congo, p. 61 (1901).

Depth of body  $6\frac{1}{2}$  to  $7\frac{1}{2}$  times in total length, length of head  $4\frac{1}{2}$  to  $4\frac{3}{4}$  times. Head twice as long as deep, with straight, slightly declivous upper profile; snout rounded, almost truncate, projecting a little beyond mouth, the width of which equals only  $\frac{3}{5}$  length of snout; teeth notched,

Fig. 23.

*Mormyrops parvus.*Type (A. M. C.).  $\frac{5}{6}$ .

10 to 12 in each jaw; eye very small, in anterior third of head, its diameter 3 times in length of snout,  $2\frac{1}{2}$  to 3 times in interocular width. Dorsal 19-22,  $\frac{1}{2}$  or  $\frac{3}{5}$  length of anal, originating 2 to  $2\frac{1}{2}$  times as far from end of snout as from base of caudal. Anal 33-36, originating

considerably in advance of dorsal (9th or 10th ray corresponding to first dorsal), and at equal distance from head and from base of caudal. Pectoral obtusely pointed,  $\frac{3}{5}$  length of head. Caudal rather small, greater part covered with scales, with rounded lobes. Caudal peduncle twice as long as deep,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head. 70-76 scales in lateral line,  $\frac{10-11}{14-16}$  in transverse series on body, 17-18 in transverse series between dorsal and anal, 12 round caudal peduncle. Pale grey above, finely speckled with black, white beneath.

Total length 165 millim.

Lower Congo.—Types in Congo Museum, Tervueren.

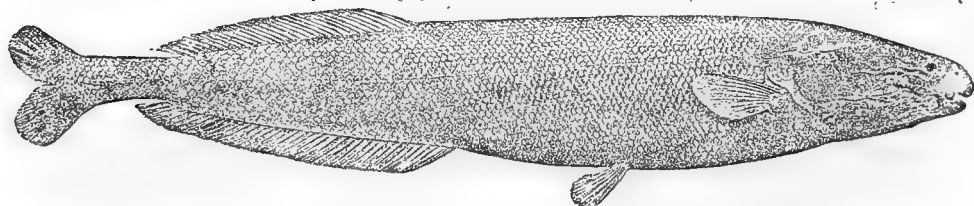
- |                      |       |                    |
|----------------------|-------|--------------------|
| 1. One of the types. | Boma. | M. P. Delhez (C.). |
| 2. Skel.             | "     | "                  |

#### 7. MORMYROPS MASUIANUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 4, pl. ii. fig. 1 (1898), Proc. Zool. Soc. 1898, p. 784, and Poiss. Bass. Congo, p. 61 (1901).

Depth of body 6 times in total length, length of head  $4\frac{2}{3}$  times. Head  $1\frac{2}{3}$  as long as deep, with straight, declivous upper profile; snout rounded, projecting a little beyond the mouth; width of mouth a little greater than length of snout; teeth truncate, 12 in upper jaw, 14 in lower; eye very small, situated in anterior third of head, its diameter

Fig. 24.



*Mormyrops masuianus.*

Type (A. M. C.).  $\frac{1}{3}$ .

3 times in length of snout or interorbital width. Dorsal 30-31,  $\frac{4}{5}$  length of anal, originating  $1\frac{2}{3}$  as far from end of snout as from base of caudal. Anal 40-46, originating a little in advance of dorsal (its 7th or 8th ray corresponding to first dorsal), and slightly nearer head than base of caudal. Pectoral  $\frac{1}{2}$  length of head. Caudal rather small, densely scaled, with rounded lobes. Caudal

peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{2}$  length of head. 90–93 scales in lateral line,  $\frac{14-15}{19-20}$  in transverse series on body, 21–23 in transverse series between dorsal and anal, 18 round caudal peduncle. Pale brownish.

Total length 410 millim.

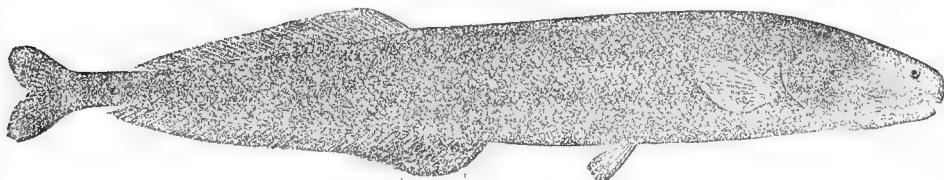
Upper Congo (Upoto and Sanga R.).—Type in Congo Museum, Tervueren.

#### 8. MORMYROPS SIRENOIDES.

Bouleng. Ann. Mus. Congo, Zool. i. p. 4, pl. i. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 785, and Poiss. Bass. Congo, p. 62 (1901).

Depth of body  $6\frac{1}{2}$  to 8 times in total length, length of head  $4\frac{1}{2}$  to 6. Head  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as deep, with straight, declivous upper profile; snout rounded, projecting a little beyond the mouth; width of mouth greater than length of snout; teeth truncate, 12 to 14 in each jaw; eye very small, situated in the anterior third or fourth of the head, its diameter 3 times in length of snout,  $3\frac{1}{2}$  to 4 times in interocular

Fig. 25.



*Mormyrops sirenoides.*

Type (A. M. C.).  $\frac{1}{4}$ .

width. Dorsal 29–32,  $\frac{2}{3}$  or  $\frac{3}{4}$  length of anal, originating  $1\frac{1}{2}$  as far from the end of the snout as from the base of the caudal. Anal 45–47, originating considerably in advance of dorsal (its 13th or 14th ray corresponding to first dorsal), and at nearly equal distance from end of snout and root of caudal. Pectoral rounded, about  $\frac{1}{2}$  length of head. Caudal small, densely scaled, with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{2}$  length of head. 90–95 scales in lateral line,  $\frac{12-13}{19}$  in transverse series on body, 20 in transverse series between dorsal and anal, 16–18 round caudal peduncle. Uniform dark brown, somewhat lighter beneath.

Total length 630 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

1–3. Hgr.

Monsembe.

Rev. J. H. Weeks (P.).

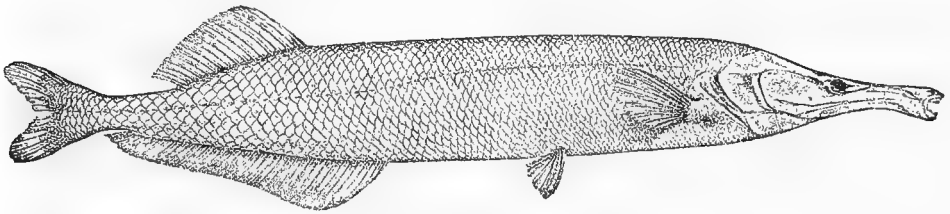
## 9. MORMYROPS ZANCLIROSTRIS.

*Mormyrus zanclirostris*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 114, pl. ii. fig. B.

*Mormyrops zanclirostris*, Bouleng. Ann. Mus. Congo, Zool. i. p. 3 (1898), and Proc. Zool. Soc. 1898, p. 783.

Depth of body 6 to 7 times in total length, length of head  $3\frac{1}{3}$  to 4 times. Head  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times as long as deep; snout much produced, tubiform, nearly as long as postorbital part of head; mouth terminal, very small; teeth truncate, 14 in each jaw; eye very small, situated in anterior half of head, its diameter  $\frac{1}{2}$  to  $\frac{2}{3}$  interocular width. Dorsal 19–21,  $\frac{1}{2}$  length of anal, originating 3 to  $3\frac{1}{2}$  times as far from

Fig. 26.

*Mormyrops zanclirostris*.

Type, after Günther (Ann. & Mag. N. H. 1867).  $\frac{1}{2}$ .

head as from base of caudal. Anal 34–39, originating considerably in advance of dorsal (its 12th to 14th ray corresponding to the first dorsal ray), and at nearly equal distance from head and base of caudal. Pectoral  $\frac{2}{5}$  length of head. Caudal small, densely scaled in its basal half, with rounded lobes. Caudal peduncle twice as long as deep,  $\frac{1}{3}$  length of head. 70–74 scales in lateral line,  $\frac{9-10}{14-16}$  in transverse series on body, 14–15 in transverse series between dorsal and anal, 10 or 12 round caudal peduncle. Dark brown.

Total length 270 millim.

Gaboon.

|               |                   |                         |
|---------------|-------------------|-------------------------|
| 1 Ad., type.  | Gaboon.           |                         |
| 2. Ad.        | Talagouga, Ogowe. | Miss Kingsley (C.).     |
| 3. Ad., skel. | ”                 | ”                       |
| 4–5. Hgr.     | Masoma R., Ogowe. | Dr. W. J. Ansorge (C.). |

## 10. MORMYROPS BOULENGERI.

Pellegr. Bull. Mus. Paris, 1900, p. 349; Bouleng. Poiss. Bass. Congo, p. 63 (1901).

Depth of body 9 times in total length, length of head  $3\frac{1}{2}$  times. Head 3 to  $3\frac{1}{2}$  times as long as deep; snout produced into a long, slender,



slightly curved tube, 6 or 7 times as long as deep; mouth terminal, very small; teeth truncate,  $\frac{12}{14}$ ; eye small, a little nearer opercular border than end of snout, its diameter  $\frac{2}{3}$  interocular width. Dorsal 17,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of anal and above its middle, and 3 times as distant from end of snout as from root of caudal. Anal 38, originating nearer caudal than head.

Fig. 27.

*Mormyrops boulengeri.*Type.  $\frac{5}{8}$ .

Pectoral rounded,  $\frac{1}{3}$  length of head. Caudal small, scaly at the base, with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep, its length  $3\frac{1}{2}$  or 4 times in length of head. 63–70 scales in lateral line,  $\frac{9}{10-11}$  in transverse series on body, 12–13 in transverse series between dorsal and anal, 8 round caudal peduncle. Blackish brown.

Total length 240 millim.

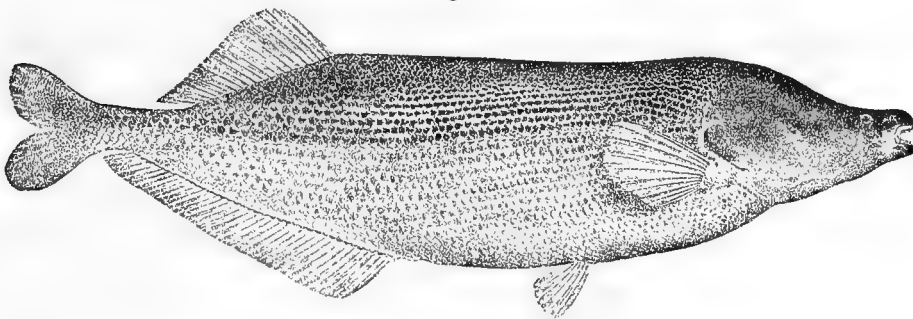
Alima River, Congo.—Types in Paris Museum.

1. One of the types. Diele, Alima R. Paris Museum (E.).

#### 11. MORMYROPS CURTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 66, pl. xxxii. fig. 1 (1899), and Poiss. Bass. Congo, p. 64 (1901).

Fig. 28.

*Mormyrops curtus.*Type (A. M. C.).  $\frac{1}{3}$ .

Depth of body equal to length of head, 4 to  $4\frac{1}{4}$  times in total length. Head once and  $\frac{1}{2}$  as long as deep, with concave upper profile; snout short, rounded; mouth terminal, its width equal to length of snout;

teeth truncate, 22 or 24 in each jaw; eye small, in anterior third of head, its diameter 3 to  $3\frac{1}{2}$  times in length of snout,  $2\frac{1}{2}$  to 3 times in interocular width. Dorsal 24–25, half as long as anal and above its middle,  $2\frac{1}{2}$  times as distant from end of snout as from root of caudal. Anal 40–43, its origin at equal distance from head and from root of caudal. Pectoral rounded,  $\frac{3}{5}$  length of head. Caudal small, greater part covered with scales, with rounded lobes. Caudal peduncle a little longer than deep,  $\frac{1}{4}$  to  $\frac{1}{3}$  length of head. 65–67 scales in lateral line,  $\frac{13-14}{17-19}$  in transverse series on body, 21–23 in transverse series between dorsal and anal, 16 round caudal peduncle. Purplish brown, lighter beneath, with darker blotches or marblings, or with small dark spots forming longitudinal lines.

Total length 400 millim.

Lower Congo.—Types in Congo Museum, Tervueren.

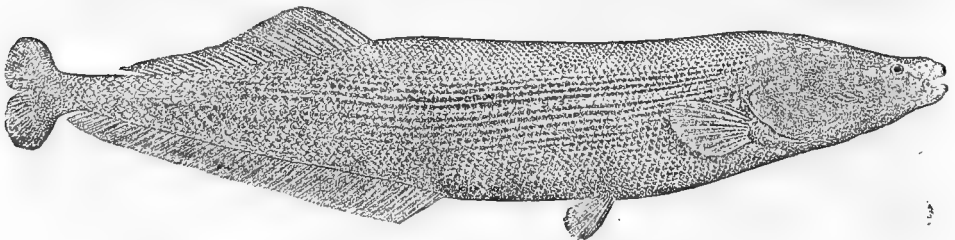
1. One of the types. Boma. M. P. Delhez (C).

## 12. MORMYROPS LINEOLATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 5, pl. ii. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 785, and Poiss. Bass. Congo, p. 65 (1901).

Depth of body 5 to 6 times in total length, length of head  $3\frac{2}{3}$  to 5 times. Head  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times as long as deep, upper profile slightly concave; snout rounded; jaws equal; width of mouth nearly equal to length of snout; teeth truncate, 16 to 22 in each jaw; eye small,

Fig. 29.



*Mormyrops lineolatus.*

Type (A. M. C.).  $\frac{1}{3}$ .

in anterior third of head, its diameter 2 to 3 times in length of snout or in interocular width. Dorsal 29–32,  $\frac{3}{5}$  to  $\frac{2}{3}$  length of anal, originating  $1\frac{2}{3}$  to  $2\frac{1}{4}$  times as far from end of snout as from base of caudal. Anal 46–50, originating considerably in advance of dorsal (11th to 15th ray corresponding to first dorsal), and a little nearer head than root of caudal. Pectoral rounded,  $\frac{1}{2}$  length of head. Caudal small,

densely scaled, with rounded lobes. Caudal peduncle as long as deep,  $\frac{1}{4}$  to  $\frac{1}{5}$  length of head. 80–90 scales in lateral line,  $\frac{14-16}{16-21}$  in transverse series on body, 23–25 in transverse series between dorsal and anal, 16–18 round caudal peduncle. Pale brown, with dark lines along the series of scales.

Total length 400 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

|         |                        |                      |
|---------|------------------------|----------------------|
| 1. Ad.  | Kutu, Lake Leopold II. | M. P. Delhez (C.).   |
| 2. Yg.  | Coquilhatville.        | ”                    |
| 3. Hgr. | Upper Congo.           | Brussels University. |

### 13. MORMYROPS NIGRICANS.

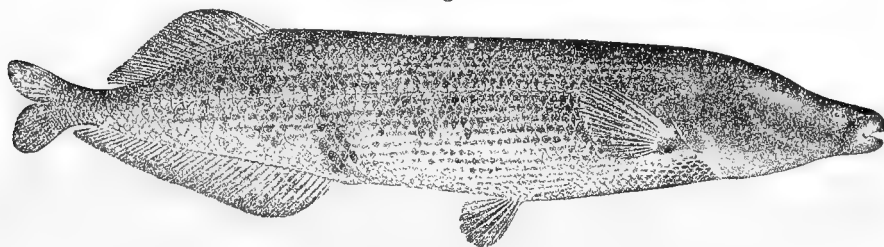
Bouleng. Ann. Mus. Congo, Zool. i. p. 66, pl. xxxii. fig. 2 (1899), and Poiss. Bass.

Congo, p. 66 (1901); Pellegr. Bull. Soc. Philom. (9) ix. 1907, p. 20.

*Mormyrops vaillanti*, Pellegr. Bull. Mus. Paris, 1899, p. 358.

Depth of body 5 to  $5\frac{1}{2}$  times in total length, length of head  $3\frac{3}{4}$  times. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep, upper profile slightly concave; snout rounded; mouth terminal, its width equal to length of snout; teeth truncate, 24 to 28 in each jaw; eye small, in anterior third of head, its diameter  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in length of snout or interocular

Fig. 30.



*Mormyrops nigricans*.

Type (A. M. C.).  $\frac{1}{3}$ .

width. Dorsal 24–25,  $\frac{2}{5}$  length of anal, its origin 3 times as distant from end of snout as from root of caudal. Anal 38–41, originating considerably in advance of dorsal, its origin twice as distant from end of snout as from root of caudal. Pectoral rounded,  $\frac{1}{2}$  length of head. Caudal small, greater part covered with scales, lobes short and rounded. Caudal peduncle not or but slightly longer than deep,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head. 54–58 scales in lateral line,  $\frac{11}{13-15}$  in transverse series on body, 14–16 in transverse series between dorsal and anal, 12 round caudal

peduncle. Blackish on the back, greyish on the belly; sides brown, with darker longitudinal lines, with or without black blotches.

Total length 340 millim.

Upper Congo, Ogowe.—Type in Congo Museum, Tervueren.

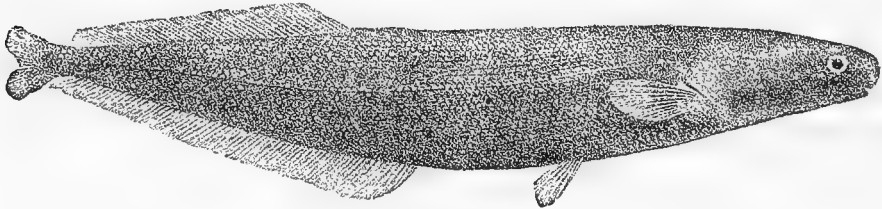
1. Hgr. Monsembe, Upper Congo. Rev. J. H. Weeks (P.).

#### 14. MORMYROPS MICROSTOMA.

Bouleng. Ann. Mus. Congo, Zool. i. p. 6, pl. i. fig. 3 (1898), Proc. Zool. Soc. 1898, p. 786, and Poiss. Bass. Congo, p. 67 (1901).

Depth of body  $6\frac{1}{3}$  times in total length, length of head  $4\frac{2}{3}$  times. Head twice as long as deep, with straight upper profile; snout rounded, projecting beyond mouth; width of mouth  $\frac{2}{3}$  length of snout; teeth truncate, 14 in each jaw; eye moderate, its diameter once and  $\frac{1}{2}$  in length of snout, twice in interocular width. Dorsal 45, nearly  $\frac{3}{4}$  length of anal, originating nearly twice as far from end of snout as from base of

Fig. 31.



*Mormyrops microstoma.*

Type (A. M. C.).  $\frac{2}{3}$ .

caudal. Anal 70, originating considerably in advance of dorsal (17th ray corresponding to first dorsal), and nearer head than base of caudal. Pectoral rounded,  $\frac{1}{2}$  length of head. Caudal very small, scaled at the base, with rounded lobes. Caudal peduncle hardly as long as deep,  $\frac{1}{6}$  length of head. 102 scales in lateral line,  $\frac{12}{15}$  in transverse series on body, 16 in transverse series between dorsal and anal, 14 round caudal peduncle. Blackish brown.

Total length 165 millim.

Upper Congo (New Antwerp).—Type in Congo Museum, Tervueren.

#### 15. MORMYROPS MARIÆ.

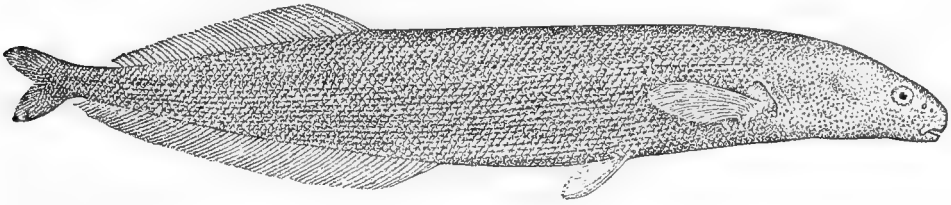
*Mormyrus (Mormyrops) mariæ*, Schilthuis, Tijdschr. Ned. Dierk. Ver. (2) iii. 1891, p. 92.

*Mormyrops mariæ*, Bouleng. Ann. Mus. Congo, Zool. i. p. 3 (1898), Proc. Zool. Soc. 1898, p. 786, and Poiss. Bass. Congo, p. 67 (1901).

Depth of body  $5\frac{1}{2}$  to 7 times in total length, length of head 4 to

5 times. Head once and  $\frac{2}{3}$  to nearly twice as long as deep, with straight or slightly concave upper profile; snout rounded, jaws equal; width of mouth a little less than length of snout; teeth truncate, 14 to 20 in each jaw; eye very small, in anterior third of head, its diameter 3 or 4 times in length of snout,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in interocular width. Dorsal 34-39,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of anal, originating at equal distance from head and from base of caudal, or a little nearer latter. Anal 47-59,

Fig. 32.

*Mormyrops mariae.*Type.  $\frac{5}{8}$ .

originating in advance of dorsal (8th to 11th ray corresponding to first dorsal), and much nearer base of caudal than end of snout. Pectoral rounded,  $\frac{1}{2}$  length of head. Caudal very small, scaled at the base, with rounded lobes. Caudal peduncle not longer than deep,  $\frac{1}{3}$  to  $\frac{1}{6}$  length of head. 100-106 scales in lateral line,  $\frac{18-20}{25-30}$  in transverse series on body, 28-31 in transverse series between dorsal and anal, 22-24 round caudal peduncle. Pale purplish, uniform or finely speckled with brown.

Total length 390 millim.

Congo.

|                |                          |                      |
|----------------|--------------------------|----------------------|
| 1-2. Hgr.      | Matadi, Lower Congo.     | Capt. Wilverth (C.). |
| 3. Ad.         | Boma, „                  | M. P. Delhez (C.).   |
| 4. Hgr., type. | Kinshassa, Stanley Pool. | M. A. Greshoff (C.). |

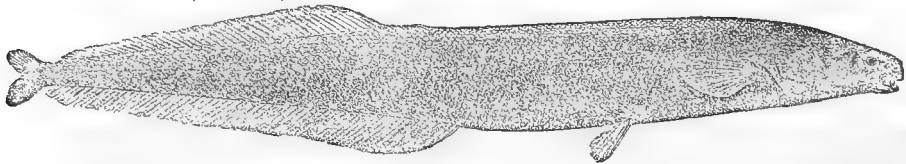
#### 16. MORMYROPS ATTENUATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 6, pl. i. fig. 4 (1898), Proc. Zool. Soc. 1898, p. 786, Poiss. Bas. Congo, p. 68 (1901), and Ann. & Mag. N. H. (7) xvi. 1905, p. 641.

Depth of body 8 to  $8\frac{1}{2}$  times in total length, length of head  $5\frac{1}{2}$  to  $6\frac{1}{2}$  times. Head nearly twice as long as deep, upper profile straight, declivous; snout rounded, projecting a little beyond mouth; width of mouth  $\frac{2}{3}$  length of snout; teeth truncate,  $\frac{12}{14}$ ; eye small, in anterior third of head, its diameter  $2\frac{1}{2}$  times in length of snout or interocular width. Dorsal 41-43,  $\frac{3}{4}$  length of anal, originating a little nearer base

of caudal than head. Anal 63–64, originating considerably in advance of dorsal (14th ray corresponding to first dorsal), and at equal distance from end of snout and base of caudal. Pectoral rounded, a little more than  $\frac{1}{2}$  length of head. Caudal very small, scaled at the base, with rounded lobes. Caudal peduncle hardly as long as deep,  $\frac{1}{6}$  length of

Fig. 33.

*Mormyrops attenuatus.*Type (A. M. C.).  $\frac{1}{3}$ .

head. 90–95 scales in lateral line,  $\frac{12}{17}$  in transverse series on body, 18 in transverse series between dorsal and anal, 16 round caudal peduncle. Whitish, finely and closely speckled with brown.

Total length 410 millim.

Upper Congo (Upoto); Kassai River.—Type in Congo Museum, Tervueren.

#### 17. MORMYROPS FURCIDENS.

Pellegr. Bull. Mus. Paris, 1900, p. 350; Bouleng. Poiss. Bass. Congo, p. 69 (1901).

Depth of body  $7\frac{1}{2}$  times in total length, length of head 5 times. Head nearly twice as long as deep, with straight declivous profile; snout rounded, projecting a little beyond the mouth, the width of which equals  $\frac{2}{3}$  length of snout; teeth bicuspid, forked, 14 in each jaw; eye small, in anterior third of head, its diameter  $2\frac{1}{2}$  times in length of snout, twice in interocular width. Dorsal 33–35,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of anal, its origin nearer root of caudal than head. Anal 55–61, originating considerably in advance of dorsal (15th ray corresponding to first dorsal) and at nearly equal distance from head and from root of caudal. Pectoral rounded,  $\frac{1}{2}$  length of head. Caudal very small, scaled at the base, lobes short and rounded. Caudal peduncle a little longer than deep, its length  $4\frac{1}{2}$  to 5 times in length of head. 90–95 scales in lateral line,  $\frac{13}{18-19}$  in transverse series on body, 20 in transverse series between dorsal and anal, 14 round caudal peduncle. Brown, minutely dotted and indistinctly marbled with blackish.

Total length 300 millim.

Alima River, Congo.—Types in Paris Museum.

2. PETROCEPHALUS.

*Petrocephalus*, part., Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14, and Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 111.

*Mormyrus*, part., Günth. Cat. Fish. vi. p. 214 (1866).

*Petrocephalus*, Gill, Proc. Ac. Philad. 1862, p. 443; Bouleng. Proc. Zool. Soc. 1898, p. 787, Poiss. Bass. Congo, p. 70 (1901), and Fish. Nile, p. 32 (1907).

Teeth in the jaws bicuspid, forming a single complete series on the entire edge of both jaws (10–26 upper and 16–36 lower); minute conical teeth on the parasphenoid and on the tongue; mouth inferior, situated below the eyes. Nostrils close together, close to the eye. Body short; ventral fins nearer the pectorals than the anal. Dorsal and anal fins usually not very unequal in length. Vertebrae 42–44 (9–12 + 4–6 + 27–29).

Nile and Tropical Africa.

*Synopsis of the Species.*

I. Anal originating more or less in advance of dorsal, which has at least 20 rays.

A. Diameter of eye greater than length of snout.

1. D. 28–33; A. 31–39; L. l. 39–50.

Diameter of eye  $\frac{2}{3}$ – $\frac{5}{8}$  interorbital width; teeth  $\frac{14-22}{22-30}$ ;

10–12 scales round caudal peduncle . . . 1. *P. bane*, Lacep., p. 48.

Diameter of eye equal to interorbital width;

teeth  $\frac{20-26}{28-30}$ ; 12 scales round caudal peduncle . . . 2. *P. sauvaigi*, Blgr., p. 49.

Diameter of eye  $1\frac{1}{2}$  interorbital width; teeth  $\frac{10}{20}$ ;

8 scales round caudal peduncle . . . 3. *P. ansorgii*, Blgr., p. 51.

2. D. 20–28.

a. 10–12 scales round caudal peduncle.

α. Base of dorsal at least as long as its distance from caudal.

D. 21–25; A. 28–30; L. l. 35–37; 16–18

scales between D. & A.; teeth  $\frac{20-24}{30-36}$  . . . 4. *P. ballayi*, Sauv., p. 52.

D. 24–28; A. 30–34; L. l. 38–45; 21–26 scales

between D. & A.; teeth  $\frac{10-18}{16-24}$  . . . 5. *P. simus*, Sauv., p. 53.

β. Base of dorsal shorter than its distance from caudal; teeth  $\frac{10-18}{16-26}$ .

D. 22–26; A. 30–35; L. l. 38–43 . . . 6. *P. bovei*, C. & V., p. 54.

D. 25; A. 38–39; L. l. 41–44 . . . 7. *P. keatingii*, Blgr., p. 55.

D. 20–22; A. 25–29; L. l. 35–38 . . . 8. *P. stuhlmanni*, Blgr., p. 56.

b. 16 scales round caudal peduncle.

D. 20–22; A. 25–29; L. l. 37–40; teeth  $\frac{12-14}{18-20}$  . . . 9. *P. catostoma*, Gthr., p. 57.

B. Diameter of eye slightly less than length of snout.

D. 27 ; A. 29 ; L. l. 40 ; teeth  $\frac{14}{24}$  . . . . . 10. *P. gliroides*, Vincig., p. 58.

II. Dorsal and anal originating in the same vertical.

D. 19 ; A. 27 ; L. l. 41 ; 12 scales round caudal peduncle ; teeth  $\frac{10}{22}$  . . . . . 11. *P. degeni*, Blgr., p. 58.

### 1. PETROCEPHALUS BANE.

*Mormyrus bane*, Lacep. Hist. Poiss. v. p. 620 (1803) ; Cuv. & Val. Hist. Poiss. xix. p. 276 (1846) ; Günth. Cat. Fish. vi. p. 220 (1866), and Pethorick's Trav. ii. p. 254 (1869).

*Mormyrus cyprinoides* (non L.), I. Geoffr. Descr. Égypte, Poiss. p. 277, pl. viii. figs. 3 & 4 (1827).

*Mormyrus dequesne*, Cuv. & Val. t. c. p. 281.

*Mormyrus joannisii*, Cuv. & Val. t. c. p. 282.

*Mormyrus ehrenbergii*, Cuv. & Val. t. c. p. 283.

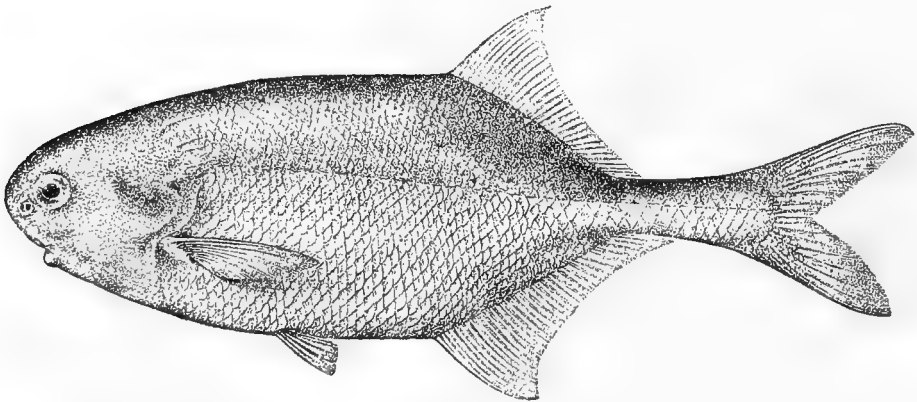
*Petrocephalus bane*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14, and Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 146 ; Bouleng. Proc. Zool. Soc. 1898, p. 788, and Fish. Nile, p. 32, pl. vi. fig. 1 (1907).

*Petrocephalus dequesne*, Marcusen, Bull. p. 14.

*Petrocephalus dejoannis*, Marcusen, l. c.

*Petrocephalus ehrenbergii*, Marcusen, l. c.

Fig. 34.



*Petrocephalus bane*.  
Cairo (F. N.).  $\frac{5}{2}$ .

Depth of body  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{3}{4}$  to  $4\frac{1}{2}$  times. Head as long as deep or a little deeper than long, rounded ; snout very short,  $\frac{1}{6}$  to  $\frac{1}{5}$  length of head, rounded, projecting beyond the mouth ; mouth situated below the eye, its width  $\frac{1}{5}$ – $\frac{2}{7}$  length of head ; teeth bicuspid, 14–22 in upper jaw, 22–30 in lower ; nostrils on



a level with lower border of eye; eye large, longer than snout,  $\frac{2}{3}$  to  $\frac{5}{6}$  interorbital width. Dorsal 29–33, originating above 3rd to 10th ray of anal, its length  $1\frac{1}{2}$  to 2 times in its distance from head. Anal 31–37, equally distant from base of ventral and from base of caudal. Pectoral pointed,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, twice as long as ventral, and extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. 39–50 scales in lateral line,  $\frac{11-15}{12-15}$  in transverse series on body,  $\frac{10-14}{13-16}$  in transverse series between dorsal and anal, 10–12 round caudal peduncle. Silvery, greyish on the back; extremity of anterior dorsal rays brownish or blackish.

Total length 195 millim.

Nile and Chad Basins, Niger.

|                   |                              |                                                      |
|-------------------|------------------------------|------------------------------------------------------|
| 1–3. Ad. & hgr.   | Lower Nile.                  | J. Petherick, Esq. (C.).                             |
| 4. Skel.          | „                            | „                                                    |
| 5. „              | „                            | Dr. Rüppell (C.).                                    |
| 6–8. Ad.          | Rosetta Nile, near Barrage.  | L. Loat, Esq. (C.).                                  |
| 9. Ad.            | Nile S. of Cairo.            | „                                                    |
| 10–19. Ad. & hgr. | Wasta, Lower Nile.           | „                                                    |
| 20–23. Ad. & hgr. | Beni Souef, „                | „                                                    |
| 24–29. Ad. & hgr. | Sanhur, „                    | „                                                    |
| 30–31. Ad.        | Lahun, Bahr Yusuf, Fayum.    | „                                                    |
| 32–34. Ad.        | Between Assiout and Abu Tig. | „                                                    |
| 35–37. Ad.        | Luxor.                       | „                                                    |
| 38–40. Yg.        | Regulator near Luxor.        | „                                                    |
| 41. Hgr.          | Between Luxor and Assuan.    | „                                                    |
| 42–45. Ad.        | Near Assuan.                 | „                                                    |
| 46–53. Ad. & hgr. | Khartum.                     | J. Petherick, Esq. (C.).                             |
| 54. Hgr.          | Omdurman.                    | L. Loat, Esq. (C.).                                  |
| 55–60. Ad.        | Wad Medine, Blue Nile.       | „                                                    |
| 61. Ad.           | Rosaires, „                  | Capt. S. Flower (P.).                                |
| 62–65. Ad. & hgr. | Between Khartum and Sobat R. | Mr. P. C. Zaphiro (C.);<br>W.N. McMillan, Esq. (P.). |
| 66. Hgr.          | Fashoda, White Nile.         | L. Loat, Esq. (C.).                                  |
| 67. Ad.           | Tewfikyeh, „                 | „                                                    |
| 68–69. Ad.        | Yo R., Lake Chad.            | Capt. G. B. Gosling (P.).                            |
| 70. Ad.           | Jebba, Upper Niger.          | Capt. G. F. Abadie (P.).                             |

## 2. PETROCEPHALUS SAUVAGII.

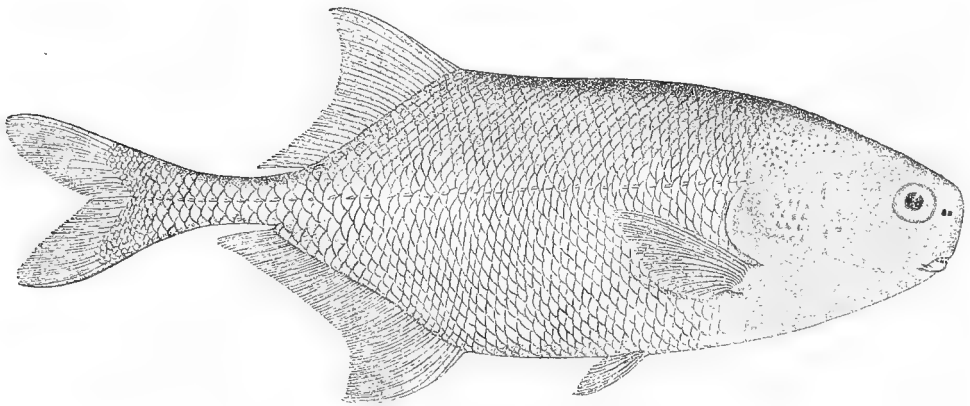
*Mormyrus (Petrocephalus) sauvagii*, Bouleng. Ann. & Mag. N. H. (5) xix. 1887, p. 149.

*Mormyrus cyprinoides* (non Geoffr.), Perugia, Ann. Mus. Genova, xxx. 1891, p. 976.

*Petrocephalus sawagii*, Bouleng. Proc. Zool. Soc. 1898, p. 788, and Poiss. Bass. Congo, p. 70 (1901).

Depth of body  $2\frac{3}{4}$  to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to 4 times. Head as long as deep, with straight, feebly declivous upper profile; snout very short,  $\frac{1}{6}$  to  $\frac{1}{5}$  length of head, obliquely truncate, projecting beyond mouth; mouth situated below anterior border of the eye, its width  $\frac{2}{7}$  or  $\frac{1}{3}$  length of head; teeth bicuspid, 20-26 in upper jaw, 28-30 in lower; eye large, its diameter greater than length of snout, equal to interorbital width. Dorsal 28-31, originating above 4th to 7th ray of anal, its length a little more than half its distance from head. Anal 35-38, equally distant from base of ventral and base of caudal, or

Fig. 35.



*Petrocephalus sawagii*.

Type.  $\frac{5}{7}$ .

slightly nearer latter. Pectoral pointed, about  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, twice as long as ventral, and extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head. 40-46 scales in lateral line,  $\frac{9-12}{13-14}$  in transverse series on body,  $\frac{10-12}{10-12}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Plumbeous above, silvery white below; a round blackish spot sometimes present below origin of dorsal.

Total length 190 millim.

Lower Congo, Old Calabar.

|          |                       |                      |
|----------|-----------------------|----------------------|
| 1. Type. | Lower Congo.          | M. F. Hens (C.).     |
| 2. Ad.   | Loango, Lower Congo.  | M. De Meuse (C.).    |
| 3. Ad.   | Boma,            " .  | M. P. Delhez (C.).   |
| 4. Skel. | "                 " . | "                    |
| 5. Hgr.  | Matadi,         " .   | Capt. Wilverth (C.). |

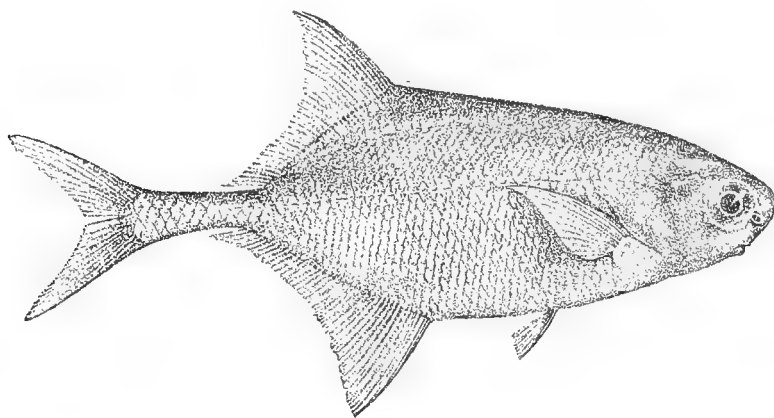
|                  |                      |                        |
|------------------|----------------------|------------------------|
| 6. Ad.           | Bolobo, Upper Congo. | Rev. G. Grenfell (P.). |
| 7-8. Ad. & hgr.  | Monsembe, „          | Rev. J. H. Weeks (P.). |
| 9-10. Ad.        | Coquilhatville, „    | M. P. Delhez (C.).     |
| 10-12. Ad. & yg. | Upper Congo.         | Brussels University.   |
| 13-14. Yg.       | Old Calabar.         | Miss Kingsley (C.).    |

3. PETROCEPHALUS ANSORGII.

Bouleng. Proc. Zool. Soc. 1902, ii. p. 325, pl. xxviii. fig. 2.

Depth of body 3 times in total length, length of head  $4\frac{1}{3}$  times. Head slightly longer than deep; snout rounded,  $\frac{1}{6}$  length of head; mouth situated below eye, its width  $\frac{1}{6}$  length of head; teeth bicuspid, 10 in upper jaw, 20 in lower; nostrils a little above level of lower border of eye; eye large, twice as long as snout,  $1\frac{1}{3}$  interorbital width. Dorsal 33, originating above 9th ray of anal, its length  $1\frac{1}{2}$  in its distance from head. Anal 39, equally distant from base of ventral and from base of caudal. Pectoral

Fig. 36.



*Petrocephalus ansorgii*.  $\frac{4}{5}$ .  
Type (P. Z. S. 1902).

pointed,  $\frac{3}{4}$  length of head, twice as long as ventral and extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{2}{3}$  length of head. 45 scales in lateral line,  $\frac{11}{13}$  in transverse series on body,  $\frac{14}{12}$  in transverse series between dorsal and anal, 8 round caudal peduncle. Silvery, brownish on the back and on the anterior rays of the dorsal.

Total length 105 millim.

Lower Niger.

1. Type.

Agberic.

Dr. W. J. Ansorge (C.).

## 4. PETROCEPHALUS BALLAYI.

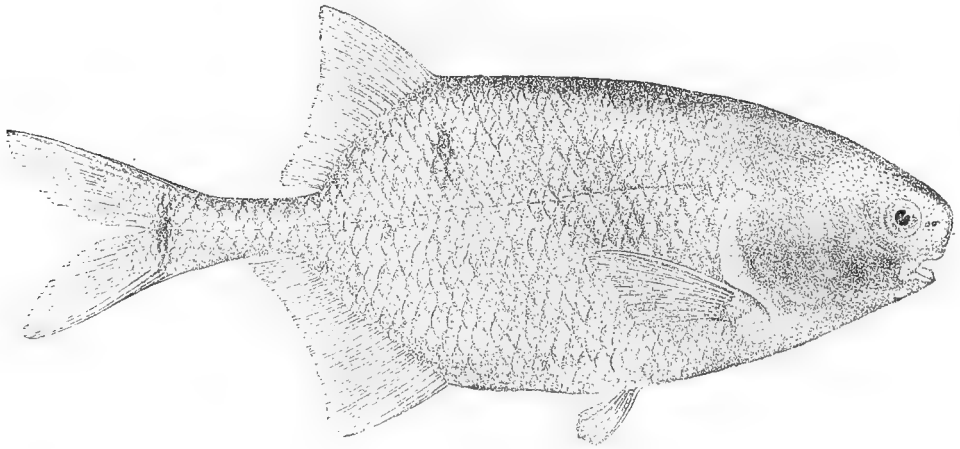
*Mormyrus catostoma* (non Günth. 1866), Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 166.

*Petrocephalus balayi*, Sauv. Bull. Soc. Philom. (7) vii. 1883, p. 159; Bouleng. Proc. Zool. Soc. 1898, p. 789, and Poiss. Bass. Congo, p. 72 (1901); Pellegr. Bull. Soc. Philom. (9) ix. 1907, p. 20.

*Mormyrus amblystoma*, Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 281, pl. xiv. fig. A.

Depth of body  $2\frac{3}{5}$  to 3 times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{3}{5}$  times. Head as long as deep, with convex upper profile; snout very short,  $\frac{1}{6}$  to  $\frac{1}{5}$  length of head, obliquely truncate, projecting beyond mouth; mouth below anterior border or centre of eye, its width  $\frac{1}{3}$  length of head; teeth bicuspid, 20–24 in upper jaw, 30–36 in lower; nostrils above lower border of eye; eye large, its diameter greater than length of snout,  $\frac{2}{3}$  interorbital width. Dorsal 21–25, originating above 4th or 5th ray of anal, its length nearly  $\frac{1}{2}$  its distance from head and equal to its

Fig. 37.

*Petrocephalus ballayi*.

Type of *M. amblystoma*, after Günther (Ann. & Mag. N. H. 1896).

distance from caudal. Anal 28–30, slightly nearer base of caudal than base of ventral. Pectoral pointed,  $\frac{2}{3}$  length of head,  $1\frac{3}{4}$  length of ventral, extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 35–37 scales in lateral line,  $\frac{6-8}{11-12}$  in transverse series on the body,  $\frac{7-9}{8}$  in transverse series between dorsal and anal,

10 or 12 round caudal peduncle. Brown above, silvery below; a dark spot at base of caudal, and another below origin of dorsal.

Total length 170 millim.

Ogowe, Congo.—Type in Paris Museum.

1. Ad. (Type of *M. amblystoma*.) Talagouga, Ogowe. Miss Kingsley (C.).

2-4. Ad. & hgr. Komadekke, Ogowe. Dr. W. J. Ansorge (C.).

#### 5. PETROCEPHALUS SIMUS.

Sauv. Bull. Soc. Philom. (7) iii. 1878, p. 100; Boulng. Proc. Zool. Soc. 1898, p. 789, and Poiss. Bass. Congo, p. 73 (1901); Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 344.

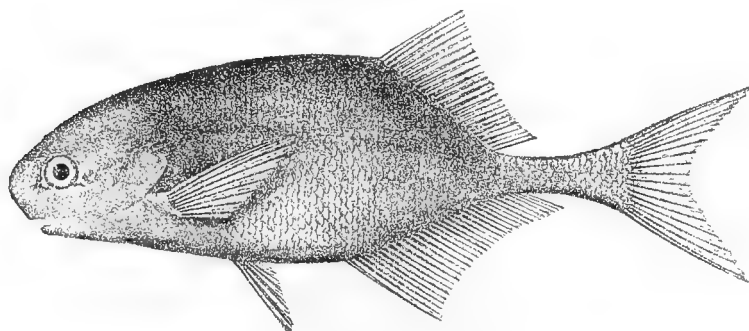
*Mormyrus (Petrocephalus) simus*, Sauv. N. Arch. Mus. (2) iii. 1880, p. 51, pl. ii. fig. 3.

*Mormyrus tenuicauda*, Steind. Notes Leyd. Mus. xvi. 1894, p. 69, pl. vi. fig. 1.

*Mormyrus simus*, Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 282.

Depth of body  $2\frac{3}{4}$  to  $3\frac{1}{3}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times. Head as long as deep, with convex upper profile; snout very short,  $\frac{1}{5}$  length of head, obliquely truncate, projecting beyond mouth; mouth below anterior border of eye, its width  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; teeth bicuspid, 10-18 in upper jaw, 16-24 in lower; nostrils near lower border of eye; eye rather large, a little longer than snout,  $\frac{2}{3}$  inter-

Fig. 38.



*Petrocephalus simus*.

Type, after Sauvage (N. Arch. Mus. 1880).

orbital width. Dorsal 24-28, originating above 5th to 7th ray of anal, its length  $1\frac{3}{4}$  to 2 times in its distance from head, and equal to or slightly greater than its distance from caudal. Anal 30-34, equally distant from base of ventral and from base of caudal. Pectoral pointed,  $\frac{4}{5}$  length of head, twice as long as ventral, extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle

3 times as long as deep,  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, more or less constricted at the base. 38-45 scales in lateral line,  $\frac{9-10}{11-12}$  in transverse series on body,  $\frac{11-13}{11-12}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown above, silvery beneath; anterior part of dorsal blackish; a brown spot sometimes present below origin of dorsal.

Total length 120 millim.

Liberia to Congo.—Type in Paris Museum.

|                   |                                       |                         |
|-------------------|---------------------------------------|-------------------------|
| 1-2. Hgr. & yg.   | Duqueah R., Liberia.                  | Dr. Büttikofer (C.).    |
| 3. Hgr.           | Agberi, S. Nigeria.                   | Dr. W. J. Ansorge (C.). |
| 4-5. Ad.          | Kribi R., S. Cameroon.                | G. L. Bates, Esq. (C.). |
| 6-10. Ad. & hgr.  | Ja R. at Bitye, Cameroon.             | "                       |
| 11-13. Ad.        | Talagouga, Ogowe.                     | Miss Kingsley (C.).     |
| 14. Hgr.          | Ibali, Lake Leopold II., Upper Congo. | M. P. Delhez (C.).      |
| 15. Ad.           | Upper Congo.                          | Brussels University.    |
| 16. Ad.           | Banzville, Ubanghi.                   | Capt. Royaux (C.).      |
| 17-18. Hgr. & yg. | Quanza R., Angola.                    | Dr. W. J. Ansorge (C.). |

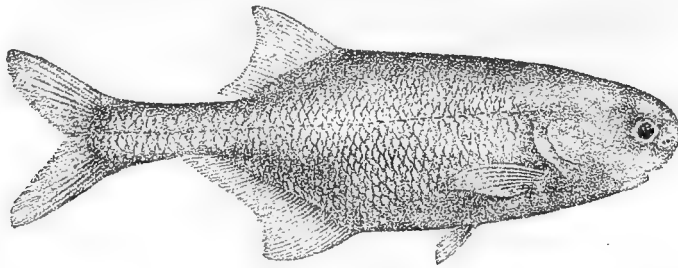
#### 6. PETROCEPHALUS BOVEI.

*Mormyrus bovei*, Cuv. & Val. Hist. Poiss. xix. p. 283 (1846); Günth. Petherick's Trav. ii. p. 255 (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 553.

*Petrocephalus bovei*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14; Bouleng. Proc. Zool. Soc. 1898, p. 789, and Fish. Nile, p. 36, pl. viii. fig. 1 (1907).

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head as long as deep; snout very short,  $\frac{1}{7}$  to  $\frac{1}{5}$  length of head, rounded, projecting beyond mouth; mouth below eye, its width  $\frac{2}{7}$  to  $\frac{1}{4}$  length of head; teeth bicuspid, 10-14 in upper jaw, 16-20 in

Fig. 39.



*Petrocephalus bovei*.  
Lower Nile (F. N.).

lower; nostrils on a level with lower border of eye; eye large, longer than snout, its diameter  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in length of head,  $1\frac{1}{4}$  to  $1\frac{3}{5}$  times in interorbital width. Dorsal 22-26, originating above 6th to 8th ray of anal, its length  $1\frac{1}{2}$  to 2 times in its distance from head and a little

less than its distance from caudal. Anal 30-35, equally distant from base of ventral and from base of caudal, or a little nearer latter. Pectoral pointed,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head, nearly twice as long as ventral, and extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to barely 3 times as long as deep,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. 38-43 scales in lateral line,  $\frac{9-10}{11-15}$  in transverse series on body,  $\frac{10-11}{9-12}$  in transverse series between dorsal and anal, 10 or 12 round caudal peduncle. Uniform silvery, the back a little darker, the fins white.

Total length 120 millim.

Lower Nile, Senegal, Gambia.—Type in Paris Museum.

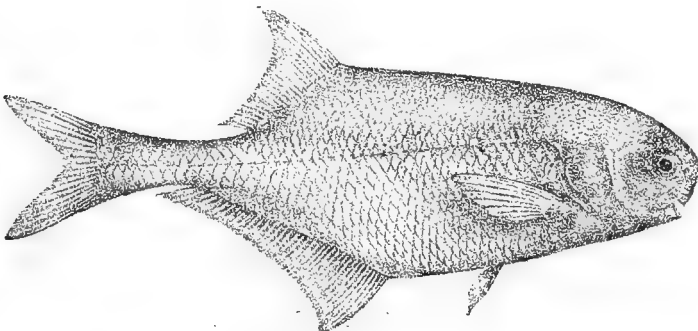
- |                  |                              |                           |
|------------------|------------------------------|---------------------------|
| 1. Ad.           | Kafr-el-Zayat, Rosetta Nile. | L. Loat, Esq. (C.).       |
| 2-11. Ad. & hgr. | Kaädi, Senegal.              | M. P. Delhez (C.).        |
| 12. Ad.          | McCarthy Id., Gambia.        | J. S. Budgett, Esq. (P.). |

7. PETROCEPHALUS KEATINGII.

Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 444, and Fish. Nile, p. 38, pl. viii. fig. 2 (1907).

Depth of body  $2\frac{4}{5}$  to 3 times in total length, length of head 4 to  $4\frac{1}{3}$  times. Head as long as deep; snout very short,  $\frac{1}{6}$  or  $\frac{1}{7}$  length of head, rounded, projecting beyond mouth; mouth below eye, its width  $\frac{2}{7}$  length of head; teeth bicuspid, 16 in upper jaw, 26 in lower; nostrils on

Fig. 40.



*Petrocephalus keatingii.*

Type (F. N.).

a level with lower border of eye; eye large, longer than snout, its diameter  $\frac{1}{4}$  length of head, equal to interocular width. Dorsal 25, originating above 15th ray of anal, its length twice in its distance from head. Anal 38-39, equally distant from base of ventral and from base

of caudal, or a little nearer latter. Pectoral pointed,  $\frac{4}{5}$  length of head, twice as long as ventral and extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  length of head. 41-44 scales in lateral line,  $\frac{10}{12-13}$  in transverse series on body,  $\frac{13}{8-9}$  in transverse series between dorsal and anal, 10 or 12 round caudal peduncle. Silvery, the back and the anterior rays of the dorsal darker.

Total length 105 millim.

White Nile.

- |          |                              |                                                        |
|----------|------------------------------|--------------------------------------------------------|
| 1. Type. | Fashoda.                     | L. Loat, Esq. (P.).                                    |
| 2. Ad.   | Between Khartum and Sobat R. | Mr. P. C. Zaphiro (C.) ;<br>W. N. McMillan, Esq. (P.). |

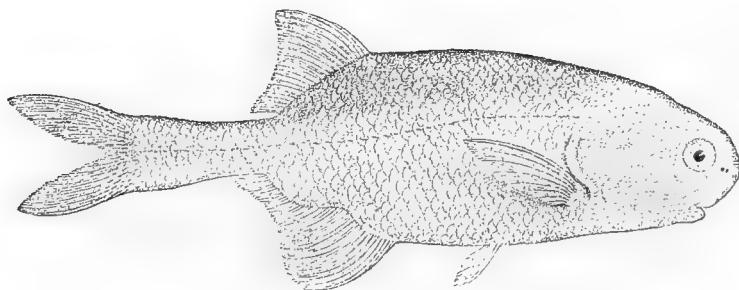
#### 8. PETROCEPHALUS STUHLMANNI, sp. n.

*Mormyrus catostoma* (non Günth.), Pfeffer, Thierw. O.-Afr., Fische, p. 39 (1896).

*Petrocephalus catostoma*, Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 344.

Depth of body equal to length of head,  $3\frac{1}{4}$  times in total length. Head slightly longer than deep, with convex upper profile; snout very short,  $\frac{1}{5}$  length of head, rounded, strongly projecting beyond mouth; mouth below eye, its width  $\frac{1}{4}$  length of head; teeth bicuspid, 12-16 in upper jaw, 20-24 in lower; eye rather large, as long as snout, about  $\frac{3}{5}$  interorbital width. Dorsal 20-22, originating above 5th ray of

Fig. 41.



*Petrocephalus stuhlmanni*.

Type.

anal, its length hardly half its distance from head. Anal 25-29, a little nearer base of ventrals than base of caudal. Pectoral pointed,  $\frac{2}{3}$  length of head, nearly twice as long as ventral and extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle hardly more than twice as long as deep,  $\frac{2}{3}$  length of head. 35-38 scales in lateral line,



$\frac{9}{13}$  in transverse series on body,  $\frac{10}{9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, back dark brown.

Total length 85 millim.

Kingani River, East Africa.

1. Type. Kingani R. Dr. Stuhlmann (C.);  
Berlin Museum (E. ).

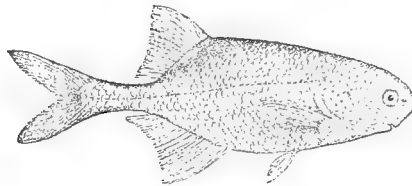
9. PETROCEPHALUS CATOSTOMA.

*Mormyrus catostoma*, Günth. Cat. Fish. vi. p. 222 (1866).

*Petrocephalus catostoma*, Bouleng. Proc. Zool. Soc. 1898, p. 790.

Depth of body 3 to  $3\frac{1}{3}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head as long as deep, with convex upper profile; snout very short,  $\frac{1}{5}$  length of head, rounded, projecting beyond mouth; mouth situated below eye, its width  $\frac{1}{4}$  length of head; teeth bicuspid, 12-14

Fig. 42.



*Petrocephalus catostoma*.

Type.

in upper jaw, 18-20 in lower; eye large, at least as long as snout, at least  $\frac{3}{4}$  interorbital width. Dorsal 20-22, originating above 4th or 5th ray of anal, its length hardly half its distance from head. Anal 25-29, equally distant from base of ventral and from base of caudal. Pectoral pointed, nearly  $\frac{3}{4}$  length of head, twice as long as ventral, and extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep, a little shorter than head. 37-40 scales in lateral line,  $\frac{9-10}{13-15}$  in transverse series on body,  $\frac{10}{10-11}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Silvery, back blackish.

Total length 55 millim.

Rovuma River and Lake Nyassa.

1-5. Types. Rovuma River. Dr. C. Livingstone (P.).  
6. Ad. Between Kondowe and Karonga, Sir H. H. Johnston (P.).  
N. of L. Nyassa.

## 10. PETROCEPHALUS GLIROIDES.

*Mormyrus gliroides*, Vincig. Ann. Mus. Genova, (2) xvi. 1897, p. 353.

*Petrocephalus gliroides*, Bouleng. Proc. Zool. Soc. 1898, p. 790.

Depth of body  $2\frac{4}{5}$  times in total length, length of head  $3\frac{2}{3}$  times. Head nearly as long as deep; snout prominent, rounded, hardly  $\frac{1}{4}$  length of head; mouth inferior, below anterior third of eye, its width  $\frac{1}{5}$  length of head; teeth bicuspid, 14 in upper jaw, 24 in lower; eye moderate, slightly shorter than snout,  $\frac{1}{5}$  length of head,  $\frac{1}{2}$  interorbital width. Dorsal 27, originating above 3rd ray of anal, at equal distance from head and from base of caudal. Anal 29, equally distant from base of ventral and from base of caudal. Pectoral pointed,  $\frac{2}{3}$  length of head. Caudal peduncle  $2\frac{1}{2}$  times as long as deep. About 40 scales in lateral line,  $\frac{12}{12}$  in transverse series on body,  $\frac{12}{14}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Greyish above, yellowish beneath.

Total length 125 millim.

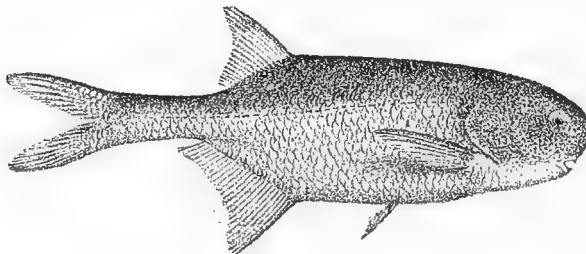
Between Ganana and Lugh, Somaliland.—Type, in Genoa Museum, examined.

## 11. PETROCEPHALUS DEGENI.

Bouleng. Ann. & Mag. N. H. (7) xvii. 1906, p. 434, and Fish. Nile, p. 39, pl. x. fig. 1 (1907).

Depth of body  $3\frac{1}{2}$  times in the total length, length of head  $3\frac{3}{4}$  times. Head as long as deep; snout very short, about  $\frac{1}{6}$  length of head, rounded,

Fig. 43.



*Petrocephalus degeni*.

Type (F. N.).  $\frac{3}{4}$ .

projecting beyond mouth; mouth below eye, its width  $\frac{1}{4}$  length of head; teeth bicuspid, 10 in upper jaw, 22 in lower; nostrils on a level with lower border of eye; eye rather large, longer than snout, its diameter  $4\frac{1}{2}$  times in length of head, once and  $\frac{1}{2}$  in interorbital width. Dorsal 19,

originating above first ray of anal; its length twice and  $\frac{1}{3}$  in its distance from head. Anal 27, equally distant from base of ventral and from base of caudal. Pectoral pointed, about  $\frac{2}{3}$  length of head, twice as long as ventral, and extending beyond vertical of base of latter. Caudal fin with pointed lobes. Caudal peduncle twice and  $\frac{1}{2}$  as long as deep,  $\frac{3}{4}$  length of head. 41 scales in lateral line,  $\frac{10}{12}$  in transverse series on body,  $\frac{9}{9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery; back dark grey; fins grey.

Total length 88 millim.

Lake Victoria.

1. Type. Mouth of Katonga R. Mr. E. Degen (C.).

### 3. ISICHTHYS.

Gill, Proc. Ac. Philad. 1862, p. 444 (1863); Bouleng. Proc. Zool. Soc. 1898, p. 791.

*Mormyrops*, part., Günth. Cat. Fish. vi. p. 223 (1866).

Teeth rather large, notched, few, 5–6 in the upper jaw, 6 in the lower; minute conical teeth on the parasphenoid and on the tongue; mouth subinferior, below the level of the eye. Nostrils widely separated. Body much elongate; ventrals much nearer anal than pectorals. Dorsal a little longer than anal. Vertebrae 64 (26+38).

West Africa.

#### 1. ISICHTHYS HENRYI.

Gill, Proc. Ac. Philad. 1862, p. 444; Bouleng. Proc. Zool. Soc. 1898, p. 791; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 347.

*Mormyrops henryi*, Günth. Cat. Fish. vi. p. 224 (1866); Hubrecht, Notes Leyd. Mus. iii. 1881, p. 70.

*Mormyrus henryi*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 115; Steind. Notes Leyd. Mus. xvi. 1894, p. 66.

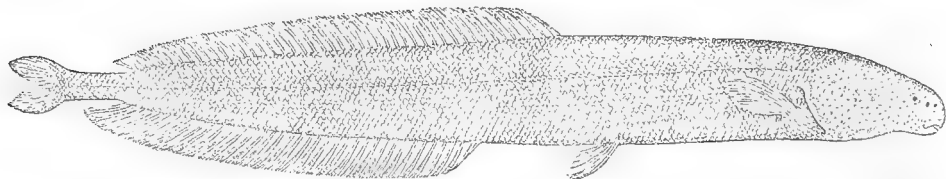
*Mormyrus cobitiformis*, Peters, Sitzb. Ges. nat. Fr. Berl. 1862, p. 72.

*Mormyrus (Isistius) henryi*, Sauvage, Bull. Soc. Zool. France, 1884, p. 207, pl. vi. fig. 1.

Depth of body 8 to 11 times in total length, length of head 6 to  $7\frac{1}{2}$  times. Head  $1\frac{3}{4}$  to 2 times as long as deep; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth subinferior, its width  $\frac{1}{4}$  length of head; nostrils midway between eye and end of snout; eye small, hardly  $\frac{1}{2}$  length of snout,  $\frac{1}{3}$  inter-orbital width. Dorsal 39–50, longer than its distance from head. Anal 38–47, originating a little posterior to origin of dorsal. Pectoral about

$\frac{1}{2}$  length of head. Caudal small, with obtusely pointed lobes. Caudal peduncle twice as long as deep,  $\frac{1}{2}$  length of head. 120–140 scales in lateral line,  $\frac{9}{9}$  between dorsal and anal, 18–20 round caudal peduncle. Dark brown.

Fig. 44.



*Isichthys henryi*.  
S. Cameroon.  $\frac{2}{3}$ .

Total length 205 millim.

West Africa, from Liberia to Mayumba, French Congo.—Type in U.S. National Museum, Washington.

|                  |                        |                         |
|------------------|------------------------|-------------------------|
| 1. Ad.           | Sapelle, Lower Niger.  | Dr. W. J. Ansorge (C.). |
| 2–4. Ad.         | Kribi R., S. Cameroon. | G. L. Bates, Esq. (C.). |
| 5–6. Ad.         | Eloby, Gaboon.         |                         |
| 7, 8. Ad. & hgr. | Gaboon.                |                         |
| 9. Skel.         | ”                      |                         |
| 10. Ad.          | Masoma R., Ogowe.      | Dr. W. J. Agsorge (C.). |
| 11. Hgr.         | W. Africa.             |                         |

#### 4. MARCUSENIUS.

*Petrocephalus*, part., Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14, and Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 113.

*Marcusenius*, Gill, Proc. Ac. Philad. 1862, p. 129; Bouleng. Proc. Zool. Soc. 1898, p. 792, Poiss. Bass. Congo, p. 74 (1901), and Fish. Nile, p. 40 (1907).

*Heteromormyrus*, Steind. Verh. zool.-bot. Ges. Wien, xvi. 1866, p. 765.

*Mormyrus*, part., Günth. Cat. Fish. vi. p. 214 (1866).

*Hippopotamyrus*, Pappenh. Sitzb. Ges. naturf. Fr. Berl. 1906, p. 260, and Mitth. Zool. Mus. Berl. iii. 1907, p. 350.

Teeth in the jaws rather large or small, truncate or notched (3–9 upper and 6–10 lower); minute conical teeth on the parasphenoid and on the tongue; mouth inferior or subinferior, below the level of the eyes. Nostrils widely separated. Body short or more or less elongate; ventral fins midway between pectorals and anal, or nearer the former. Dorsal and anal fins subequal in length, or either the longer. Vertebrae 37–48 (9–16 + 4–6 + 23–30).

Nile and Tropical Africa.

*Synopsis of the Species.*

- I. Anal originating in advance of dorsal.
- A. Teeth  $\frac{9}{10}$ ; lat. l. 49-53; depth of body 3-3½ times in total length; caudal peduncle 3-3½ times as long as deep, 12 scales round it.
- D. 20-22; A. 26-27; caudal peduncle  $\frac{2}{3}$  to  $\frac{3}{4}$  length [p. 63.  
of head . . . . . 1. *M. nigripinnis*, Blgr.,
- D. 23-25; A. 28-29; caudal peduncle  $\frac{2}{3}$  to  $\frac{2}{3}$  length [p. 63.  
of head . . . . . 2. *M. pulverulentus*, Blgr.,
- B. Teeth  $\frac{5-7}{6-8}$ .
1. 12-14 scales round caudal peduncle.
- a. Depth of body at least 3½ times in total length.
- α. Base of anal not more than once and  $\frac{1}{3}$  that of dorsal.
- D. 22-24; A. 30-31; l. l. 62; depth of body 3½-4 times in total length; caudal peduncle 4-5 times as long as deep . . . . . 3. *M. marchii*, Sauv., p. 64.
- D. 16-20; A. 21-26; l. l. 55-65; depth of body 4-5 times in total length; caudal peduncle 2½-3 times as long as deep . . . . . 4. *M. kingsleyæ*, Gthr., p. 65.
- D. 17-21; A. 24-26; l. l. 67-90; depth of body 5-6 times in total length; caudal peduncle 3-3½ times as long as deep . . . . . 5. *M. sphecodes*, Sauv., p. 66.
- β. Base of anal at least once and  $\frac{3}{4}$  that of dorsal.
- D. 15-18; A. 25-30; l. l. 58-64; depth of body 4½-5½ times in total length; caudal peduncle 2½-3 times as long as deep . . . . . 6. *M. brachistius*, Gill, p. 67.
- D. 14-16; A. 31-33; l. l. 60-66; depth of body 5-5½ times in total length; caudal peduncle 3-3½ times as long as deep . . . . . 7. *M. longianalis*, Blgr., [p. 69.
- b. Depth of body 3-3¼ times in total length.
- D. 18-20; A. 25-28; l. l. 48-50; caudal peduncle shorter than head, 2-2½ times as long as deep . . . . . 8. *M. lhuysii*, Sldr., p. 70.
- D. 20-22; A. 26-29; l. l. 46-56; caudal peduncle nearly as long as head, 3 times as long as deep. 9. *M. adpersus*, Gthr., p. 70.
- D. 28; A. 31; l. l. 45; caudal peduncle a little shorter than head, 3 times as long as deep . . 10. *M. weeksii*, Blgr., p. 71.
2. 16-20 scales round caudal peduncle.
- a. Depth of body 4-5 times in total length.
- D. 16-17; A. 22-23; l. l. 68-70; caudal peduncle 2½-2¾ times as long as deep; eye about half length of snout . . . . . 11. *M. batesii*, Blgr., p. 72.

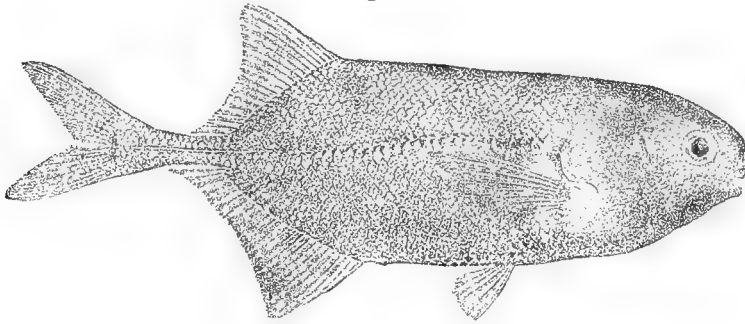
- D. 19 ; A. 24-26 ; l. l. 67-72 ; caudal peduncle  
 $2\frac{1}{2}$ -3 times as long as deep ; eye a little shorter  
 than snout . . . . . 12. *M. ansorgii*, Blgr., p. 73.
- b. Depth of body  $2\frac{3}{4}$ - $3\frac{2}{3}$  times in total length.
- D. 18 ; A. 23 ; l. l. 70 ; caudal peduncle not twice  
 as long as deep . . . . . 13. *M. pauciradiatus*, Stdr., [p. 74.
- D. 15-18 ; A. 24-25 ; l. l. 46-53 ; caudal peduncle  
 $2\frac{1}{2}$ - $2\frac{2}{3}$  times as long as deep,  $\frac{2}{3}$ - $\frac{3}{4}$  length of  
 head . . . . . 14. *M. nigricans*, Blgr., p. 75.
- D. 18-22 ; A. 22-26 ; l. l. 53-60 ; caudal peduncle  
 $2\frac{1}{2}$ -3 times as long as deep,  $\frac{4}{5}$  length of head . 15. *M. isidori*, C. & V., p. 75.
- II. Dorsal and anal originating in the same vertical ; D. 30-32 ; A. 30-35 ;  
 l. l. 80-93. [p. 77.
- 16 scales round caudal peduncle . . . . . 16. *M. castor*, Pappenh.,
- 12 scales round caudal peduncle . . . . . 17. *M. harringtoni*, Blgr.,
- III. Dorsal originating in advance of anal. [p. 78.
- A. Teeth  $\frac{7-9}{8-10}$  ; depth of body  $3-3\frac{1}{4}$  times in total length ; caudal peduncle  
 $3\frac{1}{2}$ -4 times as long as deep, 16 scales round it.
- D. 29 ; A. 28 ; l. l. 60 ; dorsal originating slightly  
 in advance of anal . . . . . 18. *M. tumifrons*, Blgr., p. 79.
- D. 31-35 ; A. 27-30 ; l. l. 55-70 ; anal originating  
 below 10th to 12th ray of dorsal . . . . . 19. *M. plagiosoma*, Blgr., [p. 80.
- B. Teeth  $\frac{3-7}{6-8}$  ; depth of body  $2\frac{1}{2}$ - $3\frac{1}{2}$  times in total length ; caudal peduncle  
 2-3 times as long as deep, 12-14 scales round it.
1. Interorbital width about  $\frac{1}{3}$  length of head ; snout projecting beyond  
 mouth ; D. 30-36 ; A. 23-27.
- L. l. 65-70 ; eye as long as or a little shorter than  
 snout ; base of dorsal  $1\frac{1}{4}$ - $1\frac{1}{2}$  times its distance  
 from head . . . . . 20. *M. discorhynchus*, Peters,
- L. l. 55-65 ; eye as long as or slightly longer than  
 snout ; dorsal as long as or slightly shorter  
 than its distance from head . . . . . 21. *M. petherici*, Blgr., p. 82. [p. 81.
- L. l. 67 ; eye much longer than snout ; base of  
 dorsal nearly as long as its distance from head. 22. *M. budgetti*, Blgr., p. 83.
2. Interorbital width about  $\frac{1}{4}$  length of head ; D. 33-41 ; A. 23-27 ;  
 l. l. 58-69.
- Eye much longer than snout ; width of mouth  $\frac{1}{6}$   
 length of head . . . . . 23. *M. macrops*, Blgr., p. 84.
- Eye not or but slightly longer than snout ; width of  
 mouth  $\frac{1}{6}$ - $\frac{1}{5}$  length of head . . . . . 24. *M. psittacus*, Blgr., p. 85.
- Eye shorter than snout ; width of mouth  $\frac{1}{4}$ - $\frac{1}{3}$  length  
 of head . . . . . 25. *M. wilcerthi*, Blgr., p. 86.

## 1. MARCUSENIUS NIGRIPINNIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 67, pl. xxxiii. fig. 1 (1899), and Poiss. Bass. Congo, p. 77 (1901).

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head 4 to  $4\frac{1}{4}$  times. Head as long as deep; snout rather truncate,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head, projecting very slightly beyond mouth; latter small, its width 4 times in length of head; teeth truncate or feebly notched, 9 in upper jaw, 10 in lower; anterior nostril halfway between end of snout and eye, on a line with centre of latter, posterior lower down and close to eye; eye rather large, its diameter equal to length of snout and  $\frac{3}{4}$  interorbital

Fig. 45.

*Marcusenius nigripinnis.*

Type (A. M. C.).

width. Dorsal 20-22, originating above 6th or 7th ray of anal, its length  $\frac{1}{2}$  its distance from head. Anal 26-27, a little nearer root of caudal than root of ventral. Pectoral pointed, as long as head,  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times as long as ventral, extending beyond base of latter. Caudal with long pointed lobes. Caudal peduncle 3 to  $3\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 46-53 scales in lateral line,  $\frac{8-14}{10-16}$  in transverse series on body,  $\frac{9}{11}$  between dorsal and anal, 12 round caudal peduncle. Dark purplish brown, speckled with black; fins blackish.

Total length 110 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

1-2. Two of the types. . . . . Kutu, L. Leopold II. . . . . M. P. Delhez (C.).

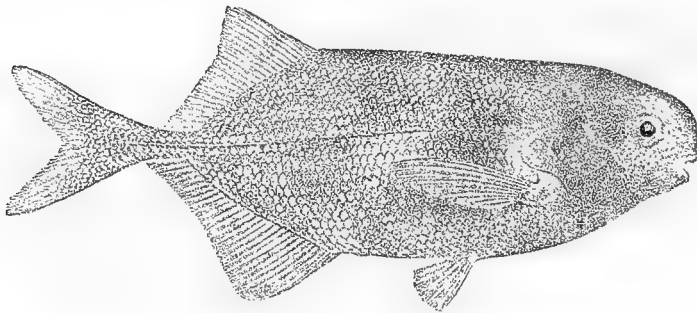
## 2. MARCUSENIUS PULVERULENTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 68, pl. xxxiii. fig. 2 (1899), and Poiss. Bass. Congo, p. 78 (1901).

Depth of body 3 to  $3\frac{1}{4}$  times in total length, length of head  $3\frac{3}{4}$  to 4 times. Head a little deeper than long; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of

head, projecting very slightly beyond mouth; latter small, its width 4 to  $4\frac{1}{2}$  times in length of head; teeth truncate or feebly notched, 9 in upper jaw, 10 in lower; anterior nostril halfway between end of snout and eye, on a line with centre of latter, posterior lower down and close to the eye; eye large, 4 to  $4\frac{1}{2}$  times in length of head,  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times in inter-orbital width. Dorsal 23-25, originating above 5th to 7th ray of anal, its length about  $\frac{1}{2}$  its distance from head. Anal 28-29, equally distant from root of ventral and from root of caudal, or a little nearer latter.

Fig. 46.

*Marcusenius pulverulentus.*Type (A. M. C.).  $\frac{5}{8}$ .

Pectoral pointed, as long as or a little longer than head, twice as long as ventral, the extremity of which it reaches. Caudal with long pointed lobes. Caudal peduncle 3 to  $3\frac{1}{2}$  times as long as deep,  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head. 50 scales in lateral line,  $\frac{15}{18}$  in transverse series on body,  $\frac{9-10}{11}$  between dorsal and anal, 12 round caudal peduncle. Olive-brown, speckled with black; fins blackish.

Total length 100 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

- |                        |                 |                    |
|------------------------|-----------------|--------------------|
| 1-2. Two of the types. | Coquilhatville. | M. P. Delhez (C.). |
| 3. Ad.                 | Lindi R.        | M. M. Storms (C.). |

### 3. MARCUSENIUS MARCHII.

*Petrocephalus marchei*, Sauv. Bull. Soc. Philom. (7) iii. 1878, p. 100.

*Mormyrus marchei*, Sauv. N. Arch. Mus. (2) iii. 1880, p. 50, pl. ii. fig. 5; Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 287.

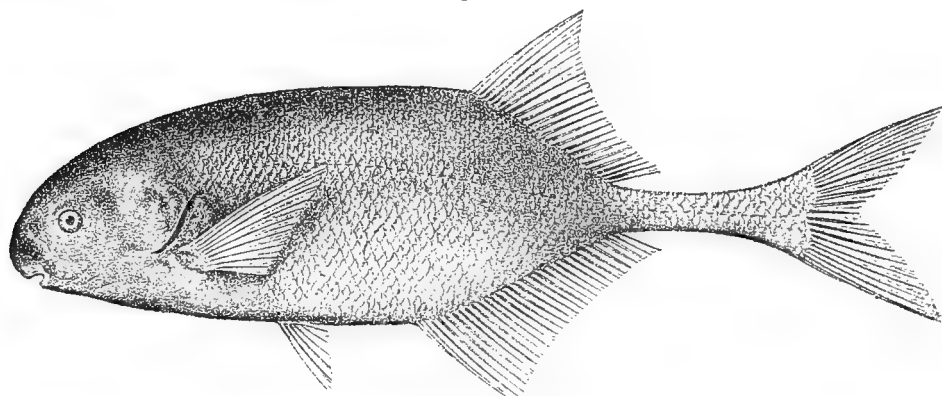
*Marcusenius marchii*, Bouleng. Proc. Zool. Soc. 1898, p. 792.

Depth of body  $3\frac{1}{2}$  to 4 times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head nearly as long as deep; snout rounded,  $\frac{2}{7}$  length of head,



projecting a little beyond mouth; latter small, inferior, its width  $\frac{1}{5}$  length of head; teeth truncate or feebly notched, 5 in upper jaw, 6 in lower; nostrils halfway between end of snout and eye; eye moderate,  $\frac{2}{3}$  length of snout, a little more than  $\frac{1}{2}$  interorbital width. Dorsal 22-24, originating above 10th ray of anal, its length  $2\frac{1}{2}$  times in its distance from head. Anal 30-31,  $1\frac{1}{2}$  times as long as dorsal, nearer base of

Fig. 47.

*Marcusenius marchii.*

Type, after Sauvage (N. Arch. Mus. 1880).  $\frac{5}{6}$ .

ventral than base of caudal. Pectoral pointed, as long as head, twice as long as ventral, extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle 4 to 5 times as long as deep, a little longer than head. 62 scales in lateral line,  $\frac{7}{16}$  in transverse series on body,  $\frac{11}{8}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Olive-brown above, silvery beneath; head speckled with brown.

Total length 160 millim.

Ogowe.—Type in Paris Museum.

1. Ad.

Talagouga.

Miss Kingsley (C.).

#### 4. MARCUSENIUS KINGSLEYÆ.

*Mormyrus kingsleyæ*, Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 281, pl. xv. fig. A.

*Marcusenius kingsleyæ*, Bouleng. Proc. Zool. Soc. 1898, p. 794.

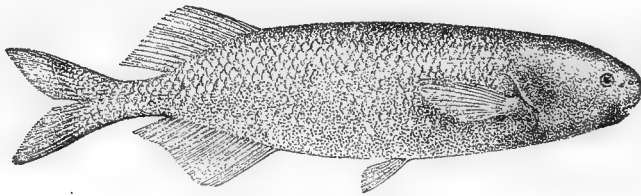
*Marcusenius cabræ*, Bouleng. Ann. Mus. Congo, Zool. i. p. 130, pl. xlvi. fig. 1 (1900), and Poiss. Bass. Congo, p. 76 (1901).

*Marcusenius brachyistius*, part., Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 348.

Depth of body 4 to 5 times in total length, length of head about same. Head once and  $\frac{1}{4}$  as long as deep; snout convex,  $\frac{1}{4}$  length of head,

slightly projecting beyond mouth; mouth small, subinferior, its width  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; teeth feebly notched, 5 in upper jaw, 6 in lower; nostrils nearly equally distant from end of snout and from eye, anterior on a level with centre of latter, posterior with lower border; eye small,  $\frac{1}{2}$  length of snout,  $\frac{2}{5}$ - $\frac{1}{2}$  interorbital width. Dorsal 16-20, its length  $\frac{1}{3}$  to  $\frac{2}{5}$  its distance from head, originating above 8th to 10th ray of anal. Anal 21-26, a little longer than dorsal, nearer base of caudal than base of ventral. Pectoral pointed,  $\frac{4}{5}$  length of head,  $1\frac{2}{3}$  times length

Fig. 48.

*Marcusenius kingsleyæ.*

Type, after Günther (Ann. & Mag. N. H. 1896).  $\frac{2}{3}$ .

of ventral, not reaching base of latter. Caudal densely scaled in the basal half, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,  $\frac{3}{4}$  length of head. 55-65 scales in lateral line,  $\frac{10}{14}$  in transverse series on body,  $\frac{8-9}{6-8}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown.

Total length 150 millim.

Old Calabar to Mayombe.

|                                       |                                 |                         |
|---------------------------------------|---------------------------------|-------------------------|
| 1. Type.                              | Old Calabar.                    | Miss Kingsley (C.).     |
| 2. Ad.                                | Kribi R., S. Cameroon.          | G. L. Bates, Esq. (C.). |
| 3. Ad.                                | Ja R. at Bitye, Cameroon.       | "                       |
| 4-9. Ad. & hgr.                       | Benito R., Spanish Guinea.      | "                       |
| 10. Hgr. (Type of <i>M. cabraë</i> .) | Marshes of Kop-Malafu, Mayombe. | Major Cabra (C.).       |

##### 5. MARCUSENIUS SPHECODES.

*Mormyrops sphaecodes*, Sauv. Bull. Soc. Philom. (7) iii. 1878, p. 101, and N. Arch Mus. (2) iii. 1880, p. 55, pl. ii. fig. 4.

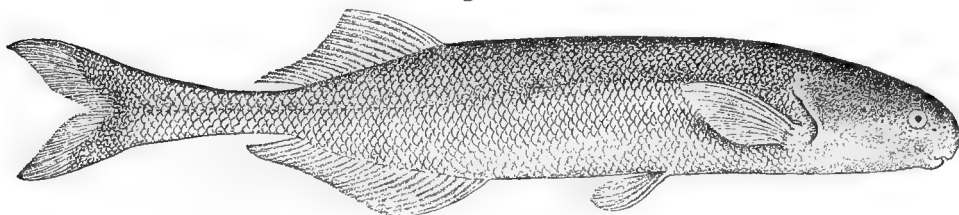
*Mormyrus sphaecodes*, Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 280.

*Marcusenius sphaecodes*, Bouleng. Proc. Zool. Soc. 1898, p. 793.

Depth of body equal to or a little less than length of head, 5 to 6 times in total length. Head once and  $\frac{1}{4}$  as long as deep; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth small, subinferior, its width  $\frac{1}{5}$  length of

head; teeth small, notched, 5 in upper jaw, 6 in lower; nostrils midway between eye and end of snout, posterior on a line with lower border of eye; eye small,  $\frac{1}{2}$  length of snout,  $\frac{1}{3}$  interorbital width. Dorsal 17–21, originating above 5th ray of anal, not  $\frac{1}{2}$  as long as its distance from the head. Anal 24–26, equally distant from base of ventral and from base of caudal or a little nearer latter, not more than once and  $\frac{1}{3}$  as long as dorsal. Pectoral pointed,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head,  $1\frac{1}{2}$  length of ventral,

Fig. 49.

*Marcusenius sphaecodes.*Kribi River.  $\frac{2}{3}$ .

reaching base of latter. Caudal with pointed lobes. Caudal peduncle  $\frac{3}{4}$  to  $3\frac{1}{2}$  times as long as deep, nearly as long as head. 67–90 scales in lateral line,  $\frac{11-12}{16-17}$  in transverse series on body,  $\frac{9}{8}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown, lighter beneath.

Total length 210 millim.

Cameroon to Congo.—Type in Paris Museum.

|                     |                           |                         |
|---------------------|---------------------------|-------------------------|
| 1–2, 3–5. Ad. & yg. | Kribi R., S. Cameroon.    | G. L. Bates, Esq. (C.). |
| 6. Skel.            | ”                         | ”                       |
| 7–10. Ad.           | Ja R. at Bitye, Cameroon. | ”                       |
| 11. Ad.             | Talagouga, Ogowe.         | Miss Kingsley (C.).     |
| 12. Hgr.            | Lukula R., Congo.         | Brussels Museum (E.).   |

## 6. MARCUSENIUS BRACHISTIUS.

*Marcusenius brachyistius*, Gill, Proc. Ac. Philad. 1862, p. 139; Bouleng. Proc. Zool. Soc. 1898, p. 793, and Poiss. Bass. Congo, p. 75 (1901).

*Mormyrus brachyistius*, Günth. Cat. Fish. vi. p. 219 (1866).

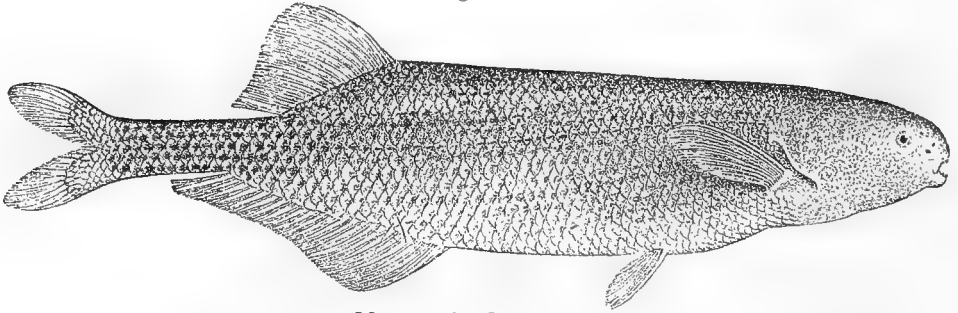
*Mormyrus microcephalus*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 115.

*Mormyrus liberiensis*, Steind. Notes Leyd. Mus. xvi. 1894, p. 67.

Depth of body  $4\frac{1}{3}$  to  $5\frac{1}{3}$  times in total length, length of head  $4\frac{1}{2}$  to  $6\frac{1}{3}$  times. Head  $1\frac{1}{5}$  to  $1\frac{1}{4}$  times as long as deep; snout convex  $\frac{1}{4}$  to  $\frac{2}{7}$  length of head, slightly projecting beyond mouth; mouth small,

subinferior, its width  $\frac{1}{3}$  length of head; teeth small, feebly notched, 5 in upper jaw, 6 in lower; nostrils nearly equally distant from end of snout and from eye, anterior on a level with centre of latter, posterior with lower border; eye small, about  $\frac{1}{2}$  length of snout or interorbital width. Dorsal 15–18, hardly  $\frac{1}{3}$  as long as its distance from head, originating above 10th to 14th ray of anal. Anal 25–30, nearly 2 to  $2\frac{1}{2}$

Fig. 50.



*Marcusenius brachistius*.  
From Liberia.

times as long as dorsal, nearer base of caudal than base of ventral. Pectoral obtusely pointed, at least  $\frac{3}{4}$  length of head,  $1\frac{1}{2}$  to  $1\frac{2}{3}$  length of ventral, reaching base of latter. Caudal densely scaled in the basal half, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep, as long as head or a little shorter. 58–64 scales in lateral line,  $\frac{8-10}{13-14}$  in transverse series on body,  $\frac{7-9}{6-7}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown.

Total length 175 millim.

West Africa, from Sierra Leone to the Congo.—Type in U. S. National Museum, Washington.

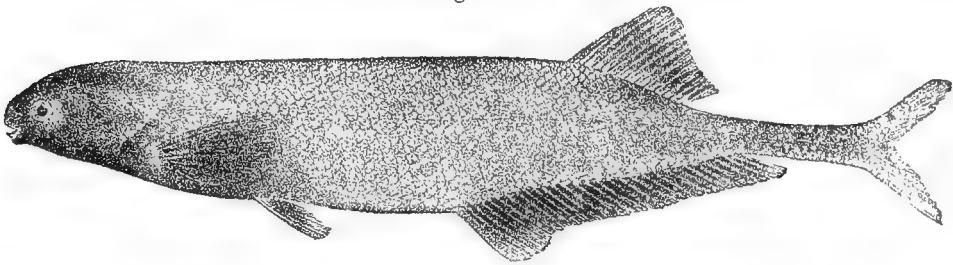
|                                      |                      |                             |
|--------------------------------------|----------------------|-----------------------------|
| 1. Hgr.                              | Sierra Leone.        | H. C. Hart, Esq. (P.).      |
| 2. Hgr.                              | ”                    |                             |
| 3–5. Ad. (Types of                   | Liberia.             | Dr. Büttikofer (C.).        |
| <i>M. liberiensis</i> .)             |                      |                             |
| 6–8. Hgr.                            | Lagos.               | Sir A. Moloney (P.).        |
| 9–10, 11. Ad. & hgr.                 | Ogowe.               | R. B. N. Walker, Esq. (C.). |
| (Types of <i>M. microcephalus</i> .) |                      |                             |
| 12–14. Ad.                           | Talagouga, Ogowe.    | Miss Kingsley (C.).         |
| 15–18. Ad. & yg.                     | Masoma R., Ogowe.    | Dr. W. J. Ansorge (C.).     |
| 19. Hgr.                             | Matadi, Lower Congo. | Capt. Wilverth (C.).        |
| 20. Hgr.                             | Stanley Falls.       | M. De Meuse (C.).           |

## 7. MARCUSENIUS LONGIANALIS.

Bouleng. Proc. Zool. Soc. 1901, i. p. 5, pl. iii. fig. 1.

Depth of body 5 to  $5\frac{2}{3}$  times in total length, length of head  $5\frac{1}{2}$  to  $6\frac{1}{2}$  times. Head once and  $\frac{1}{4}$  as long as deep; snout convex,  $\frac{1}{4}$  length of head, slightly projecting beyond mouth; latter small, its width  $\frac{1}{5}$  length of head; teeth feebly notched, 5 in upper jaw, 6 in lower; nostrils nearly equally distant from end of snout and from eye, anterior on a level with centre of latter, posterior with its lower border; eye about  $\frac{2}{3}$  length of snout,  $\frac{2}{5}$  or  $\frac{1}{2}$  interorbital width. Dorsal 14-16, originating above 16th or 17th ray of anal, its length about  $\frac{1}{4}$  its distance from head.

Fig. 51.



*Marcusenius longianalis*.  
Type (P. Z. S. 1901).  $\frac{5}{6}$ .

Anal 31-33, 2 to  $2\frac{1}{2}$  times as long as dorsal, nearer base of caudal than base of ventral. Pectoral obtusely pointed, a little shorter than head, once and  $\frac{2}{3}$  length of ventral, reaching base of latter. Caudal with pointed lobes. Caudal peduncle 3 to  $3\frac{1}{2}$  times as long as deep, nearly as long as head. 60-66 scales in lateral line,  $\frac{9}{10-11}$  in transverse series on body,  $\frac{6-7}{6-7}$  between dorsal and anal, 12 round caudal peduncle. Purplish brown, more or less profusely speckled with blackish; fins dark brown.

Total length 145 millim.

Lower Niger.

|             |          |                                                    |
|-------------|----------|----------------------------------------------------|
| 1-2. Types. | Sapelle. | Dr. W. J. Ansorge (C.).                            |
| 3. Hgr.     | „        | Mr. J. D. Hamlyn (C.);<br>Hon. W. Rothschild (P.). |
| 4. Ad.      | Agberi.  | Dr. W. J. Ansorge (C.).                            |

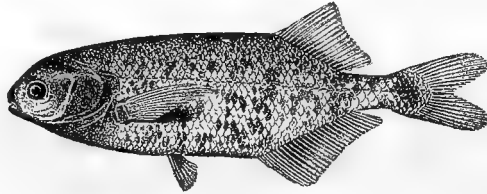
## 8. MARCUSENIUS LHUYSII.

*Mormyrus lhuysii*, Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 553, pl. ii. fig. 3.

*Marcusenius lhuysii*, Bouleng. Proc. Zool. Soc. 1898, p. 795.

Depth of body  $2\frac{3}{4}$  to  $3\frac{1}{4}$  times in total length, length of head  $4\frac{1}{2}$  times. Head as long as deep; snout rounded, not quite  $\frac{1}{4}$  length of head, projecting slightly beyond mouth; mouth small, terminal, but situated below level of eyes; teeth small, notched, 5 or 7 in upper jaw, 6 in lower; eye as long as snout,  $\frac{1}{2}$  interocular width; posterior nostril a little lower down than upper, close to eye. Dorsal 18–20, originating above 6th to 8th ray of anal, its length  $2\frac{1}{2}$  times in its distance from

Fig. 52.

*Marcusenius lhuysii*.

Type, after Steindachner (*l. c.*).  $\frac{5}{6}$ .

head. Anal 25–28, nearer base of caudal than base of ventral. Pectoral pointed, as long as head, twice as long as ventral, extending as far as extremity of latter. Caudal with pointed lobes. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 48–50 scales in lateral line, 12 round caudal peduncle. Greyish above, silvery beneath, uniform or spotted with brown.

Total length 60 millim.

Senegal, Shari River.—Type in the Vienna Museum.

1. Ad. Kaëdi, Senegal. M. P. Delhez (C.).

## 9. MARCUSENIUS ADSPERSUS.

*Mormyrus adpersus*, Günth. Cat. Fish. vi. p. 221 (1866).

*Marcusenius adpersus*, Bouleng. Proc. Zool. Soc. 1898, p. 795, and Poiss. Bass. Congo, p. 76 (1901).

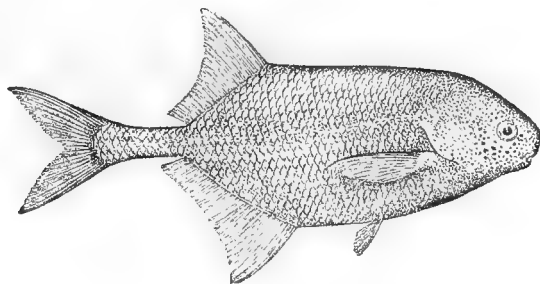
Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{4}$  times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head as long as deep; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth small, subinferior, its width  $\frac{1}{5}$  length of head; teeth small, notched, 5 or 7 in upper jaw, 8 in lower; nostrils on a line with centre of eye, posterior close to eye; eye moderate, as long as or a little

longer than snout,  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times in interorbital width. Dorsal 20-22, originating above 9th or 10th ray of anal, about  $\frac{1}{2}$  as long as its distance from head. Anal 26-29, equally distant from base of ventral and from base of caudal. Pectoral pointed, as long as head, at least twice as long as ventral, reaching extremity of latter. Caudal with pointed lobes. Caudal peduncle 3 times as long as deep, as long as head or a little shorter. 46-56 scales in lateral line,  $\frac{10-11}{14-15}$  in transverse series on body,  $\frac{9-10}{9-10}$  in transverse series between dorsal and anal, 12 or 14 round caudal peduncle. Brown or olive, dotted with blackish, the dots largest on the head.

Total length 80 millim.

Lagos, Lower Congo.

Fig. 53.



*Marcusenius adspersus*.

Type.

1-2. Types.

3. Ad.

4-7. Ad. & hgr.

West Africa.

Lagos.

Boma.

Sir A. Moloney (P.).

M. P. Delhez (C.).

#### 10. MARCUSENIUS WEEKSII.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 24, pl. vii. fig. 2 (1902).

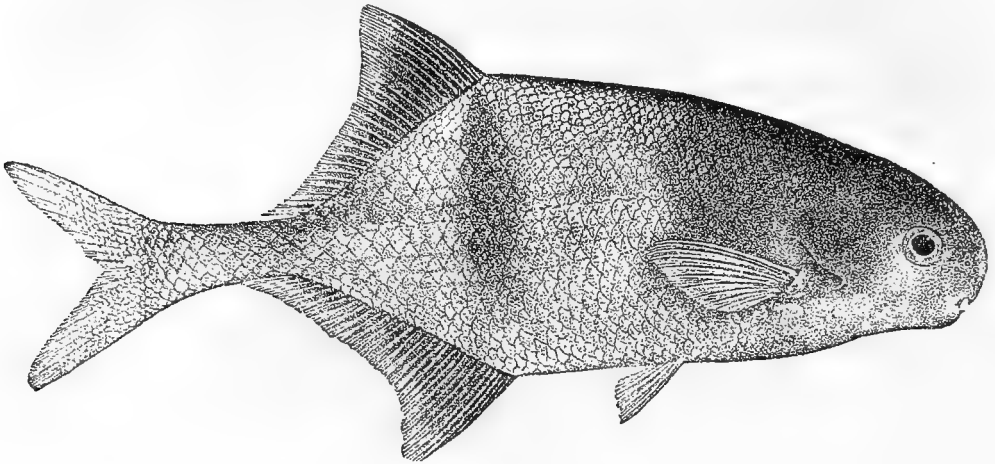
Depth of body 3 times in total length, length of head  $4\frac{2}{3}$  times. Head as long as deep; snout rounded, nearly  $\frac{1}{4}$  length of head, projecting beyond the mouth; mouth small, its width  $\frac{1}{5}$  length of head; teeth truncate, 5 in upper jaw, 6 in lower; posterior nostril lower than anterior, on a line with lower border of eye; eye moderate, as long as snout,  $\frac{1}{2}$  interorbital width. Dorsal 28, originating above 5th ray of anal, about  $\frac{2}{3}$  its distance from head. Anal 31, nearer base of ventral than base of caudal. Pectoral pointed, nearly as long as head, nearly twice as long as ventral, extending beyond base of latter. Caudal partly scaled, with long, pointed lobes. Caudal peduncle nearly 3 times

as long as deep, a little shorter than head. 45 scales in lateral line,  $\frac{14}{17}$  in transverse series on body,  $\frac{10}{10}$  between dorsal and anal, 12 round caudal peduncle. Brownish, with an ill-defined darker vertical band between origin of dorsal and origin of anal; anterior half of caudal peduncle dark brown.

Total length 140 millim.

Upper Congo.

Fig. 54.



*Marcusenius wecksi*.

Type (A. M. C.).  $\frac{5}{6}$ .

1. Type.

Monsembe.

Rev. J. H. Weeks (P.).

#### 11. MARCUSENIUS BATESII.

Bouleng. Ann. & Mag. N. H. (7) xviii. 1906, p. 36.

Depth of body equal to length of head,  $4\frac{1}{2}$  to 5 times in total length. Head once and  $\frac{1}{3}$  as long as deep; snout rounded,  $\frac{1}{4}$  length of head; mouth small, subinferior, its width  $\frac{1}{4}$  length of head; a very distinct mental swelling; teeth small, notched, 5 or 6 in upper jaw, 6 in lower; nostrils midway between eye and end of snout, anterior on a level with centre of former, posterior on a level with its lower border; eye small,  $\frac{2}{5}$  or  $\frac{1}{2}$  length of snout,  $\frac{1}{3}$  interocular width. Dorsal 16-17, originating above fifth ray of anal, its length about  $\frac{1}{3}$  of its distance from head. Anal 22-23, a little nearer root of caudal than base of ventral. Pectoral pointed, about  $\frac{3}{4}$  length of head, once and  $\frac{1}{2}$  length of ventral, not reaching base of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  or  $2\frac{2}{3}$  times as long as deep, a little shorter than head. 68-70 scales

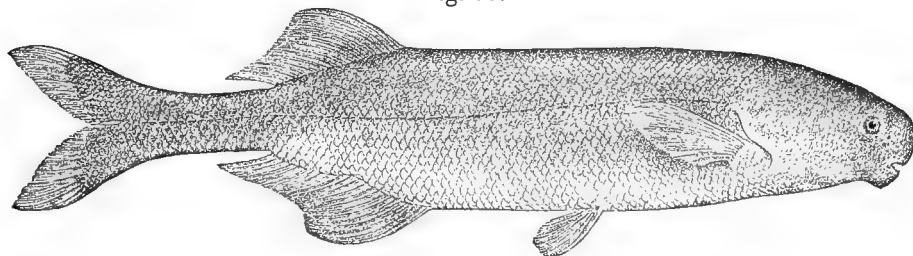


in lateral line,  $\frac{10}{17}$  in transverse series on body,  $\frac{9-10}{9-10}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Uniform brown, somewhat lighter beneath.

Total length 145 mm.

South Cameroon.

Fig. 55.



*Marcusenius batesii*.

Type. ♂.

1-2. Types.

Kribi R. at Efulen.

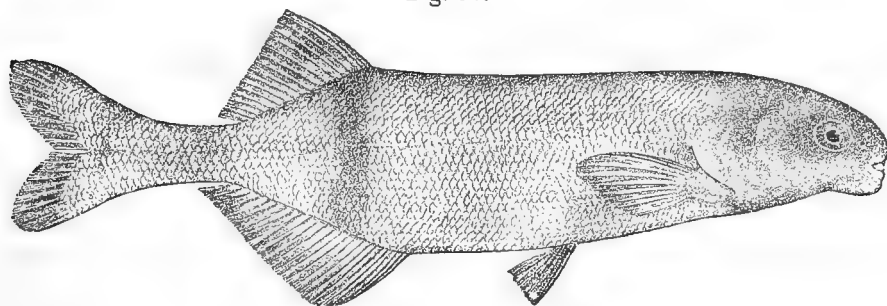
G. L. Bates, Esq. (C.).

## 12. MARCUSENIUS ANSORGII.

Bouleng. Ann. & Mag. N. H. (7) xv. 1905, p. 457.

Depth of body equal to length of head,  $4\frac{1}{2}$  to 5 times in total length. Head once and  $\frac{1}{5}$  as long as deep; snout rounded,  $\frac{1}{4}$  length of head; mouth small, terminal, but situated below level of eye; a feeble mental swelling; teeth notched, 7 in upper jaw, 8 in lower; anterior nostril on

Fig. 56.



*Marcusenius ansorgii*.

Type.

a level with centre of eye, posterior lower down and separated from eye by a space equal to its distance from the anterior; eye a little shorter than snout. Dorsal 19, originating above 5th or 6th ray of anal, its length about  $2\frac{1}{2}$  times in its distance from head. Anal 24-26, equally distant from base of ventral and from base of caudal, or a little nearer

latter. Pectoral obtusely pointed,  $\frac{2}{3}$  length of head, once and  $\frac{2}{3}$  as long as ventral, not quite reaching base of latter. Caudal with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. 67–72 scales in lateral line,  $\frac{13-14}{17-18}$  in transverse series on body,  $\frac{11}{10}$  between dorsal and anal, 16 round caudal peduncle. Brownish; a blackish vertical bar between origin of dorsal and anal.

Total length 110 millim.

Angola.

1–2. Types.                      Between Benguella and Bihé.                      Dr. W. J. Ansorge (C.).

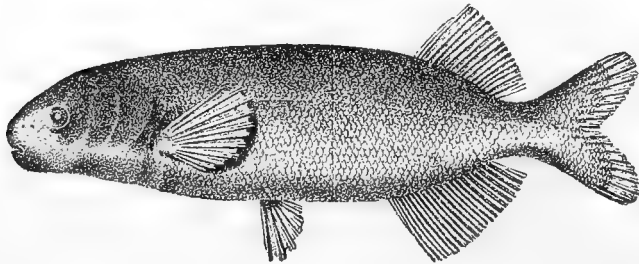
### 13. MARCUSENIUS PAUCIRADIATUS.

*Mormyrus pauciradiatus*, Steind. Verh. zool.-bot. Ges. Wien, xvi. 1866, p. 765, pl. xvii. fig. 2.

*Marcusenius pauciradiatus*, Bouleng. Proc. Zool. Soc. 1898, p. 795.

Depth of body equal to length of head,  $3\frac{2}{3}$  times in total length. Head once and  $\frac{1}{4}$  as long as deep; snout rounded,  $\frac{1}{4}$  length of head; mouth small, subterminal, but situated considerably below level of eye; teeth notched; eye rather small,  $\frac{2}{3}$  length of snout; nostrils on a level with lower border of eye, midway between latter and end of the snout.

Fig. 57.



*Marcusenius pauciradiatus*.

Type, after Steindachner (*l. c.*).  $\frac{4}{5}$ .

Dorsal 18, originating a little posterior to origin of anal, its length 3 times in its distance from head. Anal 23, a little nearer base of caudal than base of ventral. Pectoral shorter than head, hardly reaching base of ventral. Caudal with rounded lobes. Caudal peduncle once and  $\frac{1}{2}$  as long as deep,  $\frac{1}{2}$  length of head. 70 scales in lateral line, about 20 round caudal peduncle.

Total length 100 millim.

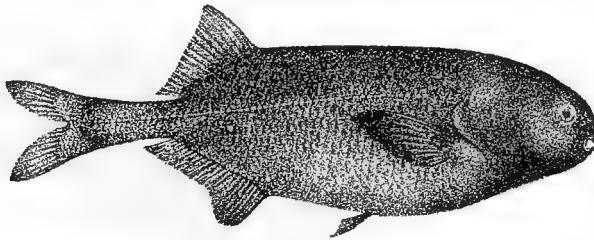
Angola.—Type in Vienna Museum.

## 14. MARCUSENIUS NIGRICANS.

Bouleng. Ann. & Mag. N. H. (7) xvii. 1906, p. 434, and Fish. Nile, p. 40, pl. ix. fig. 2 (1907).

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head 4 to  $4\frac{1}{3}$  times. Head as long as deep; snout about  $\frac{1}{5}$  length of head, rounded, projecting beyond mouth; mouth situated below nostrils, its width about 4 times in length of head; teeth bicuspid, 7 in upper jaw, 8 in lower; anterior nostril on a line with centre of eye, midway between latter and end of snout, posterior nostril a little lower down, close to eye; eye moderate, as long as snout,  $\frac{1}{2}$  to  $\frac{3}{5}$  interocular width. Dorsal 15-18, originating above 5th or 6th ray of anal, its length about

Fig. 58.

*Marcusenius nigricans.*

Type (F. N.).  $\frac{3}{4}$ .

$\frac{2}{5}$  its distance from head. Anal 24-25, nearly equally distant from base of ventral and from base of caudal. Pectoral pointed, subfalcate, as long as or a little shorter than head, 2 to  $2\frac{1}{2}$  times as long as ventral and extending beyond root of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times as long as deep,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. 46-53 scales in lateral line,  $\frac{10-11}{14-15}$  in transverse series on body,  $\frac{10-12}{10-11}$  in transverse series between dorsal and anal, 16 to 20 round caudal peduncle. Uniform blackish brown.

Total length 93 millim.

Lake Victoria.

1-9. Types.

Mouth of Katonga R.

Mr. E. Degen (C.).

## 15. MARCUSENIUS ISIDORI.

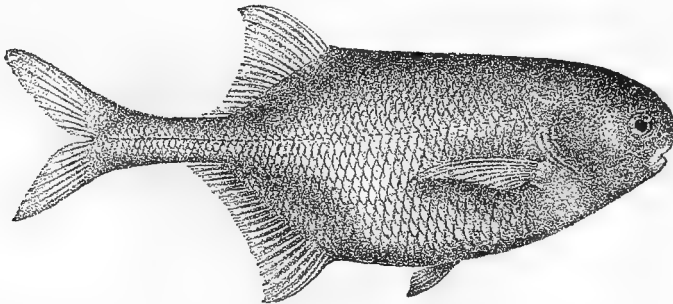
*Mormyrus isidori*, Cuv. & Val. Hist. Poiss. xix. p. 285 (1846); Günth. Cat. Fish. vi. p. 221 (1866), and Petherick's Trav. ii. p. 256 (1869).

*Petrocephalus isidori*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14, and Mén. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 150, pl. v. fig. 20.

*Marcusenius isidori*, Bouleng. Proc. Zool. Soc. 1898, p. 798, and Fish. Nile, p. 42, pl. vii. fig. 1 (1907).

Depth of body  $2\frac{3}{4}$  to  $3\frac{1}{3}$  times in total length; length of head 4 to  $4\frac{1}{2}$  times. Head as long as deep; snout  $\frac{1}{3}$  to  $\frac{1}{4}$  length of head, rounded, projecting beyond mouth; mouth situated below nostrils, its width  $4\frac{1}{2}$  to 5 times in length of head; teeth bicuspid, 7 in upper jaw, 8 in lower; anterior nostril on a line with centre of eye, midway between latter and end of snout; posterior nostril close to eye, near its lower border; eye moderate, as long as snout,  $\frac{1}{2}$  to  $\frac{3}{5}$  interocular width. Dorsal 18–22, originating above 3rd or 4th ray of anal, its length about half its distance from head. Anal 22–26, nearly equally distant from base of ventral and from base of

Fig. 59.



*Marcusenius isidori*.  
Nile Delta (F. N.).

caudal. Pectoral pointed, subfalcate, as long as or a little shorter than head, 2 to  $2\frac{1}{2}$  times as long as ventral, and extending beyond root of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep, as long as or a little shorter than head. 53–60 scales in lateral line,  $\frac{9-11}{15-17}$  in transverse series on body,  $\frac{11-13}{10-12}$  in transverse series between dorsal and anal, 16 or 18 round caudal peduncle. Brown on the back, silvery white beneath, uniform or dotted with brown.

Total length 100 millim.

Nile, from the Delta to the Bahr-el-Gebel.—Types in Paris Museum.

|                         |                                            |                       |
|-------------------------|--------------------------------------------|-----------------------|
| 1–2, 3–5. Ad.           | Lower Nile.                                | Dr. Rüppell (C.).     |
| 6–7. Ad.                | Rosetta Nile, near Barrage.                | L. Loat, Esq. (C.).   |
| 8. Skel.                | ” ”                                        | ”                     |
| 9–11. Ad. & hgr.        | Nile near Cairo.                           | Capt. S. Flower (P.). |
| 12. Ad.                 | Lahun, Fayum.                              | L. Loat, Esq. (C.).   |
| 13–16. Ad. & hgr.       | Between Assiut and Abu Tig,<br>Lower Nile. | ”                     |
| 17–36. Ad., hgr., & yg. | Luxor.                                     | ”                     |

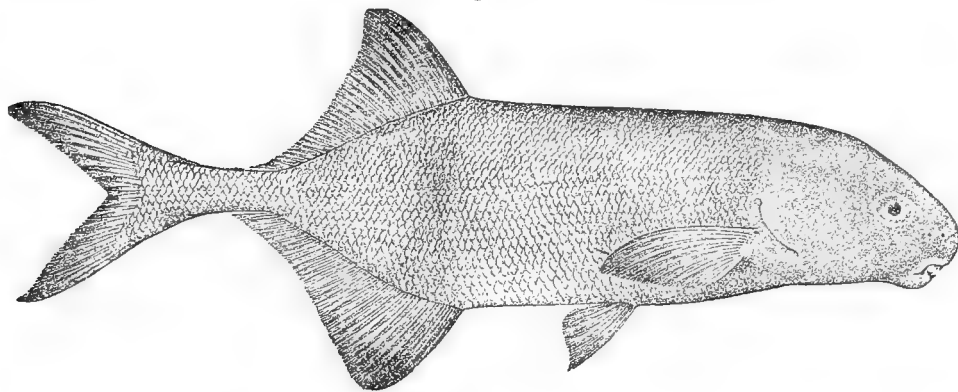
|                         |                           |                     |
|-------------------------|---------------------------|---------------------|
| 37-46. Ad., hgr., & yg. | Between Luxor and Assuan. | L. Loat, Esq. (C.). |
| 47. Ad.                 | Assuan.                   | "                   |
| 48. Hgr.                | Lake No, White Nile.      | "                   |
| 49. Hgr.                | Gondokoro, Bahr-el-Gebel. | "                   |

## 16. MARCUSENIUS CASTOR.

*Hippopotamyrus castor*, Pappenh. Sitzb. Ges. nat. Fr. Berl. 1906, p. 260, and Mitth. Zool. Mus. Berl. iii. 1907, p. 351, pl. ii. figs. 2 & 3.

Depth of body equal to length of head,  $3\frac{2}{3}$  to 4 times in total length. Head  $1\frac{1}{5}$  to  $1\frac{1}{4}$  times as long as deep, with curved upper profile; snout rounded,  $\frac{1}{4}$  length of head, projecting beyond mouth; mouth below nostrils, its width  $\frac{1}{4}$  length of head; teeth bicuspid (truncate when worn down), 5 in upper jaw, 6 in lower, median pair of lower teeth much larger than the others; nostrils equally distant from end of snout and from eye, on a line with lower border of eye; eye moderate, about  $\frac{2}{3}$

Fig. 60.

*Marcusenius castor*.Type.  $\frac{1}{2}$ .

length of snout and  $\frac{3}{5}$  interorbital width. Dorsal 31-32, its origin corresponding to that of anal, its length  $\frac{3}{5}$  its distance from head. Anal 32-35, nearer base of caudal than base of ventral. Pectoral pointed, a little shorter than head, not quite twice as long as ventral, and extending beyond root of latter. Caudal densely scaled on half of its surface, with pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{3}{4}$  length of head. 85-93 scales in lateral line,  $\frac{17}{23}$  in transverse series on body,  $\frac{13}{15}$  in transverse series between dorsal and anal, 16 round

caudal peduncle. Brown, with an indistinct darker vertical band between origin of dorsal and anal.

Total length 215 millim.

Cameroon.—Types in Berlin Museum.

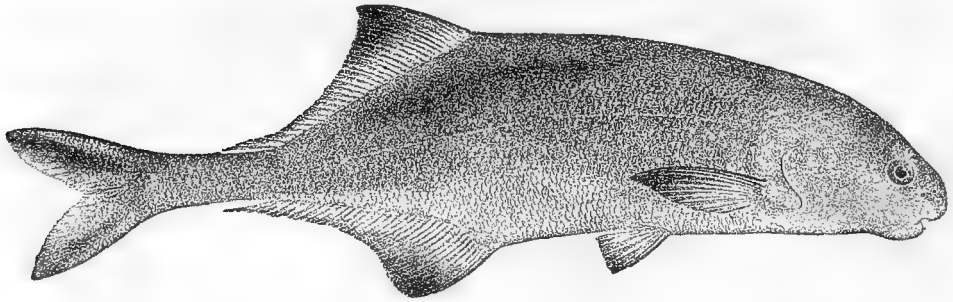
1. One of the types. Lokunde R., near Bipindi. Hr. G. Zenker (C.);  
Berlin Museum (E.).

#### 17. MARCUSENIUS HARRINGTONI.

Bouleng. Ann. & Mag. N. H. (7) xv. 1905, p. 457; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 348, pl. xi. fig. 1; Bouleng. Fish. Nile, p. 44, pl. ix. fig. 3 (1907).

Depth of body  $3\frac{4}{5}$  times in total length; length of head  $5\frac{1}{3}$  times. Head as long as deep, once and  $\frac{2}{3}$  as long as broad; snout rounded,  $\frac{2}{7}$  length of head, projecting beyond mouth; mouth below nostrils, its width 4 times in length of head; teeth bicuspid, 5 in upper jaw, 6 in lower; nostrils equally distant from end of snout and from eye, anterior on a line with lower border of eye, posterior a little lower down; eye moderate, its diameter  $\frac{3}{5}$  length of snout and half interocular width.

Fig. 61.



*Marcusenius harringtoni.*

Type (F. N.).  $\frac{1}{3}$ .

Dorsal 30–31, its origin corresponding to that of anal, its length nearly  $\frac{2}{3}$  its distance from head. Anal 30–33, equally distant from base of ventral and from base of caudal. Pectoral pointed, a little shorter than head, not quite twice as long as ventral, and extending beyond root of latter. Caudal densely scaled on more than half of its surface, with pointed lobes. Caudal peduncle  $3\frac{1}{2}$  times as long as deep, as long as head. 80–87 scales in lateral line,  $\frac{15}{16}$  in transverse series on body,  $\frac{14}{14}$  in transverse series between dorsal and anal, 12 round caudal peduncle.

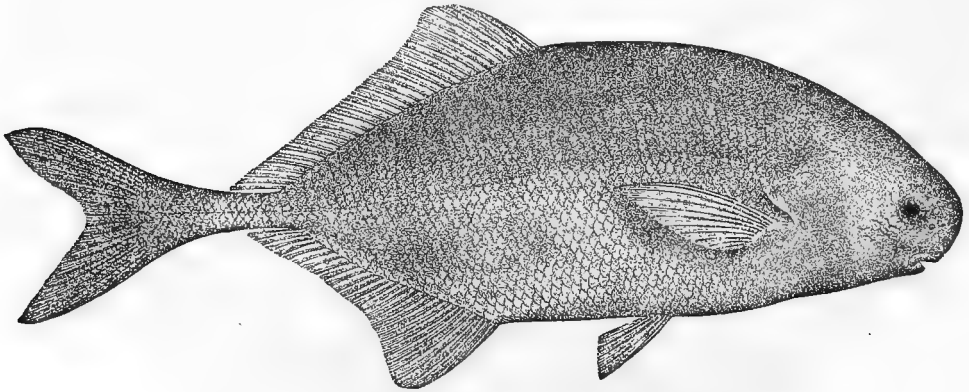


## 19. MARCUSENIUS PLAGIOSTOMA.

Bouleng. Ann. Mus. Congo, Zool. i. 1898, p. 7, pl. iii. fig. 1, Proc. Zool. Soc. 1898, p. 796, and Poiss. Bass. Congo, p. 79 (1901).

Depth of body  $2\frac{2}{3}$  to 3 times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head as long as deep, with convex or slightly concave upper profile; snout  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth inferior, its width  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; teeth very small, feebly notched, 7 to 9 in upper jaw, 8 to 10 in the lower; nostrils on a line with lower border of eye, posterior close to the eye; eye moderate, as long as or slightly longer than snout,  $\frac{2}{3}$  or  $\frac{3}{4}$  interorbital width. Dorsal 31–35, as

Fig. 63.

*Marcusenius plagiostoma.*Type (A. M. C.).  $\frac{2}{3}$ .

long as its distance from head. Anal 27–30, originating below 10th to 12th ray of dorsal, equally distant from base of ventral and from base of caudal. Pectoral pointed, as long as head, once and  $\frac{2}{3}$  length of ventral, reaching beyond base of latter. Caudal peduncle  $3\frac{1}{2}$  to 4 times as long as deep,  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. 55–70 scales in lateral line,  $\frac{15-20}{20-23}$  in transverse series on body,  $\frac{10-12}{15-15}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Pale brownish above, silvery beneath; fins greyish.

Total length 200 millim.

Congo.—Types in Congo Museum, Tervueren.

|                              |                      |                      |
|------------------------------|----------------------|----------------------|
| 1. Ad., one of the types.    | Boma, Lower Congo.   | Capt. Wilverth (C.). |
| 2–3. Hgr., two of the types. | Matadi, “            | ”                    |
| 4. Ad.                       | Kutu, L. Leopold II. | M. P. Delhez (C.).   |
| 5–6. Ad. & hgr.              | Irebu, Upper Congo.  | ”                    |
| 7. Skel.                     | ” “                  | ”                    |
| 8–11. Ad. & hgr.             | Upper Congo.         | Brussels University. |



## 20. MARCUSENIUS DISCORHYNCHUS.

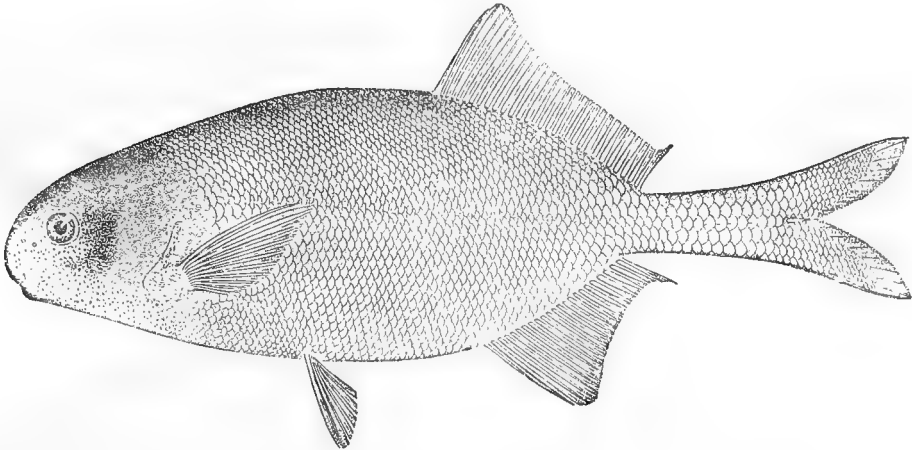
*Mormyrus discorhynchus*, Peters, Mon. Berl. Ac. 1852, p. 275, and Reise Mossamb. iv. p. 75, pl. xiv. (1868).

*Marcusenius discorhynchus*, Bouleng. Proc. Zool. Soc. 1898, p. 7, and Poiss. Bass. Congo, p. 82 (1901); Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 349.

*Marcusenius tanganicanus*, Bouleng. Tr. Zool. Soc. xvii. 1906, p. 545, pl. xxx. fig. 1.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to  $4\frac{2}{3}$  times. Head as long as deep; snout rounded,  $\frac{2}{7}$  length of head; mouth small, subinferior, its width  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; teeth small, notched, 5 in upper jaw, 6 in lower; nostrils on a line with lower border of eye, nearer latter than end of snout; eye moderate, as long as or a little shorter than snout,  $\frac{2}{3}$  interorbital width. Dorsal 30-36, its length

Fig. 64.

*Marcusenius discorhynchus*.

Type, after Peters (Reise Mossamb.).  $\frac{2}{3}$ .

$1\frac{1}{4}$  to  $1\frac{1}{2}$  times in its distance from head. Anal 23-27, originating below 8th to 12th ray of dorsal, equally distant from base of ventral and from base of caudal. Pectoral pointed, nearly as long as head,  $1\frac{1}{2}$  times length of ventral, extending to base of latter or a little beyond. Caudal with obtusely pointed lobes. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep, a little shorter than head. 65-70 scales in lateral line,  $\frac{17-20}{20-22}$  in transverse series on body,  $\frac{12-15}{13-15}$  in transverse series between dorsal and anal, 12 or 14 round caudal peduncle. Dark olive or brownish above, silvery white beneath.

Total length 160 millim. (grows to 260).

Lower Zambesi; Lake Nyassa; Katanga; Lake Tanganyika.—Types in Berlin Museum.

- |                                              |                                    |                            |
|----------------------------------------------|------------------------------------|----------------------------|
| 1. Hgr.                                      | L. Nyassa.                         | J. A. Williams, Esq. (C.). |
| 2. Hgr., type of <i>M. tanganicanus</i> .    | River at Msamba,<br>L. Tanganyika. | Dr. W. A. Cunningham (C.). |
| 3-4. Hgr., types of <i>M. tanganicanus</i> . | Sumbu, L. Tanganyika.              | „                          |

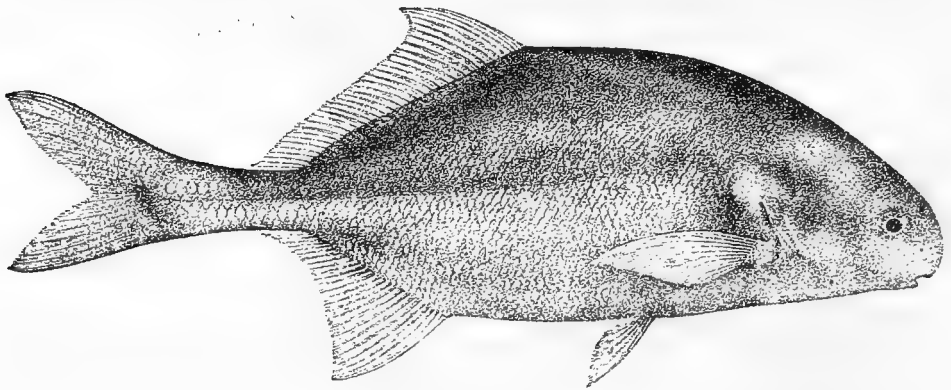
## 21. MARCUSENIUS PETHERICI.

*Mormyrus discorhynchus* (non Peters), Günth. Cat. Fish. vi. p. 220 (1866), and Petherick's Trav. ii. p. 255 (1869).

*Marcusenius petherici*, Bouleng. Ann. Mus. Congo, Zool. i. p. 7 (1898), Proc. Zool. Soc. 1898, p. 797, and Fish. Nile, p. 45, pl. viii. fig. 3 (1907).

Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{4}$  times in total length, length of head  $4\frac{2}{3}$  to 5 times. Head as long as deep or a little deeper than long,  $1\frac{2}{3}$  to  $1\frac{4}{5}$  times as long as broad; snout  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head, rounded, projecting beyond mouth; mouth situated below nostrils, its width  $4\frac{2}{3}$  to  $5\frac{2}{3}$  times in length of head; teeth bicuspid, truncate when worn down, 5 in upper jaw, 6 in lower; nostrils on a line with lower border of eye, nearer latter than end of snout; eye moderate, as long as or a little longer than snout, about  $\frac{2}{3}$  interocular width. Dorsal 34-36, as long as or a little

Fig. 65.

*Marcusenius petherici*.Type (F. N.).  $\frac{5}{9}$ .

shorter than its distance from head. Anal 24-26, originating below 14th to 16th ray of dorsal, equally distant from base of ventral and from base of caudal, or a little nearer latter. Pectoral pointed, subfalcate, nearly as long as head,  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times length of ventral and extending beyond base of latter. Caudal with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep, as long as or a little shorter

than head. 55-65 scales in lateral line,  $\frac{18-21}{19-22}$  in transverse series on body,  $\frac{12-13}{12-13}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown above, silvery white below, more or less speckled with darker; an ill-defined dark bar, extending obliquely from origin of dorsal to that of anal, sometimes present; dorsal fin, and sometimes also anal, brownish in front.

Total length 220 millim.

White Nile and Blue Nile.

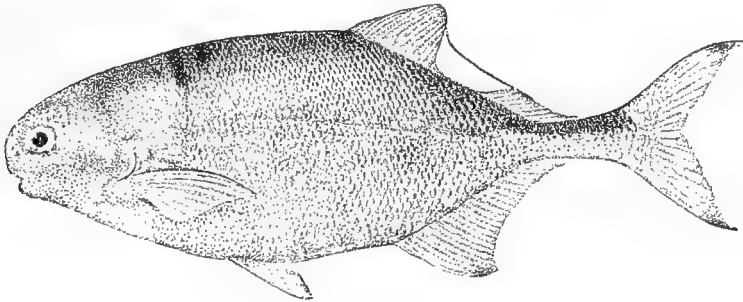
|             |                        |                          |
|-------------|------------------------|--------------------------|
| 1-3. Types. | Khartum.               | J. Petherick, Esq. (C.). |
| 4. Skel.    | "                      | "                        |
| 5. Ad.      | Fashoda, White Nile.   | L. Loat, Esq. (C.).      |
| 6-9. Ad.    | Wad Medine, Blue Nile. | "                        |

## 22. MARCUSENIUS BUDGETTI.

Bouleng. Proc. Zool. Soc. 1904, i. p. 197, pl. vii. fig. 1.

Depth of body 3 times in total length, length of head 5 times. Head a little deeper than long; snout rounded,  $\frac{1}{7}$  length of head; mouth small, inferior, its width  $\frac{1}{5}$  length of head; teeth notched, 5 in upper jaw, 6 in lower; anterior nostril on a line with lower border of pupil, posterior on a line with lower border of eye; eye nearly twice as long

Fig. 66.



*Marcusenius budgetti.*

Type (P. Z. S. 1904).  $\frac{1}{2}$ .

as snout,  $\frac{3}{5}$  interorbital width. Dorsal circa 32, nearly as long as its distance from head. Anal 25, originating below 11th ray of dorsal, nearer base of caudal than base of ventrals. Pectoral pointed, a little shorter than head, once and  $\frac{1}{2}$  length of ventral, extending beyond vertical of base of latter. Caudal with pointed lobes. Caudal peduncle 3 times as long as deep, as long as head. 67 scales in lateral line,  $\frac{17}{17}$  in

transverse series on body,  $\frac{10}{11}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Pale brownish above, silvery white beneath; head closely dotted with dark brown; a pair of dark brown bars across nape.

Total length 190 millim.

Lower Niger.

1. Type.

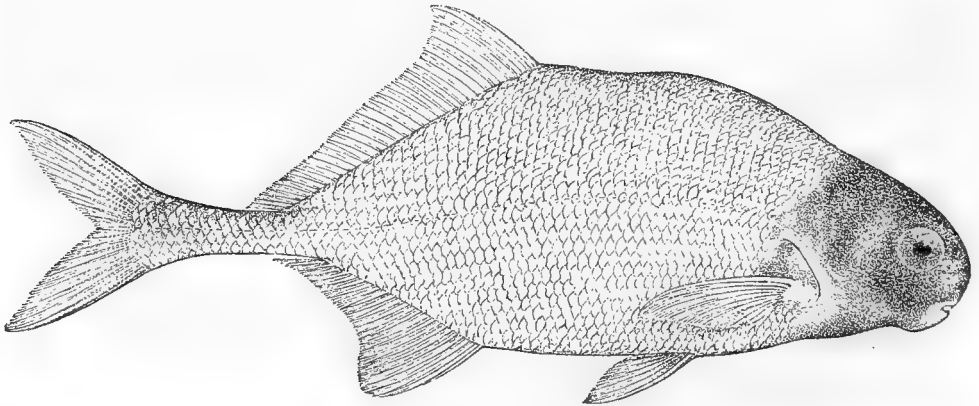
Assay.

J. S. Budgett, Esq. (P.).

23. MARCUSENIUS MACROPS, sp. n.

Depth of body 3 times in total length, length of head  $4\frac{2}{3}$  times. Snout rounded, projecting beyond the mouth,  $\frac{1}{6}$  length of head; mouth small, inferior, its width  $\frac{1}{6}$  length of head; teeth small, truncate or feebly notched, 5 in upper jaw, 6 in lower; chin slightly swollen; nostrils nearer eye than end of snout, on a line with lower border of eye; eye very large, twice as long as snout, a little greater than interorbital width, which is 4 times in length of head. Dorsal 37, as long as its

Fig. 67.



*Marcusenius macrops*.  $\frac{5}{8}$ .

distance from head. Anal 27, originating below 9th ray of dorsal, equally distant from base of ventral and from base of caudal. Pectoral pointed, nearly as long as head, once and  $\frac{1}{2}$  as long as ventral, extending beyond base of latter. Caudal with long, pointed lobes. Caudal peduncle 3 times as long as deep, a little shorter than head. 60 scales in lateral line,  $\frac{17}{19}$  in transverse series on body,  $\frac{11}{11}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Dark brown above, lighter beneath.

Total length 190 millim.

Upper Congo.

1. Type.

Upper Congo.

Brussels University.

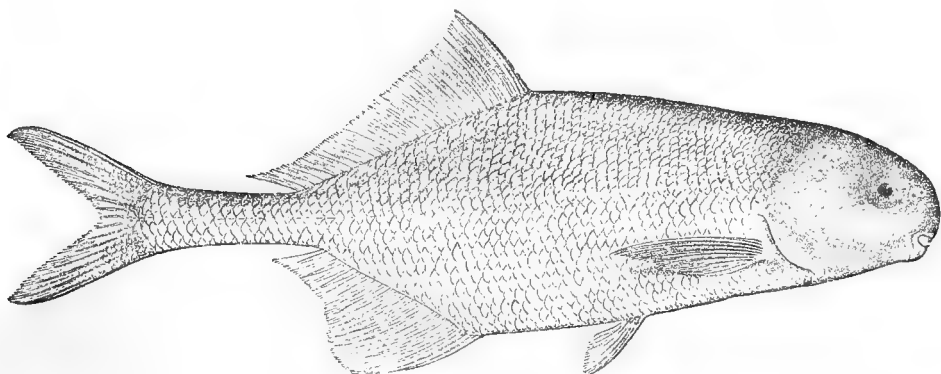
## 24. MARCUSENIUS PSITTACUS.

*Mormyrus psittacus*, Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 427.

*Marcusenius psittacus*, Bouleng. Proc. Zool. Soc. 1898, p. 798, and Poiss. Bass. Congo, p. 81 (1901).

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times. Head as long as deep; snout rounded,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth small, terminal or subinferior, its width  $\frac{1}{5}$  or  $\frac{1}{6}$  length of head; teeth small, notched, 5-7 in upper jaw, 6-8 in lower; chin slightly swollen; nostrils on a line with or a little below centre of eye, nearer latter than end of snout; eye rather large, not or but slightly longer than snout, equal to or a little less than interorbital width. Dorsal

Fig. 68.

*Marcusenius psittacus*.

Type.

33-41, as long as its distance from head. Anal 23-27, originating below 10th to 13th ray of dorsal, equally distant from base of ventral and from base caudal. Pectoral pointed, as long as or a little shorter than head,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as ventral, reaching base of latter or beyond. Caudal with long, pointed lobes. Caudal peduncle 3 times as long as deep, as long as head or a little shorter. 58-69 scales in lateral line,  $\frac{10-13}{11-13}$  in transverse series on body,  $\frac{15-19}{16-19}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, dark grey on the back.

Total length 210 millim.

Congo.

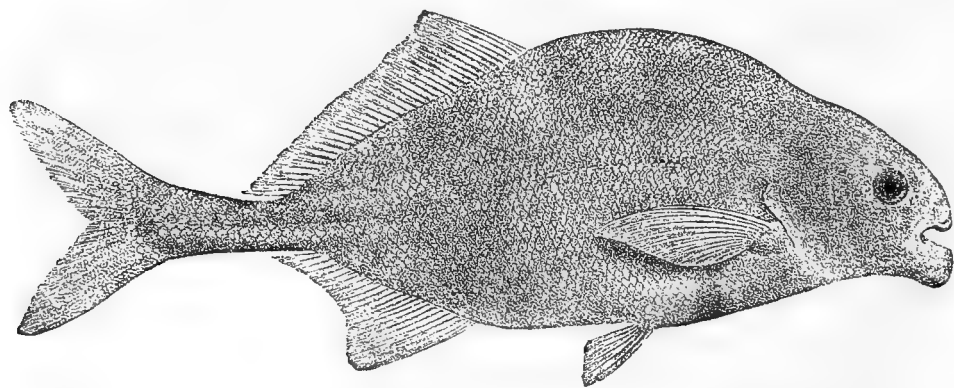
|                  |                              |                          |
|------------------|------------------------------|--------------------------|
| 1. Hgr., type.   | Stanley Falls.               | Rev. W. H. Bentley (C.). |
| 2-6. Ad.         | „                            | „                        |
| 7-8. Yg.         | Coquilhatville, Upper Congo. | M. P. Delhez (C.).       |
| 9-10. Ad. & hgr. | Boma, Lower Congo.           | „                        |
| 11. Hgr.         | Loango, „                    | Brussels University.     |
| 12. Ad.          | Banana, „                    | M. P. Delhez (C.).       |

## 25. MARCUSENIUS WILVERTHI.

Bouleng. Ann. Mus. Congo, Zool. i. 1898, p. 8, pl. iv. fig. 1, Proc. Zool. Soc. 1898, p. 796, and Poiss. Bass. Congo, p. 80 (1901).

Depth of body  $2\frac{1}{2}$  to 3 times in total length, length of head  $4\frac{3}{4}$  to 5 times; back gibbose, with convex outline in front of dorsal and concave outline on nape. Head as long as deep, with convex upper and concave lower profile; snout short,  $\frac{1}{4}$  to  $\frac{1}{3}$  length of head; mouth terminal or subinferior, its width  $\frac{1}{4}$  to  $\frac{1}{3}$  length of head, below level of eye; chin with a strong globular swelling; teeth extremely minute, almost hidden in the thick gums, truncate or slightly notched, 3 in upper jaw, 6 in

Fig. 69.

*Marcusenius wilverthi.*Type (A. M. C.).  $\frac{1}{2}$ .

lower; nostrils in posterior half of the snout, posterior a little lower down than anterior, which is on a level with centre of eye; eye moderate,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of snout or interorbital width. Dorsal 38-40,  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times length of anal, its length equalling its distance from head. Anal 25-27, originating below 12th or 13th ray of dorsal, a little nearer base of ventral than base of caudal. Pectoral pointed, a little shorter than head,  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times length of ventral, extending a little beyond base of latter. Caudal scaled in its basal two-thirds, with pointed lobes.

Caudal peduncle 3 times as long as deep,  $\frac{4}{5}$  length of head. 61-68 scales in lateral line,  $\frac{20-21}{20-21}$  in transverse series on body,  $\frac{12-14}{13-14}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Yellowish.

Total length 260 millim.

Congo.—Types in Congo Museum, Tervueren.

- |                           |                      |                      |
|---------------------------|----------------------|----------------------|
| 1. Ad., one of the types. | Matadi, Lower Congo. | Capt. Wilverth (C.). |
| 2. Ad.,            ,,     | Upoto, Upper Congo.  | ,,                   |
| 3. Hgr.                   | Upper Congo.         | Brussels University. |

5. STOMATORHINUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 9 (1898), Proc. Zool. Soc. 1898, p. 799, and Poiss. Bass. Congo, p. 83 (1901).

Teeth in the jaws bicuspid (7-10 upper, 8-10 lower); minute conical teeth on the parasphenoid and on the tongue; mouth inferior, in advance of the eyes. Nostrils widely separated, superposed, the lower (posterior) close to the mouth. Body short; ventral fins nearer the pectorals than the anal. Dorsal and anal fins subequal in length. Vertebræ 39 (14+25).

Tropical Africa.

*Synopsis of the Species.*

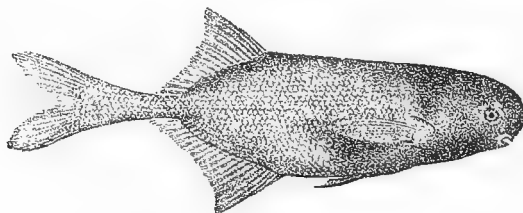
- I. Caudal peduncle  $3\frac{1}{2}$  times as long as deep,  $\frac{4}{5}$  to  $\frac{5}{8}$  length of head.
  - L. l. 52-55; 16 scales round caudal peduncle; depth of body  $3-3\frac{1}{2}$  times in total length. 1. *S. puncticulatus*, Blgr., p. 88.
- II. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  to  $\frac{2}{3}$  length of head.
  - L. l. 50-53; 16 scales round caudal peduncle; depth of body  $3\frac{1}{2}-3\frac{2}{3}$  times in total length. 2. *S. walkeri*, Gthr., p. 88.
  - L. l. 51-53; 14-16 scales round caudal peduncle; depth of body  $4\frac{1}{2}-5$  times in total length. . . . . 3. *S. humilior*, Blgr., p. 89.
- III. Caudal peduncle twice as long as deep,  $\frac{1}{2}$  length of head.
  - L. l. 48; 12 scales round caudal peduncle; depth of body  $3\frac{1}{2}$  times in total length. . 4. *S. corneti*, Blgr., p. 90.
  - L. l. 54-60; 20-22 scales round caudal peduncle; depth of body  $3\frac{2}{3}-4\frac{1}{3}$  times in total length. . . . . 5. *S. polylepis*, Blgr., p. 91.
  - L. l. 48-53; 16-18 scales round caudal peduncle; depth of body  $4-4\frac{1}{2}$  times in total length. . . . . 6. *S. microps*, Blgr., p. 92.

## 1. STOMATORHINUS PUNCTICULATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 69, pl. xxxi. fig. 3 (1899), and Poiss. Bass. Congo, p. 84 (1901).

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head 4 times. Head hardly longer than deep; snout rounded, strongly projecting beyond mouth,  $\frac{2}{7}$  length of head; mouth small, its width 5 times in length of head; 7 teeth in upper jaw, 8 in lower; eye very small,  $\frac{1}{2}$

Fig. 70.

*Stomatorhinus puncticulatus.*Type (A. M. C.).  $\frac{4}{5}$ .

length of snout,  $\frac{1}{3}$  interorbital width. Dorsal 17-18, a little more than  $\frac{1}{2}$  as long as its distance from head. Anal 21-22, 7th ray corresponding to 1st of dorsal, slightly nearer base of ventral than base of caudal. Pectoral pointed, slightly shorter than head, twice length of ventral, reaching nearly extremity of latter. Caudal with long, obtusely pointed lobes. Caudal peduncle  $3\frac{1}{2}$  times as long as deep,  $\frac{4}{5}$  to  $\frac{5}{6}$  length of head. 52-55 scales in lateral line,  $\frac{8-9}{13-14}$  in transverse series on body,  $\frac{10}{8-9}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Purplish brown, dotted all over with blackish; dorsal and anal fins darker in front.

Total length 87 mil im.

Lower Congo.—Types in Congo Museum, Tervueren.

- |                      |         |                    |
|----------------------|---------|--------------------|
| 1. One of the types. | Boma.   | M. P. Delhez (C.). |
| 2. Ad.               | Loango. | M. De Meuse (C.).  |

## 2. STOMATORHINUS WALKERI.

*Mormyrus walkeri*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 116, pl. iii. fig. C.

*Petrocephalus affinis*, Sauv. Bull. Soc. Philom. (7) iii. 1878, p. 101.

*Mormyrus affinis*, Sauv. N. Arch. Mus. (2) iii. 1880, p. 52, pl. ii. fig. 2; Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 283.

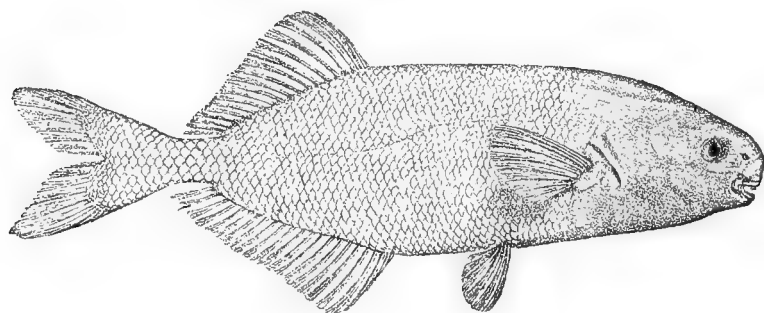
*Stomatorhinus walkeri*, Bouleng. Proc. Zool. Soc. 1898, p. 799.

Depth of body  $3\frac{1}{2}$  to  $3\frac{3}{4}$  times in total length, length of head  $3\frac{3}{4}$  times.



Head once and  $\frac{1}{6}$  as long as deep; snout rounded, projecting beyond mouth,  $\frac{1}{4}$  length of head; mouth small, its width  $\frac{1}{5}$  length of head; 10 teeth in either jaw; eye moderate,  $\frac{2}{3}$  length of snout,  $\frac{1}{2}$  interorbital width. Dorsal 19–20, a little more than  $\frac{1}{2}$  as long as its distance from head. Anal 23–25, a little nearer base of caudal than base of ventral,

Fig. 71.

*Stomatorhinus walkeri.*

Type, after Günther (Ann. & Mag. N. H. 1867).

originating a little in advance of dorsal. Pectoral pointed, about  $\frac{2}{3}$  length of head,  $1\frac{2}{3}$  times length of ventral, extending beyond base of latter. Caudal with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  length of head. 50–53 scales in lateral line,  $\frac{6-7}{17-18}$  in transverse series on body,  $\frac{10}{10}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Brown.

Total length 90 millim.

Ogowe.

1–2. Types.

Gaboon.

3. Ad.

Talagouga, Ogowe.

Miss Kingsley (C.).

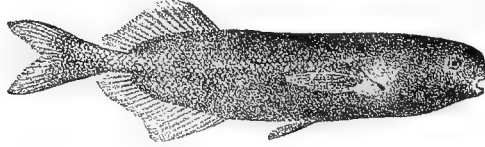
### 3. STOMATORHINUS HUMILIOR.

Bouleng. Ann. Mus. Congo, Zool. i. p. 70, pl. xxxi. fig. 4 (1899), and Poiss. Bass. Congo, p. 84 (1901).

Depth of body  $4\frac{1}{3}$  to 5 times in total length, length of head  $3\frac{2}{3}$  to 4 times. Head once and  $\frac{1}{3}$  as long as deep; snout vertically truncate, not extending beyond mouth,  $\frac{1}{4}$  length of head; mouth small, its width  $\frac{1}{5}$  length of head; 7 teeth in upper jaw, 8 in lower; eye small,  $\frac{1}{2}$  length of snout,  $\frac{1}{3}$  interorbital width. Dorsal 18–19, its length a little more than half its distance from head. Anal 20–22, 4th or 5th ray below 1st of dorsal, equally distant from base of ventral and from base of caudal.

Pectoral obtusely pointed,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, once and  $\frac{2}{3}$  length of ventral, reaching middle of latter. Caudal with obtusely pointed lobes.

Fig. 72.

*Stomatorhinus humilior.*Type (A. M. C.).  $\frac{4}{5}$ .

Caudal peduncle twice and  $\frac{1}{2}$  as long as deep,  $\frac{3}{5}$  length of head. 51–53 scales in lateral line,  $\frac{6}{16-17}$  in transverse series on body,  $\frac{8-9}{8-9}$  in transverse series between dorsal and anal, 14–16 round caudal peduncle. Dark purplish brown, lighter beneath; head with light dots.

Total length 80 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

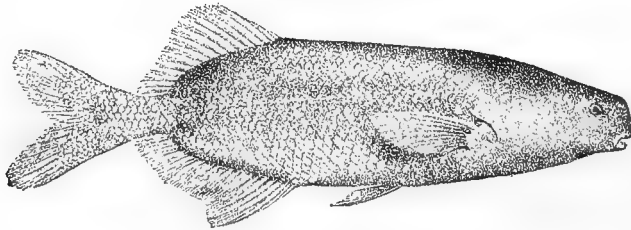
1. Hgr., one of the types. Coquilhatville. M. P. Delhez (C.).

#### 4. STOMATORHINUS CORNETI.

Bouleng. Ann. Mus. Congo, Zool. i. p. 71, pl. xxxi. fig. 5 (1899), and Poiss. Bass. Congo, p. 85 (1901).

Depth of body nearly equal to length of head,  $3\frac{1}{2}$  times in total length. Head once and  $\frac{1}{4}$  as long as deep; snout vertically truncate, not projecting beyond mouth,  $\frac{1}{4}$  length of head; mouth small, its width

Fig. 73.

*Stomatorhinus corneti.*Type (A. M. C.).  $\frac{4}{5}$ .

$\frac{1}{4}$  length of head; 9 teeth in upper jaw, 10 in lower; eye very small,  $\frac{1}{3}$  length of snout. Dorsal 17, its length  $\frac{2}{3}$  its distance from head. Anal 20, 4th ray below 1st of dorsal. Pectoral obtusely pointed,  $\frac{3}{4}$  length of head, once and  $\frac{2}{3}$  length of ventral, reaching middle of latter. Caudal

with rounded lobes. Caudal peduncle twice as long as deep,  $\frac{1}{2}$  length of head. 48 scales in lateral line,  $\frac{6}{15}$  in transverse series on body,  $\frac{8}{9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown above, whitish beneath; fins colourless.

Total length 100 millim.

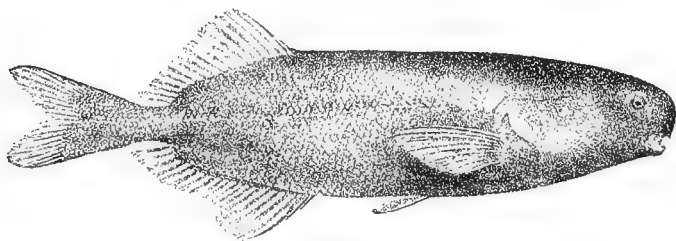
Congo (Stanley Pool).—Type in Congo Museum, Tervueren.

#### 5. STOMATORHINUS POLYLEPIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 71, pl. xxxi. fig. 6 (1899), and Poiss. Bass. Congo, p. 86 (1901).

Depth of body  $3\frac{2}{3}$  to  $4\frac{1}{3}$  times as long as deep, length of head  $3\frac{1}{2}$  to 4 times. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep; snout rounded, projecting a little beyond mouth,  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; mouth small, its width  $\frac{1}{5}$  to  $\frac{1}{4}$  length of head; 7 teeth in upper jaw, 8 in lower; eye very small,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head,  $\frac{1}{3}$  interorbital width. Dorsal 18–19, its length once and  $\frac{2}{3}$  in its distance from head. Anal 20–23, 4th or 5th ray below 1st of dorsal, a little nearer base of caudal than base of ventral. Pectoral obtusely pointed,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head,  $1\frac{2}{3}$  to 2 times length of ventral,

Fig. 74.



*Stomatorhinus polylepis.*

Type (A. M. C.).  $\frac{4}{5}$ .

extending more or less beyond base of latter. Caudal with rounded lobes. Caudal peduncle twice as long as deep,  $\frac{1}{2}$  length of head. 54–60 scales in lateral line,  $\frac{9-10}{18-20}$  in transverse series on body,  $\frac{10-11}{10-11}$  in transverse series between dorsal and anal, 20–22 round caudal peduncle. Dark purplish brown, lighter beneath; fins grey.

Total length 110 millim.

Congo.—Types in Congo Museum, Tervueren.

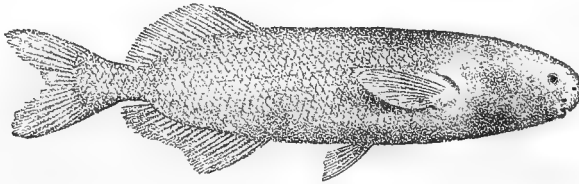
1–2. Two of the types. Coquilhatville, Upper Congo. M. P. Delhez (C.).

## 6. STOMATORHINUS MICROPS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 9, pl. iv. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 800, and Poiss. Bass. Congo, p. 87 (1901).

Depth of body 4 to  $4\frac{1}{2}$  times in total length, length of head 4 times. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep; snout rounded, strongly projecting beyond mouth,  $\frac{1}{4}$  to  $\frac{2}{7}$  length of head; mouth small, its width  $\frac{1}{6}$  to  $\frac{1}{5}$  length of head; 7 teeth in upper jaw, 8 in lower; eye extremely small. Dorsal 18–20, about  $\frac{1}{2}$  as long as its distance from head. Anal 20–22, nearer base of caudal than base of ventral. Pectoral

Fig. 75.

*Stomatorhinus microps.*Type (A. M. C.).  $\frac{4}{5}$ .

obtusely pointed,  $\frac{2}{3}$  length of head,  $1\frac{2}{3}$  times length of ventral, extending beyond base of latter. Caudal with rounded lobes. Caudal peduncle twice as long as deep, about  $\frac{1}{2}$  length of head. 48–53 scales in lateral line,  $\frac{7-9}{14-16}$  in transverse series on body,  $\frac{8-9}{9-10}$  in a transverse series between dorsal and anal, 16–18 round caudal peduncle. Colourless.

Total length 100 millim.

Congo.—Types in Congo Museum, Tervueren.

|                          |                |                      |
|--------------------------|----------------|----------------------|
| 1–3. Three of the types. | Matadi.        | Capt. Wilverth (C.). |
| 4. Skel.                 | ”              | ”                    |
| 5. One of the types.     | Leopoldville.  | ”                    |
| 6–8. Ad. & hgr.          | Stanley Falls. | M. De Meuse (C.).    |

## 6. MYOMYRUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 9 (1898), Proc. Zool. Soc. 1898, p. 800, and Poiss. Bass. Congo, p. 88 (1901).

5 or 6 conical teeth in the upper jaw, 6 compressed teeth in the lower jaw, median pair very large and incisor-like; mouth inferior, anterior to the eyes. Nostrils moderately far apart, distant from the eye. Body short; ventrals nearer pectorals than anal. Dorsal much longer than anal. Vertebrae 50 (14 + 4 + 32).

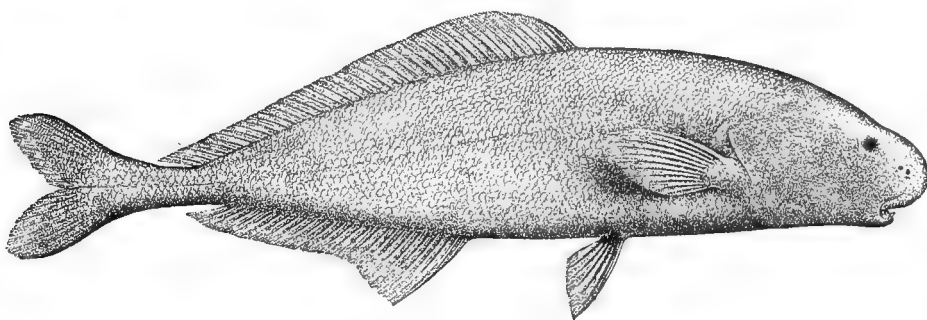
Congo.

## 1. MYOMYRUS MACRODON.

Bouleng. ll. ce. p. 10, pl. vii. fig. 1, p. 800, and p. 89.

Depth of body nearly equal to length of head, 4 to  $4\frac{2}{3}$  times in total length. Head  $1\frac{1}{8}$  to  $1\frac{1}{4}$  times as long as deep, with slightly concave upper profile; snout short,  $\frac{1}{4}$  to  $\frac{2}{7}$  length of head, strongly projecting beyond mouth; mouth small, its width  $\frac{1}{4}$  to  $\frac{1}{6}$  length of head; nostrils below level of eye, nearer end of snout than eye; eye very small,  $\frac{1}{4}$  to  $\frac{1}{3}$  interorbital width. Dorsal 38-42, as long as or slightly longer than its

Fig. 76.

*Myomyrus macrodon.*

Type (A. M. C.).  $\frac{1}{2}$ .

distance from end of snout. Anal 26-30, originating below 13th to 16th ray of dorsal, a little nearer base of caudal than base of ventral. Pectoral obtusely pointed,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head,  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times length of ventral, reaching base of latter. Caudal scaled, with rounded lobes. Caudal peduncle 3 times as long as deep,  $\frac{3}{5}$  length of head. 88-93 scales in lateral line,  $\frac{15-20}{24-25}$  in transverse series on body,  $\frac{11-13}{12-15}$  in transverse series between dorsal and anal, 16-20 round caudal peduncle. Pale brownish above, whitish below.

Total length 340 millim.

Congo.—Types in Congo Museum, Tervueren.

- |                            |                        |                                             |
|----------------------------|------------------------|---------------------------------------------|
| 1. Hgr., one of the types. | Matadi, Lower Congo.   | Capt. Wilverth (C.).                        |
| 2. Hgr.                    | Boma, „                | M. P. Delhez (C.).                          |
| 3. Ad.                     | Upper Congo.           | Brussels University.                        |
| 4. Yg.                     | Lindi R., Upper Congo. | M. M. Storms (C.);<br>Brussels Museum (E.). |

## 7. GNATHONEMUS.

*Mormyrus*, part., Linn. Syst. Nat. i. p. 522 (1766); Günth. Cat. Fish. vi. p. 214 (1866).

*Mormyrops*, part., Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14, and Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 113.

*Gnathonemus*, Gill, Proc. Ac. Philad. 1862, p. 443; Bouleng. Proc. Zool. Soc. 1898, p. 801, and Poiss. Bass. Congo, p. 89 (1901); Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 352; Bouleng. Fish. Nile, p. 48 (1907).

*Campylomormyrus*, Bleek. Versl. Ak. Amsterd. (2) viii. 1874, p. 367; Pappenh. t. c. p. 357.

Teeth in the jaws small, conical, truncate, or notched (3–10 upper, 4–10 lower); minute conical teeth on the parasphenoid and on the tongue; mouth terminal. Nostrils moderately far apart, remote from the eye. Body moderately elongate; ventral fins equally distant from the pectorals and from the anal, or nearer the former. Dorsal and anal fins not very unequal in length. Vertebræ 44–49 (10–14 + 4–8 + 27–30). Nile and Tropical Africa.

*Synopsis of the Species.*

I. Snout shorter than postocular part of head.

A. Anal originating in advance of dorsal.

1. Teeth notched or bicuspid.

a. 8 scales round caudal peduncle, which is  $2\frac{1}{2}$ –3 times as long as deep.

α. A globular mental swelling.

D. 20–25; A. 25–33; L. l. 43–49; depth of body  $3\text{--}3\frac{3}{4}$  times in total length; pectoral reaching beyond base of ventral. 1. *G. moorii*, Gthr., p. 95.

D. 23–24; A. 26–28; L. l. 44–45; depth of body  $3\frac{1}{2}$ –4 times in total length; pectoral just reaching base of ventral . . . . 2. *G. lambouri*, Pellegr., p. 97.

D. 27–28; A. 33; L. l. 49–54; depth of body 4 times in total length; pectoral reaching beyond base of ventral . . . . 3. *G. schilthuisiae*, Blgr., p. 98.

β. A long, cylindrical, tapering mental appendage.

D. 27–29; A. 34–36; L. l. 63–70; depth of body  $3\frac{3}{4}$ – $4\frac{1}{4}$  times in total length. . . . 4. *G. petersii*, Gthr., p. 99.

b. 10–12 scales round caudal peduncle.

α. Caudal peduncle not twice and  $\frac{1}{2}$  as long as deep.

\* A long, cylindrical, tapering mental appendage.

D. 22–25; A. 28–30; L. l. 58–64; depth of body  $4\text{--}4\frac{1}{2}$  times in total length . . . . 5. *G. longibarbis*, Hilg., p. 100.

\*\* No mental appendage.

- D. 17-20; A. 25-28; L. l. 51-58; depth of body  $3\frac{1}{5}$ - $3\frac{5}{8}$  times in total length . . . 6. *G. niger*, Gthr., p. 101.  
 D. 24-25; A. 30-31; L. l. 55-60; depth of body  $3\frac{1}{2}$ -4 times in total length . . . 7. *G. leopoldianus*, Blgr., p. 102.

β. Caudal peduncle  $2\frac{1}{2}$ -3 times as long as deep.

\* Depth of body 5- $5\frac{1}{2}$  times in total length.

- D. 19; A. 31; L. l. 65 . . . . . 8. *G. friteli*, Pellegr., p. 103.  
 D. 23; A. 34; L. l. 58 . . . . . 9. *G. bentleyi*, Blgr., p. 103.

\*\* Depth of body 3-4 times in total length.

- D. 21-24; A. 28-31; L. l. 62-65. . . . . 10. *G. livingstonii*, Blgr., p. 104.  
 D. 26; A. 33; L. l. 55 . . . . . 11. *G. bruyeri*, Pellegr., p. 105.  
 D. 28-33; A. 36-43; L. l. 75-80; a round or oval mental appendage . . . . . 12. *G. monteiri*, Gthr., p. 105.

γ. Caudal peduncle 4 times as long as deep.

- D. 29-33; A. 36; L. l. 84-85. . . . . 13. *G. mento*, Blgr., p. 106.

2. Teeth conical; depth of body 3-4 times in total length; caudal peduncle 2-3 times as long as deep.

a. 12 scales round caudal peduncle.

- D. 28-32; A. 35-40; L. l. 70-85; pectoral extending beyond root of ventral . . . 14. *G. stanleyanus*, Blgr., p. 107.  
 D. 25-28; A. 30-36; L. l. 68-72; pectoral not extending beyond root of ventral . . . 15. *G. senegalensis*, Sldr., p. 108.  
 D. 24-26; A. 29-33; L. l. 56-60; mental swelling feeble . . . . . 16. *G. angolensis*, Blgr., p. 109.

b. 14-16 (rarely 12 or 18) scales round caudal peduncle.

- D. 25-30; A. 30-37; L. l. 70-86 . . . 17. *G. cyprinoides*, L., p. 110.  
 D. 23-25; A. 28-32; L. l. 50-69 . . . 18. *G. macrolepidotus*, Peters, p. 112.

B. Dorsal and anal originating in the same vertical, 31-33; depth of body about  $3\frac{1}{2}$  times in total length.

- L. l. 78; caudal peduncle 3 times as long as deep, 12 scales round it . . . . . 19. *G. pictus*, Marcus., p. 113.

- L. l. 85; caudal peduncle 4 times as long as deep, 14 scales round it . . . . . 20. *G. gilli*, Blgr., p. 114.

C. Dorsal originating in advance of anal; depth of body  $3\frac{1}{4}$ - $3\frac{2}{3}$  times in total length.

1. D. 28-29; A. 27-30.

- L. l. 42-43; caudal peduncle 4 times as long as deep, 8 scales round it . . . 21. *G. kutuensis*, Blgr., p. 115.

- L. l. 55; caudal peduncle twice as long as deep, 12 scales round it . . . . . 22. *G. ussheri*, Gthr., p. 116.

2. D. 31-36 ; A. 29-34 ; caudal peduncle  $3\frac{1}{2}$  to 4 times as long as deep. L. l. 72-80 ; 12 scales round caudal peduncle. 23. *G. greshoffi*, Schilth., p. 117. L. l. 98 ; 16 scales round caudal peduncle . 24. *G. abadii*, Blgr., p. 118.

II. Snout much longer than postorbital part of head, produced into a tube, with a mental appendage or barbel ; anal originating in advance of dorsal.

A. 10-12 scales round caudal peduncle ; L. l. 70-80.

D. 26-30 ; A. 29-34 ; least depth of snout 4-5 times in its length ; mental appendage about as long as eye . . . . 25. *G. tamandua*, Gthr., p. 118.

D. 34 ; A. 35 ; least depth of snout 3 times in its length ; mental appendage  $\frac{3}{4}$  length of snout . . . . . 26. *G. mirus*, Blgr., p. 119.

D. 31-35 ; A. 33-37 ; least depth of snout 3-4 times in its length ; mental appendage about as long as eye . . . . . 27. *G. elephas*, Blgr., p. 120.

B. 16-18 scales round caudal peduncle ; D. 27-34 ; A. 29-37 ; L. l. 75-90.

Snout strongly curved, its least depth 5-7 times in its length ; caudal peduncle  $3-3\frac{1}{2}$  times as long as deep . . . . 28. *G. rhynchophorus*, Blgr., p. 121.

Snout strongly curved, its least depth 8-10 times in its length ; caudal peduncle 3 times as long as deep . . . . . 29. *G. ibis*, Blgr., p. 122.

Snout strongly curved, its least depth 12 times in its length ; caudal peduncle 4 times as long as deep . . . . . 30. *G. curvirostris*, Blgr., p. 123.

Snout feebly curved, its least depth 20 times in its length in the adult ; caudal peduncle 3 times as long as deep . . 31. *G. numenius*, Blgr., p. 124.

### 1. GNATHONEMUS MOORII.

*Mormyrus moorii*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 116.

*Mormyrus lepturus*, Günth. Proc. Zool. Soc. 1871, p. 670, pl. lxix. fig. B, and Ann. & Mag. N. H. (6) xvii. 1896, p. 280.

*Mormyrus grandisquamis*, Peters, Mon. Berl. Ac. 1876, p. 250, pl. —. fig. 3 ; Schilth. Tijdschr. Nederl. Dierk. Ver. (2) iii. 1891, p. 84.

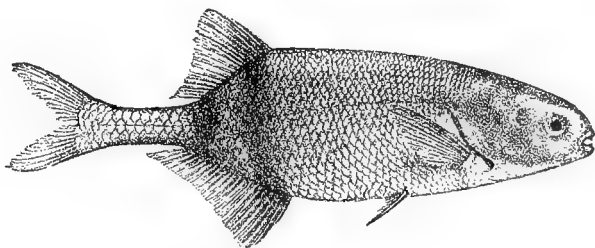
*Gnathonemus moorii*, Bouleng. Proc. Zool. Soc. 1898, p. 803, and Poiss. Bass. Congo, p. 94 (1901) ; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 354.

Depth of body 3 to  $3\frac{3}{4}$  times in total length, length of head 4 to 5 times. Head as long as deep or slightly longer than deep, with curved upper profile ; snout short, about  $\frac{1}{4}$  length of head ; a globular dermal swelling on the chin ; teeth small, notched, 5 in upper jaw, 6 in lower ; eye moderate,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of snout, about  $\frac{1}{2}$  interorbital width.



Dorsal 20–25, originating above 4th to 6th ray of anal, its length 2 to  $2\frac{1}{3}$  times in its distance from head. Anal 25–33, equally distant from base of ventral and base of caudal, or nearer latter. Pectoral as long as or slightly shorter than head, twice as long as ventral, extending beyond base of latter. Caudal densely scaled in its anterior third, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep, as long as or

Fig. 77.

*Gnathonemus moorii.*

Type of *M. lepturus*, after Günther (P. Z. S. 1871).

a little shorter than head. 43–49 scales in lateral line,  $\frac{10-11}{13-15}$  in transverse series on body,  $\frac{7}{7}$  in transverse series between dorsal and anal, 8 round caudal peduncle. Brownish, with a dark brown vertical band from anterior rays of dorsal to anterior rays of anal, sometimes followed by a second.

Total length 200 millim.

Cameroon, Gaboon, Congo.—Type, from Ogove (in Liverpool Museum), examined.

|                                            |                        |                         |
|--------------------------------------------|------------------------|-------------------------|
| 1–2. Ad.                                   | Kribi R., S. Cameroon. | G. L. Bates, Esq. (C.). |
| 3–9. Ad., hgr., & yg.                      | Ja R. at Bitye, „      | „                       |
| 10–11. Yg. (Types of <i>M. lepturus</i> .) | Gaboon.                |                         |
| 12. Hgr.                                   | „                      |                         |
| 13. Ad.                                    | Eloby, Gaboon.         |                         |
| 14–16. Ad.                                 | Talagouga, Ogove.      | Miss Kingsley (C.).     |
| 17–18. Yg.                                 | Masoma R., Ogove.      | Dr. W. J. Ansorge (C.). |
| 19–20. Hgr.                                | Sette Cama, Gaboon.    |                         |
| 21–22. Ad.                                 | Boma, Lower Congo.     | M. P. Delhez (C.).      |

## 2. GNATHONEMUS LAMBOURL.

Pellegr. Bull. Mus. Paris, 1904, p. 439.

Depth of body  $3\frac{1}{2}$  to 4 times in total length, length of head 4 to  $4\frac{2}{3}$  times. Head a little longer than deep, with feebly curved upper profile;

snout short, about  $\frac{1}{4}$  length of head; mouth on a level with lower border of eye; a globular dermal swelling on the chin; teeth notched, 3 or 5 in upper jaw, 5 or 6 in lower; eye moderate, a little shorter than snout,  $\frac{1}{2}$  interorbital width. Dorsal 23-24, its length  $1\frac{3}{4}$  to 2 times in its distance from head. Anal 26-28, originating in advance of dorsal. Pectoral a little shorter than head, just reaching origin of ventral. Caudal scaled at the base, with long pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep. 44-45 scales in lateral line,  $\frac{10}{12-14}$  in transverse series on body,  $\frac{7}{7}$  in transverse series between dorsal and anal, 8 round caudal peduncle. Olive-brown, with darker longitudinal lines along the series of scales; a black vertical band from anterior rays of dorsal to anterior rays of anal.

Total length 150 millim.

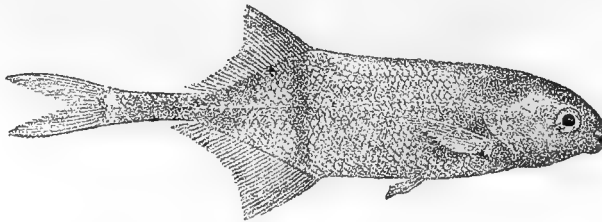
Alima R., Upper Congo.—Types in Paris Museum.

### 3. GNATHONEMUS SCHILTHUISIÆ.

Bouleng. Ann. Mus. Congo, Zool. i. p. 73, pl. xxxiii. fig. 4 (1899), and Poiss. Bass. Congo, p. 95 (1901).

Depth of body 4 times in total length, length of head  $4\frac{1}{2}$  times. Head scarcely longer than deep, with strongly curved upper profile; length of snout  $4\frac{1}{2}$  times in length of head; chin with a moderately developed globular swelling; teeth deeply notched, 5 in upper jaw, 6 in lower;

Fig. 78.



*Gnathonemus schilthuisiæ.*

Type (A. M. C.).  $\frac{3}{4}$ .

eye rather large, as long as snout,  $\frac{2}{3}$  interorbital width. Dorsal 27-28, originating above 4th ray of anal, its length a little less than  $\frac{1}{2}$  its distance from head. Anal 33. Pectoral pointed, a little shorter than head, twice as long as ventral, reaching beyond base of latter. Caudal scaled at the base, with long pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{3}{4}$  length of head. 49-54 scales in lateral line,  $\frac{8}{13}$  in transverse series on body,  $\frac{8}{8}$  in transverse series between dorsal and anal,

8 round caudal peduncle. Brown, darker on head and caudal peduncle, a blackish vertical band from anterior rays of dorsal to anal; fins blackish.

Total length 85 millim.

Upper Congo (Stanley Pool and L. Leopold II.).—Type in Congo Museum, Tervueren.

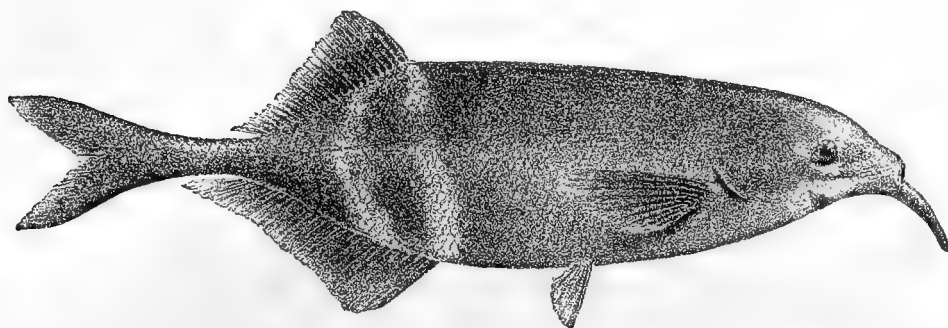
#### 4. GNATHONEMUS PETERSII.

*Mormyrus petersii*, Günth. Arch. f. Nat. 1862, p. 64, Proc. Zool. Soc. 1864, p. 22, pl. ii. fig. 2, and Cat. Fish. vi. p. 218 (1866).

*Gnathonemus petersii*, Gill, Proc. Ac. Philad. 1862, p. 444; Bouleng. Proc. Zool. Soc. 1898, p. 808, and Poiss. Bass. Congo, p. 99 (1901); Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 355.

Depth of body  $3\frac{3}{4}$  to  $4\frac{1}{4}$  times in total length, length of head  $4\frac{1}{5}$  to  $4\frac{2}{3}$  times. Head  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep, upper profile descending in a straight or slightly convex line; snout  $\frac{2}{5}$  length of head; lower jaw with a cylindrical, tapering dermal appendage, as long as or a little

Fig. 79.



*Gnathonemus petersii*.

Type, after Günther (P. Z. S. 1864).  $\frac{5}{6}$ .

longer than the snout and directed forwards; teeth very small, notched, 3 or 5 in upper jaw, 5 or 6 in lower; eye moderate, about  $\frac{1}{2}$  or  $\frac{2}{5}$  length of snout,  $\frac{3}{5}$  to  $\frac{1}{2}$  interorbital width. Dorsal 27–29, originating above 10th to 12th ray of anal, its length nearly twice in its distance from head. Anal 34–36, nearer base of caudal than base of ventral. Pectoral pointed,  $\frac{3}{4}$  to  $\frac{4}{5}$  as long as head, twice as long as ventral, extending beyond base of latter. Caudal scaled, with long, pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 63–70 scales in lateral line,  $\frac{12-13}{15-18}$  in transverse series on body,  $\frac{10-11}{10-11}$  in transverse series

between dorsal and anal, 8 round caudal peduncle. Dark brown, with two lighter vertical bars between dorsal and anal.

Total length 230 millim.

Niger, Old Calabar, Cameroon, Congo.

|                |                        |                          |
|----------------|------------------------|--------------------------|
| 1-2. Yg.       | Oguta, Lower Niger.    | Dr. W. J. Ansorge (C.).  |
| 3. Hgr., type. | Old Calabar.           | Dr. A. Günther (P.).     |
| 4-6. Ad. & yg. | Monsembe, Upper Congo. | Rev. J. H. Weeks (P.).   |
| 7-8. Ad.       | Stanley Falls.         | Rev. W. H. Bentley (C.). |
| 9. Ad.         | "                      | M. De Meuse (C.).        |
| 10. Yg.        | Banzville, Ubanghi.    | Capt. Royaux (C.).       |

### 5. GNATHONEMUS LONGIBARBIS.

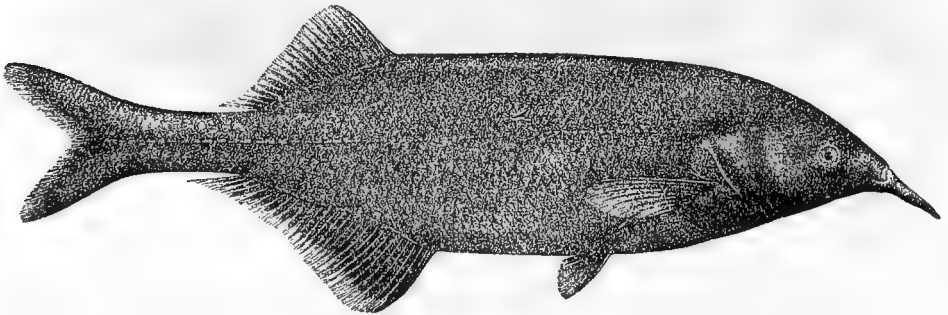
*Mormyrus petersii* (non Günth. 1862), Günth. Petherick's Trav. ii. p. 256 (1869).

*Mormyrus longibarbis*, Hilgend. Sitzb. Ges. nat. Fr. Berlin, 1888, p. 78.

*Gnathonemus longibarbis*, Bouleng. Proc. Zool. Soc. 1898, p. 802; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 256, pl. xii. fig. 1; Bouleng. Fish. Nile, p. 55, fig., pl. x. fig. 2 (1907).

Depth of body 4 to  $4\frac{1}{2}$  times in total length, length of head  $4\frac{1}{5}$  to  $4\frac{1}{2}$  times. Head longer than deep, with feebly curved upper profile; snout about  $\frac{2}{3}$  length of postocular part of head,  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times diameter of eye, about  $\frac{1}{2}$  interorbital width; chin with a long, cylindrical, pointed

Fig. 80.



*Gnathonemus longibarbis*.

Buganga (F. N.).  $\frac{5}{9}$ .

dermal appendage, as long as or a little longer than snout, directed forwards; teeth small, notched, 3 or 5 in upper jaw, 4 or 6 in lower. Dorsal 22-25, its length about  $\frac{1}{2}$  or  $\frac{2}{3}$  its distance from head and equal to or a little greater than its distance from caudal. Anal 28-31, originating a little in advance of dorsal, its distance from ventral a little

greater than that from caudal. Pectoral obtusely pointed, about  $\frac{2}{3}$  length of head and extending to base of ventral, which is only about half as long. Caudal nearly entirely scaled, with pointed lobes. Caudal peduncle  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, 2 or  $2\frac{1}{3}$  times as long as deep. 58-64 scales in lateral line,  $\frac{13-14}{17-19}$  in transverse series on body,  $\frac{10-11}{9-10}$  in transverse series between dorsal and anal, 10 or 12 round caudal peduncle. Uniform blackish brown, lower side of head sometimes whitish.

Total length 200 millim.

Lake Victoria.—Type in Berlin Museum.

1-7. Ad.

Buganga.

Mr. E. Degen (C.).

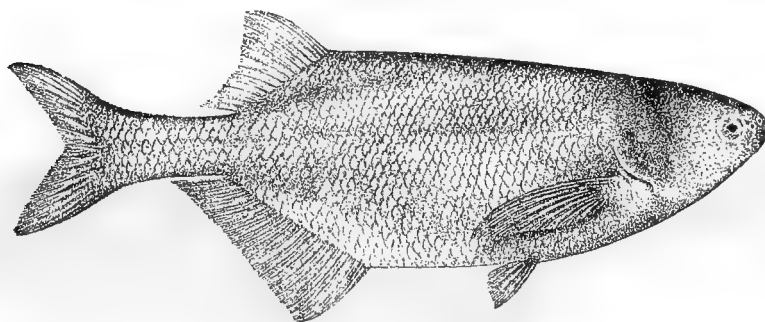
### 6. GNATHONEMUS NIGER.

*Mormyrus niger*, Günth. Cat. Fish. vi. p. 219 (1866).

*Gnathonemus niger*, Bouleng. Proc. Zool. Soc. 1898, p. 802, and Fish. Nile, p. 57, pl. ix. fig. 3 (1907).

Depth of body  $3\frac{1}{5}$  to  $3\frac{5}{6}$  times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head as long as deep, with convex upper profile; snout very short,  $\frac{1}{6}$  to  $\frac{1}{5}$  length of head; no mental swelling; teeth small, notched, 5 in upper jaw, 8 or 10 in lower; eye rather small, slightly shorter than the snout,

Fig. 81.



*Gnathonemus niger*.  
White Nile (F. N.).  $\frac{4}{5}$ .

$\frac{1}{2}$  to  $\frac{3}{5}$  interorbital width. Dorsal 17-20, originating above 8th to 10th ray of anal, its length 2 to  $2\frac{1}{2}$  times in its distance from head. Anal 25-28, nearer base of caudal than base of ventral. Pectoral pointed, a little longer than head, at least twice as long as ventral, extending almost to extremity of latter. Caudal densely scaled in its basal third, with obtusely pointed lobes. Caudal peduncle about twice as long as

deep,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. 51–58 scales in lateral line,  $\frac{8-11}{14-15}$  in transverse series on body,  $\frac{8-11}{8-9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Blackish brown above, sides silvery, speckled with dark brown.

Total length 125 millim.

White Nile, Gambia, Niger.

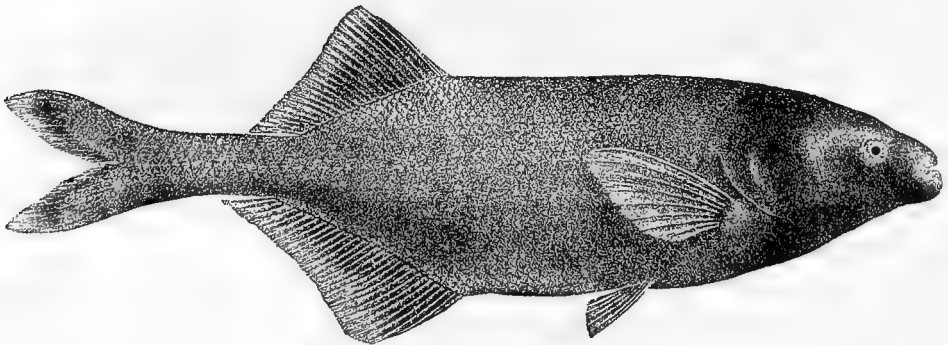
|            |                          |                                                       |
|------------|--------------------------|-------------------------------------------------------|
| 1. Type.   | Gambia.                  | Mr. J. T. Dalton (C.).                                |
| 2. Type.   | Niger.                   | "                                                     |
| 3–4. Ad.   | W. Africa.               |                                                       |
| 5–8. Ad.   | Fashoda, White Nile.     | L. Loat, Esq. (C.).                                   |
| 9. Skel.   | " "                      |                                                       |
| 10–13. Ad. | Polkom, Baro R. (Sobat). | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |

#### 7. GNATHONEMUS LEOPOLDIANUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 72, pl. xxxiii. fig. 3 (1899), and Poiss. Bass. Congo, p. 91 (1901).

Depth of body  $3\frac{1}{2}$  to 4 times in total length, length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$  times. Head a little longer than deep, upper profile declivous and feebly convex; snout a little more than  $\frac{1}{4}$  length of head; teeth notched, 6 or 8 in upper jaw, 10 in lower; chin scarcely swollen; eye moderately

Fig. 82.



*Gnathonemus leopoldianus*.

Type (A. M. C.).  $\frac{1}{2}$ .

large, not more than  $\frac{1}{2}$  length of snout,  $\frac{2}{5}$  interocular width. Dorsal 24–25, originating above 5th or 6th ray of anal, its length  $\frac{1}{2}$ , or a little less than  $\frac{1}{2}$ , its distance from head. Anal 30–31, nearer base of caudal than base of ventral. Pectoral pointed, a little shorter than head, twice

as long as ventral, extending beyond base of latter. Caudal scaled in its basal half, with long, pointed lobes. Caudal peduncle twice as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 55-60 scales in lateral line,  $\frac{11}{15-16}$  in transverse series on body,  $\frac{8-9}{8-9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Uniform blackish.

Total length 270 millim.

Lake Leopold II., Congo.—Types in Congo Museum, Tervueren.

1. One of the types. Ibali. M. P. Delhez (C.).

#### 8. GNATHONEMUS FRITELI.

Pellegr. Bull. Mus. Paris, 1904, p. 440.

Depth of body equal to length of head,  $5\frac{1}{2}$  times in total length. Head longer than deep; snout a little more than  $\frac{1}{4}$  length of head; teeth strongly notched, 4 in upper jaw, 5 in lower; chin with a globular swelling; eye half length of snout,  $\frac{1}{3}$  interorbital width. Dorsal 19, originating above 12th ray of anal, its length nearly  $\frac{1}{3}$  its distance from head. Anal 31. Pectoral rounded,  $\frac{3}{4}$  length of head, not reaching base of ventral. Caudal scaled at the base, with rounded lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep. 65 scales in lateral line,  $\frac{10}{14}$  in transverse series on body,  $\frac{8}{9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Uniform brownish.

Total length 135 millim.

Alima R., Congo.—Type in Paris Museum.

#### 9. GNATHONEMUS BENTLEYI.

*Mormyrus bentleyi*, Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 426.

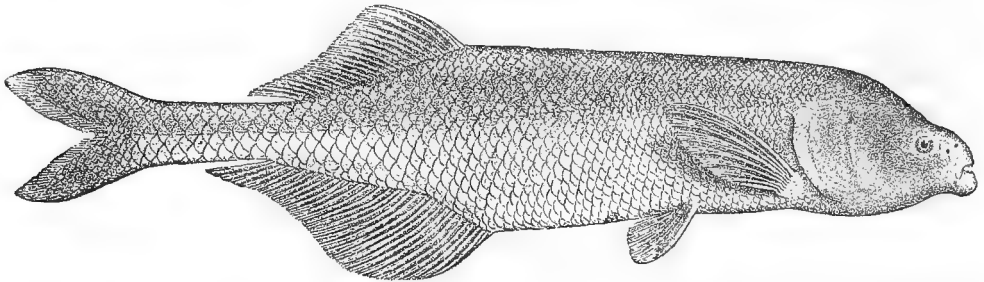
*Gnathonemus bentleyi*, Bouleng. Proc. Zool. Soc. 1898, p. 804, and Poiss. Bass.

Congo, p. 92 (1901).

Depth of body equal to length of head, 5 times in total length. Head once and  $\frac{1}{4}$  as long as deep, upper profile slightly concave above the eye; snout  $\frac{1}{4}$  length of head; teeth notched, 7 in upper jaw, 10 in lower; chin strongly swollen; eye moderate,  $\frac{1}{2}$  length of snout,  $\frac{2}{5}$  interorbital width. Dorsal 23, originating above 5th ray of anal, its length twice in its distance from head. Anal 34, nearer base of caudal than base of ventral. Pectoral pointed, almost as long as head, nearly twice as long as ventral, extending beyond base of latter. Caudal densely scaled, with pointed lobes. Caudal peduncle 3 times as long as deep, almost as long

as head. 58 scales in lateral line,  $\frac{9}{15}$  in transverse series on body,  $\frac{8}{10}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Dark olive.

Fig. 83.

*Gnathonemus bentleyi*.Type.  $\frac{4}{9}$ .

Total length 270 millim.

Upper Congo.

1. Type.

Stanley Falls.

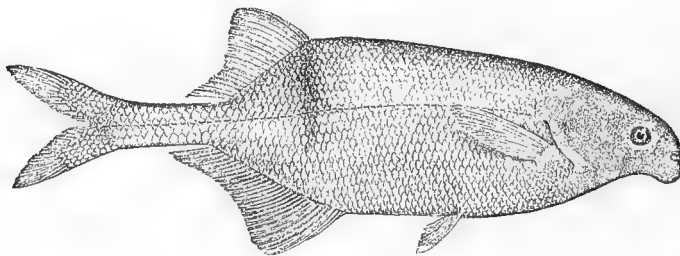
Rev. W. H. Bentley (C.).

## 10. GNATHONEMUS LIVINGSTONII.

Bouleng. Proc. Zool. Soc. 1898, p. 803; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 353.

Depth of body  $3\frac{2}{3}$  times in total length, length of head  $4\frac{1}{2}$  times. Head nearly as long as deep, with curved upper profile; snout  $\frac{2}{7}$  length

Fig. 84.

*Gnathonemus livingstonii*.

Type.

of head; chin with a globular dermal appendage; teeth bicuspid, 5 in upper jaw, 6 in lower; eye small,  $\frac{1}{2}$  length of snout,  $\frac{2}{8}$  interorbital width. Dorsal 21-24, originating above 10th ray of anal, its length  $2\frac{1}{2}$  times in its distance from head. Anal 28-31, equally distant from base of ventral and from base of caudal. Pectoral obtusely pointed,  $\frac{3}{4}$  length



of head, twice length of ventral, reaching a little beyond base of latter. Caudal with obtusely pointed lobes. Caudal peduncle 3 times as long as deep, a little shorter than head. 62-65 scales in lateral line,  $\frac{15}{20}$  in transverse series on body,  $\frac{11}{11}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, brownish on the back; a dark brown vertical bar on the body below origin of dorsal.

Total length 83 millim.

Rovuma River, East Africa.

1. Yg., type.

Rovuma R.

Dr. C. Livingstone (P.).

#### 11. GNATHONEMUS BRUYERII.

Pellegr. Bull. Mus. Paris, 1904, p. 441.

Depth of body  $3\frac{1}{2}$  times in total length, length of head 5 times. Head scarcely longer than deep, with curved upper profile; snout a little less than  $\frac{1}{3}$  length of head; teeth notched, 5 in both jaws; chin with a globular swelling; eye  $\frac{2}{3}$  length of snout,  $\frac{1}{2}$  interorbital width. Dorsal 26, originating slightly further back than anal. Anal 33. Pectoral pointed, as long as head, twice as long as ventral, extending beyond base of latter. Caudal scaled at the base, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep. 55 scales in lateral line,  $\frac{12}{17}$  in transverse series on body,  $\frac{10}{11}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, darker on the back; traces of a dark vertical band between origin of dorsal and anal.

Total length 110 millim.

Ivory Coast.—Type in Paris Museum.

#### 12. GNATHONEMUS MONTEIRI.

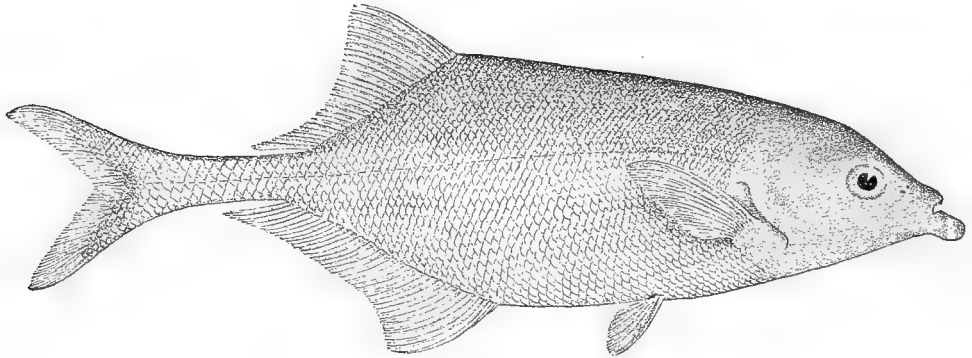
*Mormyrus monteiri*, Günth. Ann. & Mag. N. H. (4) xii. 1873, p. 144.

*Gnathonemus monteiri*, Bouleng. Proc. Zool. Soc. 1898, p. 807, and Poiss. Bass. Congo, p. 98 (1901).

Depth of body  $3\frac{1}{5}$  to 4 times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head  $1\frac{1}{5}$  to  $1\frac{1}{3}$  times as long as deep, upper profile descending in a straight or slightly concave line; snout  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head; lower jaw with a roundish or oval, depressed dermal appendage about as long as eye; teeth notched, 5 to 10 in upper jaw, 6 to 10 in lower; eye moderate,  $\frac{1}{2}$  to  $\frac{3}{8}$  length of snout,  $\frac{1}{2}$  to  $\frac{3}{4}$  interorbital width. Dorsal 28-33, originating above 10th to 15th ray of anal, its length about twice

in its distance from head. Anal 36-43, equally distant from base of ventral and from base of caudal. Pectoral pointed,  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, more than twice as long as ventral, extending beyond base of latter. Caudal scaled, with long pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. 75-80 scales in lateral line,  $\frac{15-19}{21-23}$  in transverse series on body,  $\frac{13-17}{10-14}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Uniform silvery.

Fig. 85.

*Gnathonemus monteiri.*Type.  $\frac{5}{7}$ .

Total length 450 millim.

Congo, Lake Bangweu.

|                   |                     |                            |
|-------------------|---------------------|----------------------------|
| 1-3. Hgr., types. | Boma, Lower Congo.  | J. J. Monteiro, Esq. (C.). |
| 4. Ad.            | " "                 | M. P. Dëlhez (C.).         |
| 5. Skel.          | " "                 | "                          |
| 6-7. Ad.          | Irebu, Upper Congo. | "                          |
| 8. Ad.            | Upper Congo.        | Brussels University.       |
| 9-10. Ad.         | L. Bangweu.         | F. H. Melland, Esq. (P.).  |

## 13. GNATHONEMUS MENTO.

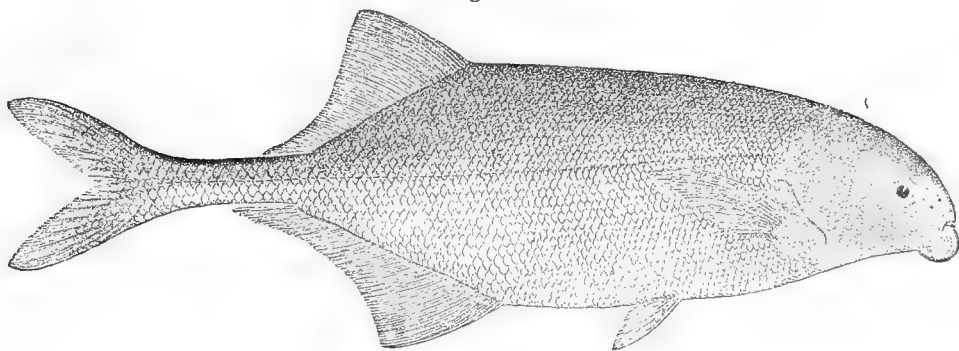
*Mormyrus mento*, Bouleng. Ann. & Mag. N. H. (6) vi. 1890, p. 193; Steind. Notes Leyd. Mus. xvi. 1894, p. 72.

*Gnathonemus mento*, Bouleng. Proc. Zool. Soc. 1898, p. 807.

Depth of body  $3\frac{1}{2}$  times in total length, length of head 5 times. Head as long as deep, with strongly curved upper profile; snout  $\frac{3}{10}$  length of head; a strong mental swelling; teeth notched, 5 in upper jaw, 6 in lower; eye moderate,  $\frac{3}{4}$  length of snout, about  $\frac{2}{3}$  interorbital width. Dorsal 29-33, originating above 9th ray of anal, its length twice in its distance from head. Anal 36, equally distant from base of ventral and

from base of caudal. Pectoral a little shorter than head,  $1\frac{2}{3}$  times length of ventral, extending a little beyond base of latter. Caudal scaled in its basal half, with pointed lobes. Caudal peduncle nearly 4 times as long as deep, as long as head. 84–85 scales in lateral line,  $\frac{14}{24}$  in transverse series on body,  $\frac{14}{12}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, with fine brown dots, which are very crowded on the head and the dorsal and ventral lines.

Fig. 86.

*Gnathonemus mcnto.*Type.  $\frac{5}{7}$ .

Total length 190 millim.

Gaboon, Liberia.

1. Type.

Gaboon.

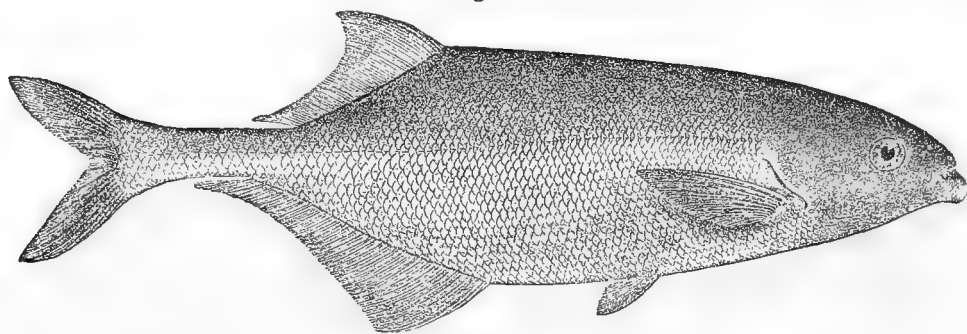
## 14. GNATHONEMUS STANLEYANUS.

*Mormyrus stanleyanus*, Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 266.*Gnathonemus stanleyanus*, Bouleng. Proc. Zool. Soc. 1898, p. 806, and Poiss. Bass. Congo, p. 97 (1901).*Gnathonemus senegalensis* (non Steind.), Bouleng. Proc. Zool. Soc. 1900, p. 512.

Depth of body  $3\frac{1}{4}$  to  $4\frac{1}{3}$  times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head not or but slightly longer than deep, with feebly curved, declivous upper profile; snout  $\frac{2}{7}$  to  $\frac{1}{3}$  length of head; teeth conical or truncate, 5 or 7 in upper jaw, 6 in lower; a globular mental appendage, as long as eye or a little shorter; eye about  $\frac{2}{3}$  length of snout,  $\frac{2}{3}$  to  $\frac{3}{4}$  interorbital width. Dorsal 28–32, originating above 7th to 13th ray of anal,  $\frac{1}{2}$  to  $\frac{2}{3}$  its distance from head. Anal 35–40, nearer base of caudal than base of ventral. Pectoral pointed, nearly as long as head, about twice as long as ventral, extending beyond base of latter. Caudal partly

covered with scales, with long pointed lobes. Caudal peduncle 3 to  $3\frac{1}{2}$  times as long as deep, as long as head or a little shorter. 70–85 scales in lateral line,  $\frac{14-18}{20-22}$  in transverse series on body,  $\frac{13-16}{12-15}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown, or brown above and silvery below.

Fig. 87.

*Gnathonemus stanleyanus.*Type.  $\frac{1}{2}$ .

Total length 400 millim.

Congo, Gambia.

|          |                      |                           |
|----------|----------------------|---------------------------|
| 1. Type. | Stanley Falls.       | Rev. W. H. Bentley (C.).  |
| 2. Ad.   | Upper Congo.         | Brussels University.      |
| 3. Yg.   | Banzyville, Ubanghi. | Capt. Royaux (C.).        |
| 4. Ad.   | Matadi, Lower Congo. | Capt. Wilverth (C.).      |
| 5-6. Ad. | Gambia.              | J. S. Budgett, Esq. (P.). |

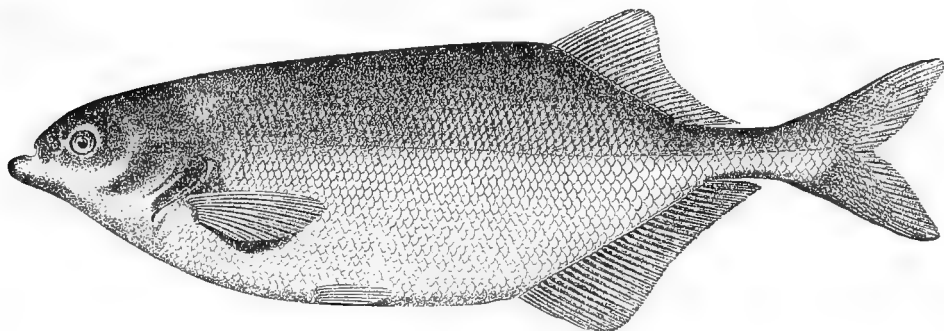
## 15. GNATHONEMUS SENEGALENSIS.

*Mormyrus senegalensis*, Steind. Sitz. Ak. Wien, lxi. i. 1870, p. 551, pl. iv. fig. 1.*Gnathonemus senegalensis*, Bouleng. Proc. Zool. Soc. 1898, p. 806; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 355.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head as long as deep, with curved upper profile; snout  $\frac{1}{4}$  length of head, or a little less; teeth conical, 3 or 5 in upper jaw, 4 or 6 in lower; chin with a globular swelling or appendage; eye moderate,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of snout, about  $\frac{1}{2}$  interorbital width. Dorsal 25–28, originating above 5th to 8th ray of anal, its length  $\frac{1}{2}$  its distance from head, or a little less. Anal 30–36, nearer base of caudal than base of ventral. Pectoral pointed, a little shorter than head, twice as long as ventral, not extending beyond base of latter. Caudal scaled in its basal

half, with long pointed lobes. Caudal peduncle 3 times as long as deep, a little shorter than head. 65-72 scales in lateral line,  $\frac{13-15}{19-21}$  in transverse series on body,  $\frac{12-14}{9-12}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, brown or steel-blue on the back.

Fig. 88.

*Gnathonemus senegalensis.*Type, after Steindachner (*l. c.*).  $\frac{1}{2}$ .

Total length 210 millim.

Senegal, Togoland.—Types in Vienna Museum.

|                 |                     |                    |
|-----------------|---------------------|--------------------|
| 1. Hgr.         | St. Louis, Senegal. | M. P. Delhez (C.). |
| 2-9. Ad. & hgr. | Kaédi, „            | „                  |
| 10. Skel.       | „ „                 | „                  |

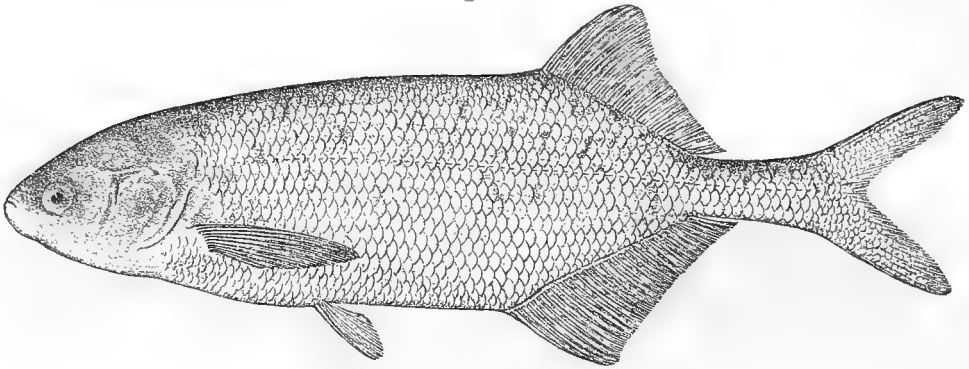
## 16. GNATHONEMUS ANGOLENSIS.

Bouleng. Ann. &amp; Mag. N. H. (7) xv. 1905, p. 458.

Depth of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head as long as deep, with curved upper profile; snout  $\frac{1}{4}$  length of head; teeth conical, 5 in upper jaw, 6 in lower; a feeble mental swelling; eye moderate, a little shorter than snout,  $\frac{2}{3}$  interorbital width. Dorsal 24-26, originating above 6th to 8th ray of anal, its length  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times in its distance from head. Anal 29-33, nearer base of caudal than base of ventral. Pectoral pointed, a little shorter than head, twice as long as ventral, extending a little beyond base of latter. Caudal scaled in its basal two-thirds, with pointed lobes. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{3}{4}$  length of head. 56-60 scales in lateral line,  $\frac{10-12}{16-18}$  in transverse series on body,  $\frac{8-10}{8-13}$  in transverse

series between dorsal and anal, 12 round caudal peduncle. Brown above, silvery white beneath; a few irregular dark brown blotches may be present on the body; fins dark brown.

Fig. 89.

*Guathonemus angolensis.*

Type.

Total length 135 millim.

Angola.

|           |                     |                         |
|-----------|---------------------|-------------------------|
| 1. Type.  | Quanza R.           | Dr. W. J. Ansorge (C.). |
| 2-4. Hgr. | Cunene, Mossamedes. | „                       |

#### 17. GNATHONEMUS CYPRINOIDES.

*Mormyrus cyprinoides*, Linn. Mus. Ad. Frid. ii. p. 109 (1764), and S. N. i. p. 522 (1766); Cuv. & Val. Hist. Poiss. xix. p. 265 (1849); Günth. Cat. Fish. vi. p. 218 (1866), and Petherick's Trav. ii. p. 254 (1869).

*Mormyrus salahie*, Lacep. Hist. Poiss. v. p. 619 (1803).

*Mormyrus labiatus*, I. Geoffr. Descr. Egypte, Poiss. p. 275, pl. vii. fig. 1 (1827); Rüpp. Fortsetz. Beschr. n. Fische Nil, p. 9, pl. ii. fig. 2 (1832).

*Mormyrus elongatus*, Rüpp. l. c. fig. 1.

*Mormyrus abbreviatus*, Cuv. & Val. t. c. p. 270.

*Mormyrops cyprinoides*, Marcusen, Bull. Ac. St. Pétersb. xii. 1854, p. 14.

*Mormyrops elongatus*, Marcusen, l. c.

*Mormyrops abbreviatus*, Marcusen, l. c.

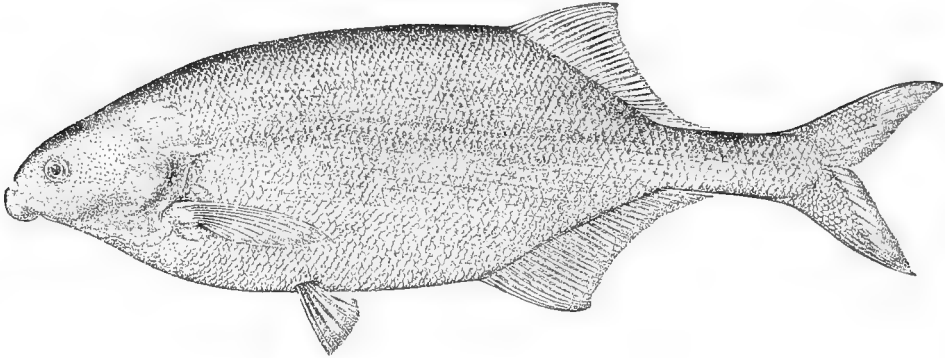
*Mormyrops labiatus*, Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 137.

*Guathonemus cyprinoides*, Bouleng. Proc. Zool. Soc. 1898, p. 805, Poiss. Bass. Congo, p. 96 (1901), and Fish. Nile, p. 50, pl. vi. fig. 2 & pl. vii. fig. 3 (1907).

Depth of body 3 to 4 times in total length, length of head 4 to  $5\frac{1}{2}$  times. Head slightly longer than deep, with curved upper profile; snout about  $\frac{1}{4}$  length of head; mouth small, on a line with lower border of eye; chin with a globular dermal appendage; teeth minute, conical,

5 in upper jaw, 6 in lower; eye moderate,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of snout,  $\frac{2}{5}$  to  $\frac{1}{2}$  interorbital width. Dorsal 25–30, originating above 6th to 9th ray of anal, its length 2 to  $2\frac{1}{2}$  times in its distance from head. Anal 30–37, equally distant from base of ventral and from base of caudal, or a little nearer latter. Pectoral pointed, as long as head or a little shorter, twice as long as ventral, reaching base of latter or beyond. Caudal scaled in its basal  $\frac{1}{2}$  or  $\frac{2}{3}$ , with pointed lobes. Caudal peduncle

Fig. 90.

*Gnathonemus cyprinoides.*Fayum (F. N.).  $\frac{1}{2}$ .

$2\frac{1}{2}$  to 3 times as long as deep, as long as head or a little shorter. 70–86 scales in lateral line,  $\frac{15-20}{19-24}$  in transverse series on body,  $\frac{12-18}{12-18}$  in transverse series between dorsal and anal, 16 (rarely 18) round caudal peduncle. Silvery, back darker, bluish or greenish; some young specimens with small blackish spots scattered on the body.

Total length 300 millim.

Nile, from the Delta to the Bahr-el-Gebel, Chad Basin, Niger, Upper Congo.

|                                           |                              |                          |
|-------------------------------------------|------------------------------|--------------------------|
| 1. Ad. (Type of<br><i>M. elongatus</i> .) | Egypt.                       | Dr. Rüppell (C.).        |
| 2-3. Ad. & hgr.                           | "                            | "                        |
| 4-5. Ad.                                  | Lower Nile.                  | S. S. Allen, Esq. (P.).  |
| 6-7. Ad.                                  | "                            | J. Petherick, Esq. (C.). |
| 8. Hgr.                                   | Kafr-el-Zayat, Rosetta Nile. | L. Loat, Esq. (C.).      |
| 9-10. Ad.                                 | Barrage N. of Cairo.         | "                        |
| 11-14. Ad.                                | Cairo.                       | "                        |
| 15. Ad.                                   | Wasta, Lower Nile.           | "                        |
| 16. Skel.                                 | " "                          | "                        |
| 17. Ad.                                   | Beni Souef, Lower Nile.      | "                        |
| 18. Ad.                                   | Between Beni Souef and Biba. | "                        |

|                   |                         |                          |
|-------------------|-------------------------|--------------------------|
| 19. Ad.           | Lahun, Fayum.           | L. Loat, Esq. (C.).      |
| 20. Ad.           | Akhmim, Lower Nile.     | "                        |
| 21-30. Hgr. & yg. | Near Luxor.             | "                        |
| 31-38. Ad.        | Assuan.                 | "                        |
| 39. Ad.           | Khartum.                | J. Petherick, Esq. (C.). |
| 40. Hgr.          | Shederah, White Nile.   | L. Loat, Esq. (C.).      |
| 41-48. Hgr.       | Fashoda, "              | "                        |
| 49. Ad.           | Tewfikyeh, "            | "                        |
| 50. Ad.           | Lake N.E. of Gondokoro. | "                        |
| 51. Ad.           | Jebba, Upper Niger.     | Capt. G. F. Abadié (P.). |
| 52. Yg.           | Agberi, Lower Niger.    | Dr. W. J. Ansorge (C.).  |
| 53-54. Ad. & hgr. | Niger.                  | Mr. J. T. Dalton (C.).   |
| 55-57. Ad.        | Stanley Falls.          | Rev. W. H. Bentley (C.). |

## 18. GNATHONEMUS MACROLEPIDOTUS.

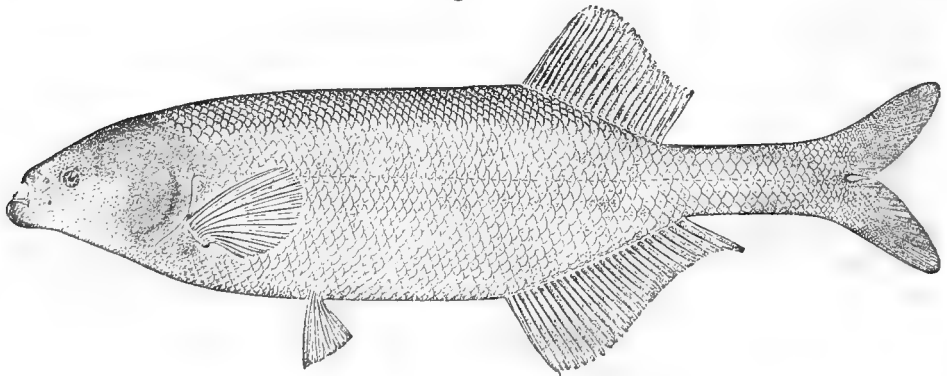
*Mormyrus macrolepidotus*, Peters, Mon. Berl. Ac. 1852, p. 275; Günth. Cat. Fish. vi. p. 219 (1866); Peters, Reise Mossamb. iv. p. 79, pl. xv. fig. 1 (1868).

*Mormyrops macrolepidotus*, Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 142.

*Gnathonemus macrolepidotus*, Bouleng. Proc. Zool. Soc. 1898, p. 804, and Poiss. Bass. Congo, p. 93 (1901); Pellegr. Mém. Soc. Zool. France, xvii. 1905, p. 181; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 354; Bouleng. Fish. Nile, p. 53, pl. x. fig. 1 (1907).

Depth of body  $3\frac{1}{3}$  to 4 times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head nearly as long as deep, with curved upper profile;

Fig. 91.

*Gnathonemus macrolepidotus*.Type, after Peters (Reise Mossamb.).  $\frac{1}{2}$ .

snout about  $\frac{1}{4}$  length of head; chin with a globular dermal appendage; teeth conical, 3 or 5 in upper jaw, 6 in lower; eye moderate,  $\frac{2}{3}$  to  $\frac{3}{4}$



length of snout,  $\frac{1}{2}$  to  $\frac{2}{3}$  interorbital width. Dorsal 23–25, originating above 5th to 8th ray of anal, its length about  $2\frac{1}{2}$  times in its distance from head. Anal 28–32, a little nearer base of caudal than base of ventral. Pectoral obtusely pointed, shorter than head, reaching base of ventral or a little beyond. Caudal scaled in basal half, with obtusely pointed lobes. Caudal peduncle 2 to 3 times as long as deep, nearly as long as head. 50–69 scales in lateral line,  $\frac{10-15}{17-19}$  in transverse series on body,  $\frac{8-12}{8-12}$  in transverse series between dorsal and anal, 14 or 16 (rarely 12) round caudal peduncle. Silvery, sometimes with black blotches.

Total length 250 millim. Reaches a length of 320 millim.

Zambesi, Katanga, Lake Bangwelu, Rovuma River.—Types in Berlin Museum.

|          |                           |                           |
|----------|---------------------------|---------------------------|
| 1. Ad.   | L. Bangwelu.              | F. H. Molland, Esq. (P.). |
| 2. Yg.   | Kazungula, Upper Zambesi. | Rev. L. Jalla (C.).       |
| 3–5. Ad. | Kafue R., „               | T. Codrington, Esq. (P.). |
| 6. Yg.   | Rovuma R.                 | Dr. C. Livingstone (C.).  |

#### 19. GNATHONEMUS PICTUS.

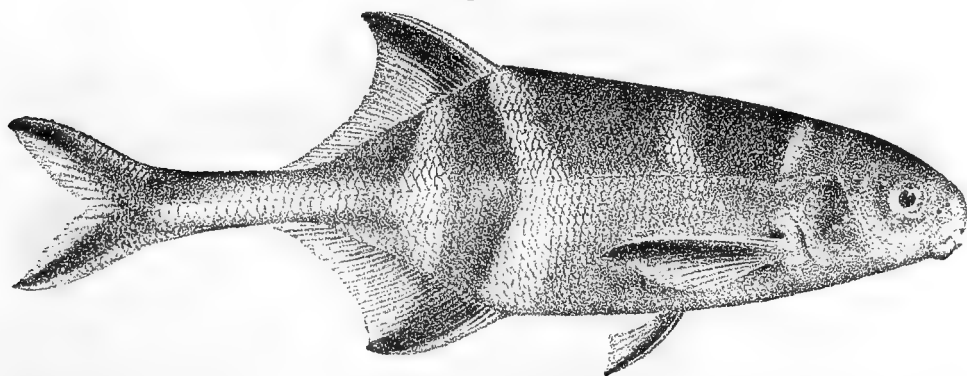
*Mormyrus*, sp. n., Heuglin, Sitzb. Ak. Wien, ix. 1852, p. 920, pl. lx. fig. 1.

*Petrocephalus pictus*, Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, p. 153.

*Gnathonemus pictus*, Bouleng. Ann. & Mag. N. H. (7) xvi. 1905, p. 38, and Fish. Nile, p. 48, pl. vii. fig. 2 (1907).

Depth of body  $3\frac{1}{2}$  times in total length, length of head 5 times. Head as long as deep, with curved upper profile; snout  $\frac{1}{4}$  length of

Fig. 92.



*Gnathonemus pictus*.

Fashoda (F. N.).  $\frac{5}{8}$ .

head; teeth bicuspid, 5 in upper jaw, 6 in lower; a slight swelling of the chin; eye rather large, equal to length of snout,  $\frac{3}{4}$  interorbital.

width. Dorsal and anal fins equally developed and exactly opposed to each other, former with 31 rays, latter with 33, equally distant from caudal and from base of ventrals. Pectoral pointed, as long as head, reaching beyond base of ventral, which is about half as long. Caudal with pointed lobes, scaled on more than half its extent. Caudal peduncle 3 times as long as deep, as long as head. 78 scales in lateral line,  $\frac{18}{17}$  in transverse series on body,  $\frac{16}{16}$  between dorsal and anal, 12 round caudal peduncle. Brown or dark olive with yellowish bars, two of which enclose a sort of blackish rhomb between the anterior rays of the dorsal and those of the anal, which bear a black bar; a black band on the pectoral and ventral and on each lobe of the caudal.

Total length 140 millim.

White Nile.—Type in Vienna Museum.

1. Ad.

Fashoda.

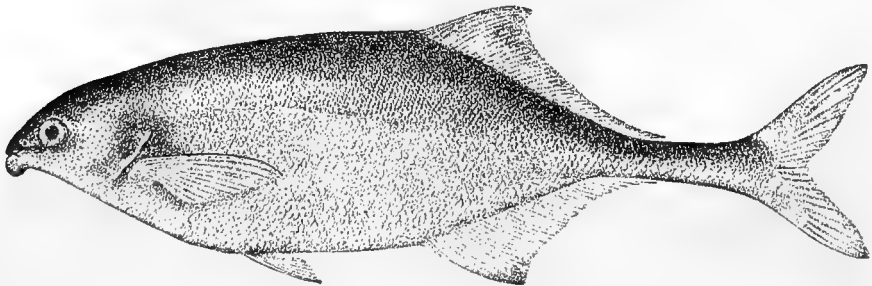
L. Loat, Esq. (C.).

#### 20. GNATHONEMUS GILLI.

Bouleng. Proc. Zool. Soc. 1904, i. p. 198, pl. vii. fig. 2.

Depth of body  $3\frac{2}{3}$  times in total length, length of head  $5\frac{2}{3}$  times. Head slightly longer than deep, with curved upper profile; snout  $\frac{1}{4}$  length of head; chin with a globular dermal appendage; teeth conical, 3 in upper jaw, 4 in lower; eye a little shorter than snout,  $\frac{2}{3}$  interorbital

Fig. 93.



*Gnathonemus gilli*.

Type (P. Z. S. 1904).  $\frac{5}{8}$ .

width. Dorsal 33, its origin corresponding to that of anal, its length once and  $\frac{1}{2}$  in its distance from head. Anal 31, equally distant from base of ventrals and from base of caudal. Pectoral pointed, as long as head, once and  $\frac{3}{4}$  as long as ventral, reaching beyond base of latter. Caudal scaled in its basal half, with pointed lobes. Caudal peduncle

4 times as long as deep, slightly longer than head. 85 scales in lateral line,  $\frac{25}{25}$  in transverse series on body,  $\frac{21}{21}$  in transverse series between dorsal and anal, 14 round caudal peduncle. Brown above, silvery white beneath; dorsal and anal fins greyish brown in front.

Total length 245 millim.

Niger.

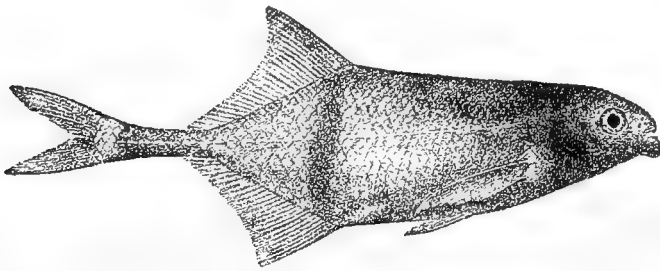
1. Type. Assay, Lower Niger. J. S. Budgett, Esq. (P.).

## 21. GNATHONEMUS KUTUENSIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 74, pl. xxxiii. fig. 5 (1899), and Poiss. Bass. Congo, p. 101 (1901).

Depth of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  times in total length, length of head 5 to  $5\frac{1}{2}$  times. Head scarcely longer than deep, with strongly curved upper profile; snout  $\frac{1}{4}$  length of head; teeth feebly notched, 5 in upper jaw, 6 in lower; a globular mental swelling; eye rather large, as long as snout,  $\frac{2}{3}$  interorbital width. Dorsal 29, its length nearly as great as its distance from head. Anal 27-29, originating under 4th to 6th ray of dorsal. Pectoral pointed, a little longer than head, twice as long as ventral, reaching nearly extremity of latter. Caudal scaled in its basal

Fig. 94.



*Gnathonemus kutuensis.*

Type (A. M. C.).  $\frac{3}{4}$ .

half, with long pointed lobes. Caudal peduncle 4 times as long as deep, as long as head. 42-43 scales in lateral line,  $\frac{10}{14}$  in transverse series on body,  $\frac{7-8}{7-8}$  in transverse series between dorsal and anal, 8 round caudal peduncle. Brown, darker in front; a dark brown vertical band between origin of dorsal and origin of anal; anterior two-thirds of caudal peduncle dark brown.

Total length 100 millim.

Congo (Lake Leopold II. and Alima River).—Type in Congo Museum, Tervueren.

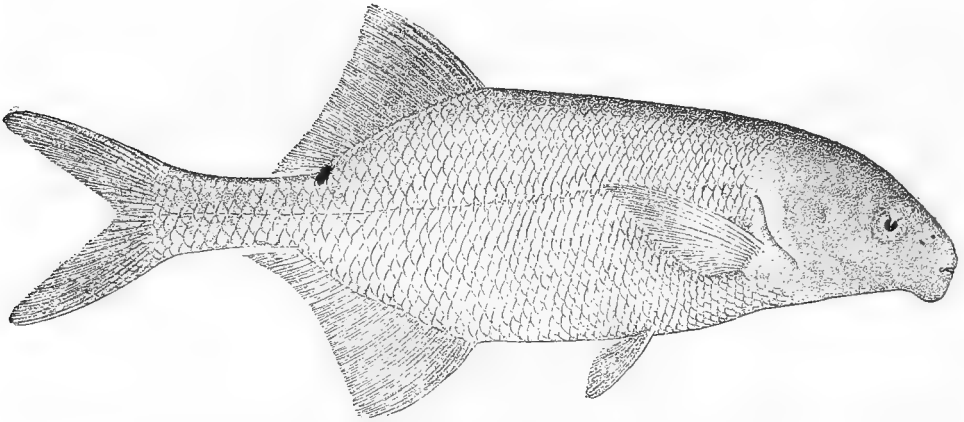
## 22. GNATHONEMUS USSHERI.

*Mormyrus ussheri*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 116; Steind. Notes Leyd. Mus. xvi. 1894, p. 71.

*Gnathonemus ussheri*, Bouleng. Proc. Zool. Soc. 1898, p. 808.

Depth of body  $3\frac{1}{3}$  times in total length, length of head  $4\frac{3}{5}$  times. Head a little longer than deep, with curved upper profile; snout  $\frac{2}{7}$  length of head; a globular mental swelling; teeth notched, 5 in upper jaw, 6 in lower; eye moderate,  $\frac{2}{3}$  length of snout or interorbital width. Dorsal 27–28, originating very slightly in advance of anal, its

Fig. 95.

*Gnathonemus ussheri*.Type.  $\frac{5}{7}$ .

length a little less than twice in its distance from head. Anal 30–32, equally distant from base of ventral and from base of caudal. Pectoral pointed, as long as head, twice as long as ventral, extending beyond base of latter. Caudal scaled in its anterior half, with pointed lobes. Caudal peduncle twice as long as deep, slightly shorter than head. 55–57 scales in lateral line,  $\frac{10}{15}$  in transverse series on body,  $\frac{9}{9}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brown.

Total length 170 millim.

Gold Coast, Liberia.

- |          |                            |                             |
|----------|----------------------------|-----------------------------|
| 1. Type. | Bossumprah R., Gold Coast. | H. T. Ussher, Esq. (C.).    |
| 2. Hgr.  | R. Offin, Gold Coast.      | R. B. N. Walker, Esq. (C.). |

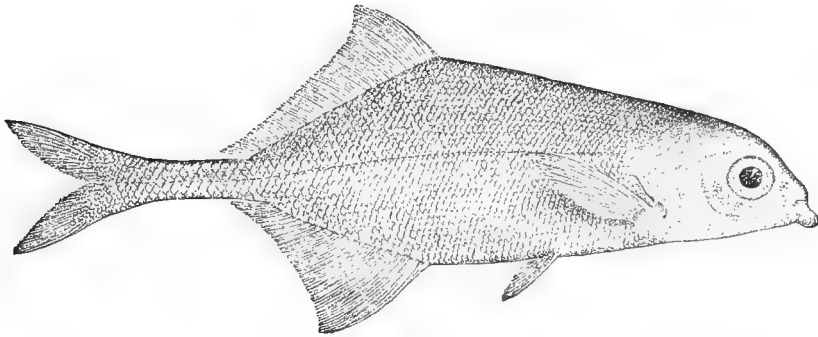
## 23. GNATHONEMUS GRESHOFFI.

*Mormyrus greshoffi*, Schilthuis, Tijdschr. Nederl. Dierk. Ver. (2) iii. 1891, p. 90, pl. vi. fig. 3.

*Gnathonemus greshoffi*, Bouleng. Proc. Zool. Soc. 1898, p. 809, and Poiss. Bass. Congo, p. 100 (1901).

Depth of body  $3\frac{1}{4}$  to  $3\frac{3}{4}$  times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head as long as deep or a little longer than deep, upper profile descending in a curve; snout  $\frac{1}{4}$  length of head; lower jaw with a dermal appendage half the length of the snout; teeth truncate, 3 in upper jaw, 2 or 4 in lower; eye large, situated in anterior half of

Fig. 96.

*Gnathonemus greshoffi*.

Type.

head, its diameter a little greater than length of snout or inter-orbital width. Dorsal 31-36, originating a little in advance of anal, its length twice in its distance from end of snout. Anal 29-32, nearer base of ventral than base of caudal. Pectoral pointed, almost as long as head, twice as long as ventral, extending beyond base of latter. Caudal rather small, with pointed lobes. Caudal peduncle 4 or 5 times as long as deep, as long as head. 72-80 scales in lateral line,  $\frac{13-16}{19-23}$  in transverse series on body,  $\frac{11-14}{12-16}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Silvery, olive on the back.

Total length 108 millim.

Congo.

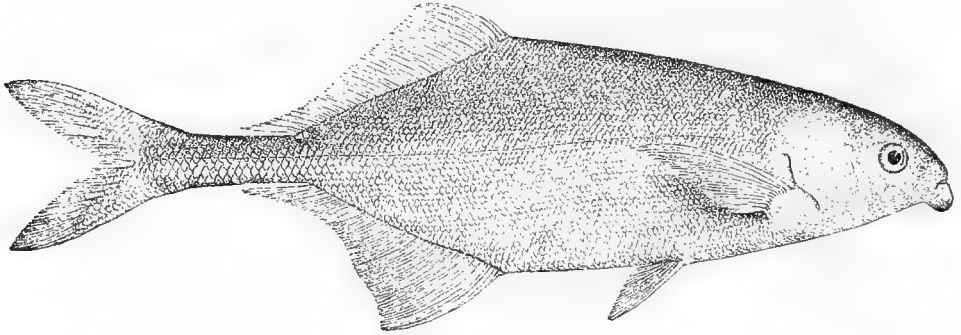
|                |                          |                      |
|----------------|--------------------------|----------------------|
| 1-3. Ad.       | Boma, Lower Congo.       | M. P. Delhez (C.).   |
| 4. Skel.       | „ „                      | „                    |
| 5. Hgr.        | Kondue, „                | M. Luja (C.).        |
| 6. Hgr., type. | Kinshassa, Stanley Pool. | M. A. Greshoff (C.). |
| 7. Ad.         | Dolo, „                  | M. P. Delhez (C.).   |
| 8-9. Ad.       | Uerre.                   | M. De Bauw (C.).     |

## 24. GNATHONEMUS ABADII.

Bouleng. Ann. & Mag. N. H. (7) vii. 1901, p. 80.

Depth of body  $3\frac{2}{3}$  times in total length, length of head  $5\frac{1}{2}$  times. Head very slightly longer than deep, with feebly curved upper profile; snout  $\frac{2}{7}$  length of head; teeth conical, 3 in upper jaw, 5 in lower; chin with a globular swelling; eye rather large,  $\frac{2}{3}$  length of snout or inter-orbital width. Dorsal 35, originating very slightly in advance of anal, its length once and  $\frac{2}{5}$  in its distance from head. Anal 34, slightly

Fig. 97.



*Gnathonemus abadii.*

Type.  $\frac{1}{2}$ .

nearer base of caudal than base of ventral. Pectoral as long as head, once and  $\frac{3}{4}$  as long as ventral, reaching far beyond base of latter. Caudal scaled in its basal half, with pointed lobes. Caudal peduncle  $3\frac{1}{2}$  times as long as deep, as long as head. 98 scales in lateral line,  $\frac{26}{28}$  in transverse series on body,  $\frac{21}{20}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Brownish above, silvery white beneath.

Total length 240 millim.

Upper Niger.

1. Type.

Jebba,

Capt. G. F. Abadie (P.).

## 25. GNATHONEMUS TAMANDUA.

*Mormyrus tamandua*, Günth. Proc. Zool. Soc. 1864, p. 22, pl. ii. fig. 1, and Cat. Fish. vi. p. 217 (1866).

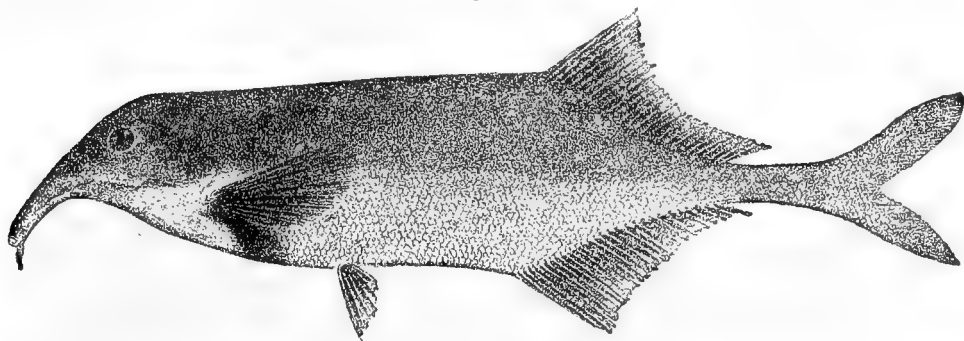
*Gnathonemus tamandua*, Bouleng. Proc. Zool. Soc. 1898, p. 809, and Poiss. Bass. Congo, p. 102 (1901).

*Campylomormyrus tamandua*, Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 359, pl. ii. figs. 2 & 3.

Depth of body 4 to  $4\frac{1}{2}$  times in total length, length of head 4 to  $4\frac{1}{3}$

times. Upper profile of head descending in a strong curve; snout much prolonged, tubiform, strongly compressed, curved downwards, its length  $1\frac{2}{3}$  to 2 times postocular part of head, and 4 to 5 times its least depth, which nearly equals diameter of eye; latter  $\frac{2}{3}$  to  $\frac{3}{4}$  interorbital width; lower jaw with a compressed dermal appendage about as long as the eye; teeth conical, 3 in upper jaw, 4 in lower. Dorsal 26-30,

Fig. 98.

*Gnathonemus tamandua.*Type, after Günther (P. Z. S. 1864).  $\frac{2}{3}$ .

originating above 6th to 8th ray of anal, its length  $1\frac{1}{2}$  to  $1\frac{4}{5}$  times in its distance from head. Anal 29-34, nearer base of caudal than base of ventral. Pectoral obtusely pointed,  $\frac{3}{3}$  to  $\frac{2}{3}$  length of head, ventral  $\frac{1}{3}$  to  $\frac{2}{5}$ ; pectoral extending beyond base of ventral. Caudal densely scaled, with pointed lobes. Caudal peduncle  $3\frac{1}{2}$  times as long as deep,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. 70-80 scales in lateral line,  $\frac{12-18}{19-21}$  in transverse series on body,  $\frac{14-15}{12-15}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above; a rather indistinct dark, light edged vertical band between origin of dorsal and anal.

Total length 360 millim.

Niger, Old Calabar, Congo, Shari.

|                 |                      |                           |
|-----------------|----------------------|---------------------------|
| 1. Type.        | Niger.               | Mr. J. T. Dalton (C.).    |
| 2. Ad.          | Assay, Lower Niger.  | J. S. Budgett, Esq. (P.). |
| 3. Ad.          | Bolobo, Upper Congo. | Rev. G. Grenfell (P.).    |
| 4. Ad.          | Monsembe, „          | Rev. J. H. Weeks (P.).    |
| 5-6. Ad.        | Upoto, „             | Capt. Wilverth (C.).      |
| 7-8. Ad. & hgr. | Upper Congo.         | Brussels University.      |

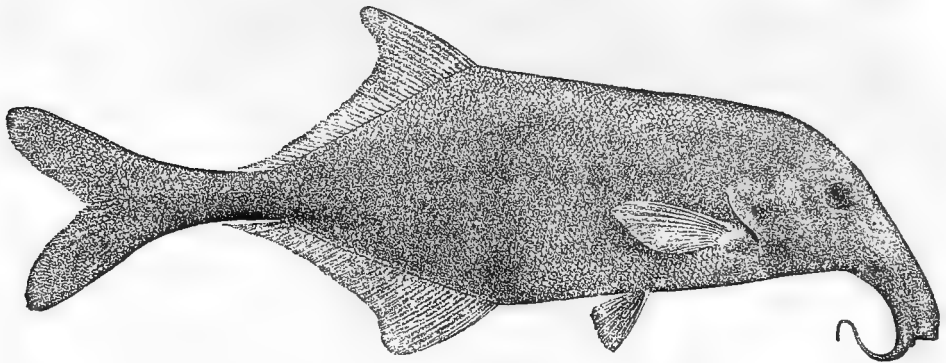
## 26. GNATHONEMUS MIRUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 11, pl. iii. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 810, and Poiss. Bass. Congo, p. 103 (1901).

Depth of body  $3\frac{1}{2}$  times in total length, length of head 4 times.

Upper profile of head descending in a strong curve; snout much prolonged, tubiform, strongly compressed, curved downwards, its length twice postocular part of head, and 3 times its least depth, which is twice diameter of eye; latter  $\frac{2}{3}$  interorbital width; lower jaw with a long, compressed, attenuate dermal appendage, measuring nearly  $\frac{3}{4}$  length of snout; teeth conical, 3 in upper jaw, 4 in lower. Dorsal 34, originating above 4th ray of anal, its length once and  $\frac{1}{2}$  in its distance from head. Anal 35, equally distant from base of ventral and from base of caudal.

Fig. 99.

*Gnathonemus mirus.*Type (A. M. C.).  $\frac{1}{3}$ .

Pectoral pointed, about  $\frac{2}{3}$  length of head, extending to middle of ventral, which is only  $\frac{1}{2}$  as long. Caudal scaled, with obtusely pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{2}{3}$  length of head. 78 scales in lateral line,  $\frac{17}{25}$  in transverse series on body,  $\frac{20}{18}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above.

Total length 320 millim.

Upper Congo (Upoto).—Type in Congo Museum, Tervueren.

## 27. GNATHONEMUS ELEPHAS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 12, pl. v. fig. 1 (1898), Proc. Zool. Soc. 1898, p. 810, and Poiss. Bass. Congo, p. 104 (1901).

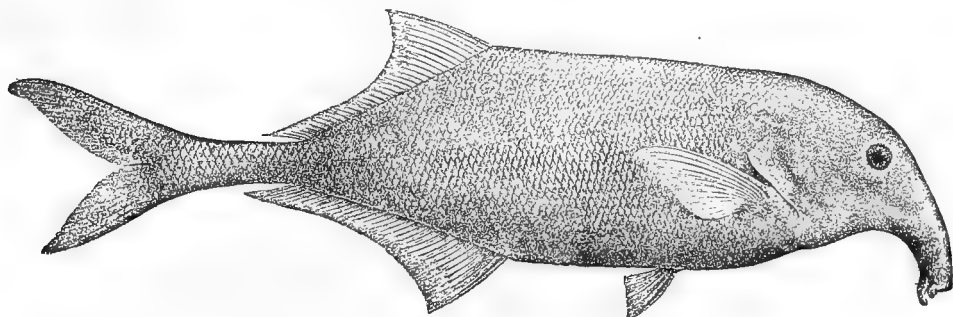
*Campylomormyrus elephas*, Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 359, pl. xii. figs. 4-6.

Depth of body 3 to 4 times in total length, length of head 4 to 5 times. Upper profile of head descending in a very strong curve; snout much prolonged, tubiform, strongly compressed, directed downwards, its length exceeding postocular part of head, 3 to 4 times its least depth, which is once and  $\frac{1}{2}$  diameter of eye; lower jaw with a short, wart-like, cylindrical



dermal appendage as long as or a little shorter than diameter of eye; teeth conical, 3 in upper jaw, 4 in lower. Dorsal 31-35, originating

Fig. 100.

*Gnathonemus elephas.*Type (A. M. C.).  $\frac{1}{4}$ .

above 5th ray of anal, its length  $1\frac{1}{3}$  to  $1\frac{2}{5}$  times its distance from head. Anal 33-37, equally distant from base of ventral and from base of caudal. Pectoral pointed, little shorter than head, extending to middle or second third of ventral, and twice as long as latter. Caudal scaled, with pointed lobes. Caudal peduncle 3 times as long as deep, as long as head or a little shorter. 70-80 scales in lateral line,  $\frac{14-15}{18-22}$  in transverse series on body,  $\frac{13-18}{10-16}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above; young with a black lateral band edged with yellowish, expanding into a rhomboidal marking between dorsal and anal.

Total length 400 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

|                      |                |                          |
|----------------------|----------------|--------------------------|
| 1. One of the types. | Upoto.         | Capt. Wilverth (C.).     |
| 2. Ad.               | Stanley Falls. | Rev. W. H. Bentley (C.). |
| 3. Skel.             | "              | "                        |
| 4. Hgr.              | Irebu.         | M. P. Delhez (C.).       |
| 5-6. Yg.             | Upper Congo.   | Brussels University.     |

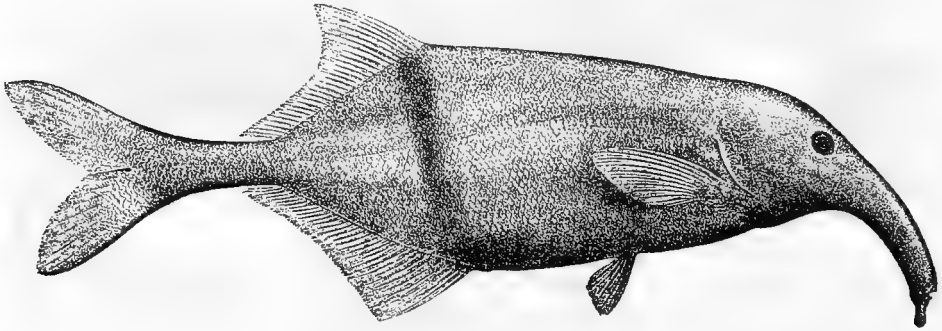
## 28. GNATHONEMUS RHYNCHOPHORUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 13, pl. v. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 810, pl. li., and Poiss. Bass. Congo, p. 105 (1901).

Depth of body equal to length of head,  $3\frac{4}{5}$  to 4 times in total length. Upper profile of head descending in a strong curve; snout much prolonged, tubiform, strongly compressed, curved downwards, its length 2 to  $2\frac{1}{3}$  times postocular part of head, and  $3\frac{1}{2}$  to 7 times its least depth,

which nearly equals diameter of eye; latter  $\frac{2}{3}$  interorbital width; lower jaw with a compressed dermal appendage about as long as eye; teeth conical, 5 in upper jaw, 4 in lower. Dorsal 27-31, originating above 6th or 7th ray of anal, its length  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times in its distance from head. Anal 31-35; nearly equally distant from base of ventral and base of caudal. Pectoral obtusely pointed,  $\frac{1}{2}$  length of head, ventral  $\frac{1}{3}$  or

Fig. 101.

*Gnathonemus rhynchophorus.*Type (A. M. C.).  $\frac{1}{3}$ .

rather less; pectoral extending beyond base of ventral. Caudal scaled, with pointed lobes. Caudal peduncle 3 to  $3\frac{1}{2}$  times as long as deep,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head. 75-85 scales in lateral line,  $\frac{18-21}{30-32}$  in transverse series on body,  $\frac{20-23}{20-23}$  in transverse series between dorsal and anal, 16 or 18 round caudal peduncle. Brownish, with a rather indistinct darker vertical band between dorsal and anal.

Total length 380 millim.

Congo.—Types in Congo Museum, Tervueren.

|                                    |                     |                       |
|------------------------------------|---------------------|-----------------------|
| 1-2. Ad. & hgr., two of the types. | Upoto, Upper Congo. | Capt. Wilverth (C.).  |
| 3. Yg.                             | Banzville, Ubanghi. | Capt. Royaux (C.).    |
| 4-5. Yg.                           | Stanley Pool.       | M. De Meuse (C.).     |
| 6. Hgr.                            | Boma, Lower Congo.  | M. P. Delhez (C.).    |
| 7. Yg.                             | Lower Congo.        | Rev. J. Pinnock (C.). |

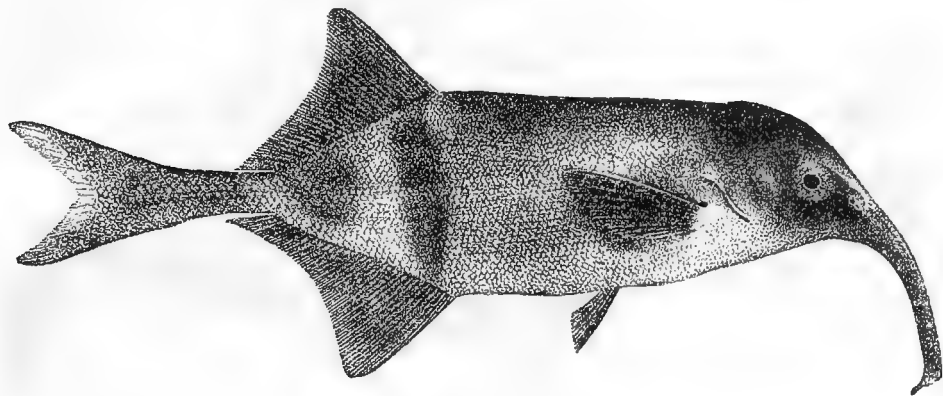
## 29. GNATHONEMUS IBIS.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 25, pl. vii. fig. 4 (1902).

Depth of body  $4\frac{1}{2}$  to  $4\frac{3}{4}$  times in total length, length of head  $3\frac{1}{5}$  to  $3\frac{1}{3}$  times. Snout produced into a long, strongly compressed and curved tube, the length of which equals  $2\frac{1}{2}$  to 3 times that of postocular part of head and 8 to 10 times its least depth; a compressed mental appendage,

measuring  $\frac{1}{2}$  diameter of eye; teeth conical, 6-8 in upper jaw, 4 in lower; eye rather large. Dorsal 32-33, originating above 6th or 7th ray of anal, its length once and  $\frac{2}{3}$  in its distance from head. Anal 36-37, a little nearer base of caudal than base of ventral. Pectoral pointed, as long as

Fig. 102.

*Gnathonemus ibis.*Type (A. M. C.).  $\frac{5}{8}$ .

head without rostrum, nearly reaching end of ventral. Caudal partly covered with scales, with pointed lobes. Caudal peduncle 3 times as long as deep, shorter than pectoral. 77-82 scales in lateral line,  $\frac{18}{25-27}$  in transverse series on body,  $\frac{20}{16-17}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Dark brown; two blackish vertical bands, separated by a light interspace, between dorsal and anal; fins blackish.

Total length 150 millim.

Ubanghi.—Type in Congo Museum, Tervueren.

1. One of the types. Banzyville. Capt. Royaux (C.).

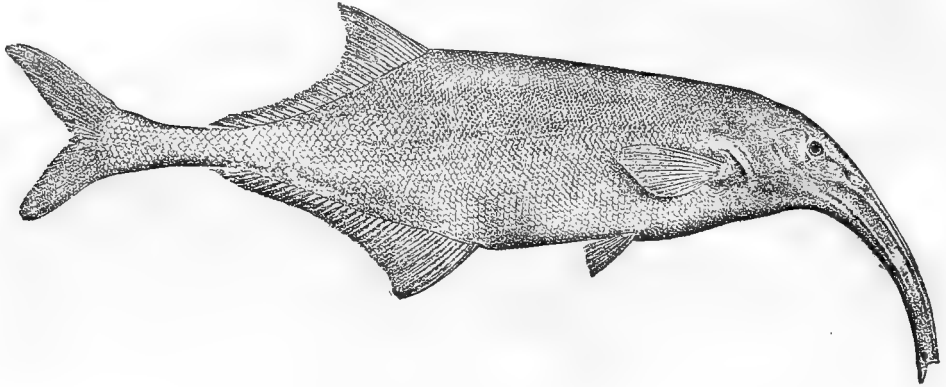
### 30. GNATHONEMUS CURVIROSTRIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 13, pl. vi. fig. 1 (1898), Proc. Zool. Soc. 1898, p. 811, and Poiss. Bass. Congo, p. 106 (1901).

Depth of body  $4\frac{2}{3}$  times in total length, length of head  $3\frac{1}{2}$  times. Upper profile of head descending in a strong curve; snout much prolonged, tubiform, strongly compressed, curved downwards, its length  $3\frac{1}{2}$  times postocular part of head, and 12 times its least depth, which a little exceeds diameter of eye; latter slightly more than  $\frac{1}{2}$  interorbital width; lower jaw with a compressed dermal appendage  $1\frac{1}{2}$  diameters of eye; teeth conical, 3 in upper jaw, 4 in lower. Dorsal 32, originating above

10th ray of anal, its length once and  $\frac{1}{2}$  in its distance from head. Anal 36, equally distant from base of ventral and from base of caudal. Pectoral pointed,  $\frac{1}{2}$  length of head, twice as long as ventral, extending beyond base of latter. Caudal scaled, with pointed lobes. Caudal peduncle

Fig. 103.

*Gnathonemus curvirostris.*Type (A. M. C.).  $\frac{1}{3}$ .

4 times as long as deep, more than  $\frac{1}{2}$  length of head. 90 scales in lateral line,  $\frac{18}{22}$  in transverse series on body,  $\frac{18}{17}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Pale brownish above, whitish below.

Total length 370 millim.

Lower Congo (Matadi).—Type in Congo Museum, Tervueren.

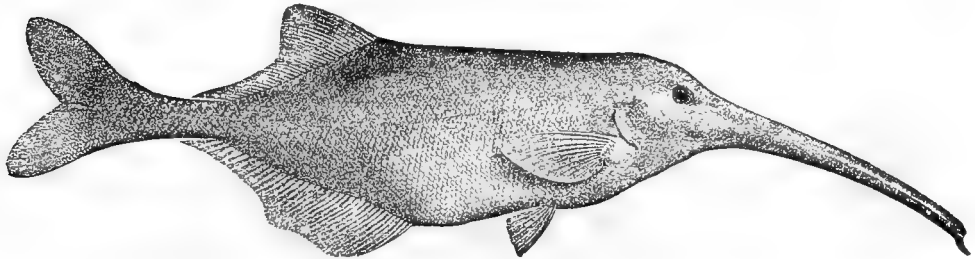
### 31. GNATHONEMUS NUMENIUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 11, pl. vi. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 811, and Poiss. Bass. Congo, p. 107 (1901).

Depth of body  $4\frac{2}{3}$  to 5 times in total length, length of head  $2\frac{2}{5}$  to  $2\frac{1}{2}$  times. Upper profile of head convex; snout produced into an extremely long, compressed tube, feebly curved downwards, its length, in the adult, 5 to  $5\frac{1}{2}$  times postocular part of head, and 20 times its least depth, which equals diameter of eye; latter  $\frac{2}{3}$  interorbital width; lower jaw with a compressed dermal appendage nearly as long as eye; teeth conical, 7 in upper jaw, 4 or 6 in lower. Dorsal 27–34, originating above 8th or 9th ray of anal, its length  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times in its distance from head. Anal 29–37, equally distant from base of ventral and from base of caudal. Pectoral pointed, less than  $\frac{1}{2}$  length of head, almost twice as long as ventral, and extending almost to extremity of latter. Caudal

scaled, with obtusely pointed lobes. Caudal peduncle 3 times as long as deep,  $\frac{1}{3}$  to  $\frac{1}{2}$  length of head. 76–81 scales in lateral line,  $\frac{15-18}{24-25}$  in

Fig. 104.

*Gnathonemus numenius.*Type (A. M. C.).  $\frac{1}{3}$ .

transverse series on body,  $\frac{16}{15-18}$  in transverse series between dorsal and anal, 16 round caudal peduncle. Pale brownish above, whitish beneath. Total length 610 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

1. One of the types. Upoto. Capt. Wilverth (C.).

## 8. GENYOMYRUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 17 (1898), Proc. Zool. Soc. 1898, p. 820, and Poiss. Bass. Congo, p. 108 (1901).

Teeth in the jaws very small, slender, conical, disposed irregularly in several rows, forming a villiform band; conical teeth on the parasphenoid and on the tongue; mouth terminal; nostrils widely separated. Body short; ventrals nearer pectorals than anal. Dorsal and anal nearly equally developed. Vertebræ 49 (13 + 7 + 29).

Congo.

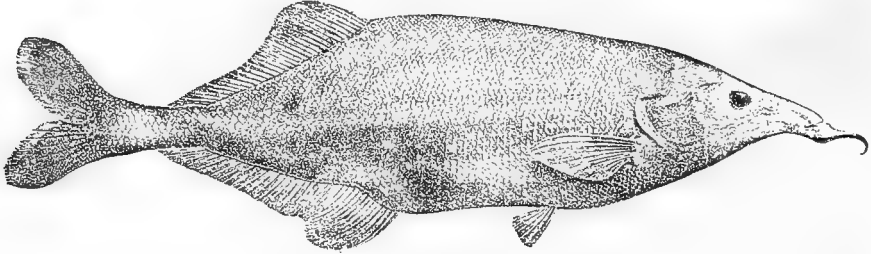
### 1. GENYOMYRUS DONNYI.

Bouleng. ll. cc., Ann. pl. ix.

Depth of body  $3\frac{1}{3}$  to 4 times in total length, length of head 4 to  $4\frac{1}{3}$  times. Head once and  $\frac{1}{2}$  as long as deep, upper profile straight or slightly concave; snout narrowed, produced, its length  $2\frac{1}{2}$  to 3 times its least depth; mouth terminal; chin with a tapering dermal appendage or barbel, nearly as long as snout, and pointing forwards; eye moderate, in middle of head,  $3\frac{1}{2}$  times in length of snout, twice in interorbital width. Dorsal 31–34, originating slightly behind origin of anal (over 2nd or 4th ray), its length  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times in its distance from head.

Anal 36-38, equally distant from extremity of ventral and from base of caudal. Pectoral obtusely pointed,  $\frac{2}{3}$  length of head, a little over twice length of ventral, and extending beyond base of latter. Caudal scaled,

Fig. 105.



*Genyomyrus donnyi*.  
Type (A. M. C.).  $\frac{1}{4}$ .

with rounded lobes. Caudal peduncle 3 times as long as deep,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. 78-82 scales in lateral line,  $\frac{16-18}{20-26}$  in transverse series on body,  $\frac{14-15}{13-14}$  in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above, lighter beneath.

Total length 450 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

|                      |                      |                        |
|----------------------|----------------------|------------------------|
| 1. One of the types. | Upoto.               | Capt. Wilverth (C.).   |
| 2. Skel.             | "                    | "                      |
| 3, 4-6. Ad. & hgr.   | Monsembe.            | Rev. J. H. Weeks (P.). |
| 7. Hgr.              | Kutu, L. Leopold II. | M. P. Delhez (C.).     |
| 8-9. Ad. & yg.       | Upper Congo.         | Brussels University.   |

## 9. MORMYRUS.

Linn. Syst. Nat. i. p. 522 (part.); Gill, Proc. Ac. Philad. 1864, p. 139; Bouleng. Proc. Zool. Soc. 1898, p. 812, Poiss. Bass. Congo, p. 109 (1901), and Fish. Nile, p. 59 (1907).

*Scrophicephalus*, Swainson, Nat. Hist. Fish. ii. p. 187 (1839).

*Mormyrodex*, Gill, l. c.

*Solenomormyrus*, Bleeker, Versl. Ak. Amsterd. (2) viii. 1874, p. 368.

Teeth in the jaws small, notched, few (5 to 12 in the upper jaw, 8 to 14 in the lower); minute conical teeth on the parasphenoid and on the tongue; mouth terminal. Nostrils moderately far apart, remote from the eye. Body moderately elongate; ventral fins equally distant from the pectorals and from the anal, or nearer the former. Dorsal fin much

elongate, more than twice as long as the anal. Vertebræ 49-55 (12-16+7-10+27-32).

Nile and Tropical Africa.

*Synopsis of the Species.*

I. Snout much shorter than postorbital part of head.

A. Dorsal originating in advance of base of ventrals, 4 to 5 times as long as anal; caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep.

D. 67-75; A. 17-20; 28-30 scales round

caudal peduncle . . . . . 1. *M. hasselquistii*, C. & V., p. 128.

D. 62-66; A. 18-20; 22-26 scales round

caudal peduncle . . . . . 2. *M. anchietae*, Guimar., p. 129.

B. Dorsal originating above base of ventrals; caudal peduncle  $2\frac{1}{2}$ -3 times as long as deep.

D. 64-65; A. 19-21; 12 scales round

caudal peduncle; dorsal 4 to  $4\frac{1}{2}$  times as long as anal; snout not longer than eye . . . . . 3. *M. macrophthalmus*, Gthr., p. 130.

D. 53-55; A. 22-23; 16 scales round

caudal peduncle; dorsal  $2\frac{2}{3}$  to 3 times as long as anal; snout twice as long as eye . . . . . 4. *M. ovis*, Blgr., p. 131.

II. Snout at least nearly as long as postorbital part of head.

A. Dorsal originating above, or a little in front, or a little behind base of ventrals.

1. A. 22-27; 12-14 scales round caudal peduncle, which is  $2\frac{1}{2}$ -3 times as long as deep; dorsal  $2\frac{2}{3}$  to 3 times as long as anal.

D. 60-70; A. 22-26; snout not tubiform;

pectoral rounded, not or barely reaching root of ventral . . . . . 5. *M. caballus*, Blgr., p. 132.

D. 65-67; A. 27-28; snout tubiform;

pectoral pointed, reaching a little beyond root of ventral . . . . . 6. *M. tapirus*, Pappenh., p. 133.

2. A. 18-21; 26-30 scales round caudal peduncle, which is  $1\frac{1}{2}$ -2 times as long as deep; dorsal  $3\frac{1}{2}$  to  $4\frac{3}{4}$  times as long as anal.

D. 60; A. 19; dorsal originating further

back than base of ventral . . . . . 7. *M. tenuirostris*, Peters, p. 134.

D. 57-75; A. 18-21; dorsal originating

above or in front of base of ventral . . . . . 8. *M. kannume*, Forsk., p. 134.

B. Dorsal originating considerably in advance of ventrals, 5 to 7 times as long as anal.

1. 26-30 scales round caudal peduncle; D. 76-90.

- D. 76-90 ; A. 18-21 ; snout bent downwards . . . . . 9. *M. caschive*, L., p. 136.
- D. 83-90 ; A. 17-18 ; snout pointing straight forwards . . . . . 10. *M. niloticus*, Bl.-Schm., p. 137.  
2. 22-28 scales round caudal peduncle ; D. 65-77.
- D. 77 ; A. 17 ; L. l. 130 . . . . . 11. *M. bozasi*, Pellegr., p. 138.
- D. 65-75 ; A. 17-19 ; L. l. 85-100 . . . . . 12. *M. longirostris*, Peters, p. 139.  
3. 18-22 scales round caudal peduncle ; D. 75-91.
- D. 78-91 ; A. 18-20 ; 20-22 scales round caudal peduncle, which is at least half as long as head ; length of snout 2 to 3 times its least depth . . . . . 13. *M. rume*, C. & V., p. 140.
- D. 75-82 ; A. 19-20 ; 18-20 scales round caudal peduncle, which is not more than  $\frac{1}{3}$  as long as head ; length of snout  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times its least depth . . . . . 14. *M. proboscirostris*, Blgr., p. 141.

*Mormyrus lacerda*, Casteln. Mém. Poiss. Afr. Austr. p. 61 (1861), from Lake Ngami, probably pertains to this genus in the vicinity of *M. hasselquistii* and *anchietæ*, but the description is insufficient and the type is lost.

D. 72 ; A. 19. Teeth notched. Grey, upper surface of head black, throat golden yellow ; anal black. Total length 360 millim. ; depth of body 90.

### 1. MORMYRUS HASSELQUISTII.

*Mormyrus herse* (non Sonnini), Lacep. Hist. Poiss. v. p. 620 (1803).

*Mormyrus caschive* (non Linn.), I. Geoffr. Descr. Égypte, Poiss. p. 273, pl. vi. fig. 2 (1827).

*Mormyrus hasselquistii*, Cuv. & Val. Hist. Poiss. xix. p. 253 (1846); Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 130 ; Günth. Cat. Fish. vi. p. 217 (1866) ; Bouleng. Proc. Zool. Soc. 1898, p. 813 ; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 360 ; Bouleng. Fish. Nile, p. 59, pl. xi. fig. 1 (1907).

*Mormyrus guentheri*, Bouleng. Proc. Zool. Soc. 1898, p. 814.

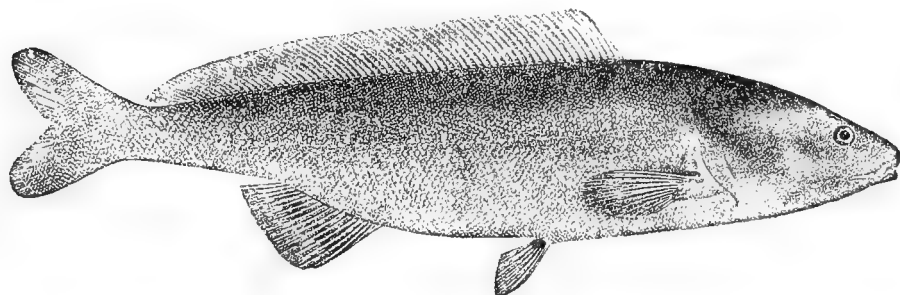
*Mormyrus aynus*, Pappenh. t. c. p. 361, pl. xiii. figs. 1 & 2.

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to  $4\frac{3}{4}$  times. Head  $1\frac{1}{4}$  to  $1\frac{2}{3}$  times as long as deep, with curved upper profile ; snout about  $\frac{1}{2}$  as long as postocular part of head, projecting a little beyond mouth, the width of which measures about half length of head ; teeth notched, 8-12 in upper jaw, 12-16 in lower ; eye moderate,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of snout or interorbital width. Dorsal 67-75, originating well in advance of ventrals, 4 to 5 times as long as anal. Anal 17-20, originating



a little nearer base of caudal than base of pectoral. Pectoral rounded or obtusely pointed,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head; ventral about  $\frac{2}{3}$  length of head. Caudal for the greater part scaled, with rounded lobes. Caudal

Fig. 106.



*Mormyrus hasselquistii*.  
White Nile (F. N.).  $\frac{1}{2}$ .

peduncle  $1\frac{1}{3}$  to 2 times as long as deep,  $\frac{2}{3}$  to  $\frac{1}{2}$  length of head. 88-98 scales in lateral line,  $\frac{17-25}{20-29}$  in transverse series on body,  $\frac{16-18}{14-16}$  in transverse series between dorsal and anal, 28-30 round caudal peduncle. Grey or brown, lighter beneath.

Total length 350 millim.

Lower Nile to Bahr-el-Gebel, Niger, Volta.—Types in Paris Museum.

|                                           |                          |                                                       |
|-------------------------------------------|--------------------------|-------------------------------------------------------|
| 1-2. Ad.                                  | Fashoda, White Nile.     | L. Loat, Esq. (C.).                                   |
| 3. Skel.                                  | "                        | "                                                     |
| 4. Ad.                                    | Polkom, Baro R. (Sobat). | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 5. Ad.                                    | Kenisseh, Bahr-el-Gebel. | L. Loat, Esq. (C.).                                   |
| 6. Ad. (Type of<br><i>M. guentheri</i> .) | Niger.                   | Mr. J. T. Dalton (C.).                                |
| 7. Ad.                                    | Benue R., N. of Ibi.     | H. L. Norton Traill, Esq. (C.).                       |

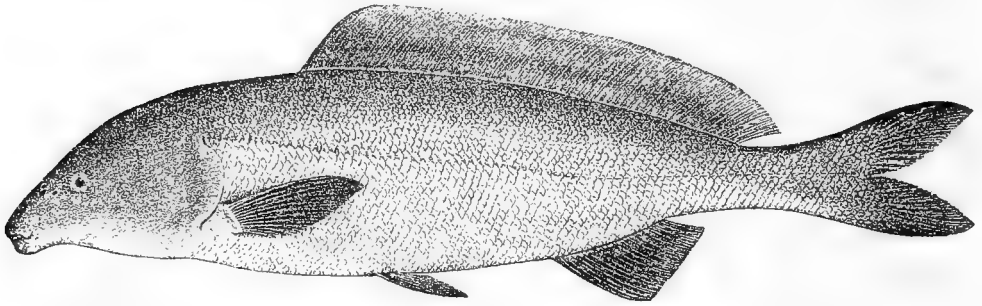
## 2. MORMYRUS ANCHIETÆ.

Guimaraes, Journ. Sc. Lisb. x. 1884, p. 4, pl. i. fig. 3; Bouleng. Proc. Zool. Soc. 1898, p. 814.

Depth of body 4 to  $5\frac{1}{2}$  times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep, with curved upper profile; snout about  $\frac{1}{2}$  as long as postorbital part of head; chin slightly swollen; teeth notched, 7 or 9 in upper jaw, 10 in lower; eye moderate, its diameter  $\frac{1}{3}$  to  $\frac{1}{2}$  length of snout,  $\frac{2}{3}$  interorbital width. Dorsal 62-66, originating well in advance of ventral, about 4 times as long as anal. Anal 18-20, originating nearer base of caudal than base of pectoral.

Pectoral rounded,  $\frac{3}{5}$  to nearly  $\frac{2}{3}$  length of head, ventral  $\frac{2}{5}$ . Caudal densely scaled, with obtusely pointed lobes. Caudal peduncle twice as long as deep, nearly  $\frac{1}{2}$  length of head. 80-86 scales in lateral line,

Fig. 107.

*Mormyrus anchieta.*

Mossamedes.

$\frac{16-18}{22-24}$  in transverse series on body,  $\frac{14-15}{13-15}$  in transverse series between dorsal and anal, 22-26 round caudal peduncle. Brownish above, silvery beneath.

Total length 330 millim.

Angola.—Type in Lisbon Museum.

1-3. Hgr.

Emme Lagoon, Mossamedes.

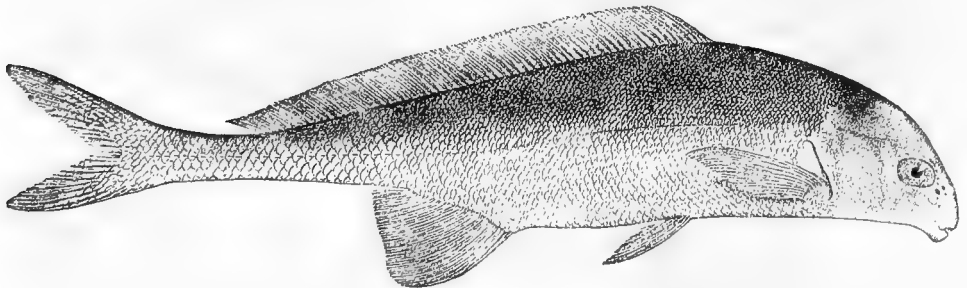
Dr. W. J. Ansorge (C.).

### 3. MORMYRUS MACROPHthalmus.

Günth. Cat. Fish. vi. p. 217 (1866); Bouleng. Proc. Zool. Soc. 1898, p. 815.

Depth of body 4 to nearly 5 times in total length, length of head 5 to 6 times. Head scarcely longer than deep, with strongly curved upper

Fig. 108.

*Mormyrus macrophthalmus.*

Type.  $\frac{1}{2}$ .

profile; snout short,  $\frac{1}{2}$  as long as postorbital part of head, projecting a little beyond the mouth; teeth very small, feebly notched, 7 in upper

jaw, 6 or 8 in lower; eye large, in anterior half of the head, nearly as long as the snout,  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times interorbital width. Dorsal 64-65, originating above base of ventral, twice as far from base of caudal as from end of snout,  $4-4\frac{1}{2}$  times as long as anal. Anal 19-21, originating a little nearer base of caudal than end of snout. Pectoral pointed, as long as head, ventral  $\frac{2}{3}$  length of head. Caudal with long pointed lobes, as long as head. Caudal peduncle  $2\frac{1}{2}$  times as long as deep,  $\frac{4}{5}$  length of head. 85-98 scales in lateral line,  $\frac{18-20}{19-22}$  in transverse series on body, 23-28 in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above, silvery white beneath.

Total length 290 millim.

Niger.

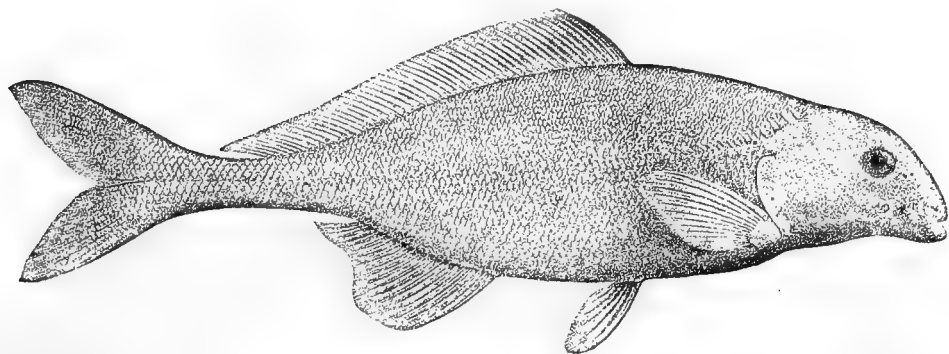
|          |                      |                         |
|----------|----------------------|-------------------------|
| 1. Type. | Niger.               | Mr. J. T. Dalton (C.).  |
| 2. Hgr.  | Agberi, Lower Niger. | Dr. W. J. Ansorge (C.). |

#### 4. MORMYRUS OVIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 15, pl. vii. fig. 2 (1898), Proc. Zool. Soc. 1898, p. 815, and Poiss. Bass. Congo, p. 110 (1961).

Depth of body  $3\frac{1}{2}$  to 4 times in total length, length of head  $4\frac{3}{4}$  to 5 times. Head nearly as long as deep, with strongly curved upper profile; snout short,  $\frac{1}{2}$  to  $\frac{2}{3}$  postorbital part of head; teeth very small, notched, 5 in upper jaw, 8 in lower; eye moderate,  $\frac{1}{2}$  length of snout,  $\frac{1}{2}$  to  $\frac{2}{3}$

Fig. 109.



*Mormyrus ovis.*

Type (A. M. C.).  $\frac{2}{3}$ .

interorbital width. Dorsal 53-55, originating above base of ventral, a little longer than its distance from end of snout,  $2\frac{2}{3}$  to 3 times as long as anal. Anal 22-23, originating a little nearer head than base of caudal. Pectoral obtusely pointed,  $\frac{3}{4}$  length of head, ventral  $\frac{1}{2}$  or  $\frac{2}{3}$

length of head. Caudal with obtusely pointed lobes, at least as long as head. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. 90–92 scales in lateral line,  $\frac{26}{18}$  in transverse series on body, 29–30 in transverse series between dorsal and anal, 16 round caudal peduncle. Pale brownish.

Total length 310 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

1. Ad. Stanley Falls. Rev. W. H. Bentley (C.).

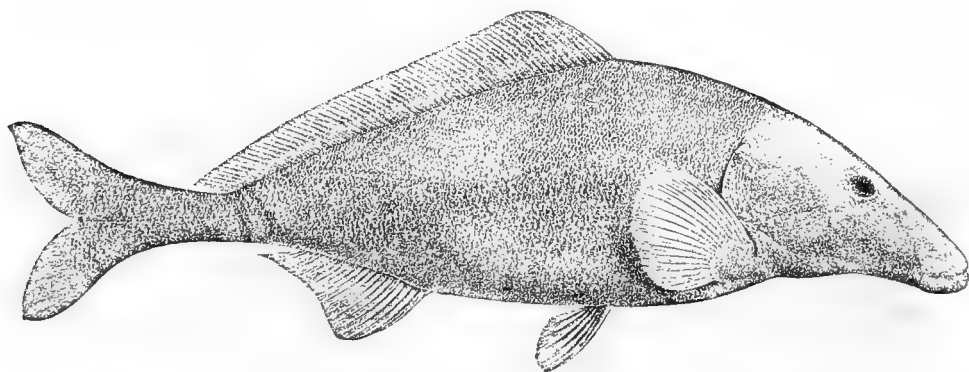
#### 5. MORMYRUS CABALLUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 16, pl. viii. fig. 1 (1898), Proc. Zool. Soc. 1898, p. 818, and Poiss. Bass. Congo, p. 111 (1901).

*Mormyrus curvifrons*, Pellegr. Bull. Mus. Paris, 1904, p. 438.

Depth of body nearly equal to length of head,  $3\frac{2}{5}$  to 5 times in total length. Upper profile of head descending in a curve; snout produced, as long as or a little shorter than postocular part of head, its length about twice its least depth; mouth very small, with thick lips; teeth notched, 5 or 7 in upper jaw, 8 or 10 in lower; eye moderate, its diameter 2 to 4 times in length of snout and  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times in inter-

Fig. 110.



*Mormyrus caballus*.

Type (A. M. C.).  $\frac{1}{4}$ .

orbital width. Dorsal 60–70, originating above base of ventral or slightly anterior to it,  $2\frac{3}{4}$  to 3 times as long as anal. Anal 22–26, originating at equal distance from head and base of caudal. Pectoral rounded,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head, not reaching or hardly reaching base of ventral; ventral about  $\frac{2}{3}$  length of head. Caudal densely scaled, with obtusely pointed lobes. Caudal peduncle  $2\frac{1}{2}$  to 3 times as long as deep,

$\frac{1}{2}$  to  $\frac{2}{3}$  length of head. 85-100 scales in lateral line,  $\frac{22-30}{23-30}$  in transverse series on body, 32-36 in transverse series between dorsal and anal, 12 or 14 round caudal peduncle. Bluish grey above, whitish below.

Total length 500 millim.

Congo.—Type in Congo Museum, Tervueren.

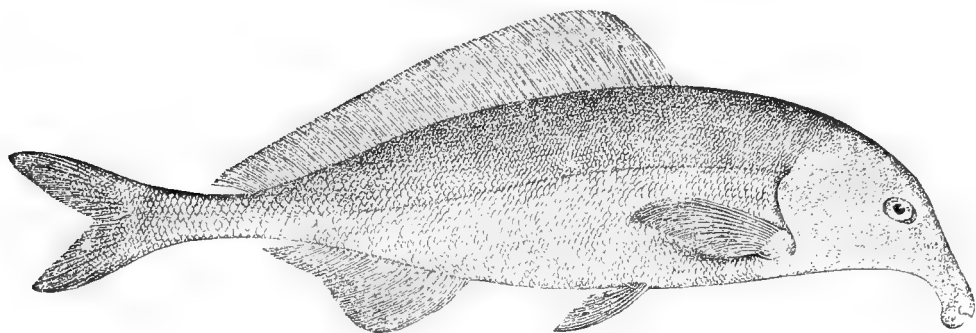
|           |                        |                      |
|-----------|------------------------|----------------------|
| 1. Ad.    | Boma, Lower Congo.     | M. P. Delhez (C.).   |
| 2. Hgr.   | Kutu, Lake Leopold II. | ..                   |
| 3-4. Hgr. | Upper Congo.           | Brussels University. |
| 5. Yg.    | Banzville, Ubanghi.    | Capt. Royaux (C.).   |

### 6. MORMYRUS TAPIRUS.

Pappenh. Sitzb. Ges. naturf. Fr. Berl. 1905, p. 217, and Mitth. Zool. Mus. Berl. iii. 1907, p. 362, pl. xiii. fig. 3.

Depth of body nearly equal to length of head, 4 to  $4\frac{1}{2}$  times in total length. Upper profile of head descending in a curve; snout much produced, tubiform, slightly longer than postocular part of head, its length about 4 times its least depth; mouth very small, with thick lips, chin rather produced; teeth notched, 5 in upper jaw, 8 in lower; eye rather large,  $\frac{1}{3}$  length of head,  $\frac{2}{3}$  interorbital width. Dorsal 65-67, originating

Fig. 111.



*Mormyrus tapirus.*

Type.  $\frac{1}{2}$ .

slightly in advance of base of ventrals,  $2\frac{2}{3}$  times as long as anal. Anal 27-28, originating at equal distance from base of pectoral and from base of caudal. Pectoral pointed,  $\frac{2}{3}$  length of head, reaching a little beyond root of ventral; latter about  $\frac{1}{2}$  length of head. Caudal scaled, with pointed lobes. Caudal peduncle 3 times as long as deep, slightly longer than postocular part of head. 95 scales in lateral line,  $\frac{18}{20}$  in transverse

series on body, 26 in transverse series between dorsal and anal, 12 round caudal peduncle. Brownish above, silvery white beneath.

Total length 280 millim.

Cameroon.—Type in Berlin Museum.

1. One of the types. Lokunje R. Hr. G. Zenker (C.);  
Berlin Museum (E.).

#### 7. MORMYRUS TENUIROSTRIS.

Peters, Sitzb. Ges. naturf. Fr. Berl. 1882, p. 73; Bouleng. Proc. Zool. Soc. 1898, p. 819; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 363.

Depth of body 5 times in total length, length of head  $3\frac{1}{3}$  times. Snout produced, attenuate, curved downwards; teeth bicuspid, 5 in upper jaw, 7 in lower; eye in middle of head. Dorsal 60, originating further back than base of ventrals, not longer than its distance from middle of snout. Anal 19. 92 scales in lateral line, 26 round caudal peduncle.

Total length 110 millim.

Athi River, E. Africa.—Type in Berlin Museum.

#### 8. MORMYRUS KANNUME.

Forsk. Descr. Anim. p. 74 (1775); Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 114; Bouleng. Proc. Zool. Soc. 1898, p. 817; Hilgond. Zool. Jahrb., Syst. xxii. 1905, p. 418; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 362; Bouleng. Fish. Nile, p. 61, pl. xii. fig. 1 (1907).

*Mormyrus oxyrhynchus*, I. Geoffr. Descr. Égypte, Poiss. i. p. 270, pl. vi. fig. 1 (1829); Joannis, Mag. Zool. 1835, iii. pl. xiii.; Cuv. & Val. Hist. Poiss. xix. p. 242 (1846); Günth. Cat. Fish. vi. p. 216 (1866), and Petherick's Trav. ii. p. 253 (1869); Hilgond. Sitzb. Ges. nat. Fr. Berl. 1888, p. 78.

*Mormyrus bachiqua*, Cuv. & Val. t. c. p. 248.

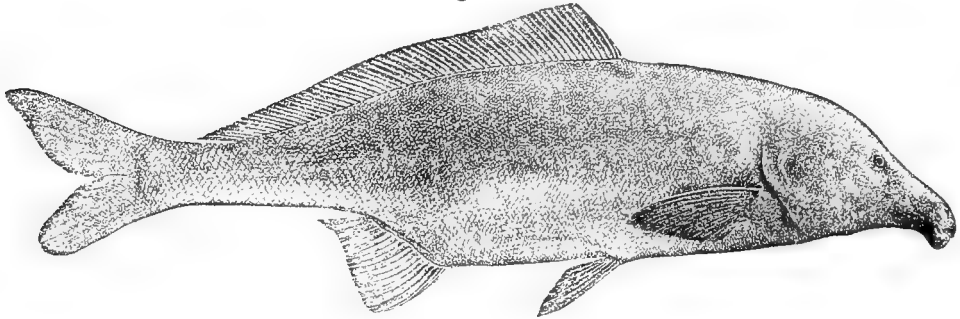
*Scrophicephalus kannume*, Rüpp. Verz. Mus. Senckenb. iv. p. 27 (1852).

? *Mormyrus hildebrandti*, Peters, Sitzb. Ges. naturf. Fr. Berl. 1882, p. 73.

Depth of body  $3\frac{1}{2}$  to  $4\frac{2}{3}$  times in total length, length of head 4 to 5 times. Upper profile of head descending in a straight line or a more or less strong curve; snout much produced, about as long as postocular part of head in the adult, its length  $1\frac{1}{2}$  (young) to 3 times its least depth; mouth very small, with thick lips; teeth notched, 5 or 7 in upper jaw, 8 or 10 in lower; eye small, its diameter  $1\frac{1}{2}$  to  $2\frac{1}{2}$  times in interorbital width. Dorsal 57-75, originating above or slightly in advance of base of ventral,  $3\frac{1}{2}$ - $4\frac{3}{4}$  times as long as anal. Anal 18-21,

originating at equal distance from base of pectoral and from base of caudal. Pectoral obtusely pointed,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head, ventral about  $\frac{1}{2}$  length of head. Caudal with obtusely pointed lobes. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. 80–115 scales in

Fig. 112.



*Mormyrus kannume.*  
Lower Nile (F. N.).  $\frac{1}{4}$ .

lateral line,  $\frac{23-30}{28-38}$  in transverse series on body, 35–42 in transverse series between dorsal and anal, 26 to 30 round caudal peduncle. Brownish or olive above, white beneath.

Total length 500 millim.

Lower Nile to Lake Victoria.

|                          |                                 |                              |
|--------------------------|---------------------------------|------------------------------|
| 1-3. Ad. & hgr.          | Lower Nile.                     | J. Petherick, Esq. (C.).     |
| 4. Yg.                   | „                               | Dr. Rüppell (C.).            |
| 5-6. Ad. & yg.           | „                               | Rev. O. P. Cambridge (P.).   |
| 7. Ad.                   | „                               | E. Lort Phillips, Esq. (P.). |
| 8. Skel.                 | „                               | Dr. Rüppell (C.).            |
| 9. Skel.                 | „                               | J. Petherick, Esq. (C.).     |
| 10-14. Ad.               | Rosetta Nile.                   | L. Loat, Esq. (C.).          |
| 15. Ad.                  | Nile at Cairo.                  | Dr. F. Werner (P.).          |
| 16-17, 18-21. Hgr. & yg. | „                               | Capt. S. Flower (P.).        |
| 22-27. Ad. & hgr.        | „                               | L. Loat, Esq. (C.).          |
| 28-29. Ad.               | Near Cairo.                     | „                            |
| 30-34. Ad. & hgr.        | Beni Souef, Lower Nile.         | „                            |
| 35-36. Hgr.              | Sanhur, near Beni Souef.        | „                            |
| 37-42. Ad. & hgr.        | Between Beni Souef and<br>Biba. | „                            |
| 43. Hgr.                 | Akhmim, Lower Nile.             | „                            |
| 44. Ad.                  | Girgeh, „                       | „                            |
| 45-46. Hgr.              | Luxor.                          | „                            |
| 47-48. Yg.               | Near Luxor.                     | „                            |
| 49. Ad.                  | Wady Halfa.                     | „                            |

|                   |                                 |                          |
|-------------------|---------------------------------|--------------------------|
| 50-59. Ad. & hgr. | Assuan.                         | L. Loat, Esq. (C.).      |
| 60-64. Yg.        | Khartum.                        | J. Petherick, Esq. (C.). |
| 65-66. Ad.        | Wad Medine, Blue Nile.          | L. Loat, Esq. (C.).      |
| 67. Hgr.          | Rosaires, „                     | Capt. S. Flower (P.).    |
| 68-70. Hgr. & yg. | Lake Victoria.                  | Sir H. H. Johnston (P.). |
| 71. Hgr.          | „                               | C. W. Hobley, Esq. (P.). |
| 72-74. Ad.        | Lake Victoria, near<br>Entebbe. | Mr. E. Degen (C.).       |

The following specimen, with only 51 rays in the dorsal fin, is referred with doubt to this species:—

|         |                                    |                                                    |
|---------|------------------------------------|----------------------------------------------------|
| 75. Yg. | Wabbi R. (Webi Shebeli<br>System). | Prof. O. Neumann and<br>Baron C. v. Erlanger (C.). |
|---------|------------------------------------|----------------------------------------------------|

The likewise East African *M. hildebrandti*, Peters, from the Athi River, is stated to have 63 rays in the dorsal, and 24 scales round the caudal peduncle.

*Mormyrus nacara*, Cuv. & Val. t. c. p. 257, is founded on a coloured sketch of a fish apparently identical with *M. kannume*.

#### 9. MORMYRUS CASCHIVE.

Linn., Hasselq. Iter Palæst. p. 398 (1757); Cuv. & Val. Hist. Poiss. xix. p. 227 (1846); Marcusen, Mém. Ac. St. Pétersb. (7) vii. 1864, no. 4, p. 120; Günth. Cat. Fish. vi. p. 215 (1866), and Petherick's Trav. ii. p. 253 (1869); Bouleng. Proc. Zool. Soc. 1898, p. 815, Poiss. Bass Congo, p. 113 (1901), and Fish Nile, p. 66, pl. xii. fig. 2 (1907).

*Mormyrus longipinnis*, Rüpp. Fortsetz. Besch. n. Fische Nil, p. 7, pl. i. fig. 2 (1832).

*Scrophicephalus longipinnis*, Swains. Nat. Hist. Fish. i. p. 309 (1838).

*Mormyrus geoffroyi* (non C. & V.), Günth. tt. cc. pp. 216, 253.

*Mormyrus longirostris*, part., Bouleng. Proc. Zool. Soc. 1898, p. 817.

Depth of body  $3\frac{3}{4}$  to 5 times in total length, length of head 4 to 5 times. Upper profile of head descending in a straight line or feeble curve; snout produced, about as long as postocular part of head in adult, its length 2 (young) to 4 times its least depth; mouth very small, with thick lips; teeth notched, 5 to 9 in upper jaw, 8 or 10 in lower; eye moderate, its diameter  $1\frac{1}{2}$  (young) to  $2\frac{1}{2}$  times in interorbital width. Dorsal 76-90, originating well in advance of base of ventral, 5 to 7 times as long as anal,  $1\frac{1}{3}$  to  $1\frac{2}{5}$  times as long as its distance from end of snout. Anal 18-21, originating at nearly equal distance from base of pectoral and from base of caudal. Pectoral obtusely pointed,  $\frac{3}{5}$  to  $\frac{3}{4}$  length of head, ventral  $\frac{1}{3}$  to  $\frac{1}{2}$  length of head. Caudal with

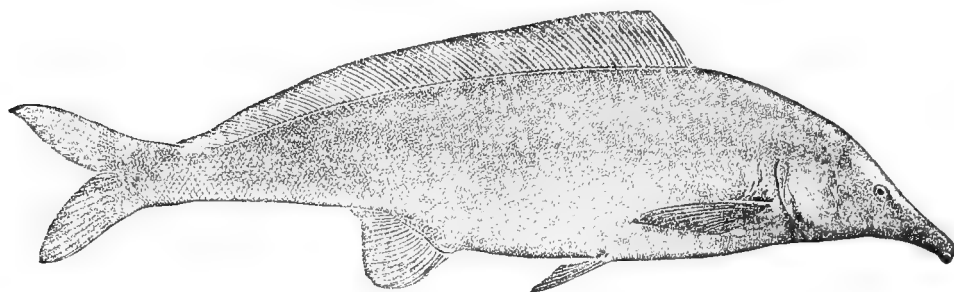


pointed lobes, densely scaled. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep,  $\frac{2}{3}$  to  $\frac{1}{2}$  length of head. 100–130 scales in lateral line,  $\frac{26-34}{28-42}$  in transverse series on body, 38–45 in transverse series between dorsal and anal, 26 to 30 round caudal peduncle. Olive above, whitish below.

Total length 520 millim.

Lower Nile to Bahr-el-Gebel.

Fig. 113.



*Mormyrus caschive*.  
Khartum (F. N.).  $\frac{1}{4}$ .

|                                               |                               |                          |
|-----------------------------------------------|-------------------------------|--------------------------|
| 1-3, 4. (Types of<br><i>M. longipinnis</i> .) | Lower Nile.                   | Dr. Rüppell (C.).        |
| 5-6. Hgr. & yg.                               | "                             |                          |
| 7-9. Hgr. & yg.                               | Nile at Cairo.                | Capt. S. Flower (P.).    |
| 10, 11. Ad. & hgr.                            | Nile near Cairo.              | L. Loat, Esq. (C.).      |
| 12. Ad.                                       | Beni Souef, Lower Nile.       | "                        |
| 13-14. Ad. & hgr.                             | Between Beni Souef and Biba.  | "                        |
| 15. Skel.                                     | " "                           | "                        |
| 16. Ad.                                       | Biba, Lower Nile.             | "                        |
| 17. Hgr.                                      | Lahun, Bahr-el-Yusef.         | "                        |
| 18-21. Yg.                                    | Near Luxor.                   | "                        |
| 22-23. Ad.                                    | Khartum.                      | J. Petherick, Esq. (C.). |
| 24. Hgr.                                      | Nur-ed-Daim, White Nile.      | L. Loat, Esq. (C.).      |
| 25-28. Hgr.                                   | Fashoda, White Nile.          | "                        |
| 29. Ad.                                       | Mouth of Lake No, White Nile. | "                        |

#### 10. MORMYRUS NILOTICUS.

*Centriscus niloticus*, Bloch-Schneid. Syst. p. 113, pl. xxx. fig. 1 (1801).

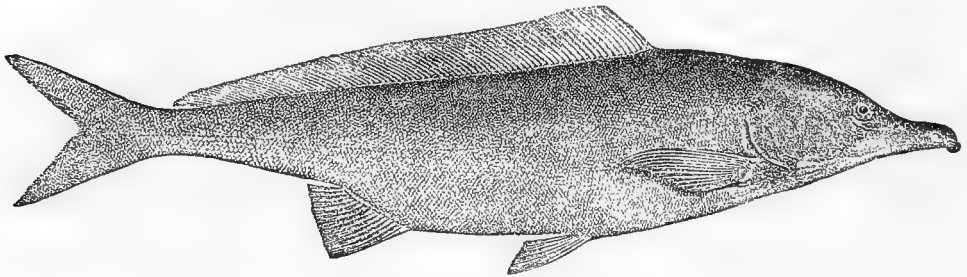
*Mormyrus geoffroyi*, Cuv. & Val. Hist. Poiss. xix. p. 240 (1846).

*Mormyrus niloticus*, Bouleng. Proc. Zool. Soc. 1898, p. 816, and Fish. Nile, p. 68, pl. xi. fig. 2 (1907).

Depth of body less than the length of head,  $4\frac{1}{2}$  to  $5\frac{2}{3}$  times in total length. Head about once and  $\frac{2}{3}$  as long as deep; snout nearly as long

as postocular part of head, straight, prolonged in the axis of the body, tubiform, with slightly concave upper profile; mouth very small, lower jaw slightly projecting; 7 or 9 teeth in upper jaw, 10 in lower; eye moderate, 4 or 5 times in length of snout,  $\frac{1}{2}$  interorbital width. Dorsal 83-90, originating well in advance of ventrals, about 6 times as long as anal, and once and  $\frac{1}{2}$  as long as its distance from end of snout. Anal 17-18, nearer base of ventral than base of caudal. Pectoral pointed, as

Fig. 114.

*Mormyrus niloticus.*Lower Nile (F. N.).  $\frac{1}{4}$ .

long as head without snout, not reaching ventral. Caudal densely scaled, with pointed lobes. Caudal peduncle nearly twice as long as deep. 110-120 scales in lateral line,  $\frac{28-35}{35-42}$  in transverse series on body,  $\frac{20-24}{22-24}$  in transverse series between dorsal and anal, 28-30 round caudal peduncle. Brown above, whitish beneath.

Total length 460 millim.

Lower Nile, Bahr-el-Gebel.

- |        |                                             |                           |
|--------|---------------------------------------------|---------------------------|
| 1. Ad. | Between Beni Souef and Biba,<br>Lower Nile. | L. Loat, Esq. (C.).       |
| 2. Ad. | Wadelai, Bahr-el-Gebel.                     | J. S. Budgett, Esq. (P.). |

#### 11. MORMYRUS BOZASI.

Pellegr. Bull. Mus. Paris, 1903, p. 327.

Depth of body  $4\frac{1}{2}$  times in total length, length of head 4 times. Upper profile of head strongly curved; snout produced, tubiform, about as long as postocular part of head; mouth small; teeth notched; eye 3 times in length of snout, once and  $\frac{1}{2}$  in interorbital width. Dorsal 77, originating in advance of ventrals, 7 times as long as anal. Anal 17, originating at equal distance from base of pectoral and from base of caudal. Pectoral pointed,  $\frac{2}{3}$  length of head. Caudal covered with

scales. Caudal peduncle a little more than once and  $\frac{1}{2}$  as long as deep, its length a little less than  $\frac{1}{2}$  that of head. 130 scales in lateral line,  $\frac{27}{32}$  in transverse series on body, 24 round caudal peduncle. Slate-grey above, white beneath.

Total length 560 millim.

Uelle River, Congo.—Type in Paris Museum.

## 12. MORMYRUS LONGIROSTRIS.

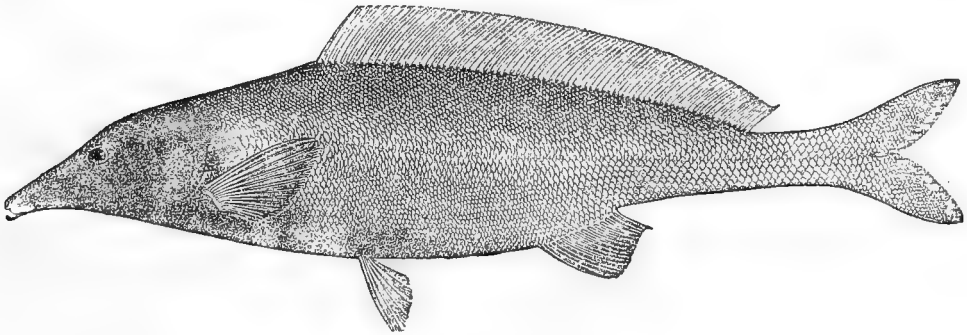
Peters, Mon. Berl. Ac. 1852, p. 275; Günth. Cat. Fish. vi. p. 216 (1866); Peters, Reise Mossamb. iv. p. 83, pl. xvi. fig. 2 (1868); Bouleng. Tr. Zool. Soc. xvii. 1906, p. 546; Pappenh. Mitth. Zool. Mus. Berl. iii. 1907, p. 362.

*Mormyrus mucupe*, Peters, tt. cc. pp. 275, 87, pl. xvi. fig. 1; Günth. t. c. p. 215.

*Mormyrus longirostris*, part., Bouleng. Proc. Zool. Soc. 1898, p. 817, and Poiss. Bass. Congo, p. 112 (1901).

Depth of body  $3\frac{2}{3}$  to 5 times in total length, length of head  $3\frac{2}{3}$  to  $4\frac{1}{2}$  times. Head  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times as long as deep, with curved or nearly straight descending upper profile; snout produced, as long as or a little shorter than postocular part of head, its length 2 to  $3\frac{1}{2}$  times its least depth; mouth very small, lower jaw slightly projecting; teeth small,

Fig. 115.



*Mormyrus longirostris.*

Type, after Peters (Reise Mossamb.).  $\frac{1}{3}$ .

notched, 5 or 7 in upper jaw, 8 to 12 in lower; eye moderate, its diameter about  $1\frac{1}{2}$  times in interorbital width. Dorsal 65–75, originating in advance of ventral, 4 to  $5\frac{1}{2}$  times as long as anal,  $1\frac{1}{6}$  to  $1\frac{1}{4}$  times as long as its distance from end of snout. Anal 17–19, originating at nearly equal distance from base of pectoral and from of base caudal. Pectoral obtusely pointed,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head, ventral  $\frac{1}{3}$  to  $\frac{1}{2}$ . Caudal

with rounded or obtusely pointed lobes, densely scaled. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep,  $\frac{2}{5}$  to  $\frac{1}{3}$  length of head. 85–100 scales in lateral line,  $\frac{23-30}{32-38}$  in transverse series on the body, 40–50 in transverse series between dorsal and anal, 22–28 round caudal peduncle. Olive above, whitish below.

Total length 550 millim.

Zambesi, Lakes Nyassa, Mweru, and Tanganyika.—Types in Berlin Museum.

|               |                       |                             |
|---------------|-----------------------|-----------------------------|
| 1. Ad.        | Chiromo, Shiré R.     | C. B. C. Storey, Esq. (P.). |
| 2–3. Ad.      | L. Nyassa.            | Capt. E. L. Rhoades (P.).   |
| 4. Ad., skin. | L. Mweru.             | Sir A. Sharpe (P.).         |
| 5. Ad.        | Sumbu, L. Tanganyika. | Dr. W. A. Cunnington (C.).  |

### 13. MORMYRUS RUME.

Cuv. & Val. Hist. Poiss. xix. p. 248, pl. cccclxix. (1846); Bouleng. Proc. Zool. Soc. 1898, p. 816.

*Mormyrus jubelini*, Cuv. & Val. t. c. p. 252; Bouleng. l. c.

*Mormyrus oxyrhynchus* (non Geoffr.), Schilth. Tijdschr. Nederl. Dierk. Ver. (2) iii. 1891, p. 84.

*Mormyrus longirostris*, part., Bouleng. Proc. Zool. Soc. 1898, p. 887, and Poiss. Bass. Congo, p. 112 (1901).

Depth of body  $3\frac{1}{2}$  to  $5\frac{1}{4}$  times in total length, length of head  $4\frac{1}{3}$  to 5 times. Upper profile of head descending in a straight line or feeble curve; snout produced, about as long as postocular part of head, its length 2 (young) to 3 times its least depth; mouth very small, with thick lips; teeth notched or truncate, 5 or 7 in upper jaw, 6 to 10 in lower; eye moderate, its diameter  $1\frac{2}{3}$  to 2 times in interorbital width. Dorsal 78–91, originating considerably in advance of base of ventrals, 5 to  $6\frac{1}{2}$  times as long as anal. Anal 18–20, originating at nearly equal distance from base of pectoral and from base of caudal. Pectoral obtusely pointed, about  $\frac{2}{3}$  length of head; ventral about  $\frac{1}{2}$  length of head. Caudal densely scaled, with obtusely pointed lobes. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head. 103–118 scales in lateral line,  $\frac{25-30}{29-36}$  in transverse series on body, 35–40 in transverse series between dorsal and anal, 20–22 round caudal peduncle. Olive or purplish brown above, white beneath.

Total length 460 millim.

Senegal to Congo and Chad Basin.—Types, in Paris Museum, examined.

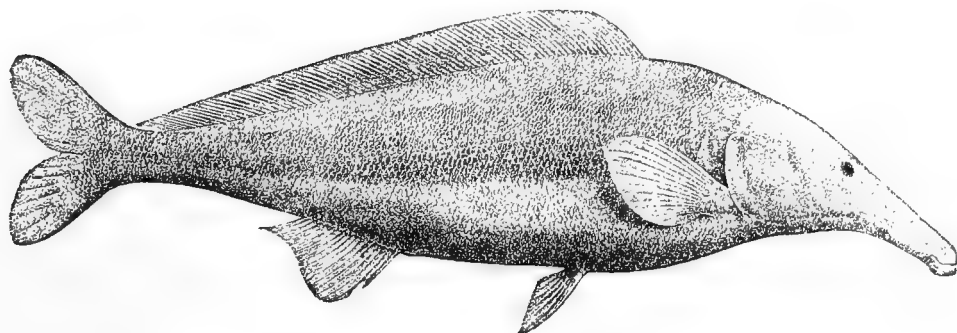
|                  |                        |                                                  |
|------------------|------------------------|--------------------------------------------------|
| 1-2. Ad. & hgr.  | St. Louis, Senegal.    | M. P. Delhez (C.).                               |
| 3-10. Hgr. & yg. | Kaëdi, "               | "                                                |
| 11-12. Ad.       | Gambia.                | J. S. Budgett, Esq. (P.).                        |
| 13. Ad.          | Mureji, Upper Niger.   | "                                                |
| 14-15. Ad.       | Jebba, "               | Capt. G. F. Abadie (P.).                         |
| 16. Hgr.         | Benue R., N. of Ibi.   | H. L. Norton Traill, Esq. (C.).                  |
| 17. Hgr.         | R. Shari at Maidugari. | Capt. G. B. Gosling (P.).                        |
| 18. Hgr.         | Gaboon.                |                                                  |
| 19. Yg.          | Lower Congo.           | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 20. Yg.          | Monsembe, Upper Congo. | Rev. J. H. Weeks (C.).                           |

## 14. MORMYRUS PROBOSCIROSTRIS.

Bouleng. Ann. Mus. Congo, Zool. i. 1898, p. 16, pl. viii. fig. 2, Proc. Zool. Soc. 1898, p. 818, and Poiss. Bass. Congo, p. 114 (1901).

Depth of body  $4\frac{1}{4}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to  $3\frac{4}{5}$  times. Upper profile of head descending in a curve; snout much produced, trunk-like, a little longer than postocular part of the head, its length  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times its least depth; mouth very small, lower jaw slightly projecting, with thick lips; teeth notched, 5 or 7 in upper jaw,

Fig. 116.

*Mormyrus proboscirostris.*Type (A. M. C.).  $\frac{1}{5}$ .

12 or 14 in lower; eye small, its diameter  $5\frac{1}{2}$  to  $7\frac{1}{2}$  times in length of snout, twice in interorbital width. Dorsal 75-82, originating well in advance of base of ventral, nearly 5 times as long as anal, once and  $\frac{1}{4}$  as long as its distance from end of snout. Anal 19-20, originating at equal distance from base of pectoral and from base

of caudal. Pectoral obtusely pointed, nearly  $\frac{1}{2}$  length of head, ventral  $\frac{1}{3}$  length of head. Caudal densely scaled, with rounded lobes. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep,  $\frac{1}{3}$  or less than  $\frac{1}{3}$  length of head. 95–100 scales in lateral line,  $\frac{21-26}{28-32}$  in transverse series on body, 32–36 in transverse series between dorsal and anal, 18–20 round caudal peduncle. Pinkish or brown, sometimes with a broad bluish-grey stripe extending along each side of the body and tail.

Total length 570 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

1. Ad. Upper Congo. Brussels University.

### 10. HYPEROPISUS.

Gill, Proc. Ac. Philad. 1862, p. 443; Günth. Cat. Fish. vi. p. 222 (1866);

Bouleng. Proc. Zool. Soc. 1898, p. 819, and Fish. Nile, p. 70 (1907).

*Phagrus*, Marcusen, Mém. Ac. St Pétersb. (7) vii. 1864, no. 4, p. 111.

Teeth in jaws small, notched, few (3–5 in the upper jaw, 5–6 in the lower); parasphenoid and tongue with a pavement of large spheroid teeth; mouth terminal, below the level of the eyes. Nostrils moderately far apart, remote from the eye. Body elongate; ventrals much nearer pectorals than anal. Dorsal very short (12–15 rays); anal very long. Vertebrae 55–59 (15–16 + 4–6 + 35–38).

#### 1. HYPEROPISUS BEBE.

*Kaschoué*, Sonnini, Voy. Égypte, pl. xxi. fig. 3 (1799).

*Mormyrus bebe*, Lacep. Hist. Poiss. v. p. 619 (1803).

*Mormyrus dorsalis*, I. Geoffr. Descr. Égypte, Poiss. p. 276, pl. viii. figs. 1 & 2 (1827); Cuv. & Val. Hist. Poiss. xix. p. 271 (1846).

*Phagrus dorsalis*, Marcus. l. c. p. 142.

*Hyperopisus dorsalis*, Günth. Cat. Fish. vi. p. 222 (1866); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 554, pl. iv. fig. 2.

*Hyperopisus occidentalis*, Günth. t. c. p. 223.

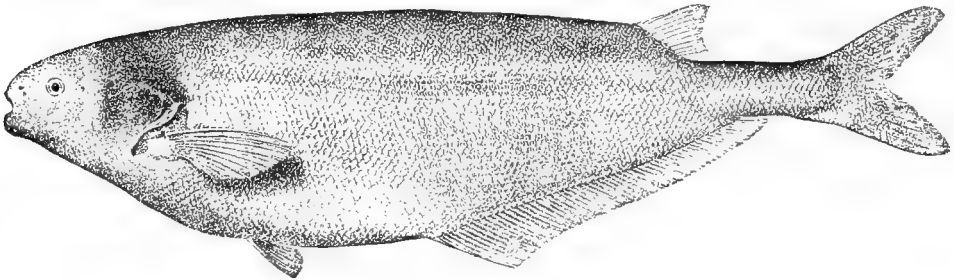
*Hyperopisus bebe*, Bouleng. Proc. Zool. Soc. 1898, p. 820, and Fish. Nile, p. 70, pl. v. fig. 2 (1907).

? *Hyperopisus tenuicauda*, Pellegr. Bull. Mus. Paris, 1904, p. 312.

Depth of body  $3\frac{2}{3}$  to  $5\frac{1}{2}$  times in total length, length of head  $4\frac{2}{3}$  to  $5\frac{2}{3}$  times. Head a little longer than deep, with strongly curved upper profile; snout  $\frac{2}{3}$  to  $\frac{1}{2}$  as long as postorbital part of head; eye moderate, its diameter about  $\frac{1}{2}$  length of snout; width of mouth  $\frac{1}{3}$  or  $\frac{1}{6}$  length of head. Dorsal 12–16,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times as far from head as from caudal. Anal 58–68, originating at equal distance from end of snout

and from root of caudal, or a little nearer latter. Pectoral obtusely pointed,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head, ventral  $\frac{1}{3}$  to  $\frac{2}{5}$ . Caudal scaled, with obtusely pointed lobes. Caudal peduncle 2 to  $2\frac{2}{3}$  times as long as deep,

Fig. 117.



*Hyperopisus bebe.*  
Lower Nile (F. N.).  $\frac{1}{2}$ .

nearly  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head. 93–120 scales in lateral line,  $\frac{15-24}{22-30}$  in transverse series on body,  $\frac{15-20}{18-22}$  in transverse series between dorsal and anal, 20 (rarely 18 or 22) round caudal peduncle. Plumbeous or olive above, silvery beneath.

Total length 460 millim.

Lower Nile to Blue Nile and Bahr-el-Gebel, Chad Basin, Senegal, Gambia, Niger.—Type in Paris Museum.

|                   |                              |                           |
|-------------------|------------------------------|---------------------------|
| 1-4. Ad. & hgr.   | Lower Nile.                  | S. S. Allen, Esq. (P.).   |
| 5. Ad.            | Barrage N. of Cairo.         | L. Loat, Esq. (C.).       |
| 6-7. Ad.          | Beni Souef, Lower Nile.      | "                         |
| 8-9. Ad.          | Between Beni Souef and Biba. | "                         |
| 10-17. Hgr. & yg. | Near Luxor.                  | "                         |
| 18-19. Ad. & yg.  | Khartum.                     | J. Petherick, Esq. (C.).  |
| 20. Skel.         | "                            | "                         |
| 21. Ad.           | Wad Medine, Blue Nile.       | L. Loat, Esq. (C.).       |
| 22-24. Ad. & hgr. | Jebelain, White Nile.        | "                         |
| 25-26. Ad. & hgr. | Fashoda, "                   | "                         |
| 27-31. Ad. & hgr. | Tewfikyeh, "                 | "                         |
| 32. Ad.           | Kerro, Bahr-el-Gebel.        | "                         |
| 33. Ad.           | Gondokoro, "                 | "                         |
| 34. Ad.           | Wadelai, "                   | J. S. Budgett, Esq. (P.). |
| 35. Ad.           | R. Shari at Maidugari.       | Capt. G. B. Gosling (P.). |
| 36-38. Ad. & yg.  | St. Louis, Senegal.          | Mr. P. Delhez (C.).       |
| 39-41. Hgr.       | Kaëdi, "                     | "                         |
| 42-45. Ad.        | Gambia.                      | J. S. Budgett, Esq. (P.). |
| 46. Ad.           | Lokoja, Upper Niger.         | "                         |

- |                                               |                     |                          |
|-----------------------------------------------|---------------------|--------------------------|
| 47. Ad.                                       | Jebba, Upper Niger. | Capt. G. F. Abadie (P.). |
| 48. Hgr.                                      | Abø, Lower Niger.   | Dr. W. J. Ansorge (C.).  |
| 49. Ad. (Type of<br><i>H. occidentalis</i> .) | Niger.              | Mr. J. T. Dalton (C.).   |

### 11. GYMNARCHUS.

Cuv. R. An. 2nd ed. ii. p. 357 (1829); Günth. Cat. Fish. vi. p. 225 (1866);  
Bouleng. Proc. Zool. Soc. 1898, p. 821, and Fish. Nile, p. 74 (1907).

Teeth forming a single complete series on the entire edge of both jaws (14 in the upper, 24–28 in the lower), with compressed, pointed, truncated, or slightly notched crowns finely serrated on the sides; palate and tongue toothless; mouth wide, terminal. Nostrils far apart, remote from the eye. Body much elongate, the tail gradually attenuated into a point. Dorsal occupying the whole length of the body; anal, ventral, and caudal fins absent. Vertebrae 114–120 (45–47 + 67–75). Air-bladder cellular, lung-like.

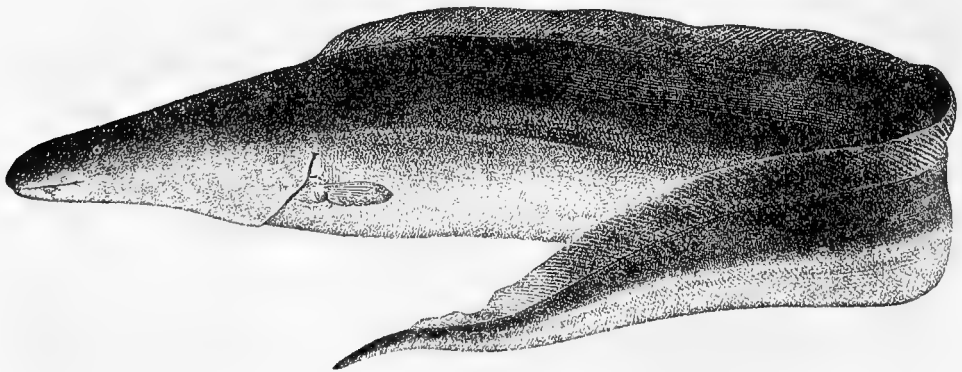
Tropical Africa, north of the Equator.

#### 1. GYMNARCHUS NILOTICUS.

Cuv. l. c.; Riffaud, Voy. Égypte, pl. 138 bis (1830); Erdl, Abh. Bayer. Ak. v. 1847, p. 209, pl. v.; Heckel, Denkschr. Ak. Wien, vi. 1854, p. 11, pl. i.; Hyrtl, Denkschr. Ak. Wien, xii. 1856, p. 1, pls. i.–iv.; Günth. Cat. Fish. vi. p. 225 (1866); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 556; Budgett, Tr. Zool. Soc. xvi. 1901, p. 126, pl. xi. figs. 4 & 5; Bouleng. ll. cc. pl. xiii.

Depth of body 7 to  $10\frac{2}{3}$  times in total length, length of head  $5\frac{1}{3}$  to  $6\frac{3}{4}$

Fig. 118.



*Gymnarchus niloticus*.  
White Nile (F. N.).  $\frac{1}{4}$ .

times. Head 2 to  $2\frac{1}{2}$  times as long as deep; snout rounded, scarcely projecting beyond the lower jaw; eye very small; a strong fold of the



skin connects the gill-openings across the isthmus. Dorsal 183–230. Pectoral rounded,  $\frac{1}{4}$  to  $\frac{2}{7}$  length of head. Scales very small, largest along the middle of the side. Olive or brown above, whitish beneath, end of tail blackish.

Total length 1070 millim.

Upper Nile to Bahr-el-Ghazal, Lake Rudolf, Chad Basin, Senegal, Gambia, Niger.—Type in Paris Museum.

|                                           |                          |                                                     |
|-------------------------------------------|--------------------------|-----------------------------------------------------|
| 1. Ad.                                    | Upper Nile.              | J. Petherick, Esq. (C.).                            |
| 2. Ad.                                    | Kawa, White Nile.        | L. Loat, Esq. (C.).                                 |
| 3–6. Hgr.                                 | Fashoda, „               | „                                                   |
| 7. Ad.                                    | Polkom, Baro R. (Sobat). | Mr. P. C. Zaphiro (C.);<br>W.N.McMillan, Esq. (P.). |
| 8. Head of ad.                            | Bahr-el-Ghazal.          | Capt. S. Flower (P.).                               |
| 9. Ad.                                    | Galeba, Lake Rudolf.     | Mr. P. C. Zaphiro (C.);<br>W.N.McMillan, Esq. (P.). |
| 10. Ad.                                   | R. Shari at Maidugari.   | Capt. G. B. Gosling (P.).                           |
| 11–14. Ad. & hgr.                         | Kaëdi, Senegal.          | M. P. Delhez (C.).                                  |
| 15. Skel.                                 | Lagos.                   | Sir A. Moloney (P.).                                |
| 16. Yg.                                   | Oguta, Lower Niger.      | Dr. W. J. Ansorge (C.).                             |
| 17–18. Yg.                                | Assay, „                 | J. S. Budgett, Esq. (P.).                           |
| 19, 20. Ad., stuffed<br>(skull separate). | Niger.                   | Mr. J. T. Dalton (C.).                              |
| 21. Hgr.                                  | „                        | „                                                   |
| 22–23. Yg.                                | West Africa.             | „                                                   |

### Fam. 3. NOTOPTERIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries, the latter the more developed; parietal bones separating the supraoccipital from the frontals; a large hole on each side of the skull, between the squamosal, the exoccipital, and the epiotic; symplectic present; no suboperculum; interoperculum small, hidden under the præoperculum. No pharyngeal teeth. Ribs sessile; accessory bones (adpleurals) attached to the extremity of the anterior ribs, with which they may be fused, and embraced by ossifications forming a double ventral serrature; præcaudal vertebræ with transverse processes in front of the ribs. Pectoral fins folding against the sides of the body. Air-bladder communicating with the ear. No oviducts.

Fresh and brackish waters of S.E. Asia and Tropical Africa.

Two genera:—

|                              |                                        |
|------------------------------|----------------------------------------|
| Dorsal fin present . . . . . | 1. <i>Notopterus</i> , Lacep., p. 146. |
| No dorsal fin . . . . .      | 2. <i>Xenomystus</i> , Gthr., p. 147.  |

1. **NOTOPTERUS.**

Lacep. Hist. Poiss. ii. p. 189 (1800), part. ; Cuv. & Val. Hist. Poiss. xxi. p. 119 (1848) ; Günth. Cat. Fish. vii. p. 478 (1868) ; Bouleng. Poiss. Bass. Congo, p. 117 (1901).

Body elongate and very strongly compressed, attenuate behind, the vent far forward ; scales small and cycloid ; lateral line distinct ; a double ventral serrature. Mouth large, with small teeth on the præmaxillaries and maxillaries ; teeth on vomer, palatines, pterygoids, and tongue. Bones of the head cavernous ; anterior nostril with a tentacle, the posterior near the eye. 6-9 branchiostegal rays. A short dorsal fin, in the middle of the body. Anal fin very long, confluent with the small caudal. Ventral fins rudimentary or absent. Air-bladder very large, with several divisions, forked in front and behind.

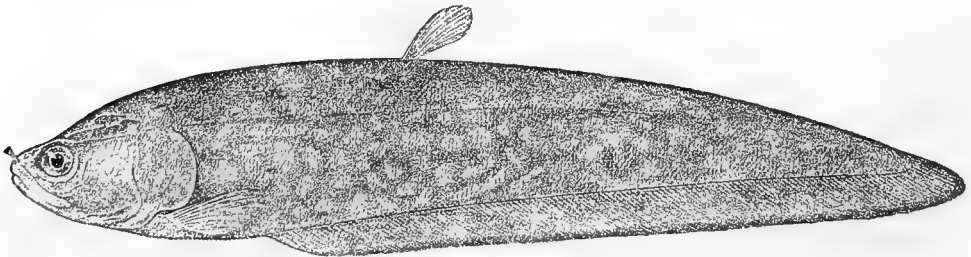
S.E. Asia and Tropical Africa.

1. **NOTOPTERUS AFER.**

Günth. Cat. Fish. vii. p. 480 (1868) ; Steind. Notes Leyd. Mus. xvi. 1894, p. 83 ; Bouleng. Poiss. Bass. Congo, p. 117 (1901).

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length, length of head 5 to 6 times. Upper profile of head slightly concave ; snout as long as or a little longer or a little shorter than eye, the diameter of which is

Fig. 119.



*Notopterus afer.*

Type.  $\frac{1}{2}$ .

$4\frac{1}{2}$  to  $6\frac{1}{2}$  times in length of head,  $1\frac{1}{4}$  to  $1\frac{3}{4}$  times in interocular width ; nasal tentacle truncate,  $\frac{2}{5}$  or  $\frac{1}{2}$  diameter of eye ; maxillary extending to below posterior border of eye ; lower border of præoperculum denticulate. Gill-membrane rather deeply notched ; 7 branchiostegal rays. Gill-rakers long, 8 or 9 on lower part of anterior arch. Dorsal 6-7. Anal 113-130 (caudal rays included). Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Ventrals absent. Ventral serrature formed of 35-40 pairs of spines.

Lateral line 130-165. Olive-grey to blackish, with more or less distinct darker spots or marblings, sometimes enclosing lighter roundish spots on the body or on the anal fin.

Total length 570 millim.

Gambia to Congo.

|                          |                               |                                                     |
|--------------------------|-------------------------------|-----------------------------------------------------|
| 1-2. Ad.                 | Gambia.                       | J. S. Budgett, Esq. (P.).                           |
| 3-4. Hgr., types.        | Sierra Leone.                 |                                                     |
| 5. Ad., type.            | Niger.                        | A. Murray, Esq. (P.).                               |
| 6. Hgr., type.           | "                             | Mr. J. T. Dalton (C.).                              |
| 7-8. Hgr., skins, types. | "                             | "                                                   |
| 9-10. Yg.                | Oguta, Lower Niger.           | Dr. W. J. Ansorge (C.).                             |
| 11. Ad.                  | Sapelle, "                    | "                                                   |
| 12. Hgr.                 | " "                           | Mr. J. D. Hamlyn (C.) ;<br>Hon. W. Rothschild (P.). |
| 13. Ad.                  | Old Calabar.                  | Miss Kingsley (C.).                                 |
| 14. Skel.                | "                             | "                                                   |
| 15. Ad.                  | Ibali, L. Leopold II., Congo. | M. P. Delhez (C.).                                  |

## 2. XENOMYSTUS.

Günth. Cat. Fish. vii. p. 479 (1868) ; Bouleng. Poiss. Bass. Congo, p. 118 (1901), and Fish. Nile, p. 80 (1907).

Differing from the preceding in the absence of dorsal fin and the presence of only 3 branchiostegal rays.

A single species.

### 1. XENOMYSTUS NIGRI.

*Notopterus nigri*, Günth. Cat. Fish. vii. p. 481 (1868).

*Notopterus (Xenomystus) nili*, Steind. Sitzb. Ak. Wien, lxxxiii. i. 1881, p. 196, pl. iv. fig. 2.

*Notopterus (Xenomystus) nigri*, Steind. Notes Leyd. Mus. xvi. 1894, p. 85.

*Xenomystus nigri*, Bouleng. Poiss. Bass. Congo, p. 118 (1901) ; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1124 ; Bouleng. Fish. Nile, p. 80, pl. xv. fig. 1 (1907).

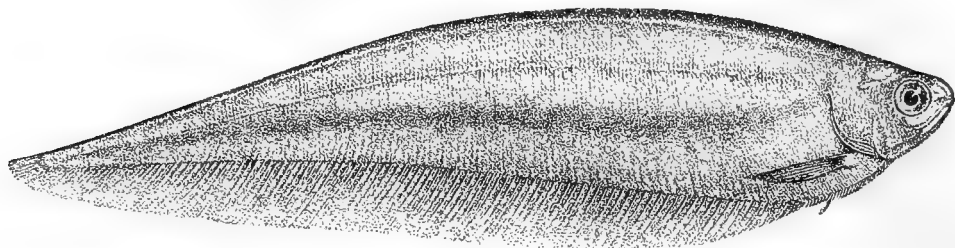
Depth of body  $4\frac{1}{3}$  to 5 times in total length, length of head 6 to  $7\frac{3}{4}$  times. Snout very short, shorter than eye, the diameter of which is 3 to  $3\frac{1}{2}$  times in length of head and equals or nearly equals interocular width ; mouth extending to below anterior third or centre of eye ; nasal tentacle long and attenuate,  $\frac{3}{5}$  to  $\frac{2}{3}$  diameter of eye ; præorbital, suborbitals, præoperculum, and mandible with the edge strongly serrated ; præoperculum with a serrated ridge, parallel with the lower border. Gill-membranes extending without a notch across the isthmus. Gill-rakers very short, tubercular, 9 to 11 on lower part of anterior arch.

Anal 108–130 (including caudal). Pectoral as long as head or a little shorter. Ventral serrature formed of 26–30 pairs of spines. Lateral line 120–142. Brownish, uniform or with fine darker longitudinal streaks.

Total length 200 millim.

Bahr-el-Gebel and Bahr-el-Zeraf, Chad Basin, Liberia, Niger, Gaboon, Congo.

Fig. 120.



*Xenomystus nigri*.

Bahr-el-Gebel (F. N.).  $\frac{2}{3}$ .

|                  |                              |                             |
|------------------|------------------------------|-----------------------------|
| 1. Hgr.          | Gondokoro, Bahr-el-Gebel.    | Dr. F. Werner (P.).         |
| 2–5. Ad.         | Fort Lamy, Shari R.          | Capt. G. B. Gosling (P.).   |
| 6. Type.         | Niger.                       | Mr. L. Fraser (C.).         |
| 7. Ad.           | Gaboon.                      | R. B. N. Walker, Esq. (P.). |
| 8. Hgr.          | Kondo-Kondo, Ogowe.          | Miss Kingsley (C.).         |
| 9–10. Ad. & hgr. | Lambarene, „                 | Dr. W. J. Ansorge (C.).     |
| 11. Hgr.         | Bangala Country, Congo.      | M. De Meuse (C.).           |
| 12. Hgr.         | Kondue, Lower Congo.         | M. Luja (C.).               |
| 13. Ad.          | Kutu, L. Leopold II., Congo. | M. P. Delhez (C.).          |
| 14. Skel.        | „ „                          | „                           |
| 15. Hgr.         | Ibali, „ „                   | „                           |
| 16–17. Ad.       | Monsembe, Upper Congo.       | Rev. J. H. Weeks (P.).      |
| 18. Ad.          | Upper Congo.                 | Brussels University.        |
| 19. Ad.          | Banzyville, Ubanghi.         | Capt. Royaux (C.).          |

#### Fam. 4. OSTEOGLOSSIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries, the latter the more developed; nasal bones large and in contact with each other; parietal bones separating the supraoccipital from the frontals; suboperculum much reduced and entirely or partially concealed under the præoperculum. No pharyngeal teeth. Ribs inserted on the strong parapophyses; epipleurals, no epineurals. Pectoral fins low down, folding against the belly. Head scaleless, the

thin skin confluent with the bones ; body covered with large bony scales, composed of pieces like mosaic. No oviducts.

Fresh waters of South America, Australia, the Malay Archipelago, and Africa.

### 1. HETEROTIS.

*Sudis* (non Rafin.), part., Cuv. Règne Anim. i. p. 180 (1817).

*Heterotis* (Ehrenb.), Cuv. & Val. Hist. Poiss. xix. p. 465 (1846) ; Günth. Cat. Fish. vii. p. 380 (1868) ; Bouleng. Fish. Nile, p. 83 (1907).

*Helicobranchus*, Hyrtl, Denkschr. Ak. Wien, viii. 1854, p. 86.

Mouth moderate, with small conical teeth forming a single series in the præmaxillaries, maxillaries, and dentaries ; groups of villiform teeth on the entopterygoids and on the tongue. Branchiostegal rays 7 or 8. Body strongly compressed. Dorsal and anal fins equally developed, on the caudal region of the body, elongate and narrowly separated from the small caudal ; ventral fins nearer end of snout than caudal fin, with 6 rays. Vertebrae 27 + 42-43. Air-bladder cellular, lodged in the closed hæmal arches of the caudal vertebrae. Fourth branchial arch with an accessory breathing-organ.

A single species.

### 1. HETEROTIS NILOTICUS.

*Sudis niloticus* (Ehrenb.), Cuv. Règne Anim. 2nd ed. i. p. 328 (1829) ; Rüpp. Besch. n. Fische Nil, p. 10, pl. iii. fig. 2 (1829).

*Sudis adansonii*, Cuv. l. c.

*Garafche*, Rifaud, Voy. Egypte, pl. exc. (1830).

*Heterotis ehrenbergii*, Cuv. & Val. Hist. Poiss. xix. p. 469, pls. cccclxxxiii. & cccclxxxiv. (1846) ; Hyrtl, Denkschr. Ak. Wien, viii. 1854, p. 73, pls. i.-iii.

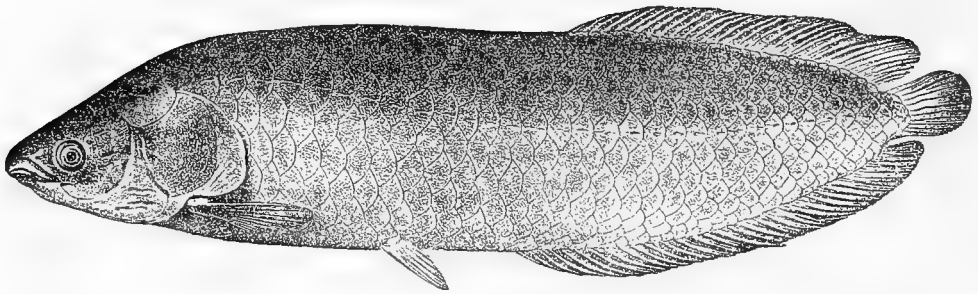
*Heterotis adansonii*, Cuv. & Val. t. c. p. 478.

*Heterotis niloticus*, Günth. Cat. Fish. vii. p. 380 (1868), and Petherick's Trav. ii. p. 266 (1869) ; Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 565, pl. viii. fig. 2 ; Hempr. & Ehrenb. Symb. Phys., Zool. pl. i., and Zoot. pls. viii. & ix. (1899) ; Budgett, Tr. Zool. Soc. xvi. 1901, p. 128, pl. xi. figs. 6 & 7 ; Bouleng. Fish. Nile, p. 84, pl. xiv. (1907).

Depth of body  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{3}{4}$  times. Head short and thick, convex above, its upper surface and sides rugose, granulate in the adult, with large sensory pits ; snout short, rounded,  $3\frac{3}{5}$  to 5 times in length of head ; eye perfectly lateral, its diameter  $5\frac{1}{2}$  to 8 times in length of head and 2 to  $3\frac{1}{4}$  times in interorbital width ; mouth with thick lips, straight and transverse in

front, obliquely bent on the sides, nearly square when fully open, extending to below anterior border of eye or a little beyond; a very large dermal flap borders the gill-cover. Gill-rakers long and slender, closely set. Dorsal 32-37, beginning a little further back than the

Fig. 121.

*Heterotis niloticus.*White Nile (F. N.).  $\frac{1}{5}$ .

anal; latter 34 to 39. Pectoral obtusely pointed,  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head. Ventral  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head. Caudal short, rounded. Caudal peduncle very short. Scales more or less rugose, 32-38 in lateral line,  $\frac{2\frac{1}{2}}{6}$  in transverse series on body in front of ventral,  $\frac{5}{6}$  between origin of dorsal and anal. Lateral line extending in a straight line from above gill-cover to middle of caudal peduncle; the canals tubular in the young, deep grooves in the adult. Brown, grey, or olive; young with dorsal and anal marked with rather indistinct longitudinal streaks, and a round dark spot on each of the scales of the caudal region of the body.

Total length 800 millim.

Tropical Africa north of the Equator.—Type in Berlin Museum.

- |                    |                                                      |                          |
|--------------------|------------------------------------------------------|--------------------------|
| 1. Ad.             | Nile.                                                |                          |
| 2-3. Ad.           | El Kirbekan, near Korti,                             | L. Loat, Esq. (C.).      |
|                    | Upper Nile.                                          |                          |
| 4. Skel.           | Khartum.                                             | J. Petherick, Esq. (C.). |
| 5, 6-9. Ad. & hgr. | Fashoda, White Nile.                                 | L. Loat, Esq. (C.).      |
| 10. Hgr.           | White Nile, lat. 9°.                                 | J. Petherick, Esq. (C.). |
| 11. Ad.            | Gabt-el-Megahid, between<br>Sobat and Bahr-el-Zeraf. | Capt. S. Flower (P.).    |

|                    |                      |                                                      |
|--------------------|----------------------|------------------------------------------------------|
| 12. Ad.            | Galeba, Lake Rudolf. | Mr. P. C. Zaphiro (C.) ;<br>W.N.McMillan, Esq. (P.). |
| 13. Skull.         | Shari River.         | Capt. G. B. Gosling (P.).                            |
| 14, 15. Ad. & hgr. | St. Louis, Senegal.  | M. P. Delhez (C.).                                   |
| 16. Ad.            | Gambia.              | J. S. Budgett, Esq. (P.).                            |
| 17. Hgr.           | Niger.               | Mr. J. T. Dalton (C.).                               |
| 18. Ad.            | "                    | W. A. Forbes, Esq. (P.).                             |
| 19-20. Yg.         | Assay, Lower Niger.  | J. S. Budgett, Esq. (P.).                            |
| 21. Yg.            | Benue R., N. of Ibi. | H. L. Norton Traill, Esq.<br>(C.).                   |

## Fam. 5. PANTODONTIDÆ.

Margin of the upper jaw formed by the single præmaxillary and the maxillaries, the former very small ; nasal bones large but not in contact with each other ; parietal bones separating the supraoccipital from the frontals ; præoperculum and suboperculum absent. Ribs inserted on the strong parapophyses ; epipleurals, no epineurals. Pectoral fin low down, folding against the belly ; mesocoracoid arch slender, strongly curved, meeting its fellow on the median line. Ventral fin with 7 rays, immediately behind pectorals.

A single genus.

## 1. PANTODON.

Peters, Mon. Berl. Ac. 1876, p. 195 ; Bouleng. Poiss. Bass. Congo, p. 121 (1901).

Body moderately elongate, compressed, the back, as well as the head, flattened, keeled below ; scales large ; lateral line distinct, canals straight and simple. Mouth large, with small sharp teeth ; similar teeth on the palate (vomer, palatines, pterygoids) and on the tongue. Nostrils widely separated, the posterior large and close to the eye. A very short dorsal fin ; anal fin longer and inserted further forward. Pectoral fin very large, the lower ray adnate to a fleshy process. Vertebræ 16+14.

A single species.

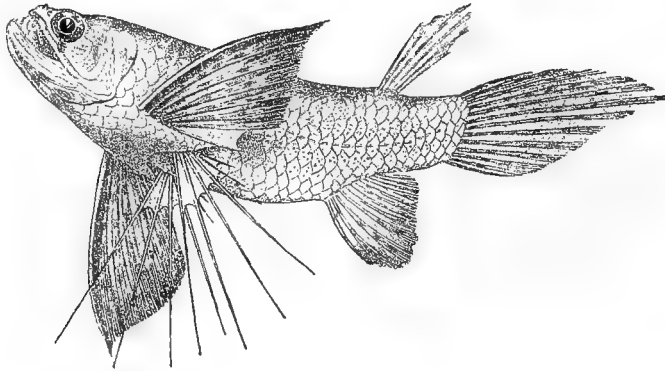
## 1. PANTODON BUCHHOLZI.

Peters, t. c. p. 196, pl. — ; Bouleng. l. c. ; Popta, Notes Leyd. Mus. xxiii. 1902, p. 111.

Depth of body  $3\frac{1}{3}$  to  $3\frac{2}{3}$  times in total length, length of head 4 to  $4\frac{1}{3}$  times. Snout shorter than eye, the diameter of which is  $3\frac{1}{2}$  times in length of head,  $1\frac{2}{3}$  times in interocular width ; mouth very oblique, directed upwards, extending beyond posterior border of eye. Dorsal 6,

above last rays of anal,  $3\frac{1}{2}$  to 4 times as distant from head as from caudal; third ray nearly as long as head. Anal 9-14, sometimes divided into two by a notch, posterior rays shortest. Pectoral  $\frac{2}{5}$  to  $\frac{1}{2}$  total length, formed of 8 rays, first longest and strong. First 4 ventral rays more or less produced, sometimes reaching caudal. Caudal pointed, median rays nearly twice as long as head. Caudal peduncle as long as deep. 28-30 scales in lateral line,  $3\frac{3}{5}$  in transverse series, 22 or 23 between occiput

Fig. 122.

*Pantodon buchholzi.*

Upper Congo.

and dorsal. Olive above, yellow or silvery beneath, more or less tinged with carmine; a few blackish dots on the body; sometimes dark bands across the back; fins pink, with small, round, purplish-brown spots, forming cross-bands on the pectorals, which are dark purple on the inner side and towards the end; dark bars across the lower jaw.

Total length 95 millim.

Niger, Old Calabar, Cameroon, Congo.—Type in Berlin Museum.

|                      |                           |                                           |
|----------------------|---------------------------|-------------------------------------------|
| 1. Ad.               | Brass, Lower Niger.       | N. Burrows, Esq. (P.).                    |
| 2. Ad.               | Assay, „                  | J. S. Budgett, Esq. (P.).                 |
| 3-4. Ad. & hgr.      | Old Calabar.              | D. G. Rutherford, Esq. (C.).              |
| 5. Skel.             | „                         | „                                         |
| 6. One of the types. | Victoria R., Cameroon.    | Dr. Buchholz (C.);<br>Berlin Museum (E.). |
| 7-8. Hgr.            | Cameroon.                 |                                           |
| 9-10. Ad.            | Monsembe, Upper<br>Congo. | Rev. J. H. Weeks (P.).                    |
| 11. Ad.              | Banzyville, Ubanghi.      | Capt. Royaux (C.).                        |



Fam. 6. CLUPEIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries; supraoccipital bone in contact with the frontals; opercular bones well developed. Ribs mostly sessile, inserted behind parapophyses; intermuscular bones (epineurals, epipleurals, adpleurals) usually numerous. Pectoral fins low down, folding against the belly; post-clavicle applied to outer side of clavicle. Air-bladder communicating with the ear (except in the *Chaninæ*, which should perhaps stand as a distinct family).

*Synopsis of the Genera.*

I. CLUPEINÆ.—Mouth large; belly keeled, serrated; no lateral line; gill-membranes deeply notched; ventrals with 6 to 9 rays.

A. Dorsal originating above ventrals; anal with less than 30 rays.

Teeth extremely small or absent . . . . . 1. *Clupea*, L., p. 153.

Teeth moderate or large . . . . . 2. *Pellonula*, Gthr., p. 155.

B. Dorsal opposite to the space between ventrals and anal.

Canine teeth present; anal with less than 30 rays. 3. *Odaxothrissa*, Blgr., p. 160.

Teeth small; anal with less than 30 rays . . . . 4. *Microthrissa*, Blgr., p. 161.

Teeth very small; anal with more than 30 rays . 5. *Ilisha*, Gray, p. 162.

II. CHANINÆ.—Mouth small, toothless; belly rounded; lateral line present; gill-membranes entirely united; ventrals with

11 or 12 rays . . . . . 6. *Chanos*, Lacep., p. 164.

1. CLUPEA.

Linn. Syst. Nat. i. p. 522 (1766), part.; Günth. Cat. Fish. vii. p. 412 (1886); Bouleng. Fish. Nile, p. 89 (1907).

*Alosa*, Cuv. Règne Anim. 2nd ed. ii. p. 319 (1829).

Mouth moderate or large; teeth small or absent; maxillary formed of three pieces. Branchiostegal rays 6 to 10. Body compressed, with an abdominal serrature formed of bony scutes; scales moderate or large; no lateral line. Dorsal fin short, opposite to the ventrals and anterior to the anal, which is more elongate. Ventrals with 6–9 rays. Vertebrae 40–59.

Of almost cosmopolitan marine distribution. One anagamous species in North Africa.

## 1. CLUPEA FINTA\*.

*Clupea alosa*, Linn. in Hasselq. Reise Palæst. p. 430 (1762), and Syst. Nat. i. p. 523 (1766), part.

*Clupea sprattus* (non Linn.), Sonnini, Trav. Egypt, p. 416, pl. xvi. fig. 4 (1800).

*Clupea nilotica*, I. Geoffr. Descr. Egypte, Poiss. p. 286, pl. x. fig. 1 (1827).

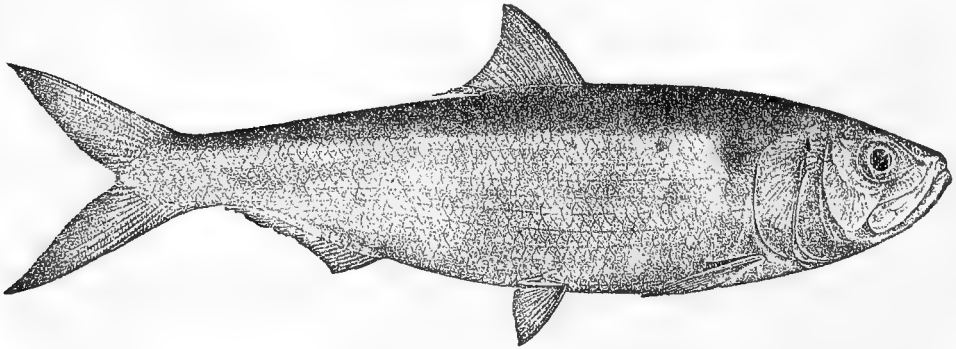
*Clupea finta*, Cuv. Règne Anim. ii. 2nd ed. p. 320 (1829); Günth. Cat. Fish. vii. p. 435 (1868), and Petherick's Trav. ii. p. 264 (1869); Vincig. Ann. Mus. Genova, xx. 1884, p. 443; Bouleng. Fish. Nile, p. 89, pl. xv. fig. 2 (1907).

*Alosa finta*, Rüpp. Beschr. n. Fische Nil, p. 5 (1829).

*Alausa vulgaris*, part., Cuv. & Val. Hist. Poiss. xx. p. 391 (1847).

Body strongly compressed, its depth  $3\frac{2}{5}$  to  $3\frac{3}{5}$  times in total length; length of head  $3\frac{2}{3}$  to 5 times. Top of head somewhat concave, the concavity bordered by two oblique ridges converging on the occiput; snout short, as long as eye in young, a little longer in adult; eye with a very distinct transparent lid in front and behind; diameter of eye 5 (young) to  $6\frac{2}{3}$  times in length of head, equal to interorbital width in young, about  $\frac{5}{6}$  that width in adult; mouth large, oblique; upper

Fig. 123.

*Clupea finta*.Nile (F. N.).  $\frac{1}{2}$ .

jaw notched in the middle, lower jaw slightly projecting, with small teeth in young, toothless in adult; maxillary large, extending to below posterior third of eye in young, to below posterior border of eye or a little beyond in adult; operculum with radiating striæ descending towards the suboperculum. Gill-rakers slender, 20-23 on lower part of anterior arch, the longest measuring  $\frac{1}{2}$  to  $\frac{2}{3}$  diameter of eye. Dorsal small, 17-20, originating nearer end of snout than root of caudal. Anal low, 21-24, originating a little nearer base of ventral than root of

\* The quotations in the synonymy refer only to African specimens.

caudal. Pectoral pointed,  $\frac{2}{5}$  to  $\frac{2}{3}$  length of head; a scaly pointed appendage above its base. Ventral small, a little behind vertical of origin of dorsal, also with a scaly appendage above its base. Caudal deeply forked, with pointed lobes, the lower often a little longer than the upper. Caudal peduncle a little longer than deep. Scales smooth and thin, deciduous, 58-64 in longitudinal series, 18-20 in transverse series; 19-21 bony keeled scutes between isthmus and ventral, 13-15 between latter and vent. Back greenish or bluish, steel-colour, sides and belly silvery white; a blackish spot behind the upper part of the gill-cover, sometimes followed by a series of four or five smaller spots on the body; fins whitish or greyish, the caudal fin often edged with blackish.

Total length 360 millim.

Coasts of Europe from the North Sea to the Mediterranean, breeding in fresh water. Ascending the rivers of North Africa.

|                 |                                         |                            |
|-----------------|-----------------------------------------|----------------------------|
| 1-2. Ad.        | Algeria.                                | Sir L. Playfair (P.).      |
| 3. Yg.          | Bahr-el-Tawilah, near Lake<br>Menzaleh. | L. Loat, Esq. (C.).        |
| 4-7. Yg.        | Samannud, Damietta Nile.                | „                          |
| 8-9. Hgr. & yg. | Rosetta Nile, near Barrage.             | „                          |
| 10. Hgr.        | Cairo.                                  | „                          |
| 11-13. Yg.      | Near Cairo.                             | „                          |
| 14. Ad.         | Birket Karun, Fayum.                    | „                          |
| 15-16. Ad.      | Nile.                                   | Rev. O. P. Cambridge (P.). |

## 2. PELLONULA.

Günth. Cat. Fish. vii. p. 452 (1868); Bouleng. Poiss. Bass. Congo, p. 124 (1901).

Mouth moderate or large; sharp, unequal conical teeth in each jaw, with strongly enlarged ones at least in the lower jaw; minute teeth on the maxillary; conical teeth on the palatines and on the tongue; maxillary formed of two pieces. Branchiostegal rays 6. Body strongly compressed, with an abdominal serrature formed of bony scutes; scales moderate; no lateral line. Dorsal fin-short, originating above ventrals; anal moderately elongate, with less than 20 rays. Ventrals with 8 or 9 rays. Vertebræ 46.

Fresh waters of Tropical Africa.

*Synopsis of the Species.*

I. Dorsal 15–17, originating at equal distance from end of snout and from base of caudal, or a little nearer the latter; lower jaw projecting beyond the upper.

Depth of body not more than 4 times in total length; keeled ventral scutes 13–15 + 9–10; anal originating a short distance behind vertical of dorsal . . . . . 1. *P. vorax*, Gthr., p. 156.

Depth of body  $4\frac{2}{3}$ – $5\frac{1}{2}$  times in total length; keeled ventral scutes 19–20 + 10–11; anal originating a long way behind dorsal . . . . . 2. *P. miodon*, Blgr., p. 157.

II. Dorsal 13–14, originating much nearer end of snout than base of caudal; upper jaw projecting beyond the lower; anal originating a long way behind dorsal.

Snout obtusely pointed; keeled ventral scutes 12–13 + 10 . . . . . 3. *P. obtusirostris*, Blgr., p. 158.

Snout acutely pointed; keeled ventral scutes 12–13 + 12 . . . . . 4. *P. acutirostris*, Blgr., p. 159.

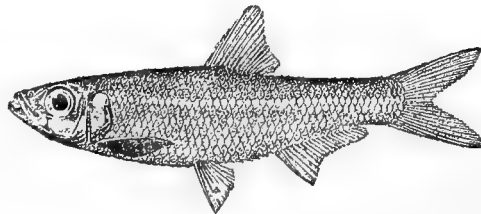
## 1. PELLONULA VORAX.

Günth. Cat. Fish. vii. p. 452 (1868); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 570, pl. vii. fig. 3; Perugia, Ann. Mus. Genova, (2) x. 1891, p. 977; Steind. Notes Leyd. Mus. xvi. 1894, p. 83; Bouleng. Poiss. Bass. Congo, p. 125 (1901).

*Pellonula modesta*, J. G. Fisch. Jahrb. Hamb. Wiss. Anst. ii. 1885, p. 75.

Depth of body  $3\frac{1}{6}$  to 4 times in total length, length of head  $3\frac{1}{2}$  to 4 times. Snout pointed, as long as eye, which is 3 to  $3\frac{1}{3}$  times in length of head,  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times interorbital width; a well-developed adipose

Fig. 124.

*Pellonula vorax.*

Senegal, after Steindachner (*l. c.*)  $\frac{5}{6}$ .

eyelid; chin projecting beyond snout; maxillary extending to below anterior border of eye or a little beyond; strongly enlarged teeth in both jaws in the adult. Gill-rakers long and slender, 27–30 on lower

part of anterior arch. Dorsal 15-17, originating at equal distance from end of snout and from root of caudal. Anal 17-19, originating immediately behind or a short distance behind vertical of dorsal. Pectoral about  $\frac{2}{3}$  length of head, not reaching ventral. Caudal deeply forked, with pointed lobes. Caudal peduncle as long as deep. 42-46 scales in longitudinal series, 13-14 in transverse series; 13-15 keeled scutes between isthmus and ventrals, 9-10 between ventrals and anal. Golden, with a silvery lateral band; young speckled with black.

Total length 120 millim.

Senegal to Congo.

|                   |                                   |                                               |
|-------------------|-----------------------------------|-----------------------------------------------|
| 1. Ad., type.     | W. Africa.                        | Mr. L. Fraser (C.).                           |
| 2. Hgr., type.    | Niger.                            | "                                             |
| 3-5. Hgr.         | Jebba, Upper Niger.               | Dr. C. Christy (C.).                          |
| 6-9. Ad. & yg.    | Agberi, Lower Niger.              | Dr. W. J. Ansorge (C.).                       |
| 10-12. Hgr.       | Old Calabar.                      | Miss Kingsley (C.).                           |
| 13. Ad.           | Cameroon.                         | Dr. Jackson (C.);<br>Hon. W. Rothschild (P.). |
| 14-16. Hgr.       | Benito River.                     | G. L. Bates, Esq. (C.).                       |
| 17. Ad.           | Gaboon.                           |                                               |
| 18. Ad.           | Boma, Lower Congo.                | J. J. Monteiro, Esq. (C.).                    |
| 19. Ad.           | Vivi, "                           | Capt. Bove (C.);<br>Genoa Museum (P.).        |
| 20-23. Yg.        | Bikoro, L. Tumba, Upper<br>Congo. | M. P. Delhez (C.).                            |
| 24-27. Hgr. & yg. | Coquilhatville, Upper<br>Congo.   | "                                             |
| 28. Hgr.          | Monsembe, Upper Congo.            | Rev. J. H. Weeks (C.).                        |
| 29. Ad.           | Stanley Falls.                    | Rev. W. H. Bentley (C.).                      |
| 30. Skel.         | "                                 | "                                             |
| 31. Ad., type.    | — ?                               | Dr. A. Günther (P.).                          |

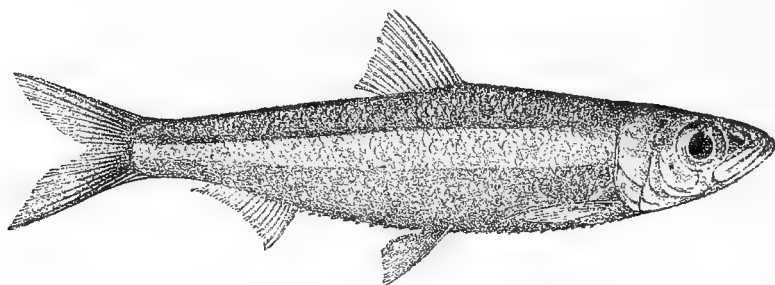
## 2. PELLONULA MIODON.

Bouleng. Tr. Zool. Soc. xvii. 1906, p. 546, pl. xxx. fig. 2.

Depth of body  $4\frac{2}{3}$  to  $5\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to 4 times. Snout obtusely pointed, as long as eye, which is  $3\frac{1}{3}$  to  $3\frac{1}{2}$  times in length of head and equals  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times interorbital width; chin projecting beyond the snout; maxillary extending to below anterior border or anterior fourth of eye; teeth small, the larger confined to anterior extremity of mandible. Gill-rakers long and slender, closely set, 35-40 on lower part of anterior arch. Dorsal 15-16, equally distant from centre or posterior border of eye and from root of caudal;

longest rays about  $\frac{1}{2}$  length of head. Anal 16-17, a long way behind dorsal, nearer root of caudal than base of ventrals. Pectoral  $\frac{3}{5}$  length of head, widely separated from ventral. Ventral below anterior third or middle of dorsal. Caudal deeply forked, with pointed lobes. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep. 45-48 scales in longitudinal

Fig. 125.

*Pellonula miodon.*

Type (Tr. Z. Soc. 1906).

series, 14 in transverse series; 19-20 keeled scutes between isthmus and ventrals, 10-11 between ventrals and anal. Olive above, silvery below; an indistinct blue lateral band; dorsal and caudal greyish.

Total length 140 millim.

Lake Tanganyika.

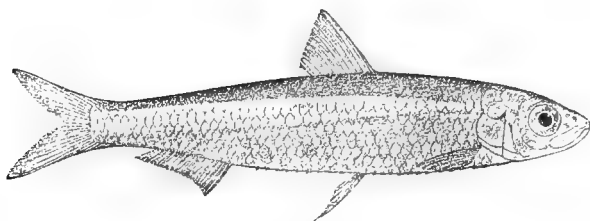
|                         |                  |                            |
|-------------------------|------------------|----------------------------|
| 1-4. Ad. & hgr., types. | Ndanvie.         | Dr. W. A. Cunningham (C.). |
| 5. Ad., type.           | Tembwi.          | "                          |
| 6. Ad., "               | Vua.             | "                          |
| 7-11. Yg., types.       | Mbete.           | "                          |
| 12-21. Yg., "           | Niamkolo Island. | "                          |
| 22-23. Ad., "           | Kasakalewa.      | "                          |

### 3. PELLONULA OBTUSIROSTRIS, sp. n.

Depth of body equal to length of head,  $4\frac{1}{4}$  or  $4\frac{1}{3}$  times in total length. Snout obtusely pointed, projecting very slightly beyond lower jaw, not quite as long as eye, which is 3 times in length of head and slightly exceeds interorbital width; adipose eyelid feebly developed; maxillary extending to below anterior third of eye; no strongly enlarged teeth. Gill-rakers slender, shorter than brachial filaments, about 15 on lower part of anterior arch. Dorsal 13, originating slightly in advance of ventrals, much nearer end of snout than base of caudal. Anal 17-18, twice as distant from base of ventral as from caudal, and originating a

long way behind vertical of dorsal. Pectoral  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle once and  $\frac{1}{2}$  as long as deep. 42-44 scales in longitudinal series, 10 in transverse series; 12-13 keeled scutes between isthmus

Fig. 126.

*Pellonula obtusirostris.*

Type.

and ventrals, 10 between ventrals and anal. Body yellowish, head and a broad lateral band silvery.

Total length 72 millim.

Upper Congo.

1-2. Types.

Aruwimi R.

R. B. Woosnam, Esq. (C.);  
Ruwenzori Expedition.

#### 4. PELLONULA ACUTIROSTRIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 63, pl. xxxv. fig. 7 (1899), and Poiss. Bass. Congo, p. 126 (1901).

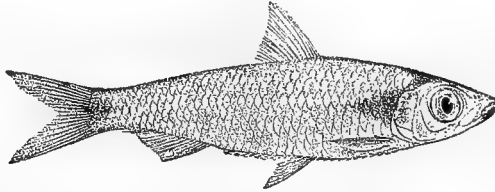
Depth of body 4 to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{3}{4}$  to 4 times. Snout acutely pointed, projecting slightly beyond lower jaw, as long as eye, which is 3 times in length of head and slightly exceeds interorbital width; a well-developed adipose lid; maxillary extending a little beyond anterior border of eye; teeth unequal in size, none very strongly enlarged. Gill-rakers slender, much shorter than branchial filaments, about 25 on lower part of anterior arch. Dorsal 13-14, originating above first ray of ventral, much nearer end of snout than base of caudal. Anal 17-18, nearly twice as distant from base of ventral as from caudal, and originating a long way behind vertical of dorsal. Pectoral  $\frac{2}{3}$  to  $\frac{2}{3}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. 40-42 scales in longitudinal series, 10 in transverse series; 12-13 keeled scutes between isthmus and ventrals, 12 between ventrals and anal.

Olive above, white beneath, with a silvery lateral band; sometimes a large dark spot on gill-cover and scapular region and another at base of caudal.

Total length 75 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

Fig. 127.



*Pellonula acutirostris.*

Type (A. M. C.).  $\frac{3}{4}$ .

|                      |                              |                      |
|----------------------|------------------------------|----------------------|
| 1. One of the types. | Coquilhatville, Upper Congo. | M. P. Delhez (C.).   |
| 2-3. Ad.             | Upper Congo.                 | Brussels University. |
| 4. Ad.               | Banzyville, Ubanghi.         | Capt. Royaux (C.).   |

### 3. ODAXOTHRISSA.

Bouleng. Ann. Mus. Congo, Zool. i. p. 64 (1899), and Poiss. Bass. Congo, p. 127 (1901).

Mouth large; sharp conical teeth in each jaw, with a large canine-like tooth on each side, directed backwards; minute teeth on the maxillary; conical teeth on the palatines and on the tongue; maxillary formed of two pieces. Branchiostegal rays 7. Body strongly compressed, with an abdominal serrature formed of bony scutes; scales moderate; no lateral line. Dorsal fin short, behind vertical of ventrals; anal rather long, with 21 or 22 rays. Ventrals with 9 rays.

Congo.

#### 1. ODAXOTHRISSA LOSERA.

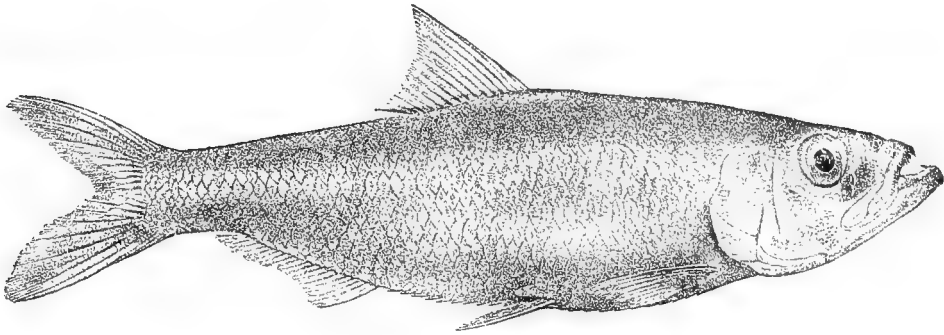
Bouleng. ll. cc. pp. 64, 128, pl. xxxi. fig. 1.

Depth of body equal to or a little less than length of head,  $3\frac{1}{2}$  to 4 times in total length. Snout rounded,  $\frac{1}{3}$  length of head, equal to diameter of eye, which is greater than interorbital width; chin projecting strongly beyond the snout; maxillary extending to below centre of eye. Gill-rakers much shorter than gill-filaments, 18-20 on lower part of anterior arch. Dorsal 16-17, originating immediately behind vertical of base of ventrals, at equal distance from end of snout and from caudal.



Anal 21-22. Pectoral  $\frac{2}{3}$  length of head, not reaching ventral. Caudal deeply forked, with pointed lobes. Caudal peduncle a little longer than deep. 44-46 scales in longitudinal series, 14 in transverse series; 17-

Fig. 128.



*Odaxotrissa losera*.  
Type (A. M. C.).  $\frac{5}{7}$ .

18 keeled scutes between isthmus and ventrals, 9-10 between ventrals and anal. Olive-brown above, white beneath; a more or less distinct silvery lateral band.

Total length 160 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

- |                      |                      |                    |
|----------------------|----------------------|--------------------|
| 1. One of the types. | Coquilhatville.      | M. P. Delhez (C.). |
| 2. Ad.               | Banzyville, Ubanghi. | Capt. Royaux (C.). |

#### 4. MICROTHRISSA.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 26 (1902).

Mouth moderately large, with a series of sharp conical teeth in each jaw; maxillary toothless, formed of two pieces; small teeth on the palatines, none on the tongue. Branchiostegal rays 6. Body strongly compressed, with an abdominal serrature formed of bony scutes; scales moderate; no lateral line. Dorsal fin short, behind vertical of ventrals; anal rather long, with 23 to 25 rays. Ventrals with 9 rays.

Congo.

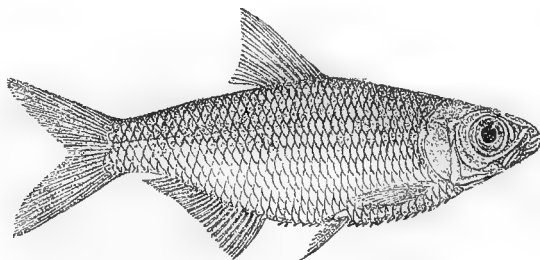
##### 1. MICROTHRISSA ROYAUXI.

Bouleng. l. c. pl. viii. fig. 1.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Snout rounded, shorter than eye, which is 3 to  $3\frac{1}{3}$  times in length of head and a little greater than interorbital width; jaws equal in front;

maxillary rather narrow, extending scarcely beyond anterior border of eye. Gill-rakers long and slender, about 20 on lower part of anterior arch. Dorsal 13, last ray above first of anal, longest ray  $\frac{4}{5}$  length of head. Anal 23-25. Pectoral rather more than  $\frac{2}{3}$  length of head, nearly

Fig. 129.

*Microthrissa royauwi.*

Type (A. M. C.).

reaching ventral. Caudal deeply forked, with pointed lobes. Caudal peduncle nearly as long as deep. 38 scales in longitudinal series, 12 in transverse series; 13 keeled scutes between isthmus and ventrals, 6-7 between ventrals and anal. Brownish, with a rather indistinct silvery lateral band.

Total length 65 millim.

Ubanghi.—Types in Congo Museum, Tervueren.

1. One of the types.

Banzville.

Capt. Royaux (C.).

### 5. ILISHA.

*Platygaster* (non Latr.), Swains. Nat. Hist. ii. p. 294 (1839).

*Ilisha*, Gray, in Richards, Ichth. China, p. 306 (1846); Bleek. Atl. Ichth. vi. p. 116 (1872).

*Pellona*, Cuv. & Val. Hist. Poiss. xx. p. 300 (1847); Günth. Cat. Fish. vii. p. 454 (1868).

Mouth moderately large, with minute teeth; small teeth on the palatines, pterygoids, and tongue; maxillary formed of 2 or 3 pieces. Branchiostegal rays 6. Body strongly compressed, with an abdominal serrature formed of bony scutes; scales moderate or small; no lateral line. Dorsal fin short, behind vertical of ventrals; anal long, with more than 30 rays. Ventrals very small, with 6 to 8 rays. Vertebrae 46\*.

Tropical Atlantic and Indian Oceans, some species entering fresh waters.

\* In *I. motius*.

## 1. ILISHA INDICA.

*Platygaster indicus*, Swains. l. c.

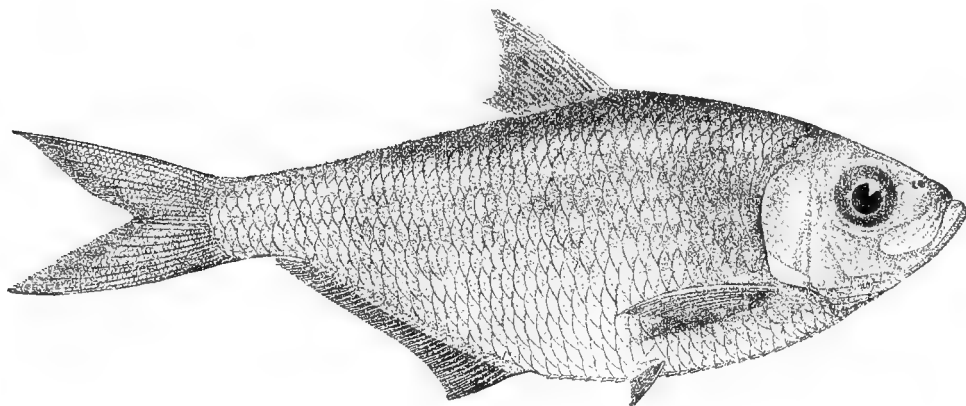
*Pellona ditchoa*, Cuv. & Val. t. c. p. 313; Playf. & Günth. Fish. Zanz. p. 122 (1866); Günth. t. c. p. 455.

*Ilisha indica*, Bleek. op. cit. p. 118, pl. cclix. fig. 4.

*Pellona indica*, Day, Fish. Ind. p. 644, pl. clxiv. fig. 4 (1878).

Depth of body  $2\frac{1}{2}$  to  $2\frac{4}{5}$  times in total length, length of head  $3\frac{2}{3}$  to 4 times. Snout short, chin projecting; eye very large, about  $2\frac{1}{2}$  times in length of head and double interorbital width; a well-developed adipose eyelid; maxillary extending to below anterior third of eye. Gill-rakers long and slender, 24–28 on lower part of anterior arch. Dorsal 16–18, originating at equal distance from end of snout and from root of caudal or a little nearer former. Anal 37–39, originating just behind vertical

Fig. 130.



*Ilisha indica*.

After Day (Fish. Ind.).  $\frac{3}{4}$ .

of last ray of dorsal. Pectoral about  $\frac{3}{5}$  length of head. Caudal deeply forked, with pointed lobes. Caudal peduncle as long as deep. 43–45 scales in longitudinal series, 13–14 in transverse series; 18–19 keeled scutes between isthmus and ventrals, 8–9 between ventrals and anal. Silvery or golden, bluish on the back.

Total length 150 millim.

East coast of Africa to Malay Archipelago, entering rivers.

1-2. Skins.

Kingani R.

Sir L. Playfair (C.).

3. Ad.

Zanzibar.

”

## 6. CHANOS.

Lacep. Hist. Poiss. v. p. 395 (1803); Günth. Cat. Fish. vii. p. 473 (1868); Bleek Atlas Ichth. vi. p. 81 (1872).

*Lutodeira* (van Hasselt), Rüpp. Fische R. Meer. p. 17 (1828).

*Scoliostrumus*, Rüpp. l. c.

Mouth small; no teeth; maxillary rather small. Eye entirely covered by a transparent adipose lid. Gill-membranes entirely united, but free from the isthmus; branchiostegal rays 4. Body compressed, belly rounded; scales small, longitudinally striated; lateral line present, with straight, simple tubules. Dorsal fin above the ventrals, longer than the anal, these fins folding in a scaly sheath. Ventral fins with 11 or 12 rays. A scaly process above the base of the pectoral, and another above the ventral. Vertebræ 43-44. Air-bladder with a constriction. An accessory branchial organ.

Indian and Tropical Pacific Oceans, often occurring in fresh waters.

## 1. CHANOS SALMONEUS.

*Mugil chanos*, Forskål, Descr. Anim. p. 74 (1775).

*Mugil salmoneus* (Forst.), Bloch-Schneid. Syst. Ichth. p. 421 (1801); Forst. Descr. Anim. p. 299 (1844).

*Chanos arabicus*, Lacep. Hist. Poiss. v. p. 396 (1803); Cuv. & Val. Hist. Pois. xix. p. 187 (1846).

*Lutodeira chanos*, Rüpp. Fische R. Meer. p. 18 (1828).

*Lutodeira salmonea*, Richards. Zool. Ereb. & Terr., Ichth. p. 58, pl. xxxvi. figs. 1 & 2 (1846).

*Chanos mento*, Cuv. & Val. t. c. p. 191.

*Chanos chloropterus*, Cuv. & Val. t. c. p. 195.

*Chanos nuchalis*, Cuv. & Val. t. c. p. 196.

*Chanos lubina*, Cuv. & Val. t. c. p. 199, pl. cccclxvii.

*Chanos salmoneus*, Cuv. & Val. t. c. p. 201; Günth. Cat. Fish. vii. p. 473 (1868); Bleek. Atlas Ichth. vi. p. 81, pl. cclxxii. fig. 4 (1872); Day, Fish. Ind. p. 651, pl. clxvi. fig. 2 (1878).

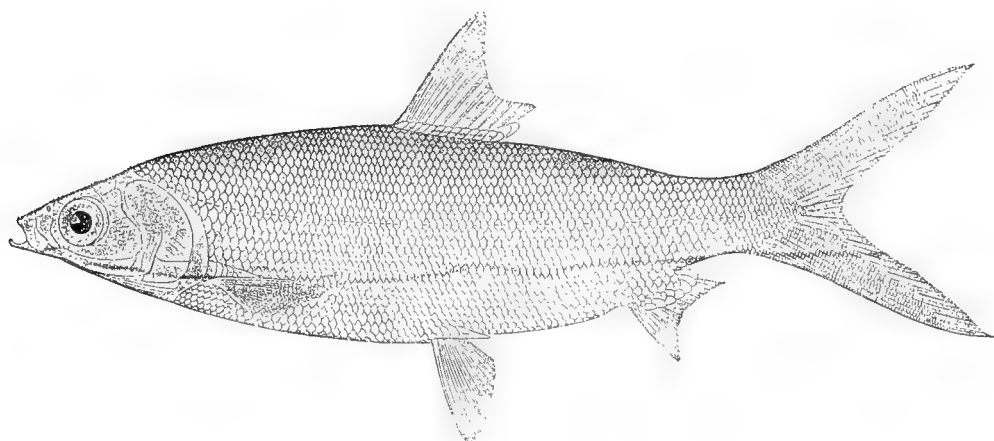
*Chanos mossambicus*, Peters, Mon. Berl. Ac. 1852, p. 684, and Reise Mossamb. iv. p. 93, pl. xx. fig. 1 (1868).

*Chanos chanos*, Klunz. Verh. zool.-bot. Ges. Wien, xxi. 1871, p. 605.

Depth of body  $3\frac{1}{5}$  to  $3\frac{2}{3}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Snout rounded, about as long as eye, which is  $3\frac{1}{2}$  to 4 times in length of head; interorbital region flat, its width 1 to  $1\frac{1}{2}$  times diameter of eye; width of mouth less than length of snout. Gill-rakers very closely set and extremely numerous, shorter than gill-lamellæ.

Dorsal 13–17, equally distant from occiput and from base of caudal. Anal 10–11. Pectoral  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head, widely separated from ventral. Caudal deeply forked, with long pointed lobes. Caudal peduncle about

Fig. 131.

*Chanos salmoneus.*

Mozambique, after Peters (Reise Mossamb.).  $\frac{2}{3}$ .

once and  $\frac{1}{2}$  as long as deep. Scales 75–90  $\frac{12-14}{18-20}$ , 12–14 between lateral line and scaly process at base of ventral. Silvery, bluish on the back.

Total length 550 millim.—Grows to 1 metre or more.

East coast of Africa to Polynesia.

|                 |                            |                         |
|-----------------|----------------------------|-------------------------|
| 1. Hgr., stfld. | Red Sea.                   | Dr. Rüppell.            |
| 2. Ad., stfld.  | Zanzibar.                  | Sir L. Playfair (C.).   |
| 3. Yg.          | „                          | Sir J. Kirk (P.).       |
| 4. Hgr.         | Seychelles.                | Sir L. Playfair (P.).   |
| 5–7. Yg.        | Rodriguez, in fresh water. | G. Gulliver, Esq. (P.). |

### Fam. 7. SALMONIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries; supraoccipital bone in contact with the frontals; opercular bones well developed. Ribs sessile, parapophyses very short or absent; epineurals, sometimes also epipleurals, present. Pectoral fins low down, folding against the belly. An adipose dorsal fin. Oviducts rudimentary or absent.

Marine and fresh-water Fishes, mostly from the Temperate and Arctic zones of the Northern Hemisphere.

## 1. SALMO.

Artedi, Gen. Pisc. p. 11 (1738); Cuv. & Val. Hist. Poiss. xxi. p. 166 (1848);  
Günth. Cat. Fish. vi. p. 2 (1866).

*Salvelinus*, Richards. Faun. Bor.-Am. iii. p. 169 (1836).

*Fario*, Cuv. & Val. t. c. p. 277.

*Salar*, Cuv. & Val. t. c. p. 314.

*Umbla*, Rapp, Fische Bodensee, p. 32 (1854).

*Oncorhynchus*, Suckley, Ann. Lyc. N. Y. 1861, p. 312; Günth. t. c. p. 155.

*Hypsifario*, Gill, Proc. Ac. Philad. 1862, p. 330.

*Trutta*, Siebold, Süßwasserf. Mitt. Eur. p. 280 (1863).

*Hucho*, Günth. t. c. p. 125.

*Cristivomer*, Jord. Man. Vert. E. U.S. 2nd ed. p. 356 (1878).

Mouth large, with strong dentition. 10 to 15 branchiostegal rays.

Dorsal fin moderately large, opposite or nearly opposite to ventrals.

9 or 10 ventral rays. Scales small or very small.

Cold and temperate parts of Northern Hemisphere.

## 1. SALMO TRUTTA.

Linn. Syst. Nat. i. p. 509 (1766).

The North-African Trout belongs to a variety (scarcely distinct from the var. *fario*, L., of Europe) of which the following is the synonymy:—

*Salar macrostigma*, A. Dumér. C. R. Ac. Sci. xlii. 1858, p. 160, and Rev. et Mag. Zool. 1858, p. 396, pl. x.

*Salmo lepasseti*, Zill, Ann. Sci. Nat. (4) ix. 1858, p. 128.

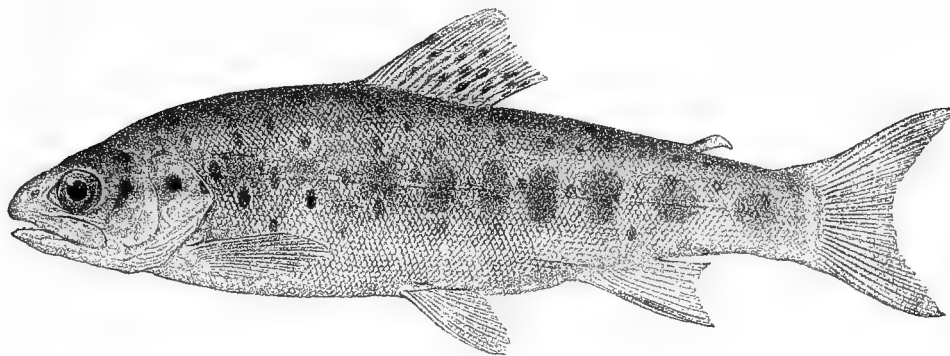
*Salmo macrostigma*, Günth. Cat. Fish. vi. p. 76 (1866); Vincig. Boll. Agrar. Roma, xviii. 1896, p. 107; Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 108.

*Salmo fario*, var. *macrostigma*, Bouleng. Ann. & Mag. N. H. (6) xviii. 1896, p. 152.

Depth of body  $3\frac{2}{3}$  to  $4\frac{1}{3}$  times in total length, length of head  $4\frac{1}{4}$  to  $4\frac{1}{2}$  times. Eye  $3\frac{2}{3}$  (young) to  $4\frac{2}{3}$  times in length of head; maxillary extending to below posterior third of eye in young, to below posterior border of eye or a little beyond in adult; vomerine teeth forming a double, zigzag row. 10–12 gill-rakers on lower part of anterior arch. Dorsal IV 9–10. Anal III 8–10. 95–128 scales in lateral line, 14–16 in an oblique series between adipose fin and lateral line. Caudal deeply notched in the young, truncate or feebly notched in the adult. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep. Olive-brown above, shading to golden yellow or yellowish white beneath; a series of 9 to

12 vertically oval, large, blackish spots (parr-marks) on each side in the young, more or less distinct traces of these persisting in the adult; small black and red spots on the back and sides, sometimes encircled with whitish or bluish; a large round black spot on the operculum; dorsal

Fig. 132.

*Salmo trutta*, var. *macrostigma*.

Type, after A. Duméril (Rev. Mag. Zool. 1858).  $\frac{5}{7}$ .

spotted with black; dorsal and anal with a dark and light anterior margin.

Total length 290 millim.

Hill-stream of Algeria (Kabylia) and Morocco; Sicily, Sardinia, Asia Minor, and Northern Persia.—Type in Paris Museum.

|                  |                         |                          |
|------------------|-------------------------|--------------------------|
| 1-3. Hgr.        | Algeria.                | Dr. Schimper (P.).       |
| 4-5. Ad. & yg.   | Near Tangier.           |                          |
| 6-14. Ad. & hgr. | Martun R., near Tetuan. | C. A. Payton, Esq. (P.). |

A second species, *Salmo irideus*, Gibb., from the western parts of North America, has been introduced in South and East Africa.

#### Fam. 8. PHRACTOLÆMIDÆ.

Mouth very protractile, bordered by the very slender præmaxillaries, maxillaries, and dentaries; supraoccipital in contact with the frontals, widely separating the small parietals; operculum and suboperculum well developed; præoperculum small; interoperculum enormous, covering the gular region and overlapping its fellow; symplectic absent. No pharyngeal teeth. Ribs stout, sessile, nearly completely encircling the body; slender epineurals, no epipleurals. Pectoral fin inserted low down. No postclavicle.

A single genus.

## 1. PHRACTOLÆMUS.

Bouleng. Proc. Zool. Soc. 1901, i. p. 6.

Body elongate, subcylindrical, covered with large striated scales; lateral line complete, tubes straight. Head strongly ossified, covered with thin skin; mouth small, probosciform, capable of being thrust forward, retractile into a depression on the upper surface of the snout; no teeth, except a conical tooth on each dentary, near the symphysis; a single narial orifice, preceded by a barbel. Gill-openings narrow, restricted to the sides; 3 branchiostegal rays; no pseudobranchiæ. Dorsal short, opposite to the space between ventrals and anal; latter short. Ventrals far back, with 6 rays. Vertebræ 34 (26 + 8). Air-bladder very large, extending as far back as the anal fin.

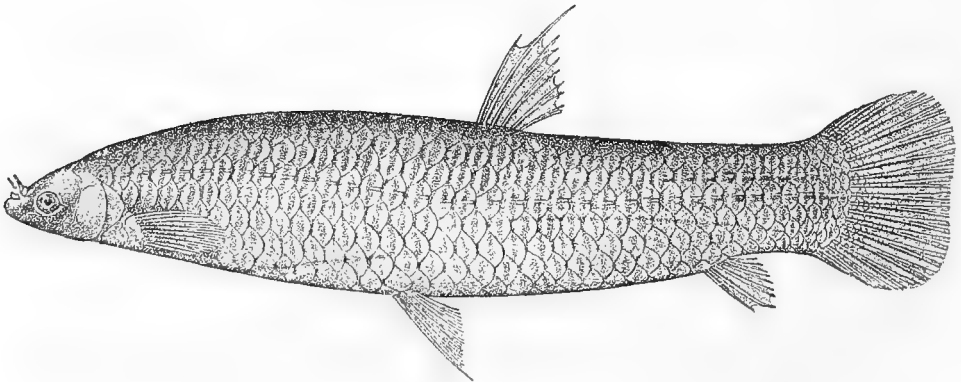
Niger, Congo.

## 1. PHRACTOLÆMUS ANSORGII.

Bouleng. l. c. pl. ii., and Ann. Mus. Congo, Zool. ii. p. 22 (1902); Ridewood, Journ. Linn. Soc., Zool. xxix. 1905, p. 277.

Depth of body 5 to 6 times in total length, length of head  $6\frac{1}{2}$  to  $7\frac{2}{3}$  times. Head depressed, with very broad, slightly convex interorbital

Fig. 133.



*Phractolæmus ansorgii*.

Type.  $\frac{5}{6}$ .

region; eye small, lateral,  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in length of head, 3 to  $3\frac{1}{2}$  times in interorbital width; nasal barbel nearly  $\frac{1}{3}$  length of head. Dorsal 6, first four rays simple, the others usually bifid, originating at equal distance from head and from root of caudal; second ray longest,  $1\frac{1}{2}$  times length of head. Anal 6, similar to dorsal, but rays shorter. Pectoral



rounded, a little shorter than head, as long as ventral, which is equally distant from head and from anal. Caudal rounded. Caudal peduncle compressed, nearly as long as deep, as long as head. Scales 35–40  $\frac{3\frac{1}{2}}{4\frac{3}{4}}$ ; on the caudal region the scales of the lateral line and those of the series above it may bear a central tubercle. Uniform olive-grey.

Total length 150 millim.

Lower Niger, Upper Congo.

- 1–3. Ad., hgr., Mouth of Ethiopie River, Niger Delta. Dr. W. J. Anson (P.).  
& yg, types.  
4. Skel. " " " "  
5. Ad. Monsembe, Upper Congo. Rev. J. H. Weeks (P.).

### Fam. 9. KNERIIDÆ.

Margin of the upper jaw formed by the præmaxillaries; mouth not protractile, inferior, toothless; supraoccipital widely separating the very small parietals; opercular bones well developed; symplectic present. Gill-opening very narrow. Body scaly. Ribs sessile. Pectoral fin inserted low down, folding like the ventrals.

Two genera, if *Xenopomatichthys* be referred to this family rather than to the Cyprinidæ, in which it has been provisionally placed by its describer.

#### 1. KNERIA.

Steind. Verh. zool.-bot. Ges. Wien, xvi. 1866, p. 769; Günth. Cat. Fish. vii. p. 372 (1868).

Mouth rather small and toothless, inferior, transverse, sharp-edged. Gill-opening very narrow, lateral; 3 branchiostegal rays. Body elongate, cylindrical or slightly depressed, covered with very small, finely striated scales. Dorsal and anal fins short, the former above or behind vertical of ventrals, which have 9 rays. Vertebræ 40 (26+14)\*. Air-bladder long and slender, extending along the whole præcaudal part of the body. Intestinal tract very long, with several convolutions.

Tropical Africa.

#### *Synopsis of the Species.*

Dorsal behind vertical of base of ventral; head  $2\frac{1}{2}$  times as long as broad,  $5\frac{1}{2}$ –6 times in total length; snout  $\frac{1}{2}$  as long as postocular part of head; eye lateral,  $3$ – $3\frac{1}{2}$  times in length of head. . . . 1. *K. angolensis*, Stdr., [p. 170.]

\* The osteological characters are taken from a skeleton of *K. camerounensis*.

Dorsal above base of ventral ; head twice as long as broad, 6 times in total length ; snout  $\frac{2}{3}$  as long as postocular part of head ; eye lateral,  $4\frac{1}{2}$ -5 times in length of head . . . . . 2. *K. spekii*, Gthr., p. 171.

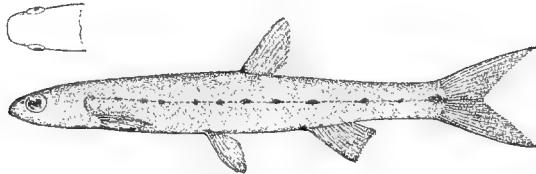
Dorsal above base of ventral ; head about  $1\frac{1}{2}$  times as long as broad,  $4\frac{1}{2}$ -5 times in total length ; snout as long as postocular part of head ; eye supero-lateral,  $4\frac{1}{2}$ -5 times in length of head. . . . . 3. *K. cameronensis*, Blgr., [p. 171.]

### 1. KNERIA ANGOLENSIS.

Steind. Verh. zool.-bot. Ges. Wien, xvi. 1866, p. 770, pl. xvii. fig. 1 ; Günth. Cat. Fish. vii. p. 372 (1868).

Body cylindrical in front, its depth  $6\frac{1}{3}$  to 7 times in total length. Head deeper than broad, twice and  $\frac{1}{2}$  as long as broad, its length  $5\frac{1}{2}$  to 6 times in total length ; snout half as long as postorbital part of head, with spine-like tubercles in the male ; eye lateral, well visible from below, 3 to  $3\frac{1}{2}$  times in length of head ; interorbital width  $\frac{2}{5}$  length of head. Dorsal II 8, originating behind vertical of base of ventrals and at equal distance from eye and from root of caudal, longest ray nearly

Fig. 134.



*Kneria angolensis*.  
Bange Ngola.

as long as head. Anal III 9, equally distant from root of ventrals and from root of caudal. Pectoral  $\frac{3}{4}$  length of head. Caudal deeply forked, with pointed lobes. Caudal peduncle twice and  $\frac{1}{2}$  as long as deep. 95-100 scales in lateral line. Yellowish to dark brown above, whitish beneath ; a lateral series of black dots ; a black dot at base of ventral and usually two at base of anal.

Total length 90 millim.

Angola.—Type in Vienna Museum.

1-2. Hgr.

Bange Ngola.

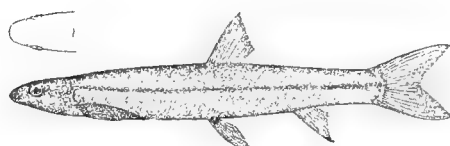
Dr. W. J. Ansorge (C.).

## 2. KNERIA SPEKII.

Günth. Cat. Fish. vii. p. 372 (1868).

Body cylindrical in front, its depth 7 times in total length. Head as broad as deep, twice as long as broad, its length 6 times in total length; snout  $\frac{2}{3}$  length of postocular part of head; eye lateral, just visible from below,  $4\frac{1}{2}$  to 5 times in length of head; interorbital width  $\frac{2}{5}$  length of head. Dorsal II 8, originating above ventrals and at equal distance

Fig. 135.

*Kneria spekii.*

Type.

from anterior border or centre of eye and from root of caudal, longest ray  $\frac{3}{4}$  length of head. Anal III 6, a little nearer root of caudal than root of ventrals. Pectoral a little shorter than head. Caudal deeply forked. Caudal peduncle nearly twice as long as deep. 100–105 scales in lateral line. Uniform brownish, the lateral line darker.

Total length 55 millim.

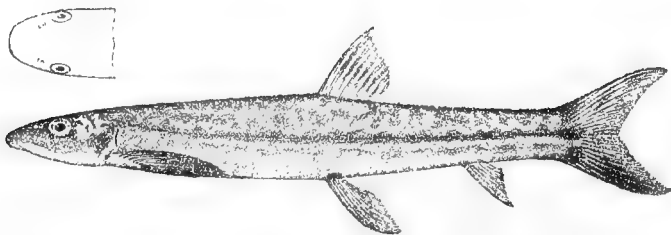
German East Africa.

1–3. Types. Uzaramo, between the coast and Usagara. Capt. Speke (P.).

## 3. KNERIA CAMERONENSIS, sp. n.

Body a little depressed in front, its depth 7 to 9 times in total length. Head broader than deep, about once and  $\frac{1}{2}$  as long as broad, its length

Fig. 136.

*Kneria cameronensis.*

Type.

$4\frac{1}{2}$  to 5 times in total length; snout as long as postocular part of head; eye supero-lateral,  $4\frac{1}{2}$  to 5 times in length of head; interorbital width

$\frac{2}{5}$  length of head. Dorsal II 8, originating above ventrals and at equal distance from eye and from root of caudal, longest ray about  $\frac{2}{3}$  length of head. Anal III 6, twice as distant from root of ventrals as from root of caudal. Pectoral as long as head. Caudal deeply forked, with pointed lobes. Caudal peduncle about once and  $\frac{2}{3}$  as long as deep. 90–102 scales in lateral line. Yellowish olive above, spotted or marbled with brown, pale yellow below; a brown lateral band; a black dot at base of ventral; caudal spotted with black, the lower lobe sometimes nearly entirely black.

Total length 75 millim.

South Cameroon.

|                         |                          |                         |
|-------------------------|--------------------------|-------------------------|
| 1–8. Ad. & hgr., types. | Ja River (Congo System). | G. L. Bates, Esq. (C.). |
| 9. Skel.                | ”                        | ”                       |

The following genus is provisionally referred to this family :—

## 2. XENOPOMATICHTHYS.

*Xenopomichthys*, Pellegr. Bull. Mus. Paris, xi. 1905, p. 145.

Mouth small and toothless, inferior, transverse, sharp-edged. Gill-opening very narrow, lateral; outer surface of operculum bearing a cup-shaped apparatus. Body moderately elongate, covered with small scales. Dorsal and anal fins short, the former slightly behind vertical of ventrals, which have 8 rays. Intestinal canal very long, forming numerous convolutions.

Mozambique.

### 1. XENOPOMATICHTHYS AURICULATUS.

*Xenopomichthys auriculatus*, Pellegr. t. c. p. 146.

Depth of body equal to length of head,  $4\frac{1}{2}$  times in total length. Snout rounded, nearly as long as eye, which is perfectly lateral, 3 times in length of head, and  $1\frac{1}{2}$  times in interorbital width; width of mouth equal to diameter of eye. Dorsal II 8, originating at equal distance from end of snout and from root of caudal. Anal II 6–7. Pectoral with 15 rays. Caudal deeply notched. Caudal peduncle half as long as deep. 60–65 scales in lateral line, about 12 between lateral line and ventral. Yellowish grey, with a darker lateral band; minute black dots at the base of the dorsal, anal, and ventral fins.

Total length 47 millim.

Muza River.—Types in Paris Museum.

## Fam. 10. CROMERIIDÆ.

Margin of the upper jaw formed by the præmaxillaries and the maxillaries; mouth not protractile, inferior, toothless; supraoccipital large and widely separating the very small parietals; opercular bones well developed; symplectic absent. Gill-opening very narrow. Body naked. Ribs sessile. Pectoral fin inserted low down, folding like the ventrals. No postclavicle.

A single genus.

## 1. CROMERIA.

Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 445, and Fish. Nile, p. 93 (1907).

Mouth small and toothless, inferior. Gill-opening very narrow, lateral; 3 branchiostegal rays. Body elongate, compressed. Dorsal and anal fins short, on the caudal portion of the body. Vertebræ 42-45 (28-30 + 14-15). Air-bladder long and slender, extending along the whole præcaudal part of the body.

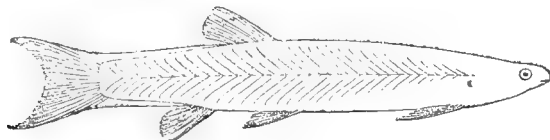
White Nile.

## 1. CROMERIA NILOTICA.

Bouleng. ll. cc. pp. 445, 94, pl. xiv. fig. 3; Swinnerton, Zool. Jahrb., Anat. xviii. 1903, p. 58, figs.

Depth of body  $6\frac{1}{2}$  to 8 times in total length, length of head 5 to 6 times. Snout rounded, projecting strongly beyond mouth, the width of which is about 6 times in length of head; diameter of eye about 5 times in length of head. Dorsal 9-10, 3 or 4 rays rudimentary,

Fig. 137.



*Cromeria nilotica.*

Type.  $\times 2$ .

5 branched, opposite to the space between ventrals and anal, about twice as distant from end of snout as from base of caudal; longest rays  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Anal 9-10, 3 or 4 rays rudimentary, 5 branched, similar to the dorsal, nearly equally distant from ventrals and from base of caudal. Pectoral  $\frac{3}{4}$  or  $\frac{4}{5}$  as long as head, longer than

ventral. Caudal forked, with a deep crescentic notch, the lobes pointed. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep, with a fold of skin above and below, extending from caudal nearly to dorsal and anal fins. Colourless, except a bright yellow stripe dotted with black along the dorsal line and the lower edge of the caudal peduncle, and a blackish line along each side of the caudal peduncle.

Total length 32 millim.

White Nile.

|              |          |                     |
|--------------|----------|---------------------|
| 1-6. Types.  | Fashoda. | L. Loat, Esq. (C.). |
| 7-13. Types. | Lake No. | „                   |

Suborder II. OSTARIOPHYSI.

Air-bladder, if well developed, communicating with the digestive tract by a duct. Pectoral arch suspended from the skull; mesocoracoid arch present. Fins without spines, or dorsal and pectoral with a single spine formed by the ossification of an articulated ray. The four anterior vertebræ strongly modified, often co-ossified and bearing a chain of small bones (so-called Weberian ossicles) connecting the air-bladder with the ear.

*Synopsis of the Families.*

- Mouth not protractile, usually toothed; pharyngeal bones normal; body usually scaly; an adipose dorsal fin often present . . . . . 1. CHARACINIDÆ.
- Mouth more or less protractile, toothless; lower pharyngeal bones large, falciform; no adipose dorsal fin . . . . . 2. CYPRINIDÆ.
- Mouth not protractile, usually toothed; pharyngeal bones normal; body naked or with bony scutes; an adipose dorsal fin often present . . . . . 3. SILURIDÆ.

Fam. 1. CHARACINIDÆ.

Mouth non-protractile, usually bordered by the præmaxillaries and the maxillaries, rarely by the præmaxillaries only; jaws toothed\*. Parietal bones united in a sagittal suture or separated by a fontanelle; opercular bones well developed; symplectic present. Pharyngeal bones normal, with small teeth. Branchiostegal rays few (3 to 5). Ribs mostly sessile; no parapophyses in the thoracic region; epipleurals

\* Exceptions in America.

and epineurals mostly free, floating. Pectoral fins inserted very low down, folding like the ventrals, which are formed of 10 to 13 rays. Body covered with scales \*. An adipose dorsal fin often present.

Fresh waters of Central and South America and Africa.

*Synopsis of the Genera.*

I. HYDROCYONINÆ.—Dentition powerful; upper jaw immovable or slightly movable; maxillaries well developed, bordering the mouth; gill-membranes free or very narrowly attached to isthmus; scales not ciliated; lateral line nearer ventral than dorsal outline.

A. Teeth unicuspid.

Teeth very numerous, unequal, conical, in two series; dorsal fin well behind ventrals . . . 1. *Sarcodaces*, Gthr., p. 177.

Teeth not very numerous, compressed, uniserial; dorsal fin above ventrals . . . 2. *Hydrocyon*, Cuv., p. 179.

B. Teeth pluricuspid, in 2 or 3 series in the upper jaw.

1. A pair of conical teeth behind the pluricuspid teeth of the lower jaw.

Teeth in 3 series in the upper jaw, the inner with more or less molariform excavated crowns; dorsal fin originating in advance of ventrals . . . . . 3. *Bryconethiops*, Gthr, p. 187.

Teeth in 2 series in the upper jaw, the inner with obliquely truncated or molariform excavated crowns; dorsal fin originating above or behind ventrals . . . . . 4. *Alestes*, M. & T., p. 190.

Teeth in 2 series in the upper jaw, both simply compressed, the front side not concave; dorsal fin originating above or behind ventrals . . . . . 5. *Micralestes*, Blgr., p. 223.

2. No conical teeth in the lower jaw.

Teeth in 2 series in the upper jaw, both simply compressed; dorsal fin originating above or behind ventrals . . . . . 6. *Petersius*, Hilg., p. 231.

II. ICHTHYOBORINÆ.—Dentition various; upper jaw freely movable upwards; maxillaries much reduced; gill-membranes free or narrowly attached to isthmus; scales ciliated; lateral line along the middle of the side.

A. Two series of teeth in each jaw; dorsal fin above ventrals.

Teeth equal; snout rounded; a naked space between the suborbitals and the præoperculum; scales small; a scaly process at the base of the ventral . . . . . 7. *Eugnathichthys*, Blgr., p. 241.

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\* Exceptions in America.

- Anterior teeth larger; snout pointed; a naked space between the suborbitals and the præoperculum; scales small; a scaly process at the base of the ventral . . . 8. *Paraphago*, Blgr., p. 244.
- Canine teeth in front; a naked space between the suborbitals and the præoperculum; scales small; a scaly process at the base of the ventral . . . . . 9. *Mesoborus*, Pellegr., p. 245.
- Anterior teeth a little larger; snout narrow; cheek entirely mailed; scales large, hard; no scaly process at the base of the ventral . . . . . 10. *Phago*, Gthr., p. 246.
- B. A single series of teeth in each jaw, with or without cardiform teeth behind them; canine teeth in front; dorsal fin behind vertical of ventrals; cheek naked; scales small; a scaly process at the base of the ventral.
- A single series of teeth . . . . . 11. *Neoborus*, Blgr., p. 249.
- Cardiform teeth on the inner side of the jaws . 12. *Ichthyoborus*, Gthr., p. 251.
- C. Teeth very small, bicuspid, in a single series, which is widely interrupted in the middle in the upper jaw; dorsal fin above ventrals.
- . . . . . 13. *Hemistichodus*, Pellegr., p. 253.
- III. DISTICHODONTINÆ.—Teeth small, notched or bicuspid; upper jaw immovable or but slightly movable; maxillary well developed; scales ciliated; lateral line along the middle of the side.
- A. Gill-membranes free from isthmus.
- Small teeth at the base of the maxillary; lateral line complete or incomplete . . 14. *Nannæthiops*, Gthr., p. 254.
- No teeth on the maxillary; lateral line incomplete or absent . . . . . 15. *Neolebias*, Stdr., p. 256.
- B. Gill-membranes attached to isthmus.
- No teeth on the maxillary; suborbitals large, protecting the cheek; dorsal with 16–27 rays . . . . . 16. *Distichodus*, M. & T., p. 258.
- No teeth on the maxillary; suborbitals large; dorsal with 12–15 rays . . . . . 17. *Nannocharax*, Gthr., p. 279.
- Small teeth at the base of the maxillary; suborbitals narrow; dorsal with 20–22 rays . . . . . 18. *Xenocharax*, Gthr., p. 287.
- IV. CITHARININÆ.—Minute ciliiform teeth inserted on the lips; maxillary very small; gill-membranes free from isthmus; lateral line along the middle of the side.
- Scales strongly denticulated . . . . . 19. *Citharidium*, Blgr., p. 289.
- Scales cycloid . . . . . 20. *Citharinus*, Cuv., p. 290.



## SARCODACES.

## 1. SARCODACES.

*Xiphorhamphus*, part., Müll. & Trosch. Hor. Ichthyol. i. p. 17 (1845).

*Xiphorhynchus*, part., Cuv. & Val. Hist. Poiss. xxii. p. 336 (1849).

*Hydrocyonoides*, Casteln. Mém. Poiss. Afr. Austr. p. 66 (1861).

*Sarcodaces*, Günth. Cat. Fish. v. p. 352 (1864); Bouleng. Poiss. Bass. Congo, p. 138 (1901).

Snout elongate; mouth very large, with pointed teeth intermixed with large canines; two series of teeth in the lower jaw, the outer with canines; præmaxillaries immovable, with a posterior process bearing small teeth, between the maxillary and the palatine; maxillary long, toothed, slipping under the præ- and suborbitals. Cheek covered by the large suborbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes free from the isthmus; 4 branchiostegal rays. Body elongate, compressed; belly rounded. Scales moderately large, not ciliated; lateral line nearer the ventral than the dorsal outline; a scaly process at the base of the ventral fin. Dorsal fin with 9 rays, well behind the vertical of the ventrals; anal with 12 rays; a small adipose dorsal fin. Vertebræ 44 (28+16).

Tropical Africa.

## 1. SARCODACES ODOË.

*Salmo odoë*, Bloch, Ausl. Fische, viii. p. 122, pl. cccxxxvi. (1794).

*Xiphorhamphus odoë*, Müll. & Trosch. op. cit. p. 18.

*Xiphorhynchus odoë*, Cuv. & Val. t. c. p. 345.

*Hydrocyonoides cuvieri*, Casteln. l. c.

*Sarcodaces odoë*, Günth. l. c., and Ann. & Mag. N. H. (3) xx. 1867, p. 114;

Sauv. Bull. Soc. Zool. France, 1882, p. 319; Steind. Notes Leyd. Mus. xvi.

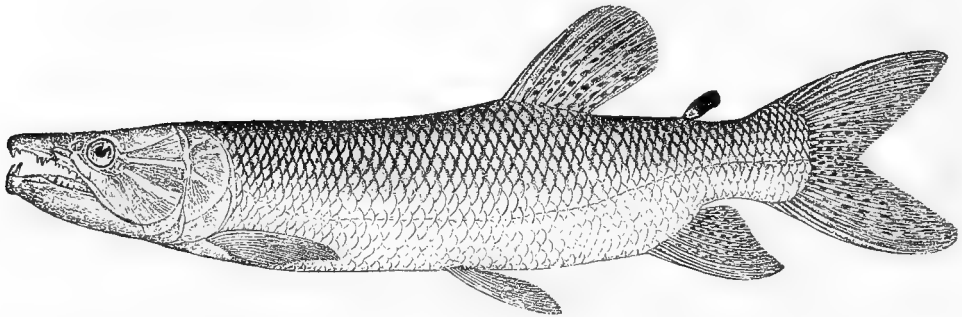
1894, p. 63; Bouleng. l. c.; Pellegr. Bull. Mus. Paris, 1904, p. 310.

*Sarcodaces odoë*, var. *microlepis*, Bouleng. t. c. p. 139.

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{3}$  times in total length, length of head 3 to  $3\frac{1}{3}$  times. Head  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times as long as broad, flat above, with straight upper profile; bones of head rugose and striated; præmaxillary part of snout narrowed, rounded, projecting beyond lower jaw; eye lateral, subinferior, 2 to  $2\frac{1}{2}$  times in length of snout, 5 to 7 times in length of head,  $1\frac{2}{3}$  to  $2\frac{1}{2}$  times in interorbital width; maxillary extending to below posterior border of eye or a little beyond; a triangular dermal fold on each side of the lower jaw, covering a notch between præmaxillary and maxillary bones. Gill-rakers long and slender, 12-14 on lower part of anterior arch. Dorsal II 7, above space between ventrals and anal,  $2\frac{1}{2}$  to 3 times as distant from end of snout as from

root of caudal, longest ray  $\frac{3}{5}$  to  $\frac{2}{3}$  length of head. Anal II 9. Pectoral pointed,  $\frac{1}{2}$  to  $\frac{3}{5}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales rather rugose, 49–58  $\frac{8-11}{7-9}$ , 3 or 4 between lateral line and scaly process at base of ventral. Brown or olive above, silvery beneath; young with

Fig. 138.



*Sarcodaces odoë.*  
Senegal.  $\frac{1}{3}$ .

rather indistinct dark cross-bars above the lateral line, and a small black spot behind the head; fins grey or blackish, dorsal, anal, and caudal often with small round darker spots between the rays; adipose fin black, orange at the base.

Total length 330 millim.

Rivers of West Africa, Shari, Congo, Zambesi, Lake Ngami.—Type in Berlin Museum.

|           |                       |                                 |
|-----------|-----------------------|---------------------------------|
| 1-2. Ad.  | St. Louis, Senegal.   | M. P. Delhez (C.).              |
| 3. Ad.    | Gambia.               | J. S. Budgett, Esq. (P.).       |
| 4-5. Ad.  | Lagos.                | H. T. Ussher, Esq. (P.).        |
| 6. Ad.    | Nyankoma, Gold Coast. | R. B. N. Walker, Esq. (P.).     |
| 7. Ad.    | Niger.                | Mr. J. T. Dalton (C.).          |
| 8. Skull. | "                     | "                               |
| 9-11. Yg. | Sapelle, Lower Niger. | Dr. W. J. Ansorge (C.).         |
| 12. Yg.   | Agberi, "             | "                               |
| 13. Ad.   | Benue R., N. of Ibi.  | H. L. Norton Traill, Esq. (C.). |
| 14. Yg.   | Ja R., S. Cameroon.   | G. L. Bates, Esq. (C.).         |
| 15. Ad.   | Benito R.             | "                               |
| 16. Ad.   | Ogowe R.              | Miss Kingsley (C.).             |
| 17. Hgr.  | Talagouga, Ogowe.     | "                               |
| 18. Hgr.  | Eloby, Gaboon.        | "                               |

|                    |                                     |                             |
|--------------------|-------------------------------------|-----------------------------|
| 19. Skel.          | Sette Cama, Gaboon.                 |                             |
| 20. Ad.            | Gaboon.                             | R. B. N. Walker, Esq. (P.). |
| 21, 22. Hgr. & yg. | „                                   |                             |
| 23-25. Ad. & hgr.  | Ibali, L. Leopold II., Upper Congo. | M. P. Delhez (C.).          |
| 26-27. Hgr.        | Bolobo, Upper Congo.                | Rev. G. Grenfell (P.).      |
| 28. Ad.            | Monsembe, „                         | Rev. J. H. Weeks (C.).      |
| 29. Ad.            | Stanley Falls.                      | Rev. W. H. Bentley (C.).    |
| 30. Yg.            | Banzville, Ubanghi.                 | Capt. Royaux (C.).          |
| 31-32. Ad.         | Kafue R., Upper Zambesi.            | T. Codrington, Esq. (P.).   |
| 33. Ad., skin.     | Botolette R., nr. L. Ngami.         | R. Ward, Esq. (P.).         |

## 2. HYDROCYON.

*Hydrocinus*, part., Cuv. Règne Anim. ii. p. 167 (1817).

*Hydrocyon*, Cuv. Mém. Mus. Paris, v. 1819, p. 353; Cuv. & Val. Hist. Poiss. xxii. p. 309 (1849); Günth. Cat. Fish. v. p. 350 (1864); Bouleng. Poiss. Bass. Congo, p. 140 (1901), and Fish. Nile, p. 98 (1907).

Snout rather elongate; mouth large, with very strong, pointed, more or less compressed, sharp-edged teeth, wide apart and forming a single series; præmaxillary bones slightly movable vertically; maxillary toothless, moderately large, and slipping under the præorbital. Cheek covered by the large suborbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes free from the isthmus; 4 branchiostegal rays. Body elongate, compressed; belly rounded. Scales moderately large, not ciliated; lateral line nearer the ventral than the dorsal outline; a scaly process at the base of the ventral fin. Dorsal fin with 10 or 11 rays, above the ventrals; anal with 13 to 18 rays; a small adipose dorsal fin.

Part of the eye, in front and behind, covered by an adipose lid. Tubules of lateral line straight and short; most of them emit a short spur, directed downwards, or a few scales here and there having the spur directed upwards. Fins more or less falcate; ventral rays 10. Vertebrae 49-52 (31-34+17-18).

Nile and Tropical Africa.

### *Synopsis of the Species.*

I. 2 series of scales between lateral line and scaly process at base of ventral.

Sc. 48-54  $\frac{7\frac{1}{2}-8\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ ; dorsal originating in advance of ventral; depth of body 4-5 $\frac{1}{2}$  times in total length . . . . . 1. *H. forskalii*, Cuv., p. 180.

- Sc. 44-48  $\frac{7\frac{1}{2}-8\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ ; dorsal originating above or slightly in advance of ventral; depth of body  $3\frac{1}{4}-4\frac{1}{2}$  times in total length . . . . . 2. *H. lineatus*, Blkr., p. 182.
- Sc. 56-57  $\frac{10\frac{1}{2}}{5\frac{1}{2}}$ ; dorsal not originating in advance of ventral; depth of body  $4-4\frac{1}{2}$  times in total length . . . . . 3. *H. vittiger*, Blgr., p. 184.
- II. 3 series of scales between lateral line and scaly process at base of ventral; dorsal not originating in advance of ventral.
- Sc. 54-58  $\frac{9\frac{1}{2}-10\frac{1}{2}}{6\frac{1}{2}}$ ; depth of body  $3\frac{2}{3}-4\frac{1}{2}$  times in total length; eye  $5\frac{1}{2}$  times in length of head in adult . . . . . 4. *H. goliath*, Blgr., p. 184.
- Sc. 47-54  $\frac{8\frac{1}{2}-9\frac{1}{2}}{6\frac{1}{2}}$ ; depth of body  $3\frac{1}{3}-4\frac{1}{2}$  times in total length; eye  $7\frac{1}{2}$  times in length of head in adult . . . . . 5. *H. brevis*, Gthr., p. 186.

## 1. HYDROCYON FORSKALII.

*Salmo dentex* (non Hasselq.), Forskål, Descr. Anim. pp. xiii & 66 (1775).

*Characinus dentex*, Geoffr. Descr. Egypte, Poiss. p. 49, pl. iv. fig. 1 (1809).

*Hydrocyon forskalii*, Cuv. Mém. Mus. v. 1819, p. 354, pl. xxviii. fig. 1; Müll. & Trosch. Horæ Ichthyol. i. p. 11, pl. iii. fig. 6 (1845); Günth. Cat. Fish. v. p. 351 (1864), and Petherick's Trav. ii. p. 244 (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 547; Vincig. Ann. Mus. Genova, xxxvii. 1896, p. 29, and xxxix. 1898, p. 258; Bouleng. Fish. Nile, p. 100, pl. xvi. fig. 1 & pl. xvii. fig. 1 (1907).

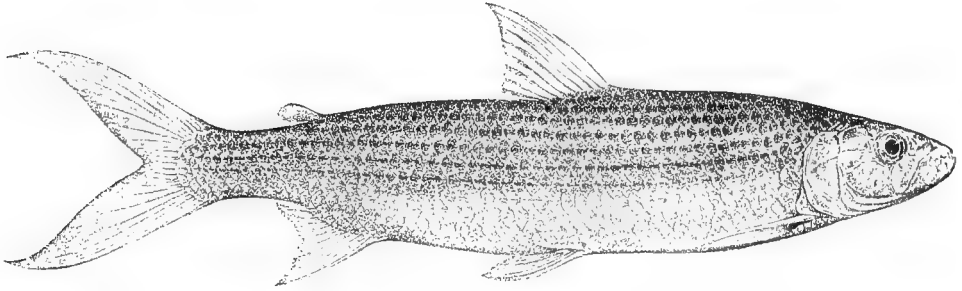
*Hydrocyon dentex*, Rüpp. Beschr. n. Fische Nil, p. 5 (1829).

*Hydrocyon forskalii*, part., Cuv. & Val. Hist. Poiss. xxii. p. 309 (1849); Peters, Reise Mossamb. iv. p. 69 (1868).

Depth of body 4 to  $5\frac{1}{2}$  times in total length, length of head 4 to 5 times. Head 2 to  $2\frac{1}{2}$  times as long as broad; snout  $\frac{1}{4}$  to  $\frac{1}{3}$  length of head; diameter of eye 4 (young) to  $6\frac{1}{2}$  times in length of head, interorbital width 3 to 4 times; mouth extending to below nostrils, maxillary bone to below anterior border or centre of eye; 5 or 6 large teeth in upper jaw and 4 or 5 in lower; suborbital and opercular bones smooth or feebly striated. Gill-rakers much shorter than gill-filaments, 8 to 10 on lower part of anterior arch. Dorsal II 8, equally distant from end of snout, nostrils, or eye, and from root of caudal, originating in front of ventral; second simple ray longest,  $\frac{3}{4}$  to  $1\frac{1}{6}$  times length of head. Anal III 11-13, third simple ray longest,  $\frac{1}{2}$  to  $\frac{3}{4}$  length of head. Pectoral fin about  $\frac{2}{3}$  length of head. Ventral as long as or shorter than pectoral, below middle of dorsal. Caudal deeply forked, with long, pointed lobes. Caudal peduncle  $1\frac{2}{3}$  to 2 times as long as deep. Scales 48-54  $\frac{7\frac{1}{2}-8\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ , 3 between lateral line and ventral, 2 between

lateral line and scaly process at base of ventral. Back grey, brown, or olive-green, sides and belly silvery white; more or less distinct longitudinal rows of blackish spots, often confluent into streaks, run along the series of scales above the lateral line, and, exceptionally, also along the series bordering the lateral line below; these spots or streaks entirely absent in very young specimens; dorsal fin and upper lobe of

Fig. 139.



*Hydrocyon forskalii*.  
Upper Nile (F. N.).  $\frac{1}{3}$ .

caudal yellowish or grey, often blackish towards the end; adipose fin grey or whitish, rarely with a black spot; ventral and anal, sometimes also pectorals, tinged with pink or pale orange; lower lobe of caudal bright red.

Total length 450 millim.—Grows to nearly 1 metre.

Lower Nile to Blue Nile and Lake Albert; Lakes Rudolf and Gandjule (Margherita); Senegal, Niger.—Type in Paris Museum.

|                              |                                            |                          |
|------------------------------|--------------------------------------------|--------------------------|
| 1. Hgr.                      | Egypt.                                     | Dr. Rüppell (C.).        |
| 2. Hgr.                      | Lower Nile.                                | J. Petherick, Esq. (C.). |
| 3. Skel.                     | "                                          | S. S. Allen, Esq. (P.).  |
| 4. Hgr.                      | Lake Edkou.                                | L. Loat, Esq. (C.).      |
| 5. Hgr.                      | Damietta Nile.                             | "                        |
| 6, 7, 8. Ad., hgr.,<br>& yg. | Near Cairo.                                | "                        |
| 9. Skel.                     | "                                          | "                        |
| 10. Ad.                      | Wasta, Lower Nile.                         | "                        |
| 11-16. Hgr. & yg.            | Beni Souef, Lower Nile.                    | "                        |
| 17. Ad.                      | Sanhur, near Beni Souef.                   | "                        |
| 18. Hgr.                     | Bahr Selah, Fayum.                         | "                        |
| 19-20. Hgr.                  | Between Assiut and Abu Tig,<br>Lower Nile. | "                        |
| 21-30. Hgr. & yg.            | Near Luxor.                                | "                        |
| 31-39. Yg.                   | Between Luxor and Assuan.                  | "                        |
| 40-43. Hgr.                  | Assuan.                                    | "                        |

|                   |                               |                                                       |
|-------------------|-------------------------------|-------------------------------------------------------|
| 44. Ad.           | Abu Hoor, Upper Nile.         | L. Loat, Esq. (C.).                                   |
| 45. Ad.           | Mirrwan, "                    | "                                                     |
| 46. Ad.           | Korosko, "                    | "                                                     |
| 47-48. Ad.        | Ibrim, "                      | "                                                     |
| 49-50. Ad. & hgr. | Fergunt, "                    | "                                                     |
| 51. Ad.           | Near Wady Halfa.              | "                                                     |
| 52-54. Ad. & hgr. | Kosheh, Upper Nile.           | "                                                     |
| 55-58. Ad. & hgr. | Khartum.                      | J. Petherick, Esq. (C.).                              |
| 59. Yg.           | Rosaires, Blue Nile.          | Capt. S. Flower (P.).                                 |
| 60. Yg.           | Wad Medine, Blue Nile.        | L. Loat, Esq. (C.).                                   |
| 61. Ad.           | Jebelain, White Nile.         | "                                                     |
| 62. Ad.           | Mouth of Lake No, White Nile. | "                                                     |
| 63-64. Ad.        | Gondokoro, Bahr-el-Gebel.     | "                                                     |
| 65. Head of ad.   | Fajao, Victoria Nile.         | J. S. Budgett, Esq. (P.).                             |
| 66. Ad.           | Butyaba, Lake Albert.         | "                                                     |
| 67-68. Hgr.       | Lake Gandjule (Margherita).   | Prof. O. Neumann (C.).                                |
| 69-74. Ad. & hgr. | " "                           | Mr. P. C. Zaphiro (C.) ;<br>W.N. McMillan, Esq. (P.). |
| 75. Hgr.          | St. Louis, Senegal.           | M. P. Delhez (C.).                                    |
| 76-78. Ad. & yg.  | Kaëdi, "                      | "                                                     |
| 79. Skull.        | " "                           | "                                                     |
| 80. Ad.           | Kurguel, near Matam, Senegal. | "                                                     |
| 81. Ad.           | Niger.                        | W. A. Forbes, Esq. (P.).                              |
| 82-83. Ad. & hgr. | Jebba, Upper Niger.           | Dr. C. Christy (P.).                                  |
| 84. Skull.        | " "                           | Capt. G. F. Abadie (P.).                              |
| 85. Hgr.          | Assay, Lower Niger.           | Dr. W. J. Ansorge (C.).                               |

## 2. HYDROCYON LINEATUS.

? *Hydrocynus vittatus*, Casteln. Mém. Poiss. Afr. Austr. p. 65 (1861).

*Hydrocyon lineatus*, Bleek. Nat. Verh. Ver. Haarl. xviii. 1862, no. 2, p. 125 ;  
Günth. Cat. Fish. v. p. 352 (1864) ; M. Web. Zool. Jahrb., Syst. x. 1897,  
p. 155 ; Bouleng. Poiss. Bass. Congo, p. 143 (1901) ; Werner, Sitzb. Ak. Wien,  
cxv. i. 1906, p. 1126 ; Bouleng. Fish. Nile, p. 104, pl. xvii. fig. 2 (1907).

*Hydrocyon forskalii*, part., Peters, Reise Mossamb. iv. p. 69 (1868).

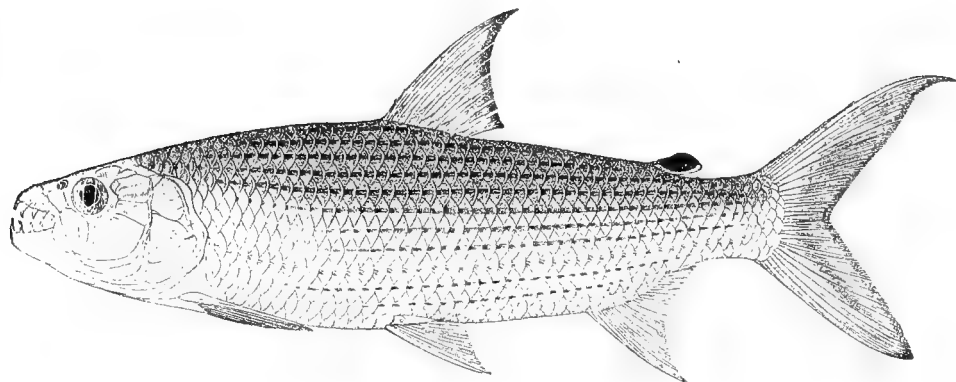
*Hydrocyon forskalii* (non Cuv.), Steind. Notes Leyd. Mus. xvi. 1894, p. 62.

Depth of body  $3\frac{1}{4}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times. Dorsal II 8-9, originating above or slightly in advance of ventral. Anal III 10-13. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times as long as deep. Scales 44-48  $\frac{7\frac{1}{2}-8\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ . Otherwise as in *H. forskalii*. Black longitudinal streaks more strongly marked and extending to the series of scales below the lateral line ; adipose dorsal with a deep black spot.

Total length 420 millim.

From the White and Blue Niles and the Niger to Lake Ngami (?) and the Limpopo River.

Fig. 140.



*Hydrocyon lineatus.*  
White Nile (F. N.).  $\frac{1}{2}$ .

|                         |                                                         |                                                       |
|-------------------------|---------------------------------------------------------|-------------------------------------------------------|
| 1. Ad.                  | Ashmed Aga, White Nile.                                 | L. Loat, Esq. (C.).                                   |
| 2-3. Ad. & hgr.         | Polkom, Baro R. (Sobat).                                | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 4-7. Ad. & hgr.         | Mouth of Lake No, White Nile.                           | L. Loat, Esq. (C.).                                   |
| 8-10. Ad. & yg.         | Gondokoro, Bahr-el-Gebel.                               | "                                                     |
| 11. Yg.                 | Wad Medine, Blue Nile.                                  | "                                                     |
| 12. Ad.                 | Niger.                                                  | Mr. J. T. Dalton (C.).                                |
| 13. Hgr.                | R. Offin, Gold Coast.                                   | R. B. N. Walker, Esq. (P.).                           |
| 14. Yg.                 | Nyankoma, "                                             | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.).   |
| 15. Hgr.                | Benue R., north of Ibi.                                 | H. L. Norton Traill, Esq. (C.).                       |
| 16. Ad.                 | Kwango R. (Congo System)<br>at Fort Don Carlos, Angola. | Dr. W. J. Ansorge (C.).                               |
| 17. Ad.                 | Leopoldville, Congo.                                    | M. P. Delhez (C.).                                    |
| 18-20. Ad., hgr., & yg. | Lake Obeke, Upper Congo.                                | "                                                     |
| 21, 22. Yg.             | Bolobo, Upper Congo.                                    | Rev. G. Grenfell (C.).                                |
| 23-25. Ad. & hgr.       | New Antwerp, Upper Congo.                               | Capt. Wilverth (C.).                                  |
| 26. Hgr.                | Stanley Falls.                                          | Rev. W. H. Bentley (C.).                              |
| 27. Yg.                 | Banzyville, Ubanghi.                                    | Capt. Royaux (C.).                                    |
| 28. Ad.                 | Lake Tanganyika.                                        | Prof. J. E. S. Moore (C.).                            |
| 29. Ad.                 | Kitutu, "                                               | Dr. W. A. Cunnington (C.).                            |
| 30. Head only.          | Lake Mweru.                                             | Sir A. Sharpe (P.).                                   |
| 31, 32. Ad.             | Lake Bangwelu.                                          | F. H. Melland, Esq. (P.).                             |
| 33-39. Ad., hgr., & yg. | Upper Zambesi, above Victoria<br>Falls.                 | T. Codrington, Esq. (P.).                             |
| 40, 41. Ad., skins.     | Unguezi, Shiré R.                                       | Dr. C. Livingstone (P.).                              |
| 42-43. Ad.              | Chiromo, "                                              | R. MacDonald, Esq. (P.).                              |

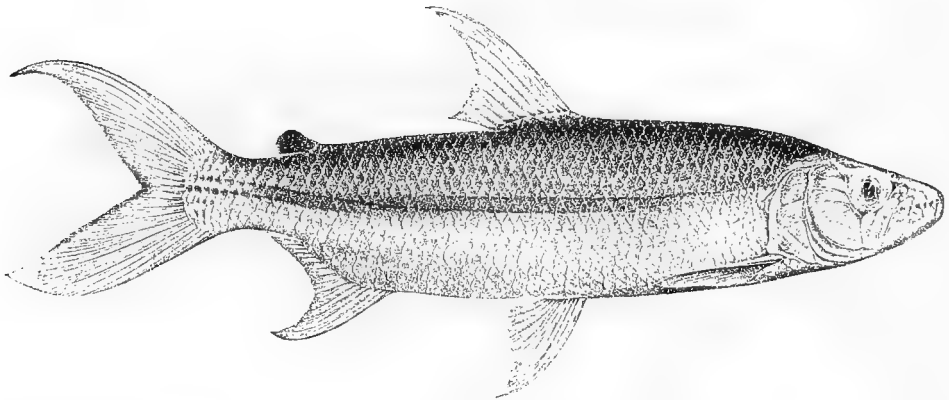
## 3. HYDROCYON VITTIGER.

*Hydrocyon vittatus* (non Casteln.), Bouleng. Ann. Mus. Congo, Zool. i. p. 24, pl. x. fig. 2 (1898), and Poiss. Bass. Congo, p. 142 (1901).

*Hydrocyon vittiger*, Bouleng. Fish. Nile, p. 106 (1907).

Depth of body equal to length of head, 4 to  $4\frac{1}{3}$  times in total length. Head  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times as long as broad; snout  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times diameter of eye, which is  $3\frac{1}{2}$  to 4 times in length of head and nearly equals interorbital width; mouth extending to below anterior third of eye; 5 large teeth in upper jaw, 4 in lower. Dorsal II 8, originating above ventral. Anal III 14. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal deeply

Fig. 141.



*Hydrocyon vittiger*.  
Type (A. M. C.).  $\frac{1}{3}$ .

forked, with long, pointed lobes. Caudal peduncle twice as long as deep. Scales 56–57  $\frac{10\frac{1}{2}}{5\frac{2}{3}}$ , 2 between lateral line and scaly process at base of ventral. Olive-brown above, whitish beneath; a blackish band along the body on the second and third series of scales above lateral line as far as adipose fin, where it drops one scale lower down; adipose fin black; caudal edged with blackish.

Total length 340 millim.

Congo.—Types in Congo Museum, Tervueren.

1. One of the types. Manyanga. Capt. Wilverth (C.).

## 4. HYDROCYON GOLIATH.

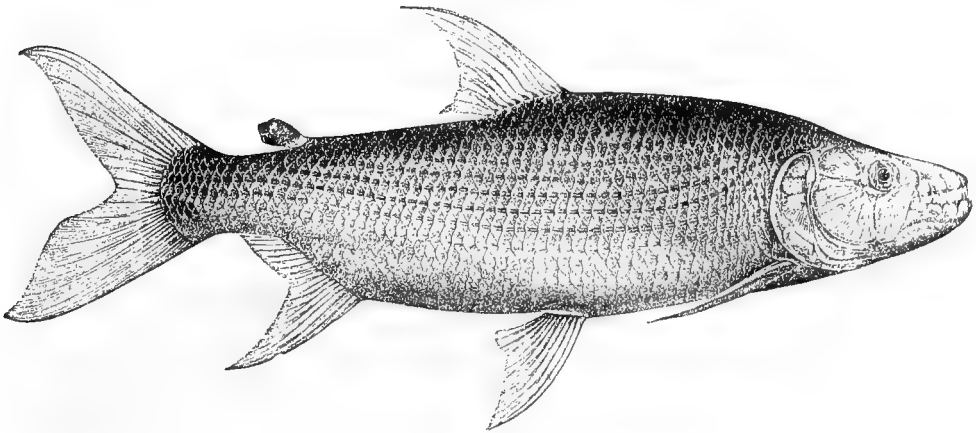
Bouleng. Ann. Mus. Congo, Zool. i. p. 23, pl. xi. (1898), and Poiss. Bass. Congo, p. 141 (1901).

Depth of body  $3\frac{2}{3}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{4}{5}$  to



$4\frac{1}{2}$  times. Head  $1\frac{1}{2}$  to  $2\frac{1}{2}$  times as long as broad; snout  $1\frac{1}{2}$  to 2 times diameter of eye, which is  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in length of head and  $1\frac{1}{2}$  to  $2\frac{1}{2}$  times in interorbital width; mouth extending to below anterior border of eye, maxillary to below centre of eye; 5 large teeth in upper jaw, 4 in lower; suborbital and opercular bones rather strongly striated. Gill-rakers very short, 10–12 on lower part of anterior arch. Dorsal II 8–9, originating above ventral, at equal distance from end of snout and from caudal, or a little nearer latter. Anal III 13–16, originating at equal distance from base of ventral and from caudal. Pectoral as

Fig. 142.



*Hydrocyon goliath.*  
Type (A. M. C.).  $\frac{1}{5}$ .

long as ventral,  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. Caudal deeply forked, with pointed lobes. Caudal peduncle once and  $\frac{2}{3}$  as long as deep. Scales 54–58  $\frac{9\frac{1}{2}-10\frac{1}{2}}{6\frac{1}{2}}$ , 3 between lateral line and scaly process at base of ventral. Olive-brown above, silvery white on the sides and beneath; more or less distinct dark lines along the series of scales above lateral line; these lines absent in the young; dorsal yellow or red; adipose fin black; caudal edged with blackish, lower lobe red.

Total length 1 metre or more.

Congo.—Types in Congo Museum, Tervueren.

|                      |              |                        |
|----------------------|--------------|------------------------|
| 1. One of the types. | Manyanga.    | Capt. Wilverth (C.).   |
| 2. One of the types. | New Antwerp. | ”                      |
| 3, 4. Ad. & hgr.     | Monsembe.    | Rev. J. H. Weeks (P.). |
| 5–6. Yg.             | Bolobo.      | Rev. G. Grenfell (C.). |
| 7. Ad.               | Upper Congo. | Brussels University.   |

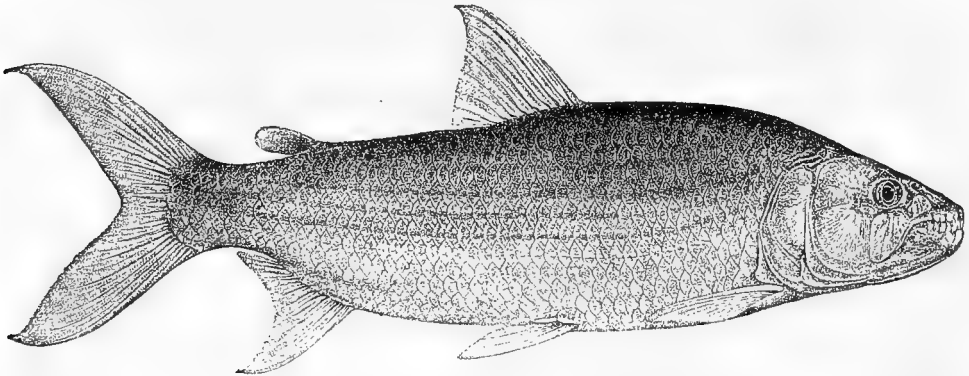
## 5. HYDROCYON BREVIS.

*Hydrocyon forskalii*, part., Cuv. & Val. Hist. Poiss. xxii. p. 309 (1849); Peters, Reise Mossamb. iv. p. 69 (1868).

*Hydrocyon brevis*, Günth. Cat. Fish. v. p. 351 (1864), and Petherick's Trav. ii. p. 245, pl. iii. fig. A (1869); Steind. Sitz. Ak. Wien, lxi. i. 1870, p. 547; Bouleng. Fish. Nile, p. 107, pl. xvi. fig. 2 (1907).

Depth of body  $3\frac{1}{3}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{1}{3}$  to  $4\frac{1}{5}$  times. Head 2 to  $2\frac{2}{3}$  times as long as broad; snout  $\frac{2}{7}$  to  $\frac{1}{3}$  length of head; diameter of eye 4 (young) to  $7\frac{1}{2}$  times in length of head, interorbital width 3 to  $3\frac{3}{4}$  times; suborbital and opercular bones more or less distinctly striated; mouth extending to below nostrils or anterior border of eye, maxillary bone to below centre or posterior border of eye; 4 or 5 large teeth in upper jaw and 3 or 4 in lower. Gill-rakers short, 7 to 9

Fig. 143.



*Hydrocyon brevis*.  
Type (F. N.).  $\frac{1}{3}$ .

on lower part of anterior arch. Dorsal II 8, equally distant from eye and from root of caudal, or a little nearer latter; second simple ray or first branched ray longest,  $\frac{2}{3}$  to nearly once length of head. Anal III 11-13 (exceptionally 15), longest ray  $\frac{2}{5}$  to  $\frac{2}{3}$  the length of head. Pectoral  $\frac{3}{5}$  to  $\frac{3}{4}$  length of head. Ventral fin a little shorter than pectoral, below anterior half of dorsal. Caudal deeply forked, with long, pointed lobes. Caudal peduncle  $1\frac{2}{5}$  to  $1\frac{2}{3}$  times as long as deep. Scales 47-54  $\frac{8\frac{1}{2}-9\frac{1}{2}}{6\frac{1}{2}}$ , 3 between lateral line and scaly process at base of ventral. Coloration very similar to that of *H. forskalii*; longitudinal dark streaks or series of spots, more or less distinct in adult specimens, usually confined

to the region above the lateral line ; a black spot sometimes present on adipose fin.

Total length 480 millim.

Lower Nile to White Nile, Chad Basin, Senegal, Gambia.

|                                   |                        |                           |
|-----------------------------------|------------------------|---------------------------|
| 1-2. Ad. & hgr.                   | Lower Nile.            | J. Petherick, Esq. (C).   |
| 3-12, 13-22, 23-30. Hgr.<br>& yg. | Near Luxor.            | L. Loat, Esq. (C.).       |
| 31. Skel.                         | "                      | "                         |
| 32-34. Types.                     | Khartum.               | J. Petherick, Esq. (C.).  |
| 35. Ad.                           | Lake Chad.             | Capt. G. B. Goeling (P.). |
| 36. Ad.                           | Shari R. at Maidugari. | "                         |
| 37. Ad.                           | Matam, Senegal.        | M. P. Delhez (C.).        |
| 38-42. Ad. & hgr.                 | McCarthy I., Gambia.   | J. S. Budgett, Esq. (P.). |

### 3. BRYCONÆTHIOPS.

Günth. Ann. & Mag. N. H. (4) xii. 1873, p. 143 ; Bouleng. Poiss. Bass. Congo, p. 145 (1901).

Snout short ; mouth moderately large ; præmaxillaries immovable, with 3 series of large pluricuspid teeth, those of the inner series with hollowed-out, tubercular crowns ; maxillary large, toothless ; a series of large, compressed, pluricuspid teeth in the lower jaw, with a pair of conical teeth behind them. Cheek covered by the large suborbitals ; nostrils near the eye, close together, separated by a valvular flap ; gill-membranes free from isthmus ; 3 branchiostegal rays. Body moderately elongate, compressed ; belly rounded. Scales moderately large, not ciliated ; lateral line nearer the ventral than the dorsal outline ; a scaly process at the base of the ventral fin. Dorsal fin with 10 rays, originating in advance of ventrals ; anal with 20-23 rays ; a small adipose dorsal fin. Vertebræ 38 (19+19).

Tropical Africa.

Two species :—

- Head longer than deep ; longest rays of dorsal not or but little longer than head ;  $6\frac{1}{2}$  series of scales above lateral line . . . . . 1. *B. microstoma*, Gthr., p. 188.
- Head as long as deep ; some of the rays of dorsal much prolonged ;  $7\frac{1}{2}$  series of scales above lateral line . . . . . 2. *B. yseuxi*, Blgr., p. 189.

## 1. BRYCONÆTHIOPS MICROSTOMA.

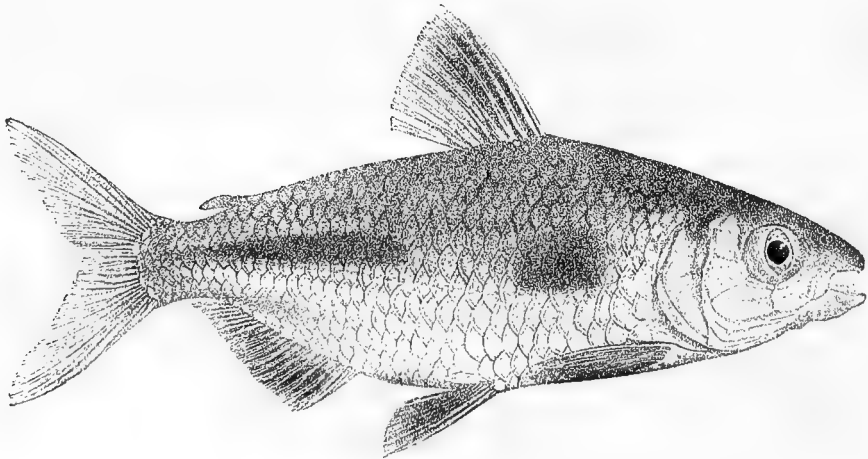
Günth. Ann. & Mag. N. H. (4) xii. 1873, p. 143 ; Bouleng. Ann. Mus. Congo, Zool. i. p. 82, pl. xxxvii. fig. 1 (1899), and Poiss. Bass. Congo, p. 145 (1901).

*Brachyalestes mocquardianus*, Thominot, Bull. Soc. Philom. (7) x. 1886, p. 167.

*Bryconæthiops boulengeri*, Pellegr. Bull. Mus. Paris, 1900, p. 101.

Depth of body  $2\frac{4}{5}$  to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{1}{3}$  to  $3\frac{2}{3}$  times. Head a little longer than deep,  $1\frac{3}{4}$  to 2 times as long as broad ; snout broad, rounded, as long or a little shorter than eye, which is  $2\frac{1}{2}$  to  $3\frac{1}{4}$  times in length of head ; adipose eyelid much developed ; interorbital width 2 to  $2\frac{1}{2}$  times in length of head ; maxillary extending to below anterior border of eye or not quite so far ; 14 teeth ( $\frac{2}{6}$ ) in upper jaw, 8 or 10 ( $\frac{6-8}{2}$ ) in lower ; lower border of second suborbital as long or a little longer than diameter of eye. Gill-rakers slender, shorter than gill-fringes, 15-17 on lower part of anterior arch. Dorsal II 8, nearer occiput than adipose fin, its fifth ray above first of ventral ; longest ray not longer than head. Anal III 17-20. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head,

Fig. 144.



*Bryconæthiops microstoma*, var. *boulengeri*.

Congo (A. M. C.).  $\frac{4}{5}$ .

not reaching ventral. Caudal forked, with long pointed lobes. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times as long as deep. Scales 35-40  $\frac{6\frac{1}{2}}{4\frac{1}{2}}$ , 3 between lateral line and root of ventral. Silvery, back olive or dark blue, with a dark vertical bar on each side above the pectoral, or (var. *boulengeri*)

with an interrupted black lateral band above the lateral line ; dorsal often blackish between the rays ; ventrals and caudal sometimes partly black.

Total length 176 millim.

Cameroon, Gaboon, Congo.

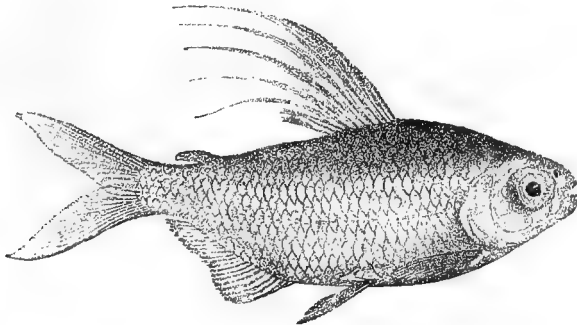
|                  |                                    |                                                     |
|------------------|------------------------------------|-----------------------------------------------------|
| 1, 2-3, 4-8. Ad. | Kribi R., S. Cameroon.             | G. L. Bates, Esq. (C.).                             |
| & hgr.           |                                    |                                                     |
| 9-10. Ad.        | Ja R. (Congo System).              | "                                                   |
| 11-12. Types.    | Boma, Lower Congo.                 | J. J. Monteiro, Esq. (C.).                          |
| 13. Skel.        | Stanley Pool.                      | M. A. Greshoff (C.).                                |
| 14. Ad.          | Coquilhatville, Upper Congo.       | M. P. Delhez (C.).                                  |
| 15. Ad.          | Ibali, Lake Leopold II., U. Congo. | "                                                   |
| 16-17. Ad.       | Monsembe, Upper Congo.             | Rev. J. H. Weeks (P.).                              |
| 18. Hgr.         | Lindi R., "                        | M. M. Storms (C.) ;<br>Brussels Museum (E.).        |
| 19. Hgr.         | Uerre R., "                        | M. De Bauw (C.).                                    |
| 20. Ad.          | Aruwimi R., "                      | R. B. Woosnam, Esq. (C.) ;<br>Ruwenzori Expedition. |

## 2. BRYCONÆTHIOPS YSEUXI.

Bouleng. Ann. Mus. Congo, Zool. i. p. 82, pl. xxxvii. fig. 2, and Poiss. Bass. Congo, p. 147 (1901).

Depth of body  $2\frac{3}{4}$  times in total length, length of head nearly 4 times. Head as long as deep, once and  $\frac{3}{4}$  as long as broad ; snout shorter than eye, which is 3 times in length of head and equals interorbital width ;

Fig. 145



*Bryconæthiops yseuxi*.

Type (A. M. C.).  $\frac{4}{5}$ .

adipose eyelid much developed ; maxillary extending to below anterior border of eye ; teeth as in the preceding. Gill-rakers short, 12 on lower part of anterior arch. Dorsal II 8, at equal distance from end of snout and from adipose fin, its fourth ray above first of ventral ; some of the rays

much produced, the longest more than half total length. Anal III 20. Pectoral as long as ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales  $38 \frac{7\frac{1}{2}}{4\frac{1}{2}}$ , 3 between lateral line and root of ventral. Brownish above, yellowish beneath; extremity of dorsal and ventral and edge of anal and caudal blackish.

Total length 80 millim.

Upper Congo.

1. Type.

Upper Congo.

Brussels University.

#### 4. ALESTES.

*Myletes*, part., Cuv. Mém. Mus. iv. 1818, p. 444.

*Alestes*, part., Müll. & Trosch. Hor. Ichthyol. i. p. 12 (1846).

*Alestes*, Cuv. & Val. Hist. Poiss. xxii. p. 179 (1849); Günth. Cat. Fish. v. p. 312 (1864); Bouleng. Poiss. Bass. Congo, p. 148 (1901), and Fish. Nile, p. 110 (1907).

*Brycinus*, Cuv. & Val. t. c. p. 157.

*Brachyalestes*, part., Günth. t. c. p. 314.

Snout short; mouth moderately large; præmaxillary bones not movable, with two series of strong teeth few in number, the outer compressed and tri- or quinquecuspid, the inner with molar-like, obliquely truncate or excavated crowns, each armed with several pointed tubercles; mandibular teeth in two series, the outer composed of several pluricuspid teeth, the inner of a pair of conical teeth; maxillary bone toothless, moderately large. Cheek covered by the large suborbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes free from the isthmus; 4 branchiostegal rays. Body more or less elongate and compressed; belly rounded. Scales moderate or large, not ciliated; lateral line nearer the ventral than the dorsal outline; a scaly process at the base of the ventral fin. Dorsal fin with 9 to 11 rays, above or behind the vertical of the ventrals; anal fin with 13 to 30 rays; a small adipose dorsal fin. Vertebrae 37-51.

Africa.

#### *Synopsis of the Species.*

I. Scales 39-50  $\frac{6\frac{1}{2}-9\frac{1}{2}}{3\frac{1}{2}}$ .

A. Dorsal originating behind vertical of base of ventrals; scales 44-51  $\frac{8\frac{1}{2}-9\frac{1}{2}}{3\frac{1}{2}}$ ; depth of body  $3\frac{3}{4}$  to  $5\frac{1}{3}$  times in total length.

A. 22-26; gill-rakers 20-26 on lower part of anterior arch; dorsal originating just

behind vertical of last ray of ventral. 1. *A. dentex*, L., p. 193.

- A. 25-30 ; gill-rakers 30-38 on lower part of anterior arch ; dorsal equidistant from vertical of last ray of ventral and first ray of anal, or a little nearer latter . . . . . 2. *A. baremose*, Joann., p. 195.
- B. Dorsal originating above ventrals ; scales 39-45  $\frac{6\frac{1}{2}-8\frac{1}{2}}{3\frac{1}{2}}$  ; gill-rakers 17-20 on lower part of anterior arch.
- A. 20-23 ; depth of body  $3\frac{1}{2}$ - $4\frac{1}{2}$  times in total length ; interorbital width 3- $3\frac{1}{2}$  times in length of head . . . . . 3. *A. macrophthalmus*, Gthr., p. 197.
- A. 18-19 ; depth of body  $3\frac{1}{4}$ -4 times in total length ; interorbital width 2- $2\frac{2}{3}$  times in length of head . . . . . 4. *A. liebrechtsii*, Blgr., p. 198.
- II. Scales 32-36  $\frac{6\frac{1}{2}}{3\frac{1}{2}}$ .
- A. Dorsal originating behind vertical of base of ventrals ; depth of body  $3\frac{1}{4}$ - $3\frac{1}{2}$  times in total length.
- A. 23 ; a much developed adipose eyelid ; gill-rakers 58 on lower part of anterior arch . . . . . 5. *A. stuhlmanni*, Pfeff., p. 199.
- A. 19-20 ; adipose eyelid feebly developed ; gill-rakers 17-18 on lower part of anterior arch . . . . . 6. *A. sadleri*, Blgr., p. 200.
- B. Dorsal originating above base of ventrals ; depth of body not more than 3 times in total length.
- A. 26-28 ; head a little longer than deep ; interorbital width not 3 times in length of head . . . . . 7. *A. tholloni*, Pellegr., p. 201.
- A. 22-24 ; head as long as deep ; interorbital width 3 times in length of head. 8. *A. intermedius*, Blgr., p. 201.
- III. Scales 21-33  $\frac{4\frac{1}{2}-5\frac{1}{2}}{2\frac{1}{4}-3\frac{1}{4}}$ .
- A. Dorsal originating above or immediately behind vertical of base of ventrals.
1.  $5\frac{1}{2}$  series of scales above lateral line.
- a. Dorsal originating above base of ventrals.
- A. 22-24 ; Sc. 24-29 ; gill-rakers 12-14 on lower part of anterior arch . . . . . 9. *A. longipinnis*, Gthr., p. 202.
- A. 18-19 ; Sc. 30-33 ; gill-rakers 20-27 on lower part of anterior arch ; interorbital width 3 times in length of head. 11. *A. lateralis*, Blgr., p. 204.
- A. 14-18 ; Sc. 26-33 ; gill-rakers 16-20 on lower part of anterior arch ; interorbital width not 3 times in length of head . . . . . 12. *A. nurse*, Rüpp., p. 205.

b. Dorsal behind vertical of base of ventrals.

- A. 21-23 ; Sc. 25-28 ; gill-rakers 12-13 on lower part of anterior arch ; eye as long as postocular part of head . . . 10. *A. chaperi*, Sauv., p. 203.
- A. 19-21 ; Sc. 25-27 ; gill-rakers 18-20 on lower part of anterior arch ; eye shorter than postocular part of head . 13. *A. affinis*, Gthr., p. 208.
2.  $4\frac{1}{2}$  series of scales above lateral line.
- a. Interorbital width at least twice in length of head ; A. 15-20.
- α. Dorsal originating above middle or last rays of ventrals ; gill-rakers 16-20 on lower part of anterior arch.
- A. 17-19 ; Sc. 23-29 ; interorbital width  $2\frac{1}{5}$ - $2\frac{2}{3}$  times in length of head . . . 14. *A. imberi*, Peters, p. 209.
- A. 17 ; Sc. 30 ; interorbital width nearly 3 times in length of head . . . 15. *A. humilis*, Blgr., p. 211.
- A. 15-16 ; Sc. 24-25 ; interorbital width  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times in length of head. . . 16. *A. kingsleyæ*, Gthr., p. 212.
- β. Dorsal entirely behind vertical of base of ventrals ; gill-rakers 20-26 on lower part of anterior arch.
- A. 15-17 ; Sc. 27-29 ; interorbital width  $2-2\frac{1}{2}$  times in length of head . . . 17. *A. bimaculatus*, Blgr., p. 213.
- A. 18-20 ; Sc. 23-26 ; interorbital width  $2-2\frac{1}{2}$  times in length of head . . . 18. *A. tenuis*, Gthr., p. 214.
- A. 16-18 ; Sc. 24-27 ; interorbital width  $2\frac{3}{4}$ -3 times in length of head . . . 19. *A. opisthotænia*, Blgr., p. 215.
- b. Interorbital width once and  $\frac{2}{3}$  in length of head.
- A. 13 ; Sc. 22 . . . . . 20. *A. poptæ*, Pellegr., p. 216.
- B. Dorsal fin well behind vertical of base of ventrals, originating much nearer caudal than end of snout ;  $4\frac{1}{2}$  series of scales above lateral line.
1. Distance between end of snout and occiput much greater than width of head ; depth of body  $3\frac{1}{3}$ - $4\frac{1}{3}$  times in total length ; A. 15-17.
- Sc. 22-26 . . . . . 21. *A. macrolepidotus*, Cuv., p. 217.
- Sc. 28-29 . . . . . 22. *A. rhodopleura*, Blgr., p. 218.
2. Distance between end of snout and occiput not or but little greater than width of head in the adult.
- A. 13-14 ; Sc. 23-27 ; depth of body  $3\frac{1}{3}$ -4 times in total length . . . . . 23. *A. grandisquamis*, Blgr., p. 220.
- A. 15-16 ; Sc. 28-29 ; depth of body  $3\frac{1}{3}$ -4 times in total length . . . . . 24. *A. batesii*, Blgr., p. 221.
- A. 16-18 ; Sc. 21-23 ; depth of body  $2\frac{3}{4}$ -3 times in total length . . . . . 25. *A. brevis*, Blgr., p. 222.



## 1. ALESTES DENTEX.

*Salmo dentex*, Linn. in Hasselq. Reise Palæst. p. 395 (1757).

*Salmo dentex*, part., Linn. Syst. Nat. i. p. 531 (1766).

*Characinus niloticus*, Geoffr. Deser. Egypte, Poiss. p. 50, pl. iv. fig. 2 (1809).

*Myletes hasselquistii*, Cuv. Mém. Mus. iv. 1818, p. 449, pl. xxi. fig. 2.

*Alestes dentex*, Müll. & Trosch. Hor. Ichth. i. p. 13, pl. ii. fig. 6 (1845); Heckel, Russegger's Reise Egypt. iii. p. 307, pl. xxi. fig. 2 (1849); Günth. Cat. Fish. v. p. 312 (1864), and Petherick's Trav. ii. p. 242 (1869); Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 488; Werner, Sitz. Ak. Wien, cxvi. i. 1906, p. 1127; Bouleng. Fish. Nile, p. 113, pl. xviii. fig. 1 (1907).

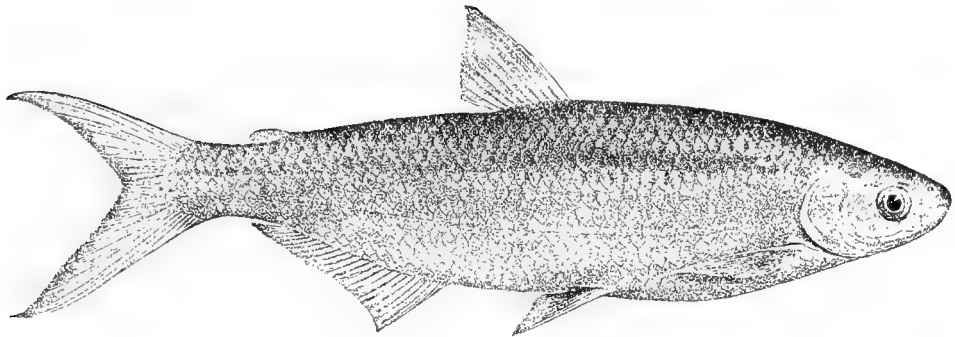
*Alestes hasselquistii*, Cuv. & Val. Hist. Poiss. xxii. p. 180 (1849).

*Alestes sethente*, Cuv. & Val. t. c. p. 190; Günth. t. c. p. 313; Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 541.

*Myletes dentex*, Eigenm. Proc. U.S. Nat. Mus. xxxiii. 1907, p. 29.

Depth of body  $3\frac{3}{5}$  to  $4\frac{2}{3}$  times in total length, length of head  $4\frac{1}{2}$  to 6 times. Head  $1\frac{2}{3}$  to  $2\frac{1}{3}$  times as long as broad,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep; snout not projecting beyond lower lip, as long as or slightly longer than eye; eye lateral, its diameter  $3\frac{1}{2}$  (young) to  $4\frac{1}{4}$  times in length of

Fig. 146.



*Alestes dentex*,  
Lower Nile (F. N.).  $\frac{1}{2}$ .

head; adipose eyelid well developed; interorbital region very convex, its width  $2\frac{1}{2}$  to 3 times in length of head; maxillary not reaching to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital longer than diameter of eye in adult. Gill-rakers rather long and slender, 20–26 on lower part of anterior arch. Dorsal II 8, beginning just behind vertical of base of ventrals, equally distant from eye and from root of caudal, or slightly nearer latter; first

branched ray longest, as long as or a little longer than head. Anal III 19-23 (usually 20-22). Pectoral as long as or a little shorter than head. Caudal deeply forked, lobes pointed. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as deep. Scales with fine granulations and feeble radiating canals, 44-51,  $\frac{8\frac{1}{2}-9\frac{1}{2}}{3\frac{1}{2}}$ , 2 or  $2\frac{1}{2}$  between lateral line and root of ventral. Silvery, back dark grey or dark green; a more or less distinct darker band may extend along each side of the back; lower lobe of caudal bright red.

Total length 400 millim.

Lower Nile to Lake Albert; Lake Rudolf; Chad Basin; Senegal, Gambia, Niger.

|                            |                                         |                                                       |
|----------------------------|-----------------------------------------|-------------------------------------------------------|
| 1-6. Hgr. & yg.            | Near Ghet-el-Nassara, Lake<br>Menzaleh. | L. Loat, Esq. (C.).                                   |
| 7. Skel.                   | Lower Nile.                             | Dr. Rüppell (C.).                                     |
| 8, 9, 10-12. Hgr.<br>& yg. | Near Cairo.                             | L. Loat, Esq. (C.).                                   |
| 13. Ad.                    | Giza, near Cairo.                       | "                                                     |
| 14. Ad.                    | Birket Karun, Fayum.                    | "                                                     |
| 15. Yg.                    | Bahr Tamiyeh, "                         | "                                                     |
| 16-19. Ad. & yg.           | Near Luxor.                             | "                                                     |
| 20. Yg.                    | Belanya, Upper Nile.                    | "                                                     |
| 21-23. Ad. & hgr.          | Khartum.                                | J. Petherick, Esq. (C.).                              |
| 24. Skel.                  | "                                       | "                                                     |
| 25-29. Hgr.                | Omdurman.                               | L. Loat, Esq. (C.).                                   |
| 30-32. Hgr.                | Polkom, Baro R. (Sobat).                | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 33-36. Ad.                 | Mouth of L. No, White Nile.             | L. Loat, Esq. (C.).                                   |
| 37-49, 40. Ad. &<br>yg.    | Gondokoro, Bahr-el-Gebel.               | "                                                     |
| 41. Ad.                    | Fajao, Victoria Nile.                   | J. S. Budgett, Esq. (P.).                             |
| 42. Ad.                    | Butyaba, Lake Albert.                   | "                                                     |
| 43. Ad.                    | Lake Chad.                              | Capt. G. B. Gosling (P.).                             |
| 44-48. Yg.                 | St. Louis, Senegal.                     | M. P. Delhez (C.).                                    |
| 49-53. Yg.                 | Kaédi, "                                | "                                                     |
| 54. Ad.                    | Gambia.                                 | Lord Derby (P.).                                      |
| 55-57. Ad. & yg.           | "                                       | J. S. Budgett, Esq. (P.).                             |
| 58-59. Ad.                 | Jebba, Upper Niger.                     | Dr. C. Christy (P.).                                  |
| 60. Ad.                    | Iokoja, "                               | J. S. Budgett, Esq. (P.).                             |
| 61. Hgr.                   | Benue R., north of Ibi.                 | H. L. Norton Traill, Esq. (C.).                       |

## 2. ALESTES BAREMOSE.

*Salmo niloticus* (non Hasselq.), Linn. Syst. Nat. i. p. 514 (1766).

*Salmo dentex*, part., Linn. t. c. p. 531.

*Myletes baremose*, Joannis, Mag. Zool. 1835, iii. pl. vi.

*Myletes hasselquistii* (non Cuv.), Guérin, Icon. R. An., Poiss. pl. lvi. fig. 1 (1844).

*Alestes kotschy*, Heckel, Russegger's Reise Egypt. iii. p. 308, pl. xxi. fig. 3 (1849); Günth. Cat. Fish. v. p. 313 (1864), and Petherick's Trav. ii. p. 242 (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 543; Vincig. Ann. Mus. Genova, (2) xix. 1898, p. 257.

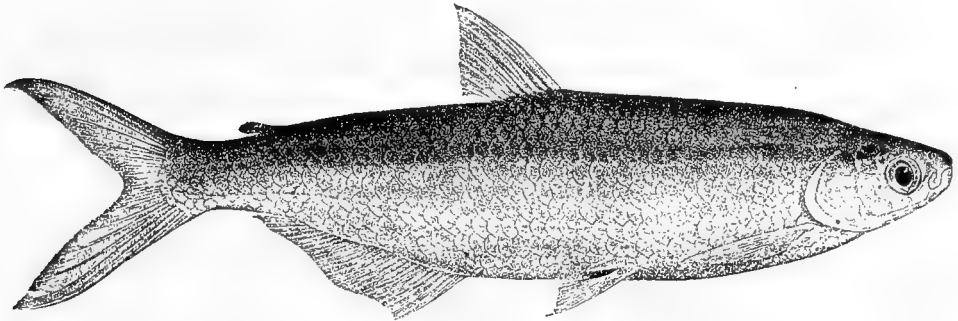
*Alestes wytsi*, Steind. t. c. p. 542, pl. ii. fig. 1.

*Alestes baremose*, Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 488; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1126; Bouleng. Fish. Nile, p. 117, pl. xviii. fig. 2 (1907).

*Alestes splendens*, Werner, t. c. p. 1127.

Depth of body  $3\frac{2}{3}$  to  $5\frac{1}{3}$  times in total length, length of head 4 to  $5\frac{2}{3}$  times. Head 2 to  $2\frac{1}{2}$  times as long as broad,  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times as long as deep; snout rounded, as long as eye (shorter in young); eye lateral, its diameter 3 (young) to 4 times in length of head; adipose eyelid well developed; interorbital region very convex, its width  $2\frac{5}{8}$  to  $3\frac{1}{2}$  times

Fig. 147.



*Alestes baremose*.

Lower Nile (F. N.).  $\frac{1}{2}$ .

in length of head; maxillary not reaching to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital longer than eye in adult. Gill-rakers rather long and slender, closely set, 30-38 on lower part of anterior arch. Dorsal II 8, equidistant from vertical of last ray of ventral and first of anal, or a little nearer latter, equally distant from eye or occiput and from root of caudal; first branched ray longest, as long as or a little longer or a

little shorter than head. Anal III 22-27, its base at least as long as head and usually longer in adult. Pectoral as long as or a little shorter than head. Caudal deeply forked, lobes pointed. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep. Scales with fine granulations and feeble radiating canals, 45-50  $\frac{8\frac{1}{2}-9\frac{1}{2}}{2\frac{1}{2}}$ ,  $1\frac{1}{2}$  or 2 between lateral line and root of caudal. Coloration same as in *A. dentex*.

Total length 310 millim.

Nile, Blue and White Niles, Lake Rudolf, Chad Basin, Senegal, Gambia, Niger.

|                            |                                       |                                                       |
|----------------------------|---------------------------------------|-------------------------------------------------------|
| 1-3. Hgr.                  | Nile.                                 | Sir J. Burton (P.).                                   |
| 4. Ad.                     | "                                     | Rev. O. P. Cambridge (P.).                            |
| 5. Skel.                   | "                                     | Dr. Rüppell (C.).                                     |
| 6-9. Ad.                   | Lower Nile.                           | J. Petherick, Esq. (C.).                              |
| 10. Yg.                    | Near Ghet-el-Nassara,<br>L. Menzaleh. | L. Loat, Esq. (C.).                                   |
| 11. Skel.                  | "                                     | "                                                     |
| 12. Hgr.                   | Samannud, Damietta Nile.              | "                                                     |
| 13-24. Ad. & hgr.          | Rosetta Nile, near Barrage.           | "                                                     |
| 25-26. Hgr. & yg.          | Cairo.                                | "                                                     |
| 27-31. Hgr. & yg.          | Beni Souef, Lower Nile.               | "                                                     |
| 32. Skel.                  | " "                                   | "                                                     |
| 33-34. Hgr. & yg.          | Between Assiut and Abu Tig.           | "                                                     |
| 35-42. Yg.                 | Near Luxor.                           | "                                                     |
| 43. Skel.                  | "                                     | "                                                     |
| 44-55. Hgr. & yg.          | Between Luxor and Assuan.             | "                                                     |
| 56-58. Hgr.                | Derau, Lower Nile.                    | "                                                     |
| 59-64. Ad., hgr.,<br>& yg. | Assuan.                               | "                                                     |
| 65-66. Hgr.                | Derr, Upper Nile.                     | "                                                     |
| 67. Hgr.                   | Near Wady Halfa.                      | "                                                     |
| 68. Ad.                    | Kosheh, Upper Nile.                   | "                                                     |
| 69-73. Ad. & hgr.          | Khartum.                              | J. Petherick, Esq. (C.).                              |
| 74. Hgr.                   | Omdurman.                             | L. Loat, Esq. (C.).                                   |
| 75. Yg.                    | Wad Medine, Blue Nile.                | "                                                     |
| 76. Hgr.                   | Between Khartum and<br>Sobat.         | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 77. Ad.                    | Mouth of Lake No, White<br>Nile.      | L. Loat, Esq. (C.).                                   |
| 78-80. Ad. & hgr.          | Gondokoro, Bahr-el-Gebel.             | "                                                     |
| 81. Ad.                    | Lake Chad.                            | Capt. G. B. Gosling (P.).                             |
| 82. Yg.                    | Fort Lamy, Shari R.                   | "                                                     |
| 83-86. Ad. & hgr.          | Kaëdi, Senegal.                       | M. P. Delhez (C.).                                    |

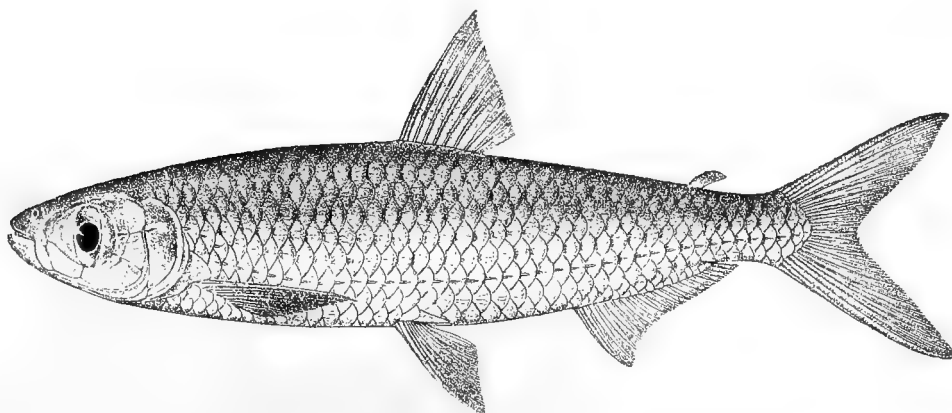
|             |                     |                           |
|-------------|---------------------|---------------------------|
| 87-88. Hgr. | Gambia.             | Sir A. Moloney (P.).      |
| 89. Ad.     | "                   | J. S. Budgett, Esq. (P.). |
| 90. Ad.     | Jebba, Upper Niger. | Capt. G. F. Abadie (P.).  |
| 91-92. Yg.  | " "                 | Dr. C. Christy (P.).      |

## 3. ALESTES MACROPHthalmus.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 113; Boulenger, Tr. Zool. Soc. xv. 1898, p. 25; Pellegr. Bull. Mus. Paris, 1900, p. 177; Boulenger, Poiss. Bass. Congo, p. 151 (1901).

Depth of body  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head 2 to  $2\frac{1}{2}$  times as long as broad,  $1\frac{1}{4}$  to  $1\frac{1}{3}$  as long as deep; snout as long as or a little shorter than eye, which is lateral and 3 to  $3\frac{1}{2}$  times in length of head; adipose eyelid well developed; interorbital region convex, its width 3 to  $3\frac{1}{2}$  times in length of head; maxillary not

Fig. 148.

*Alestes macrophthalmus.*Type.  $\frac{1}{2}$ .

extending to below anterior border of eye; 14-18 ( $\frac{6-8}{8-10}$ ) teeth in upper jaw, 10 ( $\frac{8}{9}$ ) in lower; lower border of second suborbital as long as eye. Gill-rakers long and slender, 17-20 on lower part of anterior arch. Dorsal II 8, originating above ventral, at equal distance from end of snout and from caudal, longest ray equal to or a little less than length of head. Anal III 17-20. Pectoral  $\frac{3}{4}$  to once length of head, not reaching ventral. Caudal forked, with long pointed lobes. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep. Scales without anastomosing canals, 39-45 ( $\frac{6\frac{1}{2}-8\frac{1}{2}}{3\frac{1}{4}}$ ), 2 between lateral line and root of ventral. Silvery,

bluish or greenish on the back ; pectoral and ventral fins sometimes blackish.

Total length 460 millim.

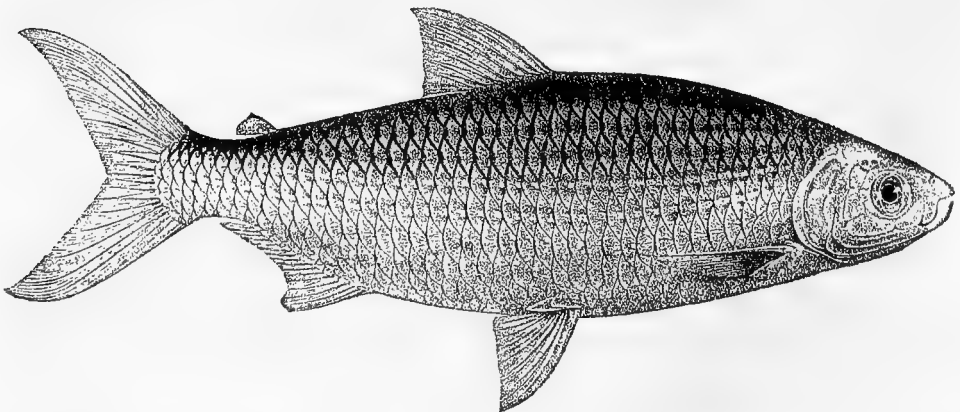
Gaboon, Congo, Lake Tanganyika, Lake Mweru, Lake Bangwelu.

|                   |                                          |                                                     |
|-------------------|------------------------------------------|-----------------------------------------------------|
| 1. Type.          | Gaboon.                                  |                                                     |
| 2. Ad.            | Tulagouga, Ogowe.                        | Miss Kingsley (C.).                                 |
| 3. Ad.            | Ja River (Congo System),<br>S. Cameroon. | G. L. Bates, Esq. (C.).                             |
| 4. Ad.            | Ituri River (Aruwimi),<br>near Iruma.    | R. B. Woosnam, Esq. (C.) ;<br>Ruwenzori Expedition. |
| 5. Ad.            | Lake Tanganyika.                         | Prof. J. E. S. Moore (C.).                          |
| 6. Ad.            | Kalambo, Lake Tanganyika.                | "                                                   |
| 7. Ad.            | Kituta, "                                | Dr. W. A. Cunningham (C.).                          |
| 8-9. Hgr.         | Mtondwe Bay, L. Tangan-<br>yika.         | "                                                   |
| 10-12. Ad. & hgr. | Niamkolo, L. Tanganyika.                 | "                                                   |
| 13. Skel.         | " "                                      | "                                                   |
| 14. Skin.         | Lake Mweru.                              | Sir A. Sharpe (P.).                                 |
| 15. Hgr.          | "                                        | Capt. Lemaire (C.).                                 |
| 16-17. Hgr.       | Lake Bangwelu.                           | F. H. Melland, Esq. (P.).                           |

#### 4. ALESTES LIEBRECHTSII.

Bouleng. Ann. Mus. Congo, Zool. i. p. 29, pl. xv. (1898), and Poiss. Bass. Congo, p. 152 (1901).

Fig. 149.



*Alestes liebrechtsii.*

Type (A. M. C.).  $\frac{1}{3}$ .

Depth of body  $3\frac{1}{4}$  to 4 times in total length, length of head  $4\frac{1}{2}$  to 5 times. Head  $1\frac{1}{2}$  to 2 times as long as broad, a little longer than deep ; snout as long as eye, which is lateral and  $3\frac{1}{2}$  times in length of head ;

adipose eyelid well developed; interorbital region convex, 2 to  $2\frac{2}{3}$  times in length of head; maxillary not extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers shorter than gill-lamellæ, 17-20 on lower part of anterior arch. Dorsal III 8, originating above ventral, at equal distance from end of snout and from caudal, longest ray as long as head. Anal III 15-16. Pectoral nearly as long as head. Caudal forked, with long pointed lobes. Caudal peduncle a little longer than deep. Scales without anastomosing canals, 39-41  $\frac{6\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back olive; scales of upper half of body black-edged and with one or several dark spots; pectorals sometimes blackish; caudal red.

Total length 400 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

|                      |                 |                        |
|----------------------|-----------------|------------------------|
| 1. One of the types. | Upoto.          | Capt. Wilverth (C.).   |
| 2. Ad.               | Monsembe.       | Rev. J. H. Weeks (P.). |
| 3. Hgr.              | Coquilhatville. | M. P. Delhez (C.).     |
| 4. Hgr.              | Leopoldville.   | „                      |

#### 5. ALESTES STUHLMANNI.

Pfeff. Thierw. O.-Afr., Fische, p. 44 (1896).

Depth of body  $3\frac{1}{4}$  times in total length, length of head 4 times. Head twice as long as broad, a little longer than deep; snout as long as eye, which is lateral and 4 times in length of head; adipose eyelid much developed; interorbital region convex, its width 3 times in length of head; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital longer than eye. Gill-rakers long and slender, very closely set, 58 on lower part of anterior arch. Dorsal II 8, just behind vertical of base of ventrals, equally distant from occiput and from caudal, longest ray a little shorter than head. Anal III 20. Pectoral a little shorter than head, not reaching ventral. Caudal deeply forked. Caudal peduncle as long as deep. Scales with radiating canals, 36  $\frac{6\frac{1}{2}}{3\frac{1}{2}}$ ,  $1\frac{1}{2}$  between lateral line and root of ventral. Uniform silvery; caudal dark-edged.

Total length 160 millim.

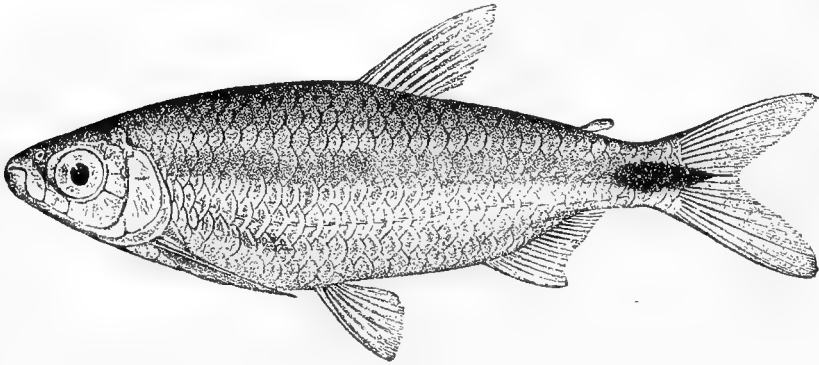
Kingani River, German East Africa.—Described from the type specimen in the Berlin Museum.

## 6. ALESTES SADLERI.

Bouleng. Ann. & Mag. N. H. (7) xvii. 1906, p. 435 ; Steind. Ann. Hofmus. Wien, xxi. 1906, p. 151 ; Bouleng. Fish. Nile, p. 121, fig. (1907).

Depth of body  $3\frac{1}{4}$  to  $3\frac{1}{2}$  times in total length, length of head 4 times or a little less. Head twice as long as broad, slightly longer than deep ; snout a little shorter than eye, which is lateral and 3 to  $3\frac{1}{4}$  times in length of head ; adipose eyelid feebly developed ; interorbital region convex, its width  $2\frac{1}{2}$  times in length of head ; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower ; lower border of second suborbital as long as eye.

Fig. 150.



*Alestes sadleri*.  
Type (F. N.).

Gill-rakers long and slender, 17–18 on lower part of anterior arch. Dorsal II 8, just behind vertical of base of ventrals, equally distant from occiput and from caudal, longest ray as long as or a little shorter than head. Anal III 16–17. Pectoral as long as head, not reaching ventral. Caudal deeply forked, lobes obtusely pointed. Caudal peduncle barely  $1\frac{1}{2}$  times as long as deep. Scales with radiating and arborescent or anastomosing canals,  $33\frac{6\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Steel-blue above, silvery white below ; a more or less distinct dark lateral band ; a black blotch on caudal peduncle, extending on middle rays of caudal fin.

Total length 94 millim.

Lake Victoria.

1–2 Types.

Entebbe.

Mr. E. Degen (C.).



## 7. ALESTES THOLLONI.

Pellegr. Bull. Mus. Paris, 1901, p. 329.

Depth of body a little less than 3 times in total length, length of head 4 times. Head a little longer than deep; snout shorter than eye, which is  $2\frac{3}{4}$  times in length of head; adipose eyelid feebly developed; interorbital width a little greater than diameter of eye; maxillary hardly reaching to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Dorsal II 8, originating above base of ventrals, at equal distance from end of snout and from caudal. Anal II 24-26. Pectoral nearly reaching base of ventral. Caudal forked. Scales  $32\frac{6\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back bluish.

Total length 105 millim.

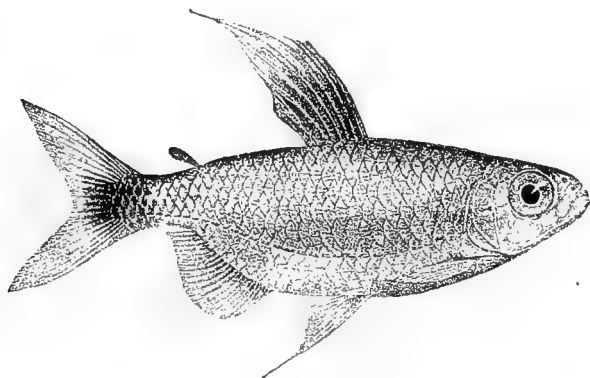
French Congo.—Types in Paris Museum.

## 8. ALESTES INTERMEDIUS.

Bouleng. Proc. Zool. Soc. 1903, i. p. 22, pl. i. fig. 1.

Depth of body 3 times in total length, length of head 4 times. Head twice as long as broad, as long as deep; snout shorter than eye; latter  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times in length of head; adipose eyelid indistinct; interorbital

Fig. 151.



*Alestes intermedius.*

Type (P. Z. S. 1903).  $\frac{4}{5}$ .

width  $\frac{1}{3}$  length of head; maxillary not extending quite to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; length of lower border of second suborbital less than diameter of eye. Gill-rakers moderately elongate, 12-13 on lower part of anterior arch. Dorsal II 8, above base of ventrals, originating a little nearer end of

snout than caudal, middle branched rays much produced ( $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as head) in males. Anal III 19-21. Pectoral shorter than head, not reaching ventral; latter produced into a long filament in males. Caudal forked. Caudal peduncle a little longer than deep. Scales with radiating and arborescent or anastomosing canals, 33-35  $\frac{6\frac{1}{2}}{3\frac{1}{4}}$ , 2 between lateral line and ventral. Silvery; a large black spot on the caudal peduncle and on the median rays of the caudal; latter yellow, blackish at the end; dorsal black and red in the male.

Total length 85 millim.

South Cameroon, Gaboon.

|             |                  |                         |
|-------------|------------------|-------------------------|
| 1-3. Types. | Kribi River.     | G. L. Bates, Esq. (C.). |
| 4-5. Ad.    | "                | "                       |
| 6. Hgr.     | Ombrokua, Ogowe. | Dr. W. J. Ansorge (C.). |

#### 9. ALESTES LONGIPINNIS.

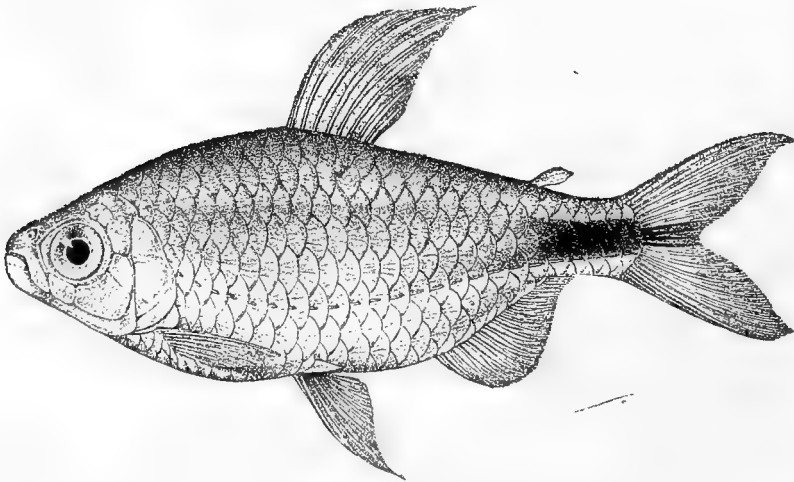
*Brachyalestes longipinnis*, Günth. Cat. Fish. v. p. 315 (1864).

*Alestes longipinnis*, Steind. Notes Leyd. Mus. xvi. 1894, p. 64; Bouleng. Poiss.

Bass. Congo, p. 150 (1901); Pellegr. Bull. Soc. Philom. (9) ix. 1907, p. 21.

*Alestes longipinnis*, part., Günth. Proc. Zool. Soc. 1902, ii. p. 338.

Fig. 152.



*Alestes longipinnis*.

Type.

Depth of body  $2\frac{1}{2}$  to 3 times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head about twice as long as broad, as long as deep; snout a little shorter than eye, which is lateral and  $2\frac{2}{3}$  to  $3\frac{1}{4}$  times in length of head; adipose eyelid scarcely developed; interorbital region convex, its

width about  $2\frac{1}{2}$  times in length of head; maxillary not quite extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 8 or 10 ( $\frac{6-8}{2}$ ) in lower; lower border of second suborbital as long as eye. Gill-rakers moderately long, 12-14 on lower part of anterior arch. Dorsal II 8, originating above first or middle rays of ventral, at equal distance from end of snout and from caudal, or a little nearer former, some of the rays produced in males, longer than head. Anal III 19-21. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, not reaching ventral, the outer branched ray of which is produced in males. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales with radiating and arborescent or anastomosing canals, 24-29  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back brown or olive; a black band on caudal peduncle, extending on caudal fin; vertical black lines sometimes present on the body; dorsal and caudal yellow in females, red in males.

Total length 110 millim.

Sierra Leone to Congo.

|                   |                         |                          |
|-------------------|-------------------------|--------------------------|
| 1-5. Types.       | Sierra Leone.           |                          |
| 6. Skel.          | "                       |                          |
| 7-16. Ad. & hgr.  | Freetown, Sierra Leone. | R. Dinzey, Esq. (P.).    |
| 17. Skel.         | " "                     | "                        |
| 18-19. Ad.        | Sapelle, Lower Niger.   | Dr. W. J. Ansorge (C.).  |
| 20-22, 23-24. Ad. | Kribi R., S. Cameroon.  | G. L. Bates, Esq. (C.).  |
| 25-29. Ad. & hgr. | Benito R.               | "                        |
| 30-36. Hgr.       | Ogowe R.                | Miss Kingsley (C.).      |
| 37-38. Ad.        | Sette Cama, Gaboon.     |                          |
| 39. Ad.           | Stanley Falls.          | Rev. W. H. Bentley (C.). |

#### 10. ALESTES CHAPERI.

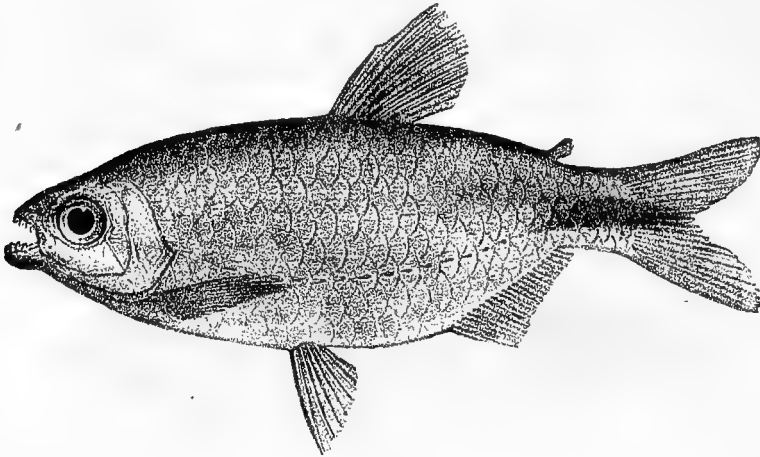
Sauv. Bull. Soc. Zool. France, 1882, p. 320, pl. v. fig. 3.

*Alestes longipinnis*, part., Günth. Proc. Zool. Soc. 1902, ii. p. 338.

Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{3}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head twice as long as broad, as long as deep; snout shorter than eye, which is lateral and  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times in length of head; inter-orbital region convex, its width  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times in length of head; maxillary extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as or a little shorter than eye. Gill-rakers moderately long, 12-13 on lower part of anterior arch. Dorsal II 8, originating just behind vertical

of base of ventral, a little nearer caudal than end of snout; longest ray as long as or a little shorter than head. Anal III 18–20. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, reaching or nearly reaching ventral. Caudal forked. Caudal peduncle a little longer than deep. Scales with radiating and arborescent or anastomosing canals, 25–28  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between

Fig. 153.

*Alestes chaperi.*

Type, after Sauvage (Bull. Soc. Zool. France, 1882).

lateral line and root of ventral. Silvery, back olive; a black band on caudal peduncle, extending on caudal fin; dorsal and caudal red.

Total length 90 millim.

Gold Coast to Benin.—Types in Paris Museum.

|             |                          |                                                     |
|-------------|--------------------------|-----------------------------------------------------|
| 1–5. Types. | Assini, Gold Coast.      | M. M. Chaper (C.);<br>Paris Museum (E.).            |
| 6. Ad.      | Kotchwah R., Gold Coast. | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |
| 7. Ad.      | Akropon, Gold Coast.     | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |
| 8. Ad.      | Ethiope R. at Kwale.     | R. D. Gardner, Esq. (P.).                           |

#### 11. ALESTES LATERALIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 130, pl. xlvi. fig. 2 (1900), and Poiss.

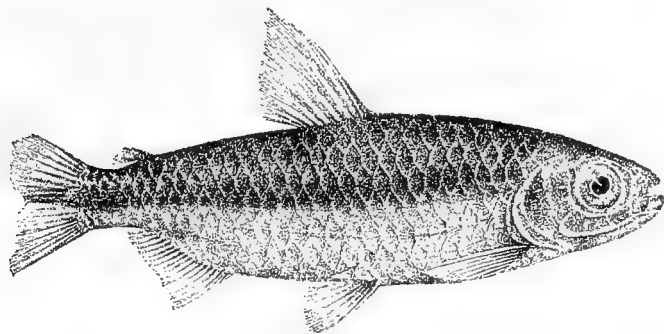
Bass. Congo, p. 153 (1901).

*Alestes natalensis*, Bouleng. Ann. & Mag. N. H. (7) xiv. 1904, p. 155.

Depth of body equal to length of head,  $3\frac{3}{4}$  to  $4\frac{1}{2}$  times in total length. Head twice as long as broad, a little longer than deep; snout shorter than eye, which is lateral and 3 times in length of head; adipose eyelid

feebly developed; interorbital region moderately convex, its width 3 times in length of head; maxillary not reaching to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as eye. Gill-rakers long and slender, 20–27 on lower part of anterior arch. Dorsal II–III 8, originating above base of ventrals, at equal distance from end of snout and from caudal, longest ray nearly as long as head. Anal III–IV 15–16. Pectoral  $\frac{3}{4}$  length of head, not reaching ventral. Caudal deeply forked. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep. Scales without

Fig. 154.

*Alestes lateralis.*Type (A. M. C.).  $\frac{4}{5}$ .

arborescent or anastomosing canals, 30–33  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, darker on the back; a blackish lateral band, extending to median rays of caudal.

Total length 120 millim.

Katanga (Lake Dilolo), Zambesi, Zululand, Natal.—Types in Congo Museum, Tervueren.

- |                      |                           |                           |
|----------------------|---------------------------|---------------------------|
| 1. One of the types. | Lake Dilolo, Katanga.     | Capt. Lemaire (C.).       |
| 2–4. Ad.             | Kafue R., Upper Zambesi.  | T. Codrington, Esq. (P.). |
| 5–6. Ad.             | Elcheleselwane, Zululand. | Dr. E. Warren (P.).       |
| 7. Ad., type of      | Natal.                    | J. F. Quekett, Esq. (P.). |

*A. natalensis.*

## 12. ALESTES NURSE.

*Myletes nurse*, Rüpp. Fortsetz. Beschr. Fische Nil, p. 12, pl. ii. fig. 3 (1832).

*Myletes guile*, Joannis, Mag. Zool. 1835, iii. pl. ix.

*Alestes nurse*, Müll. & Trosch. Hor. Ichthyol. i. p. 13 (1845); Cuv. & Val. Hist.

Poiss. xxii. p. 188 (1849); Günth. Petherick's Trav. ii. p. 343 (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 544; Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 488; Lönnb. Ann. & Mag. N. H. (7) xii. 1903, p. 37;

Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1127 ; Bouleng. Fish. Nile, p. 122, pl. xix. figs. 1 & 2 (1907).

*Chalceus guile*, Cuv. & Val. t. c. p. 255.

*Brachyalestes nurse*, Günth. Cat. Fish. v. p. 314 (1864) ; Fowler, Proc. Ac. Philad. 1906, p. 444, fig.

*Brachyalestes ruppellii*, Günth. t. c. p. 315 ; Pfeff. Thierw. O.-Afr., Fische, p. 43 (1896).

*Alestes leuciscus*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 114.

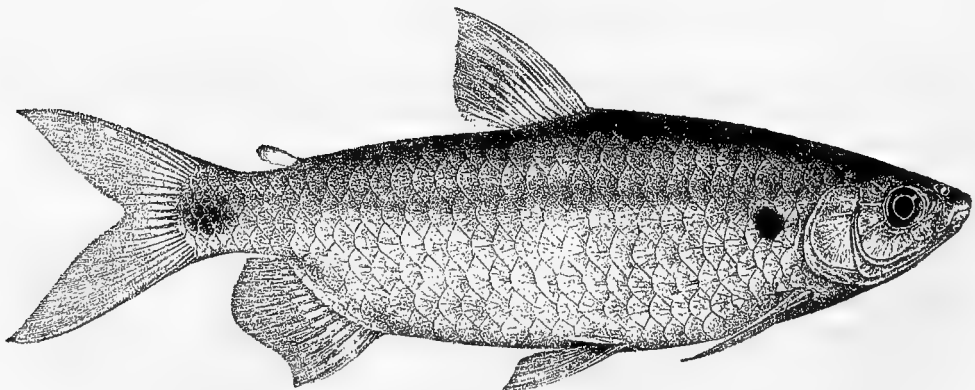
*Alestes ruppellii*, Günth. Petherick's Trav. ii. p. 343 ; Vincig. Ann. Mus. Genova, xxxix. 1898, p. 257.

*Alestes senegalensis*, Steind. t. c. p. 545, pl. ii. fig. 2.

*Brycinus nurse*, Eigenm. Proc. U.S. Nat. Mus. xxxiii. 1907, p. 29.

Depth of body  $2\frac{1}{2}$  to  $3\frac{3}{4}$  times in total length, length of head  $3\frac{1}{2}$  (young) to  $4\frac{2}{5}$  times. Head  $1\frac{2}{3}$  to 2 times as long as broad, as long as deep or a little longer ; snout rounded, not longer than eye, which is lateral and  $2\frac{1}{2}$  (young) to 4 times in length of head ; interorbital region moderately convex, its width  $2\frac{1}{4}$  to  $2\frac{3}{5}$  times in length of head ; maxillary not reaching to below anterior border of eye ; 14 or 16 teeth ( $\frac{6-8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower ; lower border of second suborbital longer

Fig. 155.



*Alestes nurse*.

Blue Nile (F. N.).  $\frac{1}{2}$ .

than eye in adult. Gill-rakers moderately long, 16-20 on lower part of anterior arch. Dorsal II 8 (rarely 7), originating above base of ventrals, its base equally distant from centre or posterior border of eye and from root of caudal ; longest ray as long as or a little shorter than head. Anal III 11-15 (rarely 16). Pectoral a little shorter than head. Caudal deeply forked, lobes pointed. Caudal peduncle 1 to  $1\frac{1}{2}$  times as long as deep. Scales with radiating and more or less distinct

arborescent or anastomosing canals, 26-33  $\frac{5\frac{1}{2}}{3\frac{2}{3}}$ , 2 between lateral line and root of ventral. Silvery or pale golden, dark grey or brown on the back; sometimes a blackish spot above lateral line, behind gill-opening, and another on caudal peduncle, sometimes extending as a streak along median rays of caudal; dorsal greyish, usually with a little pink or red; ventrals and anal white or yellow, usually with a band of red; caudal red, orange, or yellow, the base and the edge blackish.

Total length 230 millim.

Lower Nile to Lake Victoria, Lake Rudolf, Chad Basin, West Africa from the Senegal to Cameroon.—Type in Senckenberg Museum, Frankfurt (M.).

|                                            |                               |                                                       |
|--------------------------------------------|-------------------------------|-------------------------------------------------------|
| 1. Hgr.                                    | Girgeh, Lower Nile.           | L. Loat, Esq. (C.).                                   |
| 2-7, 8-15. Hgr. & yg.                      | Near Luxor.                   | "                                                     |
| 16-25. Hgr. & yg.                          | Between Luxor and Assuan.     | "                                                     |
| 26-35. Ad., hgr., & yg.                    | Assuan.                       | "                                                     |
| 36. Ad.                                    | Between Assuan and Shellal.   | "                                                     |
| 37-40. Hgr.                                | Derr, Upper Nile.             | "                                                     |
| 41-43. Ad., hgr., & yg.                    | Anebi, "                      | "                                                     |
| 44, 45-47. Ad., hgr., & yg.                | Wady Halfa.                   | "                                                     |
| 48-49. Ad.                                 | Upper Nile.                   | J. Petherick, Esq. (C.).                              |
| 50-54. Ad. & hgr.                          | Khartum.                      | "                                                     |
| 55-57. Ad., types of <i>A. ruppellii</i> . | "                             | "                                                     |
| 58. Skel.                                  | "                             | "                                                     |
| 59. Ad.                                    | Wad Medine, Blue Nile.        | L. Loat, Esq. (C.).                                   |
| 60-63. Ad.                                 | Rosaires, "                   | "                                                     |
| 64-66. Hgr.                                | " "                           | Capt. S. Flower (P.).                                 |
| 67-68. Hgr.                                | Between Khartum and Sobat R.  | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 69. Ad.                                    | Jebelain, White Nile.         | L. Loat, Esq. (C.).                                   |
| 70. Hgr.                                   | Gharb-el-Aish, White Nile.    | "                                                     |
| 71-77. Ad.                                 | Polkom, Baro R. (Sobat).      | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 78. Ad.                                    | Mouth of Lake No, White Nile. | L. Loat, Esq. (C.).                                   |
| 79-83. Ad. & hgr.                          | Gondokoro, Bahr-el-Gebel.     | "                                                     |
| 84. Ad.                                    | Lake Victoria.                | Col. Delmé Radcliffe (P.).                            |
| 85-89. Ad.                                 | Entebbe, Lake Victoria.       | Mr. E. Degen (C.).                                    |
| 90-91. Ad.                                 | Bunjako, "                    | "                                                     |

|                                                        |                       |                                                     |
|--------------------------------------------------------|-----------------------|-----------------------------------------------------|
| 92. Hgr.                                               | Yo R., Lake Chad.     | Capt. G. B. Gosling (P.).                           |
| 93-94. Two of the<br>types of <i>A. senegalensis</i> . | Senegal.              |                                                     |
| 95-99, 100-101. Hgr.<br>& yg.                          | St. Louis, Senegal.   | M. P. Delhez (C.).                                  |
| 102-105, 106-113.<br>Hgr. & yg.                        | Kaëdi, "              | "                                                   |
| 114. Ad.                                               | Matam, "              | "                                                   |
| 115-119. Ad.                                           | Gambia.               | J. S. Budgett, Esq. (P.).                           |
| 120. Ad.                                               | Nyankoma, Gold Coast. | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |
| 121. Ad.                                               | Mureji, Upper Niger.  | J. S. Budgett, Esq. (P.).                           |
| 122. Hgr.                                              | Jebba, "              | Capt. G. F. Abadie (P.).                            |
| 123-128. Hgr. & yg.                                    | " "                   | Dr. C. Christy (P.).                                |
| 129-132. Hgr. & yg.                                    | Agberi, Lower Niger.  | Dr. W. J. Ansorge (C.).                             |
| 133-134. Yg., types<br>of <i>A. leuciscus</i> .        | Niger.                | Mr. J. T. Dalton (C.).                              |
| 135. Ad.                                               | Benue R., N. of Ibi.  | H. L. Norton Traill, Esq. (C.).                     |
| 136. Hgr.                                              | Warri, Old Calabar.   | Miss Kingsley (C.).                                 |
| 137. Ad.                                               | Eg Wanga, "           | "                                                   |
| 138. Yg.                                               | Old Calabar.          | Dr. Jackson (C.);<br>Hon. W. Rothschild (P.).       |
| 139. Ad.                                               | Meme R., Cameroon.    | G. Linnell (C.);<br>Prof. E. Lönnberg (P.).         |

## 13. ALESTES AFFINIS.

Günth. Proc. Zool. Soc. 1894, p. 90; Vincig. Ann. Mus. Genova, (2) xvii. 1896, p. 28, and 1897, p. 355.

*Alestes imberi* (non Peters), Vincig. op. cit. xv. 1895, p. 28.

*Brachyalestes affinis*, Fowler, Proc. Ac. Philad. 1906, p. 445, fig.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to 4 times. Head  $1\frac{3}{4}$  to 2 times as long as broad, as long as deep or slightly longer; snout rounded, not longer than eye, which is lateral and 3 to  $3\frac{1}{2}$  times in length of head; interorbital region feebly convex, its width  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times in length of head; maxillary not quite reaching to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital longer than eye. Gill-rakers moderately long, 18-20 on lower part of anterior arch. Dorsal II 8, originating behind vertical of base of ventral, at equal distance from eye or from nostril and from caudal, longest ray a little shorter than head. Anal III 16-18. Pectoral a little shorter than head, reaching ventral.

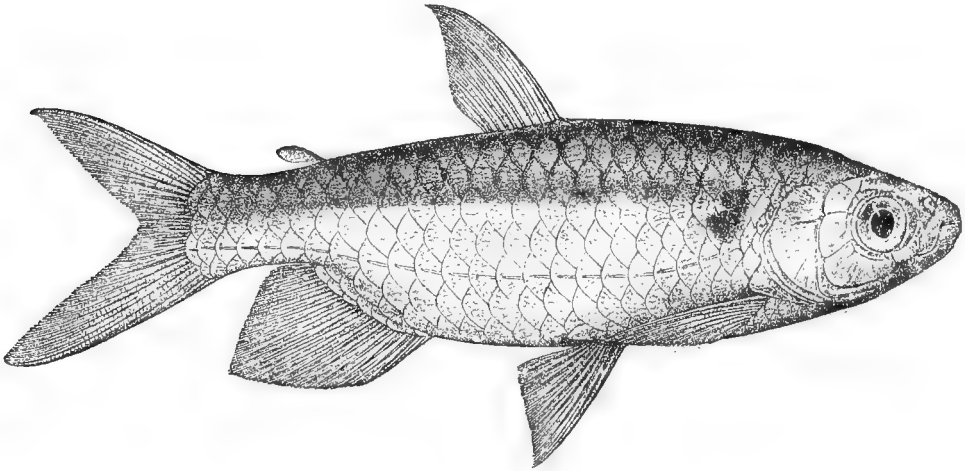


Caudal deeply forked, lobes pointed. Caudal peduncle a little longer than deep. Scales with radiating and anastomosing canals, 25-27  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, brownish on the back; a more or less distinct dark spot above the lateral line, behind the gill-opening.

Total length 140 millim.

Webi Shebeli to Tana, East Africa.

Fig. 156.



*Alestes affinis*.

Wabbi.

|             |                   |                                              |
|-------------|-------------------|----------------------------------------------|
| 1-3. Types. | Merifano, Tana R. | Prof. J. W. Gregory (P.).                    |
| 4. Ad.      | Webi Shebeli.     | Dr. Donaldson Smith (C.).                    |
| 5-6. Ad.    | Wabbi R.          | Prof. O. Neumann (C.).                       |
| 7. Ad.      | Ganana R.         | Capt. V. Bottego (C.);<br>Genoa Museum (P.). |
| 8. Ad.      | Auata R.          | „                                            |

#### 14. ALESTES IMBERI.

Peters, Mon. Berl. Ac. 1852, p. 276, and Reise Mossamb. iv. p. 66, pl. xii. fig. 3 (1868).

*Brachyalestes imberi*, Günth. Cat. Fish. v. p. 316 (1864); Pfeff. Thierw. O.-Afr., Fische, p. 43 (1896).

*Alestes fuchsii*, Bouleng. Ann. Mus. Congo, Zool. i. p. 83, pl. xxxvi. fig. 1 (1899).

*Alestes lemairii*, Bouleng. ll. cc. pp. 84, 154, fig. 2.

? *Alestes fuchsii*, var. *taniata*, Pellegr. Bull. Mus. Paris, 1903, p. 328.

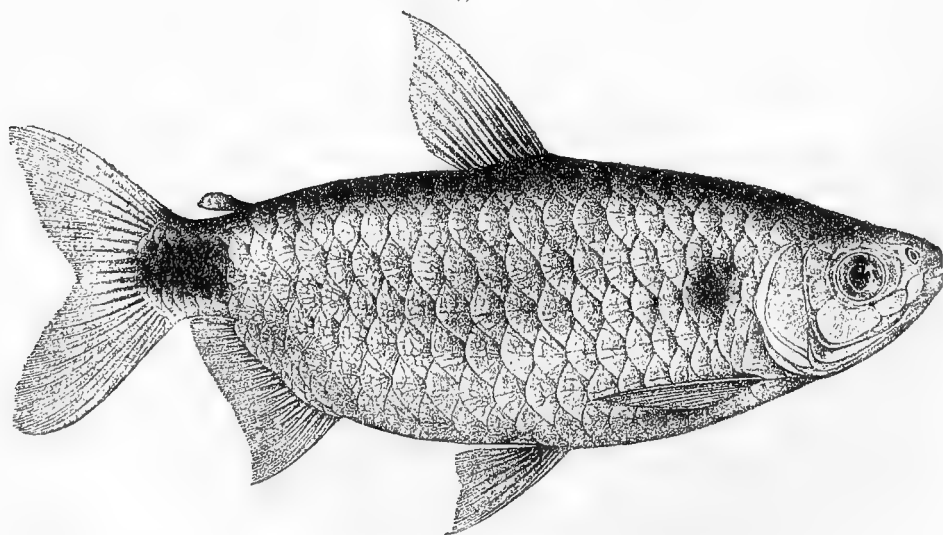
Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times. Head  $1\frac{2}{3}$  to 2 times as long as broad, as long as deep or a little longer; snout as long as or a little shorter than diameter of eye,

which is lateral and 3 to  $3\frac{1}{2}$  times in length of head; adipose eyelid feebly developed; interorbital region feebly convex, its width  $2\frac{1}{5}$  to  $2\frac{2}{3}$  times in length of head; maxillary not extending to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as or longer than eye. Gill-rakers moderately long, 16–20 on lower part of anterior arch. Dorsal II 8, originating above middle or last ray of ventral, at equal distance from end of snout and from caudal, or a little nearer latter; longest ray as long as or a little shorter than head. Anal II–III 14–16. Pectoral  $\frac{3}{4}$  to  $\frac{5}{8}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle 1 to  $1\frac{2}{3}$  times as long as deep. Scales with radiating and arborescent or anastomosing canals, 23–29  $\frac{4\frac{1}{2}}{3\frac{1}{3}}$ ,  $1\frac{1}{2}$ –2 between lateral line and root of caudal. Silvery, back olive or bluish; a dark spot often present behind the head, above the lateral line; a large black blotch on the caudal peduncle.

Total length 195 millim.

From the Congo and Rovuma to the Quanza and Limpopo.—Types in Berlin Museum.

Fig. 157.



*Alestes imberii*.

Type of *A. fuchsii* (A. M. C.).  $\frac{5}{7}$ .

- |                                |                                       |                                                  |
|--------------------------------|---------------------------------------|--------------------------------------------------|
| 1. Hgr.                        | Bange Ngola, Angola.                  | Dr. W. J. Ansorge (C.).                          |
| 2. Hgr.                        | Stanley Pool.                         | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 3. Type of <i>A. fuchsii</i> . | Kutu, L. Leopold II.,<br>Upper Congo. | M. P. Delhez (C.).                               |

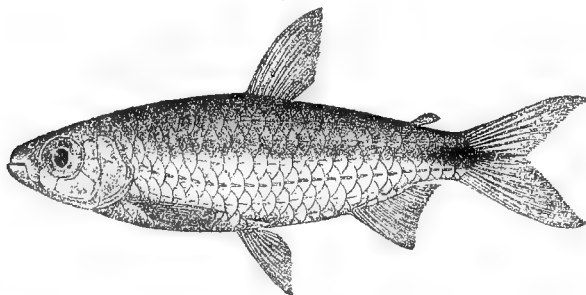
|                                  |                                                     |                                                    |
|----------------------------------|-----------------------------------------------------|----------------------------------------------------|
| 4-5. Hgr.                        | Bolobo, Upper Congo.                                | Rev. G. Grenfell (P.).                             |
| 6-9. Ad. & hgr.                  | Monsembe, „                                         | Rev. J. H. Weeks (P.).                             |
| 10-12. Ad. & hgr.                | Upper Congo.                                        | Brussels University.                               |
| 13. Ad.                          | Near Irumu, Ituri R.,<br>Upper Congo.               | R. B. Woosnam, Esq. (C.);<br>Ruwenzori Expedition. |
| 14. Hgr.                         | Rovuma R.                                           | Sir J. Kirk (P.).                                  |
| 15. Ad.                          | Lake Bangwelu.                                      | F. H. Melland, Esq. (P.).                          |
| 16. Type of <i>A. lemairii</i> . | Lake Mweru.                                         | Capt. Lemaire (C.).                                |
| 17-20. Ad. & yg.                 | Between Kondowe and<br>Karonga, L. Nyassa.          | Sir H. H. Johnston (P.).                           |
| 21. Ad.                          | Upper Shiré R.                                      | „                                                  |
| 22-25. Ad.                       | Chiromo, Shiré R.                                   | C. B. C. Storey, Esq. (P.).                        |
| 26-27. Types.                    | Zambesi.                                            | Prof. W. Peters (P.).                              |
| 28-30. Hgr.                      | Zambesi above Victoria<br>Falls.                    | T. Codrington, Esq. (P.).                          |
| 31. Hgr.                         | Beira, Portuguese<br>E. Africa.                     | Mr. C. Grant (C.);<br>C. D. Rudd, Esq. (P.).       |
| 32. Ad.                          | Makabusi R. near<br>Salisbury, Mashonaland.         | J. ff. Darling, Esq. (P.).                         |
| 33. Ad.                          | Bulawayo.                                           | Dr. J. D. F. Gilchrist (P.).                       |
| 34-37. Ad. & hgr.                | Inkomati R., near<br>Komati Poort, E.<br>Transvaal. | Major G. E. Bruce (P.).                            |

## 15. ALESTES HUMILIS.

Bouleng. Ann. & Mag. N. H. (7) xv. 1905, p. 458.

Depth of body  $3\frac{1}{2}$  times in total length, length of head 4 times. Head  $2\frac{1}{2}$  times as long as broad, a little longer than deep; snout shorter than

Fig. 158.

*Alestes humilis*.

Type.

eye, which is lateral and  $2\frac{3}{4}$  times in length of head; adipose eyelid feebly developed; interorbital region convex, its width nearly 3 times in

length of head; maxillary not quite extending to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; length of lower border of second suborbital equalling diameter of eye. Gill-rakers moderately long, 20 on lower part of anterior arch. Dorsal II 7, originating above base of ventrals and at equal distance from anterior border of eye and from root of caudal, longest ray as long as head. Anal III 14. Pectoral a little shorter than head, nearly reaching ventral. Caudal forked. Caudal peduncle twice as long as deep. Scales without anastomosing canals,  $30\frac{4\frac{1}{2}}{3\frac{2}{3}}$ , 2 between lateral line and root of ventral. Olive above, silvery beneath; a black spot on caudal peduncle, extending on median rays of caudal.

Total length 70 millim.

Quanza River, Angola.

1. Type.

Quanza River.

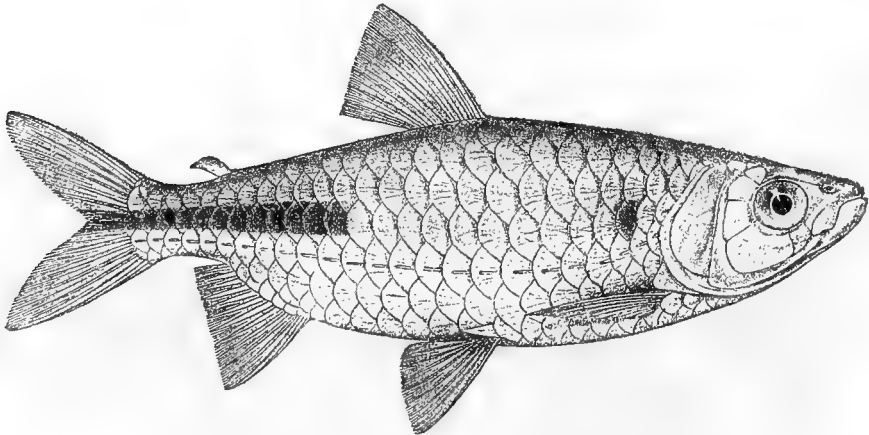
Dr. W. J. Ansorge (C).

#### 16. ALESTES KINGSLEYÆ.

Günth. Ann. & Mag. N. H. (6) xvii. 1896, p. 279, pl. xv. fig. B.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head  $1\frac{3}{4}$  to 2 times as long as broad, a little longer

Fig. 159.



*Alestes kingsleyæ.*

Type.

than deep; snout as long as or a little shorter than eye, which is lateral and 3 to  $3\frac{1}{2}$  times in length of head; adipose eyelid scarcely distinct; interorbital region feebly convex, its width  $2\frac{1}{2}$  to  $2\frac{1}{2}$  times in length of head; maxillary not extending quite to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower;

lower border of second suborbital as long as eye. Gill-rakers moderately long, 16–18 on lower part of anterior arch. Dorsal II 8, originating above middle of base of ventral, at equal distance from end of snout and from caudal, or a little nearer latter; longest ray shorter than head. Anal III 12–13. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep. Scales with radiating and arborescent or anastomosing canals, 24–25  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back brownish; a more or less distinct dark spot behind the head, above the lateral line, and a black band on the side of the caudal part of the body, extending on the middle caudal rays.

Total length 100 millim.

Ogowe River, Congo.

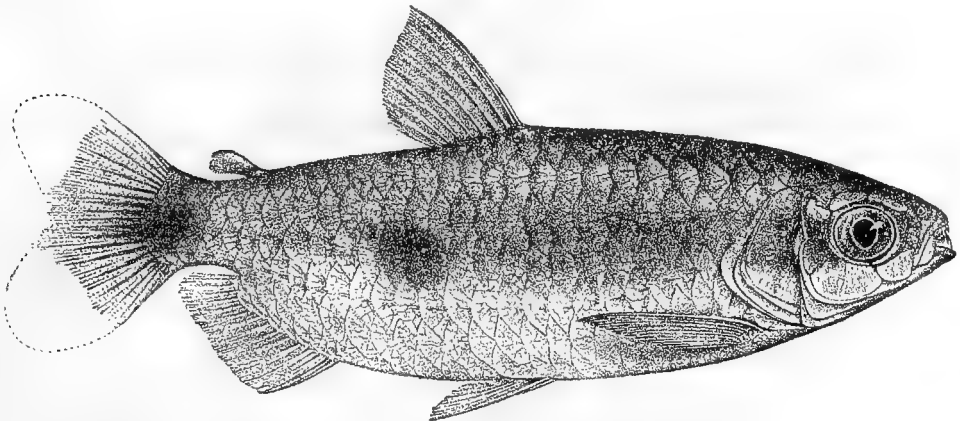
|             |                      |                       |
|-------------|----------------------|-----------------------|
| 1–4. Types. | Ogowe.               | Miss Kingsley (C.).   |
| 5. Hgr.     | Ombrokua, Ogowe.     | Dr. W. J. Anson (C.). |
| 6–7. Yg.    | Kondue, Lower Congo. | M. Luja (C.).         |

#### 17. ALESTES BIMACULATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 85, pl. xxxvi. fig. 3 (1899), and Poiss. Bass. Congo, p. 157 (1901).

Depth of body  $3\frac{1}{3}$  to  $3\frac{3}{4}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head twice as long as broad, a little longer than deep;

Fig. 160.



*Alestes bimaculatus.*  
Type (A. M. C.).  $\frac{5}{8}$ .

snout as long as or a little shorter than eye, which is lateral and 3 to  $3\frac{1}{2}$  times in length of head; no adipose eyelid; interorbital region feebly convex, 2 to  $2\frac{1}{2}$  times in length of head; maxillary not reaching anterior

border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital a little longer than eye. Gill-rakers long and slender, a little shorter than gill-filaments, 22–26 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventral, nearer caudal than end of snout, longest ray  $\frac{3}{4}$  length of head. Anal III 12–14. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, not reaching ventral. Caudal forked, with rounded lobes. Caudal peduncle a little longer than deep. Scales with radiating and anastomosing canals, 27–29  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of caudal. Dark green above, silvery beneath; two large round black spots on each side, the first between lateral line and last rays of dorsal, the second at base of caudal.

Total length 140 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

1–2 Types.

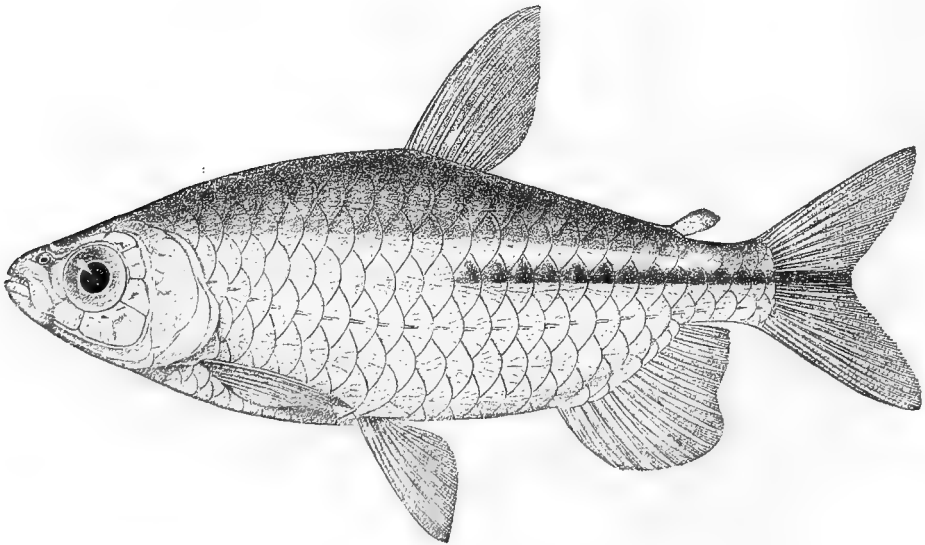
Kutu, Lake Leopold II.

M. P. Delhez (C.).

#### 18. ALESTES TÆNIURUS.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 113; Bouleng. Poiss. Bass. Congo, p. 156 (1901); Pellegr. Bull. Soc. Philom. (9) ix. 1907, p. 22, fig.

Fig. 161.



*Alestes tæniurus.*

Type.

Depth of body  $2\frac{1}{3}$  to  $2\frac{4}{5}$  times in total length, length of head 4 to  $4\frac{1}{4}$  times. Head  $1\frac{3}{4}$  to 2 times as long as broad, as long as deep or

slightly longer; snout as long as or a little shorter than eye, which is lateral and  $2\frac{2}{3}$  to  $3\frac{1}{4}$  times in length of head; adipose eyelid scarcely distinct; interorbital region feebly convex, its width 2 to  $2\frac{1}{2}$  times in length of head; maxillary not extending to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as eye. Gill-rakers rather long, 25–28 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventral, a little nearer caudal than end of snout; longest ray as long as head or a little longer. Anal III 15–17. Pectoral  $\frac{4}{5}$  length of head, reaching base of ventral. Caudal forked, with pointed lobes. Caudal peduncle as long as deep or a little longer. Scales with radiating and anastomosing canals, 23–25  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of caudal. Silvery, brownish on the back; a black streak along each side of the caudal part of the body, extending on middle rays of caudal fin.

Total length 150 millim.

Gaboon, South Cameroon.

1. Type.

Gaboon.

2–4. Ad.

Kribi R., S. Cameroon.

G. L. Bates, Esq. (C.).

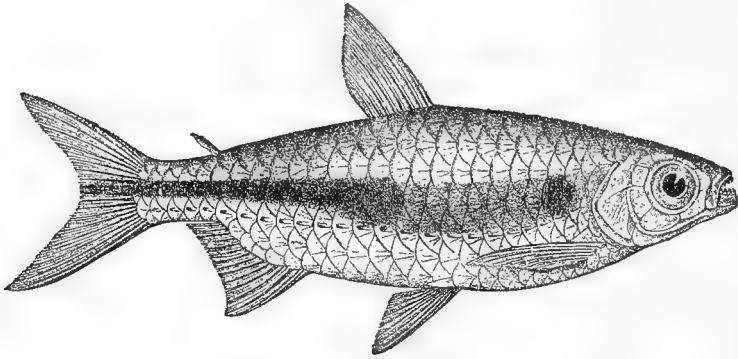
#### 19. ALESTES OPISTHOTÆNIA.

Bouleng. Proc. Zool. Soc. 1903, i. p. 22, pl. i. fig. 2.

Depth of body 3 to  $3\frac{1}{4}$  times in total length, length of head 4 or  $4\frac{1}{5}$  times. Head  $1\frac{3}{4}$  to 2 times as long as broad, a little longer than deep; snout a little shorter than eye, which is lateral and  $2\frac{3}{4}$  or 3 times in length of head; adipose eyelid very feebly developed; interorbital region convex, its width  $\frac{2}{7}$  or nearly  $\frac{1}{3}$  length of head; maxillary not extending quite to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; length of lower border of second suborbital equal to diameter of eye. Gill-rakers moderately elongate, closely set, 20 to 23 on lower part of anterior arch. Dorsal II 8, originating just behind vertical of base of ventrals, a little nearer caudal than end of snout, longest ray a little shorter than head. Anal III 13–15. Pectoral as long as head, reaching ventral or nearly as far. Caudal forked. Caudal peduncle as long as deep. Scales with radiating and anastomosing canals, 24–27  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and ventral. Silvery, brownish on the back; a black humeral spot and a black lateral band, commencing

under the dorsal and extending on the median rays of the caudal ; dorsal, caudal, and ventral fins lemon-yellow.

Fig. 162.

*Alestes oristhotania.*

Type (P. Z. S. 1903).

Total length 150 millim.

South Cameroon.

|                 |                   |                         |
|-----------------|-------------------|-------------------------|
| 1-4. Types.     | Kribi River.      | G. L. Bates, Esq. (C.). |
| 5-7. Ad. & hgr. | "                 | "                       |
| 8. Skel.        | "                 | "                       |
| 9. Ad.          | Mvile River.      | "                       |
| 10-12. Ad.      | Ja River at Bite. | "                       |

#### 20. ALESTES POPTÆ.

Pellegr. Bull. Mus. Paris, 1906, p. 367.

Depth of body 3 times in total length, length of head  $3\frac{3}{4}$  times. Head a little longer than deep, its length to occiput equal to its width ; snout a little longer than eye,  $3\frac{1}{2}$  times in length of head ; adipose eyelid rudimentary ; interorbital width  $\frac{2}{5}$  length of head ; maxillary not extending to below anterior border of eye ; 16 teeth ( $\frac{8}{8}$ ) in upper jaw ; length of lower border of second suborbital equal to diameter of eye. Gill-rakers rather short, 15 on lower part of anterior arch. Dorsal II 8, originating above last rays of ventral, nearer occiput than caudal. Adipose fin absent in the unique specimen. Anal III 10. Pectoral not reaching ventral. Caudal peduncle about as long as deep. Scales  $22\frac{4\frac{1}{2}}{3\frac{2}{3}}$ ,  $1\frac{1}{2}$  between lateral line and root of ventral. Brownish above, golden yellow on the sides and beneath, each scale edged with purplish ; fin greyish.

Total length 190 millim.

Congo.—Type in Paris Museum.



## 21. ALESTES MACROLEPIDOTUS.

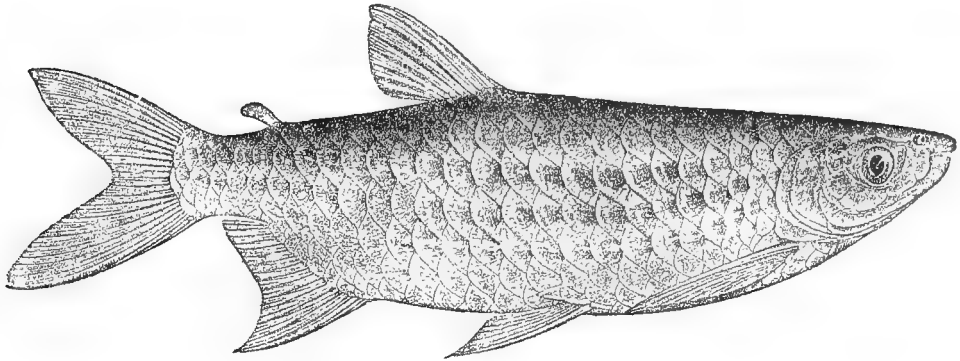
*Brycinus macrolepidotus*, Cuv. & Val. Hist. Poiss. xxii. p. 157, pl. ccccccxxxix. (1849).

*Alestes macrolepidotus*, Bilharz, Sitzb. Ak. Wien, ix. 1852, p. 469, pl. xxxvii.; Kuer, Denkschr. Ak. Wien, xviii. 1860, p. 19; Günth. Cat. Fish. v. p. 313 (1864), and Petherick's Trav. ii. p. 242 (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 540, pl. i.; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1128; Bouleng. Fish. Nile, p. 127, pl. xx. (1907).

*Alestes macrolepidotus*, part., Bouleng. Poiss. Bass. Congo, p. 158 (1901).

Depth of body  $3\frac{1}{3}$  to  $4\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{2}{3}$  times. Head much flattened above,  $1\frac{3}{4}$  to 2 times as long as broad,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep, its width considerably greater than its length to occiput; snout rounded and about as long as eye in young, more

Fig. 163.

*Alestes macrolepidotus*.Blue Nile (F. N.).  $\frac{1}{3}$ .

pointed, projecting beyond lower lip, and  $1\frac{1}{2}$  to 2 times as long as eye in adult; eye infero-lateral, not or scarcely visible from above, well visible from beneath, its diameter 3 (young) to  $5\frac{1}{4}$  times in length of head; adipose eyelid scarcely developed; interorbital width 2 to  $2\frac{1}{2}$  times in length of head; maxillary not reaching to below anterior border of eye; 16 to 20 teeth ( $\frac{8-10}{8-10}$ ) in upper jaw, 8 or 10 ( $\frac{6-8}{2}$ ) in lower; lower border of second suborbital as long as or a little longer than diameter of eye. Gill-rakers thin and moderately long, 18–22 on lower part of anterior arch. Dorsal II 8 (rarely 7), above middle of space between ventrals and anal, considerably nearer caudal than occiput; first branched ray longest,  $\frac{3}{4}$  to  $\frac{7}{8}$  length of head. Anal III 12–14. Pectoral as long as head or a little shorter, sometimes nearly reaching ventral.

Caudal deeply forked, lobes pointed, lower usually a little longer than upper. Caudal peduncle 1 to  $1\frac{1}{2}$  times as long as deep. Scales with numerous anastomosing canals, 22–26  $\frac{4\frac{1}{2}}{2\frac{1}{3}-3\frac{1}{2}}$ , 1 or 2 between lateral line and root of ventral. Brown or olive above, the scales with a darker edge, silvery white or pinkish beneath and on the cheeks; a pink band often extends along the side, from the cheek to above the anal fin; some specimens with interrupted dark brown bands along the sides; fins pink or orange, the caudal often edged with grey and blackish. Young usually with a blackish spot on each side of the caudal peduncle, and another on the shoulder.

Total length 420 millim.

Upper Nile, Blue Nile, White Nile, Bahr-el-Gebel, Omo, Senegal, Niger, Congo.—Type in Paris Museum.

|                                   |                                    |                                                       |
|-----------------------------------|------------------------------------|-------------------------------------------------------|
| 1. Ad.                            | Nile.                              | Dr. Rüppell (P.).                                     |
| 2. Ad.                            | Kosheh, Upper Nile.                | L. Loat, Esq. (C.).                                   |
| 3. Hgr.                           | Khartum.                           | J. Petherick, Esq. (C.).                              |
| 4. Hgr.                           | Wad Medine, Blue Nile.             | L. Loat, Esq. (C.).                                   |
| 5–9, 10–11. Ad.<br>& yg.          | Rosaires,                    ”     | ”                                                     |
| 12. Skel.                         | ”                                ” | ”                                                     |
| 13–15, 16–30. Ad.,<br>hgr., & yg. | Gondokoro, Bahr-el-Gebel.          | ”                                                     |
| 31. Ad.                           | Fajao, Victoria Nile.              | J. S. Budgett, Esq. (P.).                             |
| 32–33. Hgr. & yg.                 | Omo R.                             | Prof. O. Neumann (C.).                                |
| 34. Ad.                           | Cojeb R., Omo.                     | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 35–36. Ad.                        | Jebba, Upper Niger.                | Dr. C. Christy (P.).                                  |
| 37. Skel.                         | ”                                ” | Capt. G. F. Abadie (P.).                              |
| 38. Ad.                           | Mureji,                        ”   | J. S. Budgett, Esq. (P.).                             |
| 39–44. Yg.                        | Agberi, Lower Niger.               | Dr. W. J. Ansorge (C.).                               |
| 45. Skel.                         | Niger.                             |                                                       |
| 46–47. Ad.                        | Benue R., N. of Ibi.               | H. L. Norton Traill, Esq. (C.).                       |
| 48–53. Hgr. & yg.                 | Old Calabar.                       | Miss Kingsley (C.).                                   |
| 54. Yg.                           | Leopoldville, Congo.               | Drs. Dutton, Christy, & Todd<br>(P.).                 |

## 22. ALESTES RHODOPLEURA.

*Alestes macrolepidotus* (non C. & V.), Bouleng. Tr. Zool. Soc. xv. 1898, p. 25.

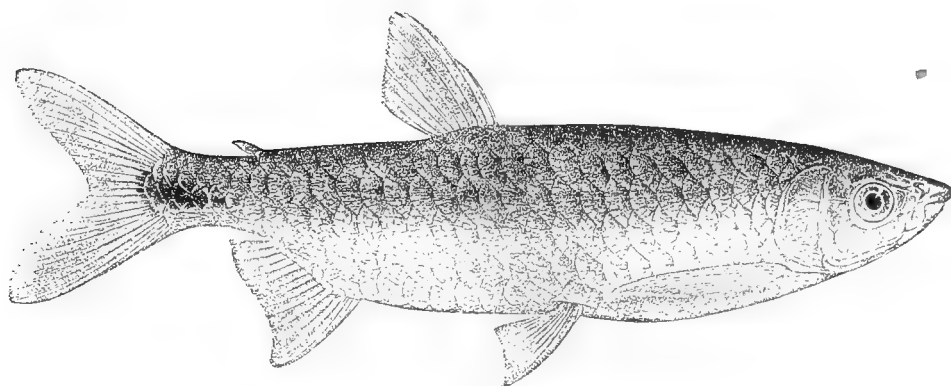
*Alestes macrolepidotus*, part., Bouleng. Poiss. Bass. Congo, p. 158 (1901).

*Alestes rhodopleura*, Bouleng. Tr. Zool. Soc. xvii 1906, p. 547, pl. xxx. fig. 3.

Depth of body 4 times in total length, length of head 4 to  $4\frac{1}{2}$  times.

Head nearly twice as long as broad, longer than deep, its width much less than its length to occiput; snout feebly projecting beyond lower jaw, once and  $\frac{1}{3}$  diameter of eye, which is 4 times in length of head; adipose eyelid feebly developed; interorbital width nearly half length of head; maxillary not extending to below anterior border of eye; 18 teeth ( $\frac{8}{10}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as or a little longer than eye. Gill-rakers moderately long, 18-19 on lower part of anterior arch. Dorsal II 8, considerably behind vertical of base of ventrals, originating much nearer caudal than end of snout, longest ray about  $\frac{3}{4}$  length of head. Anal III 12-13. Pectoral as long

Fig. 164.

*Alestes rhodopleura.*Type (Tr. Z. S. 1906).  $\frac{1}{2}$ .

as head, not reaching ventral. Caudal forked. Caudal peduncle  $1\frac{2}{3}$  to 2 times as long as deep. Scales with numerous anastomosing canals, 28-29  $\frac{4\frac{1}{2}}{2\frac{1}{2}}$ , 1 between lateral line and root of ventral. Olive-green above, silvery below, with an ill-defined pink band along each side; a large blackish blotch on caudal peduncle at root of caudal.

Total length 300 millim.

Lake Tanganyika.

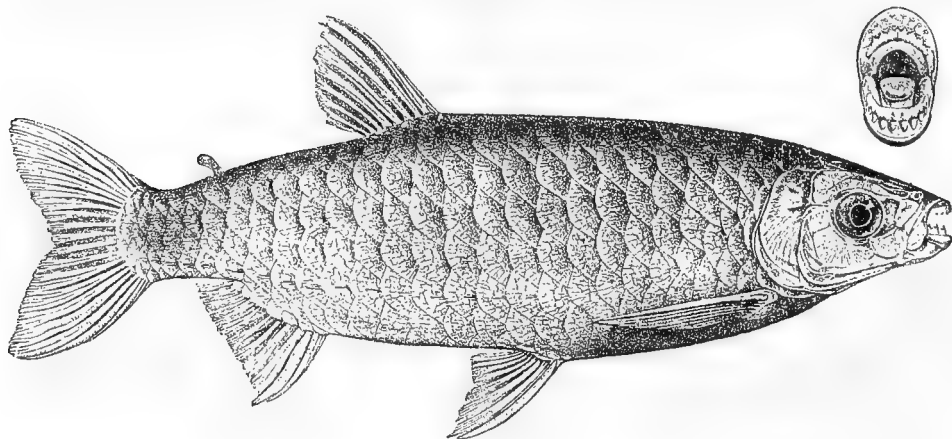
|             |              |                            |
|-------------|--------------|----------------------------|
| 1. Type.    | Tanganyika.  | Prof. J. E. S. Moore (C.). |
| 2. Type.    | Nyamkolo.    | Dr. W. A. Cunningham (C.). |
| 3. Type.    | Mtondwe Bay. | "                          |
| 4-5. Types. | Lofu.        | "                          |

## 23. ALESTES GRANDISQUAMIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 85, pl. xxxv. fig. 3 (1899), and Poiss. Bass. Congo, p. 159 (1901).

Depth of body  $3\frac{1}{3}$  to 4 times in total length, length of head  $3\frac{3}{4}$  to  $4\frac{1}{3}$  times. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad, a little longer than deep, its width a little less than its length to occiput in the adult; snout feebly projecting beyond lower jaw, as long as or a little longer than eye, which is infero-lateral and 3 to 4 times in length of head; adipose eyelid very feebly developed; interorbital region feebly convex,  $\frac{1}{2}$  to  $\frac{3}{8}$  length of head; maxillary far from reaching anterior border of eye; 16 or 18 ( $\frac{8-10}{8}$ ) teeth in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as or a little longer than eye. Gill-rakers moderately long, 15-16 on lower part of anterior arch. Dorsal II 8, opposite

Fig. 165.

*Alestes grandisquamis*.Type (A. M. C.)\*.  $\frac{1}{2}$ .

middle of space between ventrals and anal, much nearer caudal than occiput, its longest ray  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Anal III 10-11. Pectoral a little shorter than head, not reaching ventral. Caudal forked. Caudal peduncle scarcely longer than deep. Scales with numerous anastomosing canals, 23-27  $\frac{4\frac{1}{2}}{2\frac{1}{2}-3\frac{1}{4}}$ , 1 or 2 between lateral line and root of

\* The adipose fin was inadvertently left out by the artist in the original figure.

ventral. Olive-brown above, silvery beneath, often tinged with pink ; a more or less distinct blackish blotch at base of caudal.

Total length 260 millim.

Congo, Lake Bangwelo.—Types in Congo Museum, Tervueren.

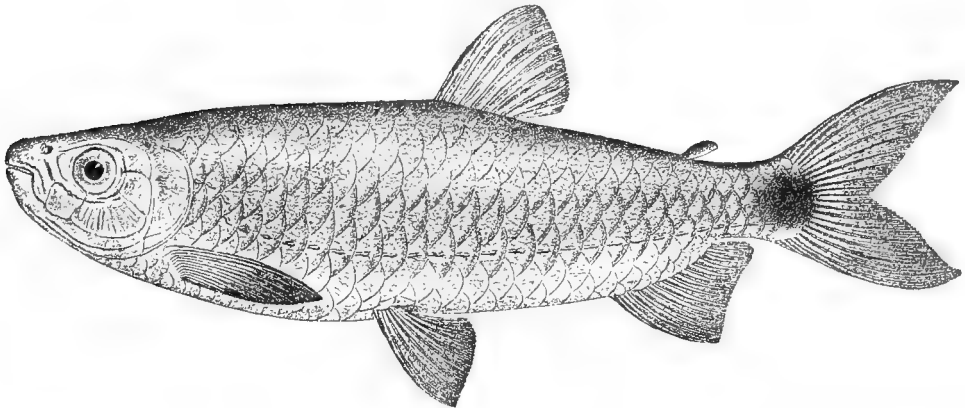
|          |                         |                                                    |
|----------|-------------------------|----------------------------------------------------|
| 1. Type. | Lower Congo.            | M. F. Hens (C.).                                   |
| 2. Type. | Ibali, Lake Leopold II. | M. P. Delhez (C.).                                 |
| 3. Yg.   | Bolobo, Upper Congo.    | Rev. G. Grenfell (P.).                             |
| 4. Ad.*  | Monsembe, „             | Rev. J. H. Weeks (P.).                             |
| 5. Ad.   | Near Irumu, Ituri R.    | R. B. Woosnam, Esq. (C.);<br>Ruwenzori Expedition. |
| 6. Ad.   | Lake Bangwelo.          | F. H. Melland, Esq. (P.).                          |

#### 24. ALESTES BATESII.

Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 435.

Depth of body  $3\frac{1}{3}$  to 4 times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head  $1\frac{2}{3}$  to 2 times as long as broad, longer than deep, distance between end of snout and occiput not or but slightly exceeding width of head ; snout as long as or longer than diameter of eye, which is 3 to 4

Fig. 166.



*Alestes batesii*.

Type.  $\frac{1}{2}$ .

times in length of head ; adipose eyelid indistinct ; interorbital width about half length of head ; maxillary not extending to below anterior border of eye ; 16 teeth ( $\frac{8}{8}$  or  $\frac{2}{6}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower ; length of lower border of second suborbital equalling or exceeding

\* The ventral fins are entirely absent in this specimen.

diameter of eye. Gill-rakers rather long, 16-18 on lower part of anterior arch. Dorsal II 7-8, well behind vertical of base of ventrals, originating much nearer root of caudal than end of snout, longest ray  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. Anal III 12-13. Pectoral shorter than head, not reaching ventral. Caudal forked. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep. Scales with numerous anastomosing canals, 28-29  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and ventral. Olive-brown above and on the sides, whitish beneath; a large round black spot on the caudal peduncle, at the base of the caudal fin; fins greyish, or blackish at the end.

Total length 250 millim.

South Cameroon.

|             |                        |                         |
|-------------|------------------------|-------------------------|
| 1-3. Types. | Kribi River at Efulen. | G. L. Bates, Esq. (C.). |
| 4-5. Ad.    | " "                    | "                       |
| 6. Yg.      | Campo River.           | "                       |

#### 25. ALESTES BREVIS.

Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 594.

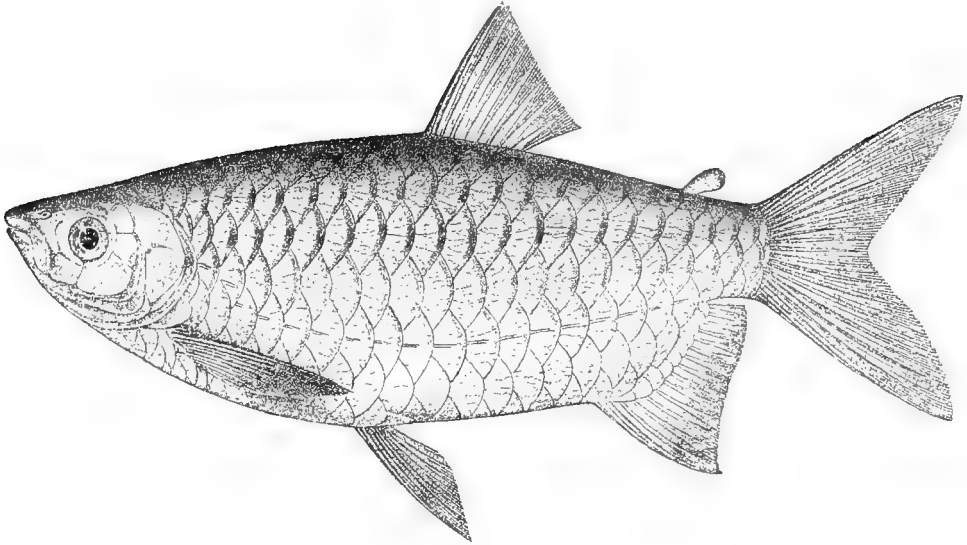
? *Alestes macrolepidotus*, Steind. Notes Leyd. Mus. xvi. 1894, p. 63.

Depth of body  $2\frac{3}{4}$  to 3 times in total length, length of head  $3\frac{3}{4}$  to  $4\frac{1}{4}$  times. Head  $1\frac{2}{3}$  to  $1\frac{3}{4}$  times as long as broad,  $1\frac{1}{6}$  to  $1\frac{1}{5}$  times as long as deep; distance between end of snout and occiput not or but slightly exceeding width of head; snout scarcely projecting beyond lower jaw, 1 to  $1\frac{1}{2}$  times as long as eye; eye lateral, visible from above and from below, its diameter 3 to  $4\frac{1}{3}$  times in length of head; adipose eyelid scarcely developed; interorbital width  $\frac{1}{2}$  length of head; maxillary not reaching to below anterior border of eye; 18 or 20 teeth ( $\frac{10-12}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower; lower border of second suborbital as long as or longer than diameter of eye. Gill-rakers rather short and thin, 18 to 20 on lower part of anterior arch. Dorsal II 8, above middle of space between ventrals and anal, considerably nearer caudal than occiput; first branched ray longest,  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Anal III 13-15, pointed in front, third simple ray longest,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Pectoral nearly as long as head, reaching or nearly reaching ventral. Caudal deeply forked. Caudal peduncle not longer than deep. Scales with numerous anastomosing canals, 21-23  $\frac{4\frac{1}{2}}{2\frac{1}{2}}$ , 1 or  $1\frac{1}{2}$  between lateral line and root of ventral. Uniform brownish above, silvery white below.

Total length 225 millim.

Lagos, Gold Coast, Liberia (?).

Fig. 167.

*Alestes brevis.*Type.  $\frac{1}{2}$ .

1. Type.

Lagos.

H. T. Ussher, Esq. (P.).

2-5. Types.

Gold Coast.

R. B. N. Walker, Esq. (C.);

Dr. A. Günther (P.).

**5. MICRALESTES.***Brachyalestes*, part., Günth. Cat. Fish. v. p. 314 (1864).*Micralestes*, Bouleng. Ann. Mus. Congo, Zool. i. p. 87 (1899), Poiss. Bass. Congo, p. 160 (1901), and Fish. Nile, p. 131 (1907).*Phenacogrammus*, Eigenm. Proc. U.S. Nat. Mus. xxxiii. 1907, p. 30.

Dwarfed *Alestes*, with the teeth simply compressed, the outer præmaxillary small and tricuspid, the inner præmaxillary and the mandibular quinque- or septemcuspid\*.

Vertebræ 34-37.

Nile and Tropical Africa.

*Synopsis of the Species.*

I. Dorsal originating above base of ventral; Anal 17-19; depth of body 3 to  $3\frac{3}{4}$  times in total length.

Dorsal originating a little nearer caudal than

end of snout; Sc. 23-28 . . . . . 1. *M. acutidens*, Peters, p. 224.

\* The inner mandibular teeth are sometimes so small as to be easily overlooked, such cases establishing a complete passage between *Micralestes* and *Petersius*.

Dorsal originating at equal distance from end

of snout and from caudal ; Sc. 22-24 . . . 2. *M. stormsi*, Blgr., p. 225.

II. Dorsal originating immediately behind vertical of base of ventral.

A. Anal 18-22.

1. Lateral line complete ; Anal 19-22.

Depth of body  $3\frac{1}{2}$ -4 times in total length ;

Sc. 27-30 . . . . . 3. *M. humilis*, Blgr., p. 226.

Depth of body  $2\frac{2}{3}$ -3 times in total length ;

Sc. 23-25 . . . . . 4. *M. holargyreus*, Gthr., p. 227.

2. Lateral line incomplete, lost on the posterior part of the body ; depth of body  $2\frac{2}{3}$ -3 times in total length.

A. 18-19 ; Sc. 25-27 ; pectoral not reaching ventral . . . . .

5. *M. urotænia*, Blgr., p. 228.

A. 21-22 ; Sc. 21-23 ; pectoral reaching ventral . . . . .

6. *M. interruptus*, Blgr., p. 229.

B. Anal 26-28.

Depth of body  $2\frac{1}{3}$ - $2\frac{2}{3}$  times in total length ;

Sc. 23-26 . . . . . 7. *M. altus*, Blgr., p. 230.

#### 1. MICRALESTES ACUTIDENS.

*Alestes acutidens*, Peters, Mon. Berl. Ak. 1852, p. 276, and Reise Mossamb. iv. p. 64, pl. xii. fig. 2 (1868).

*Brachyalestes acutidens*, Günth. Cat. Fish. v. p. 316 (1864).

*Micralestes acutidens*, Bouleng. Ann. Mus. Congo, Zool. i. p. 87 (1899), and Proc. Zool. Soc. 1903, ii. p. 329 ; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1128 ; Bouleng. Fish. Nile, p. 131, pl. xix. figs. 3 & 4 (1907).

Depth of body 3 to  $3\frac{3}{4}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times. Head 2 to  $2\frac{1}{2}$  times as long as broad, a little longer than deep ; snout shorter than eye, which is lateral and  $2\frac{1}{3}$  to 3 times in length of head, and equal to interorbital width ; maxillary extending nearly to below anterior border of eye ; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower ; lower border of second suborbital not longer than eye. Gill-rakers short, 12-15 on lower part of anterior arch. Dorsal II 8, originating above base of ventrals, at equal distance from centre or posterior border of eye and from caudal ; longest ray as long as or a little shorter than head. Anal III 14-16. Pectoral as long as or a little shorter than head, not reaching ventral. Caudal deeply forked, lobes pointed. Caudal peduncle as long as deep or slightly longer than deep. Scales 23-28  $\frac{4\frac{1}{2}}{2\frac{2}{3}-3\frac{1}{4}}$ ,  $1\frac{1}{2}$  or 2 between lateral line and root of caudal. Yellowish with a broad silvery lateral band, often edged with



blackish; fins white, transparent, the dorsal often with a blackish spot at the tip.

Total length 65 millim.

Nile, Omo, Niger, Congo, Zambesi, and Limpopo.—Types in Berlin Museum.

Fig. 168.



*Micralestes acutidens.*

Male and female.

White Nile (F. N.).

|                             |                                               |                                                    |
|-----------------------------|-----------------------------------------------|----------------------------------------------------|
| 1. Ad.                      | Near Luxor.                                   | L. Loat, Esq. (C.).                                |
| 2. Skel.                    | „                                             | „                                                  |
| 3-12. Ad. & hgr.            | Between Luxor and Assuan.                     | „                                                  |
| 13. Ad.                     | Assuan.                                       | „                                                  |
| 14. Ad.                     | Wady Halfa.                                   | „                                                  |
| 15-16. Yg.                  | Omdurman.                                     | „                                                  |
| 17-18. Hgr.                 | Fashoda, White Nile.                          | „                                                  |
| 19-33. Ad., hgr.,<br>& yg.  | Lake No, „                                    | „                                                  |
| 34-53. Hgr. & yg.           | Gondokoro, Bahr-el-Gebel.                     | „                                                  |
| 54-55. Ad.                  | Omo R.                                        | Prof. O. Neumann (C.).                             |
| 56-84. Ad. & hgr.           | Jebba, Upper Niger.                           | Dr. C. Christy (P.).                               |
| 85-86. Ad.                  | Agberi, Lower Niger.                          | Dr. W. J. Ansorge (C.).                            |
| 87. Ad.                     | Banzville, Ubanghi.                           | Capt. Royaux (C.).                                 |
| 88-89. Ad.                  | Aruwimi River.                                | R. B. Woosnam, Esq. (C.);<br>Ruwendori Expedition. |
| 90-91. Two of the<br>types. | Zambesi.                                      | Prof. W. Peters (P.).                              |
| 92-94. Ad.                  | Inkomati R., near Komati<br>Poort, Transvaal. | Major G. E. Bruce (P.).                            |

## 2. MICRALESTES STORMSI.

Bouleng. Proc. Zool. Soc. 1902, i. p. 265, pl. xxviii. figs. 1 & 2.

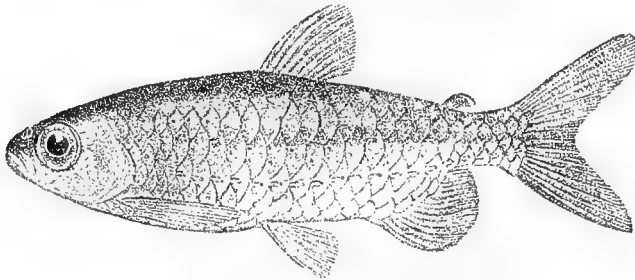
Depth of body  $3\frac{1}{2}$  times in total length, length of head 4 times. Head longer than deep, twice as long as broad; snout shorter than eye, the diameter of which equals interorbital width and is contained  $2\frac{2}{3}$  to 3

times in length of head; maxillary extending to below anterior border of eye; 16 teeth ( $\frac{8}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers short, 12 or 13 on lower part of anterior arch. Dorsal II 8, originating above base of ventrals, at equal distance from tip of snout and from caudal, longest ray about  $\frac{3}{4}$  length of head. Anal III 15-16. Pectoral  $\frac{3}{4}$  or  $\frac{4}{5}$  length of head. Caudal forked, with pointed lobes. Caudal peduncle as long as deep. Scales 22-24  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Brownish above, white beneath, with a silvery lateral band.

Total length 75 millim.

Upper Congo (Lindi River).—Types in Brussels Museum.

Fig. 169.



*Micralestes stormsi.*

Type (P. Z. S. 1902).

1-4. Types.

Lindi R.

M. M. Storms (C.);

Brussels Museum (P.).

### 3. MICRALESTES HUMILIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 87, pl. xxxvi. fig. 4 (1899), and Poiss. Bass. Congo, p. 161 (1901).

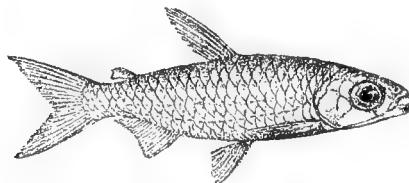
Depth of body equal to or slightly greater than length of head,  $3\frac{1}{2}$  to 4 times in total length. Head twice as long as broad, longer than deep; snout a little shorter than eye, which is  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times in length of head and nearly equals interorbital width; maxillary extending nearly to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers short, 14-15 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventrals, a little nearer caudal than end of snout, longest ray  $\frac{4}{5}$  length of head. Anal III 16-19. Pectoral a little shorter than head, reaching or nearly reaching base of ventral. Caudal deeply forked, lobes pointed. Caudal

peduncle a little longer than deep. Scales 27-30  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Olive above, whitish beneath; a silvery lateral band; anal and caudal whitish or bluish grey, the latter with an orange spot on each lobe.

Total length 75 millim.

Congo.—Type in Congo Museum, Tervueren.

Fig. 170.



*Micralestes humilis*.

Type (A. M. C.).

|                 |                                                |                                                  |
|-----------------|------------------------------------------------|--------------------------------------------------|
| 1-3. Ad. & hgr. | Kinshassa, Stanley Pool.                       | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 4-15. Ad.       | Ja R. (Congo System) at<br>Bitye, S. Cameroon. | G. I. Bates, Esq. (C.).                          |
| 16. Skel.       | ” ” ”                                          | ”                                                |

#### 4. MICRALESTES HOLARGYREUS.

*Alestes holargyreus*, Günth. Ann. & Mag. N. H. (4) xii. 1873, p. 144.

*Alestes brevipinnis*, Perugia, Ann. Mus. Genova, (2) x. 1891, p. 975.

*Micralestes holargyreus*, Bouleng. Ann. Mus. Congo, Zool. i. p. 87 (1899), and Poiss. Bass. Congo, p. 162 (1901).

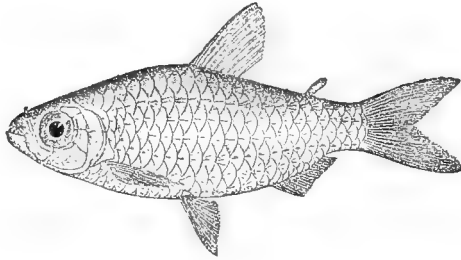
Depth of body  $2\frac{2}{3}$  to 3 times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head twice as long as broad, a little longer than deep; snout shorter than eye, which is  $2\frac{1}{2}$  to 3 times in length of head; interorbital width  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head; maxillary extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers short, 12-13 on lower part of anterior arch. Dorsal II-III 8, originating immediately behind vertical of base of ventrals, a little nearer caudal than end of snout, longest ray  $\frac{4}{5}$  to  $\frac{5}{6}$  length of head. Anal III 17-19. Pectoral a little shorter than head, reaching or nearly reaching ventral. Caudal forked, with pointed lobe. Caudal peduncle a little longer than

deep. Scales 23-25  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Olive or bluish above, whitish beneath; a silvery lateral band; fins greyish.

Total length 70 millim.

Lower Congo.

Fig. 171.



*Micralestes holargyreus.*

Type.

1-5. Types.

Boma.

J. J. Monteiro, Esq. (C.).

6. Ad.

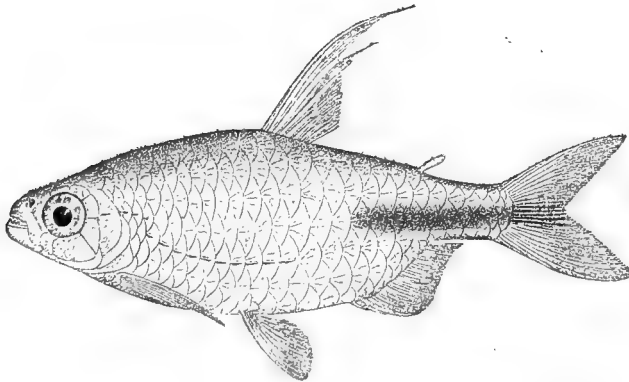
„

M. P. Delhez (C.).

#### 5. MICRALESTES UROTÆNIA, sp. n.

Depth of body  $2\frac{2}{3}$  to 3 times in total length, length of head 4 times. Head twice as long as broad, a little longer than deep; snout much shorter than eye, which is  $2\frac{1}{2}$  times in length of head and equals inter-

Fig. 172.



*Micralestes urotænia.*

Type.

orbital width; maxillary extending to below anterior border of eye; 12 teeth ( $\frac{4}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers short, about 12 on lower part of anterior arch. Dorsal II 8, originating immediately

behind vertical of base of ventrals, a little nearer caudal than end of snout, anterior branched rays produced, much longer than head. Anal III 15-16. Pectoral as long as or slightly shorter than head, not reaching base of ventral. Caudal forked, lobes pointed. Caudal peduncle a little longer than deep. Scales 25-27  $\frac{4\frac{1}{2}-5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral; lateral line incomplete, confined to 10-16 scales. Reddish, silvery below; a blackish streak on each side of the caudal part of the body, extending on median rays of caudal fin.

Total length 70 millim.

South Cameroon.

1-4. Types.

Kribi R. at Efulen.

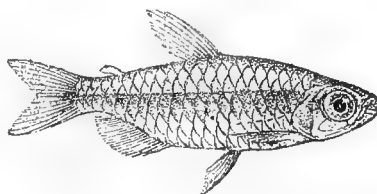
G. L. Bates, Esq. (C.).

#### 6. MICRALESTES INTERRUPTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 88, pl. xxxvi. fig. 6 (1899), and Poiss. Bass. Congo, p. 164 (1901).

Depth of body 3 times in total length, length of head  $3\frac{1}{3}$  to  $3\frac{1}{2}$  times. Head twice as long as broad, a little longer than deep; snout much shorter than eye, which is  $2\frac{1}{2}$  times in length of head and equals inter-orbital width; maxillary extending to below anterior border of eye; 12 teeth ( $\frac{4}{8}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers short, about 12 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventrals, a little nearer caudal than end of snout, longest ray as long as head. Anal IV 17-18. Pectoral  $\frac{4}{5}$  length of

Fig. 173.



*Micralestes interruptus.*

Type (A. M. C.).

head, reaching base of ventral. Caudal forked, lobes pointed. Caudal peduncle as long as deep. Scales 21-23  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line series and root of ventral; lateral line incomplete, confined to 7-10 scales. Reddish, with a silvery lateral band.

Total length 45 millim.

Upper Congo (Stanley Pool).—Types in Congo Museum, Tervueren.

1-2. Types.

Stanley Pool.

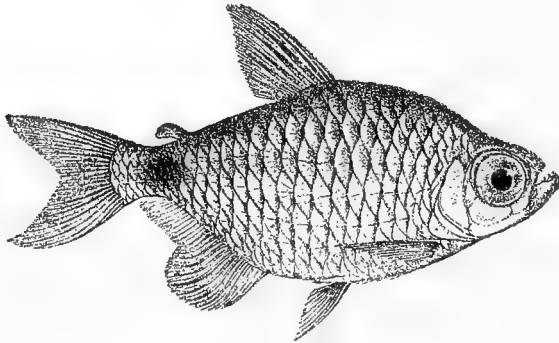
M. P. Delhez (C.).

## 7. MICRALESTES ALTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 88, pl. xxxvi. fig. 5 (1899), and Poiss. Bass. Congo, p. 163 (1901).

Depth of body  $2\frac{1}{5}$  to  $2\frac{1}{3}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head twice as long as broad, longer than deep; snout much shorter than eye, which is 2 to  $2\frac{1}{3}$  times in length of head; interorbital width about 3 times in length of head; maxillary hardly reaching to below anterior border of eye; 12–14 teeth ( $\frac{4}{8-10}$ ) in upper jaw, 10 ( $\frac{8}{2}$ ) in lower. Gill-rakers rather long, about 12 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventrals, at equal distance from end of snout and from caudal, longest ray as long

Fig. 174.



*Micralestes altus*.  
Type (A. M. C.).

as head. Anal III 23–25. Pectoral a little shorter than head, extending a little beyond origin of ventral. Caudal forked, lobes pointed. Caudal peduncle as long as deep. Scales 23–26  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back olive, scales dark-edged; a large rounded black spot on the caudal peduncle and the median caudal rays; adipose fin blackish.

Total length 65 millim.

Upper Congo (Lake Tumba, Lindi R., and Ubanghi).—Types in Congo Museum, Tervueren.

|             |                     |                                             |
|-------------|---------------------|---------------------------------------------|
| 1–2. Types. | Bikoro, L. Tumba.   | M. P. Delhez (C.).                          |
| 3–4. Ad.    | Lindi R.            | M. M. Storms (C.);<br>Brussels Museum (P.). |
| 5. Ad.      | Banzville, Ubanghi. | Capt. Royaux (C.).                          |

6. PETERSIUS.

Hilgend. Sitzb. Ges. naturf. Fr. Berl. 1894, p. 172 ; Bouleng. Poiss. Bass. Congo, p. 165 (1901).

Characters of *Micralestes*, but distinguished by the absence of the pair of conical teeth behind the mandibular series. Vertebræ 36-37 \*. Tropical Africa.

*Synopsis of the Species.*

I. Anterior præmaxillary teeth alternating with the posterior.

A. D. 10-11 ; A. 19-26.

1. Sc. 33-40  $\frac{6\frac{1}{2}-8\frac{1}{2}}{3\frac{1}{2}-4\frac{1}{2}}$

a. A. 23-26 ; depth of body 3-3 $\frac{1}{3}$  times in total length.

Sc. 40  $\frac{8\frac{1}{2}}{3\frac{1}{2}}$  ; lower jaw projecting beyond upper . . . 1. *P. modestus*, Blgr., p. 232.

Sc. 35-36  $\frac{7\frac{1}{2}}{3\frac{1}{2}}$  ; lower jaw not projecting beyond upper . . . . . 2. *P. hilyendorji*, Blgr., p. 232.

b. A. 19-22.

Sc. 33  $\frac{7\frac{1}{2}}{3\frac{1}{2}}$  ; diameter of eye 3 $\frac{1}{2}$  times in length of head ; depth of body 2 $\frac{3}{4}$  times in total length. . . . . 3. *P. conserialis*, Hilg., p. 233.

Sc. 35-36  $\frac{6\frac{1}{2}}{4\frac{1}{2}}$  ; diameter of eye 2 $\frac{1}{2}$ -2 $\frac{3}{4}$  times in length of head ; depth of body 3 $\frac{3}{4}$ -4 times in total length . . . . . 4. *P. tangensis*, Lönnb., p. 234.

2. Sc. 28-31  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$  ; A. 22-24.

Depth of body 3 $\frac{1}{2}$ -3 $\frac{2}{3}$  times in total length ; teeth with very long median cusp . . . . . 5. *P. leopoldianus*, Blgr., p. 235.

Depth of body 3 times in total length . . . . . 6. *P. brumpti*, Pellegr., p. 235.

Depth of body 2 $\frac{1}{3}$ -2 $\frac{1}{2}$  times in total length . . . . . 7. *P. caudalis*, Blgr., p. 236.

3. Sc. 24-26  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$  ; lateral line incomplete.

A. 20 ; depth of body 2 $\frac{2}{3}$ -2 $\frac{3}{4}$  times in total length. . . . . 8. *P. pulcher*, Blgr., p. 237.

A. 21-22 ; depth of body 2 $\frac{1}{4}$ -2 $\frac{1}{2}$  times in total length . . . . . 9. *P. major*, Blgr., p. 237.

B. D. 12 ; A. 14 ; Sc. 28-30  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$  . . . . . 10. *P. spilopterus*, Blgr., p. 239.

II. Anterior præmaxillary teeth corresponding to the posterior.

Sc. 29-30  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$  ; A. 20-21 ; depth of body 4 times in total length . . . . . 11. *P. woosnami*, Blgr., p. 239.

Sc. 24-27  $\frac{4\frac{1}{2}}{2\frac{1}{2}}$  ; A. 21-24 ; depth of body 3-3 $\frac{1}{4}$  times in total length . . . . . 12. *P. occidentalis*, Gthr., p. 240.

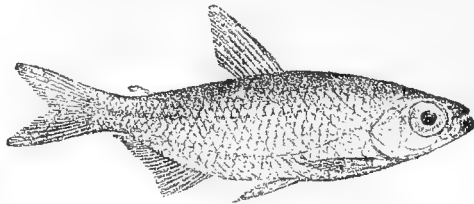
\* The type of the genus, *P. conserialis*, differs from all its congeners by its large size as well as by the complete closing up of the parietal fontanelle.

## 1. PETERSIUS MODESTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 72, pl. xxxvii. fig. 6 (1899), and Poiss. Bass. Congo, p. 169 (1901).

Depth of body  $3\frac{1}{3}$  times in total length, length of head 4 times. Head hardly longer than deep, with straight upper profile; lower jaw projecting beyond upper; snout shorter than eye, which is  $2\frac{1}{2}$  times in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with those of the inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers

Fig. 175.

*Petersius modestus.*

Type (A. M. C.).  $\frac{4}{5}$ .

moderately long, about 12 on lower part of anterior arch. Dorsal II 8, originating above last ray of ventral, at equal distance from eye and from caudal, longest ray as long as head. Anal III 20. Pectoral a little shorter than head, not quite reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales  $40\frac{8\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back olive; fins pale yellow, adipose dorsal orange.

Total length 65 millim.

Upper Congo (Lake Leopold II.). — Type in Congo Museum, Tervueren.

## 2. PETERSIUS HILGENDORFI.

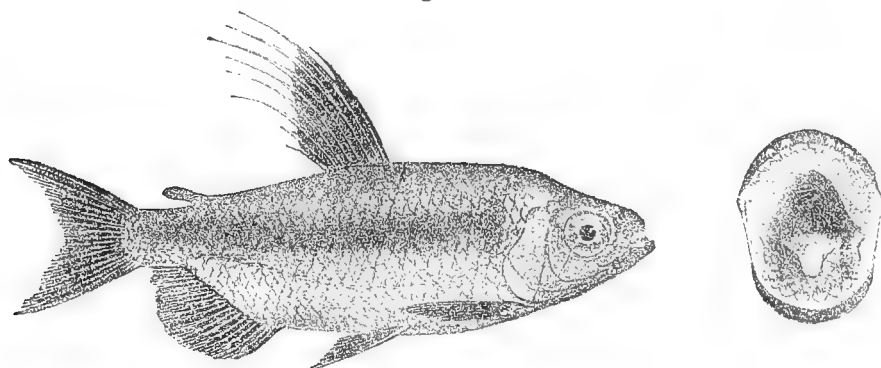
Bouleng. Ann. Mus. Congo, Zool. i. p. 91, pl. xxxvii. fig. 5 (1899), and Poiss. Bass. Congo, p. 168 (1901); Pellegr. Bull. Soc. Philom. (9) ix. 1907, p. 23, fig.

Depth of body 3 to  $3\frac{1}{3}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head hardly longer than deep, with slightly concave upper profile; lower jaw not projecting beyond upper; snout shorter than eye, which is  $2\frac{1}{2}$  to 3 times in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with those of the inner row, 8 in number; 8 teeth



in lower jaw. Gill-rakers short, 15 or 16 on lower part of anterior arch. Dorsal II 8, originating above base of ventral, at equal distance from end of snout and from caudal; some of the rays produced into long filaments in males. Anal III 20-23. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head,

Fig. 176.



*Petersius hilgendorfi.*  
Type (A. M. C.).  $\frac{4}{5}$ .

nearly reaching ventral. Caudal forked. Caudal peduncle hardly longer than deep. Scales 35-36  $\frac{7\frac{1}{2}}{3\frac{1}{3}}$ , 2 between lateral line and root of ventral. Dark brown above, silvery beneath; a dark lateral band on posterior two-thirds of body; a vertical black bar above pectoral; fins black.

Total length 100 millim.

Upper Congo (Lake Leopold II. and Alima River), Ogowe.—Types in Congo Museum, Tervueren.

|             |                      |                    |
|-------------|----------------------|--------------------|
| 1-2. Types. | Kutu, L. Leopold II. | M. P. Delhez (C.). |
| 3-4. Types. | Ibali, "             | "                  |
| 5-6. Hgr.   | Gaboon.              |                    |

### 3. PETERSIUS CONSERIALIS.

Hilgend. Sitzb. Ges. naturf. Fr. Berl. 1894, p. 173; Pfeff. Thierw. O.-Afr., Fische, p. 44 (1896).

Depth of body  $2\frac{3}{4}$  times in total length, length of head nearly 4 times. Head a little longer than deep, upper profile concave; lower jaw projecting beyond upper; snout a little shorter than eye, which is  $3\frac{1}{2}$  times in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, almost on a line with and alternating with those of the inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers rather short, 18 on lower

part of anterior arch. Dorsal II 8, originating just behind vertical of root of ventral, at equal distance from anterior border of eye and from caudal, longest ray a little shorter than head. Anal III 19. Pectoral as long as head, reaching ventral. Caudal forked. Caudal peduncle as long as deep. Scales  $33 \frac{7\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Silvery, back greyish green; a large black spot on caudal peduncle, extending on median rays of latter; anterior border of dorsal and posterior part of caudal blackish.

Total length 145 millim.

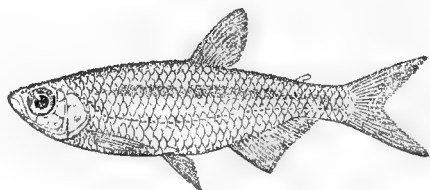
Kingani River, German East Africa.—Described from the type in the Berlin Museum.

#### 4. PETERSIUS TANGENSIS.

Lönnb. in Sjöstedt, Kilimandj.-Meru Exped., Fish. p. 2 (1907).

Depth of body  $3\frac{3}{4}$  to 4 times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head twice as long as broad, considerably longer than deep; lower jaw projecting slightly beyond snout; snout shorter than eye, which is  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times in length of head; interorbital width  $2\frac{2}{3}$  times in length of head; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with these of inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers short, 16–17 on lower part of anterior arch. Dorsal II 8, originating behind vertical of base of

Fig. 177.



*Petersius tangensis.*

Type.

ventral, at equal distance from anterior border of eye and from caudal. Adipose fin very small. Anal III 16–17. Pectoral a little shorter than head, not quite reaching ventral. Caudal deeply forked. Caudal peduncle about  $1\frac{1}{2}$  times as long as deep. Scales 35–36  $\frac{6\frac{1}{2}}{4\frac{1}{2}}$ ,  $2\frac{1}{2}$  or 3 between lateral line and root of ventral. Silvery, back olivaceous; a darker silvery lateral band.

Total length 57 millim.

Tanga River, Usambara, German East Africa.—Types in Stockholm Museum.

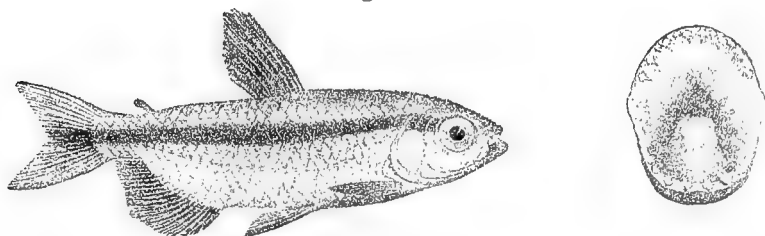
1-2. Two of the types. Tanga. Prof. Sjöstedt (C.);  
Prof. E. Lönnberg (P.).

### 5. PETERSIUS LEOPOLDIANUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 90, pl. xxxvii. fig. 4 (1899), and Poiss. Bass. Congo, p. 166 (1901).

Depth of body equal to length of head,  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times in total length. Head longer than deep, with straight upper profile; lower jaw projecting beyond upper; snout shorter than eye, which is 3 times, or a little less, in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, almost on a line with and alternating with the inner, 8 in number; 8 teeth in lower jaw. Gill-rakers long and closely set, 25-30 on lower part of anterior

Fig. 178.



*Petersius leopoldianus*.  
Type (A. M. C.).  $\frac{4}{5}$ .

arch. Dorsal II 8, originating above base of ventral, at equal distance from end of snout and from caudal, longest ray nearly as long as head. Anal III 19-20. Pectoral  $\frac{2}{3}$  to  $\frac{2}{3}$  length of head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales 30-31  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Olive-grey above, silvery beneath, with a dark lateral band.

Total length 90 millim.

Upper Congo (Lake Leopold II.). — Types in Congo Museum, Tervueren.

1-3. Types. Kutu, L. Leopold II. M. P. Delhez (C.).  
4. Skel. " " "

### 6. PETERSIUS BRUMPTI.

Pellegr. Bull. Mus. Paris, 1906, p. 368.

Form and coloration as in *P. leopoldianus*, but depth of body only

3 times in total length, and only 14 gill-rakers on lower part of anterior arch. Anal 22. 28 scales in lateral line.

Total length 55 millim.

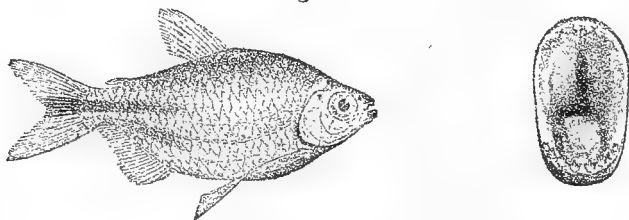
Abba River, affluent of Uelle, Congo.—Type in Paris Museum.

#### 7. PETERSIUS CAUDALIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 89, pl. xxxvii. fig. 3 (1899), and Poiss. Bass. Congo, p. 165 (1901).

Depth of body  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head as long as deep, with slightly concave upper profile;

Fig. 179.



*Petersius caudalis.*

Type (A. M. C.).  $\frac{4}{5}$ .

lower jaw projecting beyond upper; snout much shorter than eye, which is  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times in length of head and equals interorbital width; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with the inner, 8 in number; 8 teeth in lower jaw. Gill-rakers rather long, 16–18 on lower part of anterior arch. Dorsal II 8, originating immediately behind vertical of base of ventral, at equal distance from end of snout and from caudal, longest ray as long as head. Anal III–IV 19–20. Pectoral a little shorter than head, reaching or nearly reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle as long as deep. Scales 29–30  $\frac{5\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and root of ventral. Reddish, with a silvery lateral band, which becomes blackish on the caudal peduncle and extends as a black band on the caudal fin.

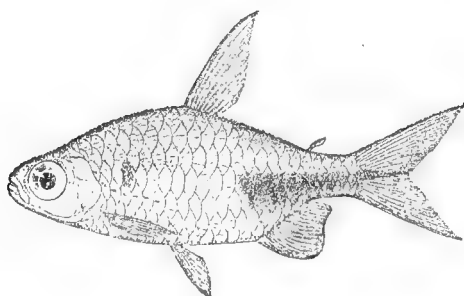
Lower Congo.—Types in Congo Museum, Tervueren.

- |                                                       |        |                              |
|-------------------------------------------------------|--------|------------------------------|
| 1-2. Two of the types.                                | Boma.  | M. P. Delhez (C.).           |
| 3. One of the types of<br><i>Alestes longipinnis.</i> | Congo. | R. College of Surgeons (P.). |

## 8. PETERSIUS PULCHER, sp. n.

Depth of body  $2\frac{2}{3}$  to  $2\frac{3}{4}$  times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{3}{4}$  times. Head  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times as long as broad, with slightly concave upper profile; jaws equal in front; snout  $\frac{1}{2}$  diameter of eye, which equals postorbital part of head; interorbital width 3 times in length of head; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with those of the inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers short, 12-13 on lower part of anterior arch. Dorsal II 8, originating just behind vertical of base of ventrals, at equal distance from nostrils and from caudal, longest ray as long as or longer

Fig. 180.

*Petersius pulcher.*

Type.

than head. Adipose fin small. Anal III 17. Pectoral nearly as long as head, reaching ventral. Caudal forked. Caudal peduncle as long as deep. Scales 24-25  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and ventral; lateral line incomplete, not extending beyond 6th to 9th scale. Greenish yellow on the back, silvery below, tinged with orange on the caudal part of the body; a vertically oval black spot above the shoulder; a broad black band on the side of the tail, continued on median rays of caudal; fins greyish, more or less tinged with orange; ventral fin black at the tip, anal finely edged with black.

Total length 55 millim.

South Cameroon.

1-2. Types. Ja River (Congo System) at Bitye. G. L. Bates, Esq. (C.).

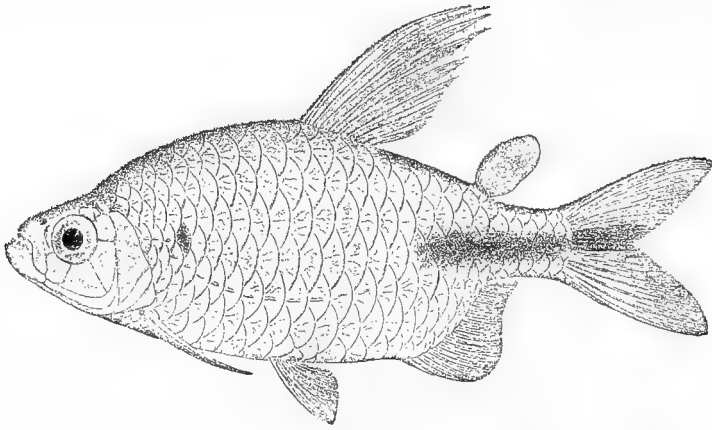
## 9. PETERSIUS MAJOR.

Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 436.

Depth of body  $2\frac{1}{4}$  to  $2\frac{1}{2}$  times in total length, length of head 4 times. Head as long as deep, twice as long as broad, with slightly

concave upper profile; lower jaw projecting beyond upper; snout shorter than eye, which is  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times in length of head; inter-orbital width  $2\frac{1}{2}$  times in length of head; maxillary extending to below anterior border of eye; outer præmaxillary teeth 4, alternating with those of the inner row, 8 in number; 8 teeth in lower jaw. Gill-rakers short, 12-15 on lower part of anterior arch. Dorsal II 8, originating just behind vertical of base of ventrals, at equal distance from nostrils and from caudal, longest ray longer than head.

Fig. 181.

*Petersius major.*

Type.

Adipose fin large, its depth at least  $\frac{1}{2}$  length of head. Anal III 18-19. Pectoral a little shorter than head, not quite reaching ventral. Caudal forked. Caudal peduncle a little longer than deep. Scales 24-26  $\frac{4\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and ventral; lateral line incomplete, not extending beyond 11th to 15th scale. Silvery, yellowish on the back; a small black spot often present above the shoulder; a black band on the side of the tail, continued on median rays of caudal; dorsal fin greyish, with a band of orange-red; ventral fin black at the tip; base of anal and caudal orange in males, yellow in females.

Total length 85 millim.

South Cameroon.

|             |                                   |                         |
|-------------|-----------------------------------|-------------------------|
| 1-2. Types. | Ja River (Congo System) at Bitye. | G. L. Bates, Esq. (C.). |
| 3. Ad.      | " "                               | "                       |
| 4. Ad.      | Kribi River at Efulen.            | "                       |
| 5-11. Ad.   | Nyong River.                      | "                       |
| 12. Skel.   | "                                 | "                       |

## 10. PETERSIUS SPILOPTERUS, sp. n.

Depth of body equal to length of head,  $3\frac{1}{3}$  times in total length. Head longer than deep; jaws equal; diameter of eye greater than length of snout, 3 times in length of head; maxillary extending to below anterior border of eye; 18 teeth ( $\frac{8}{10}$ ) in upper jaw, 10 in lower, outer præmaxillaries alternating with inner. Gill-rakers short, 10 on lower part of anterior arch. Dorsal II 10, originating above ventrals, at equal distance from anterior border of eye and from caudal,

Fig. 182.

*Petersius spilopterus.*

Type.

longest ray shorter than head. Anal III 11. Pectoral  $\frac{2}{3}$  length of head, not reaching ventral. Caudal forked. Caudal peduncle a little longer than deep. Scales in lateral line 28-30  $\frac{4\frac{1}{2}}{3\frac{1}{4}}$ , 2 between lateral line and ventral; scales above lateral line very much larger. Brown above, silvery white below; a dark, light-edged lateral band, extending from the eye to the caudal; dorsal fin with a large black spot, anal with blackish longitudinal streaks.

Total length 60 millim.

Mouths of Niger and Lagos Coast.

- |             |                                         |                         |
|-------------|-----------------------------------------|-------------------------|
| 1-2. Types. | Mouths of Niger.                        | Hr. P. Arnold (P.).     |
| 3. Type.    | Creek at Atijéré, 80 miles E. of Lagos. | Major G. E. Bruce (P.). |

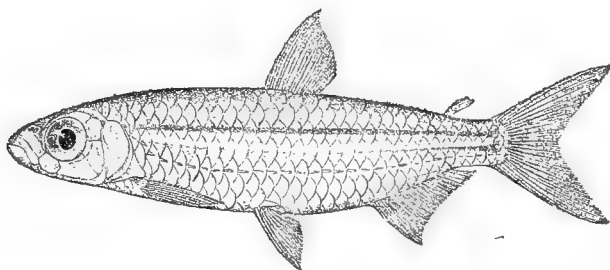
## 11. PETERSIUS WOOSNAMI.

Bouleng. Ann. & Mag. N. H. (7) xx. 1907, p. 487.

Depth of body equal to length of head, 4 times in total length. Head longer than deep, with convex upper profile; lower jaw projecting slightly beyond upper; diameter of eye equal to length of snout, 3 times in length of head; maxillary not extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 8 in lower; inner præmaxillary teeth inserted directly behind the outer. Gill-rakers short, 12 on lower part of anterior arch. Dorsal III 8, originating above base of ventrals and at equal distance from end of snout and from caudal; longest ray about  $\frac{3}{4}$  length of head. Anal III 17-18. Pectoral shorter than head, not reaching

ventral. Caudal peduncle as long as deep. Scales  $29-30 \frac{1\frac{1}{2}}{3\frac{1}{2}}$ , 2 between lateral line and ventral. No markings, except a silvery lateral band, which is black-edged above.

Fig. 183.

*Petersius woosnami.*

Type.

Total length 70 millim.

Upper Congo (Aruwimi).

1-2. Types.

Aruwimi River.

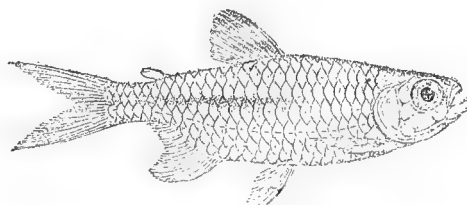
R. B. Woosnam, Esq. (C.) ;  
Ruwendori Expedition.

## 12. PETERSIUS OCCIDENTALIS.

Günth. Proc. Zool. Soc. 1899, p. 731, pl. xlv. fig. B.

Depth of body 3 to  $3\frac{1}{4}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head as long as deep, with nearly straight upper profile; jaws equal in front; snout much shorter than eye, which is  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times in length of head and equals interorbital width; maxillary

Fig. 184.

*Petersius occidentalis.*

Type, after Günther (P. Z. S. 1899).

extending to below anterior border of eye; 14 teeth ( $\frac{6}{8}$ ) in upper jaw, 8 in lower; inner præmaxillary teeth inserted directly behind the outer. Gill-rakers short, 12 or 13 on lower part of anterior arch. Dorsal III 8, originating immediately behind vertical of base of ventral, and at equal distance from end of snout and from caudal; longest ray  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Anal III 18-21. Pectoral shorter than head, not reaching



ventral. Caudal peduncle a little longer than deep. Scales 24–27  $\frac{4\frac{1}{2}}{2\frac{1}{2}}$ ,  $1\frac{1}{2}$  or 2 between lateral line and root of ventral; lateral line sometimes ending on caudal peduncle before reaching caudal fin. Silvery, with a more or less distinct darker lateral band; dorsal grey to blackish with a broad yellow transverse bar; caudal edged with grey.

Total length 65 millim.

Gold Coast.

|                   |                 |                                                     |
|-------------------|-----------------|-----------------------------------------------------|
| 1–5. Types.       | Kotchwah River. | R. B. N. Walker, Esq. (P.).                         |
| 6–15. Ad. & hgr.  | Akropon.        | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |
| 16–25. Ad. & hgr. | Infoan.         | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |

7. EUGNATHICHTHYS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 25 (1898), and Poiss. Bass. Congo, p. 170 (1901).

Snout moderately elongate, rounded; mouth large; jaws massive, upper movable upwards; maxillary very small, hidden under the præorbital when the mouth is closed; præmaxillary and dentary with two series of teeth, the outer large, subequal, compressed, bicuspid, the inner very small, compressed, obtuse, the two series separated by a considerable space. Cheek partly naked; nostrils near the eye, close together, separated by a valvular flap; gill-membranes free from isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; a scaly process at base of ventral. Dorsal fin with 11 to 18 rays, above the ventrals; anal with 12 or 13 rays; adipose dorsal fin small. Vertebræ 55 (33 + 22).

Congo.

Two species:—

- D. 17–18; Sc. 95–107  $\frac{14-16}{13-15}$  . . . . . 1. *E. eetveldii*, Blgr., p. 241.
- D. 11–14; Sc. 68–71  $\frac{9-10}{9-10}$  . . . . . 2. *E. macroterolepis*, Blgr., p. 243.

1. EUGNATHICHTHYS EETVELDII.

Bouleng. Ann. Mus. Congo, Zool. i. p. 26, pl. xii. (1898), and Poiss. Bass. Congo, p. 170 (1901).

Depth of body 4 to 5 times in total length, length of head  $3\frac{3}{4}$  to  $4\frac{1}{4}$  times. Head 2 to  $2\frac{1}{4}$  times as long as broad,  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long

as deep; snout  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times diameter of eye, which is  $3\frac{1}{2}$  (young) to 5 times in length of head, and 1 to  $1\frac{1}{2}$  times in interorbital width; upper jaw extending to below centre of eye; 12 to 14 teeth on each side in the outer series of both jaws; naked space on cheek about half width of suborbitals. Gill-rakers very small. Dorsal IV 13-14, originating a little in advance of ventrals, situated at equal distance from centre or posterior border of eye and from caudal. Base of adipose fin covered with scales. Anal III 9-10. Pectoral a little shorter than ventral and but little more than half length of head. Caudal forked, nearly

Fig. 185.

*Eugnathichthys eetveldii.*Type (A. M. C.).  $\frac{1}{2}$ .

entirely covered with very small scales, upper lobe longer and pointed, lower rounded. Caudal peduncle twice as long as deep. Scales 95-107  $\frac{14-16}{13-15}$ , 9-10 between lateral line and root of ventral. Yellowish, olive on the back, with large round or rhomboidal blackish spots arranged quincuncially; fins orange; 4 or 5 black streaks across the dorsal; a black spot on the adipose fin; a black streak on the middle rays, and 2 to 4 oblique ones on each lobe of the caudal.

Total length 290 millim.

Congo.—Types in Congo Museum, Tervueren.

1-2. Types.

Leopoldville.

Capt. Wilverth (C.).

3. Yg.

Stanley Pool.

M. De Meuse (C.).

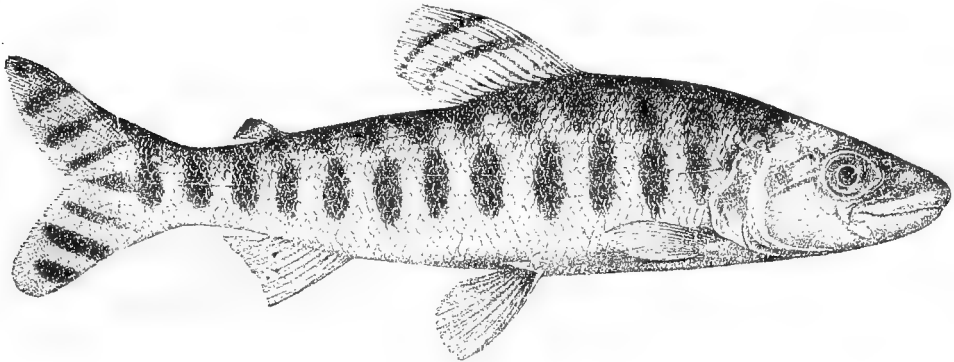
|           |                      |                        |
|-----------|----------------------|------------------------|
| 4. Yg.    | Bolobo, Upper Congo. | Rev. G. Grenfell (P.). |
| 5. Skull. | Liranga, "           | M. P. Delhez (C.).     |
| 6. Hgr.   | Monsembe, "          | Rev. J. H. Weeks (P.). |
| 7. Skel.  | " "                  | "                      |
| 8. Ad.    | Upper Congo.         | Brussels University.   |

## 2. EUGNATHICHTHYS MACROTEROLEPIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 75, pl. xxxiv. fig. 1 (1899), and Poiss. Bass. Congo, p. 172 (1901).

Depth of body  $4\frac{1}{4}$  to  $4\frac{3}{4}$  times in total length, length of head  $3\frac{1}{2}$  times. Head 2 to  $2\frac{1}{2}$  times as long as broad,  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep; snout  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times diameter of eye, which is 4 to 5 times in length of head and 1 to  $1\frac{1}{2}$  times in interorbital width; upper jaw extending to below centre of eye; naked space on cheek about  $\frac{1}{4}$  width of præorbital.

Fig. 186.

*Eugnathichthys macroterolepis.*

Type (A. M. C.).

Dorsal III 8-11, originating a little in advance of ventrals. Anal III 9. Scales 68-71  $\frac{9-10}{9-10}$ , 6 or 7 between lateral line and root of ventral. Otherwise as in the preceding. A median dorsal and a lateral series of large black spots, the latter alternating with the former and forming vertical bars; 3 black streaks across the dorsal, 2 to 4 on each caudal lobe.

Total length 145 millim.

Congo.

|          |                      |                                                  |
|----------|----------------------|--------------------------------------------------|
| 1. Type. | Loango, Lower Congo. | M. De Meuse (C.).                                |
| 2. Yg.   | Stanley Pool.        | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 3. Hgr.  | Banzyville, Ubaughi. | Capt. Royaux (C.).                               |
| 4. Hgr.  | Uerre.               | M. De Bauw (C.).                                 |

## 8. PARAPHAGO.

Bouleng. Ann. Mus. Congo, Zool. i. p. 76 (1899), and Poiss. Bass. Congo, p. 173, (1901).

Snout moderately elongate, pointed; mouth large; jaws massive, the upper movable upwards; maxillary very small, not hidden under the præorbital when the mouth is closed; præmaxillary and dentary with two series of teeth, the outer strong, compressed, bi- or tricuspid, the anterior larger, the inner small, sharply pointed, the two series separated by a considerable space. Cheek nearly entirely covered by the sub-orbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes narrowly united to isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; no scaly process at base of ventral. Dorsal fin with 15 rays, above the ventrals; anal with 13 or 14 rays; adipose dorsal fin small.

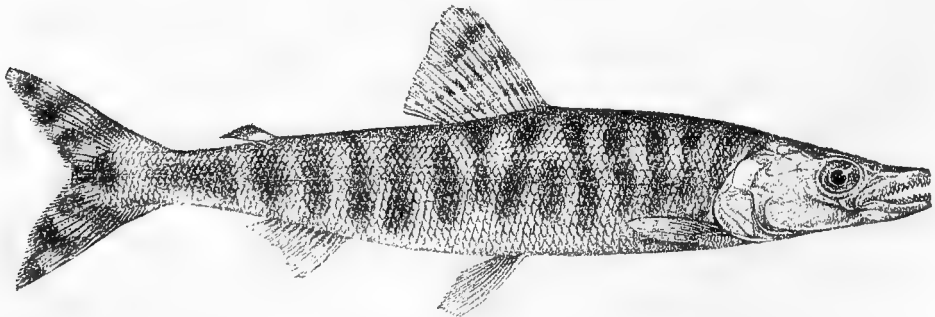
Congo.

## 1. PARAPHAGO ROSTRATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 76, pl. xxxiv. fig. 2 (1899), and Poiss. Bass. Congo, p. 174 (1901).

Depth of body  $5\frac{1}{2}$  to 6 times in total length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$  times. Head 3 times as long as broad, rugose above; snout once and  $\frac{1}{2}$  diameter of eye, which is  $4\frac{1}{2}$  to 5 times in length of head and equals interorbital width; mouth extending to below anterior third of eye;

Fig. 187.



*Paraphago rostratus*,  
Type (A. M. C.).

15 or 16 teeth on each side in the outer series of both jaws. Gill-rakers very small, rudimentary. Dorsal III 12, originating a little in advance of ventrals, at equal distance from end of snout and from caudal,

longest ray half length of head. Anal III 10–11. Pectoral shorter than ventral, hardly  $\frac{2}{5}$  length of head. Caudal forked, with obtusely pointed lobes. Caudal peduncle nearly 3 times as long as deep. Scales 87–90  $\frac{10-11}{12}$ , 9 between lateral line and root of ventral. Olive above, whitish beneath; a median and two lateral series of black spots, the lower forming vertical bars across the lateral line; three more or less regular black streaks across the dorsal; a black spot on the adipose fin; a black streak on the middle rays, and three oblique ones on each lobe of the caudal.

Total length 130 millim.

Upper Congo (Lake Leopold II.).—Types in Congo Museum, Tervueren.

1. One of the types. Kutu, L. Leopold II. M. P. Delhez (C).

### 9. MESOBORUS.

Pellegr. Bull. Mus. Paris, 1900, p. 178; Bouleng. Poiss. Bass. Congo, p. 175 (1901).

Snout elongate, pointed; mouth large; upper jaw movable upwards; maxillary very small, hidden under the præorbital when the mouth is closed; præmaxillary and dentary with two series of teeth, the outer strong, compressed, pointed, the point directed backwards, with or without a secondary cusp, the anterior large, canine-like; teeth of inner series very small. Greater part of cheek covered by the suborbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes narrowly united to isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; a small scaly process at base of ventral. Dorsal with 18 rays, above the ventrals; anal with 14 rays; adipose dorsal fin small.

Congo.

#### 1. MESOBORUS CROCODILUS.

Pellegr. l. c.; Bouleng. l. c.

Depth of body 4 times in total length, length of head 3 times. Head 3 times as long as broad; snout twice as long as eye, which is  $4\frac{1}{2}$  times in length of head and exceeds interorbital width; mouth extending to below anterior border of eye; 29 or 30 small teeth on each side and a pair of canines in front of each jaw, the canines of the lower jaw separated by a pair of small teeth; naked part of cheek half width of suborbital. Gill-rakers short, 17 on lower part of anterior arch.

Dorsal IV 14, originating well in advance of ventral and at equal distance from end of snout and from caudal, longest ray  $\frac{1}{2}$  length of head. Anal III 11. Pectoral nearly  $\frac{1}{2}$  length of head, a little longer than ventral. Caudal covered with small scales, deeply forked, lobes rounded. Caudal peduncle once and  $\frac{1}{2}$  as long as deep. Scales  $96 \frac{15}{15}$ , 12 between lateral line and root of ventral. Brownish, with traces of two alternating series of large dark spots on each side, those of the lower series about 10 in number and on the lateral line; fins greyish.

Total length 250 millim.

Alima River, Upper Congo —Type, in Paris Museum, examined.

#### 10. PHAGO.

Günth. Ann. & Mag. N. H. (3) xv. 1865, p. 209; Bouleng. Poiss. Bass. Congo, p. 177 (1901).

Snout long and narrow; mouth large; jaws beak-like, upper movable upwards; maxillary very small; præmaxillary and dentary with two series of teeth, the outer strong, compressed, bicuspid, the anterior upper larger, the inner very small and conical, the two series separated by a considerable interspace. Cheek entirely covered by the sub-orbitals; nostrils near the eye, close together, separated by a valvular flap; gill-membranes narrowly united to isthmus. Body elongate, feebly compressed. Scales large, hard, rugose, strongly ciliated; lateral line straight, along the middle of the side; no scaly process at base of ventral. Dorsal fin with 12 or 13 rays, above the ventrals; anal with 10 to 12 rays; adipose dorsal fin very small. Vertebrae 44 (20 + 24).

Congo, Niger.

#### *Synopsis of the Species.*

Snout longer than postocular part of head;

Sc. 47  $\frac{1\frac{1}{2}}{3\frac{1}{2}}$ , 1 between dorsal fin and lateral line series, 6 round caudal peduncle . . . 1. *P. loricator*, Gthr., p. 247.

Snout longer than postocular part of head;

Sc. 47  $\frac{1\frac{1}{2}}{3\frac{1}{2}}$ , 2 between dorsal fin and lateral line series, 6 round caudal peduncle . . . 2. *P. intermedius*, Blgr., p. 247.

Snout shorter than postocular part of head;

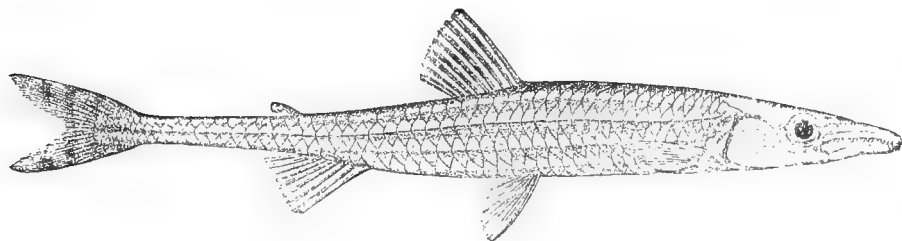
Sc. 42-45  $\frac{2\frac{1}{2}}{3\frac{1}{2}}$ , 2 between dorsal fin and lateral line series, 8 round caudal peduncle . . . 3. *P. boulengeri*, Schilth., p. 248.

## 1. PHAGO LORICATUS.

Günth. Ann. & Mag. N. H. (3) xv. 1865, p. 210, pl. v.

Depth of body 9 times in total length, length of head 4 times. Head  $3\frac{1}{2}$  times as long as broad; snout a little longer than postorbital part of head,  $2\frac{1}{3}$  times diameter of eye, which is  $5\frac{1}{3}$  times in length of head and nearly equals interorbital width; mouth extending nearly to anterior border of eye; 19 teeth on each side in outer series in each jaw, the first upper a small canine; bones of the head granulated and striated. Gill-rakers very short, rudimentary. Dorsal III 9, originating above last ray of ventral, slightly nearer end of snout than caudal, longest ray not quite half length of head. Anal III 8. Pectoral  $\frac{2}{3}$  length of head,

Fig. 188.



*Phago loricatus.*

Type, after Günther (Ann. & Mag. N. H. 1865).

a little shorter than ventral. Caudal forked, with pointed lobes. Caudal peduncle 7 times as long as deep. Scales  $47\frac{1\frac{1}{2}}{3\frac{1}{2}}$ ; a single series of scales between dorsal fin and lateral line series, 6 round caudal peduncle. Pale brownish; dorsal with two horizontal dark streaks; 3 oblique dark streaks across each lobe of caudal.

Total length 110 millim.

Niger.

1. Type.

Niger.

Mr. J. T. Dalton (C.).

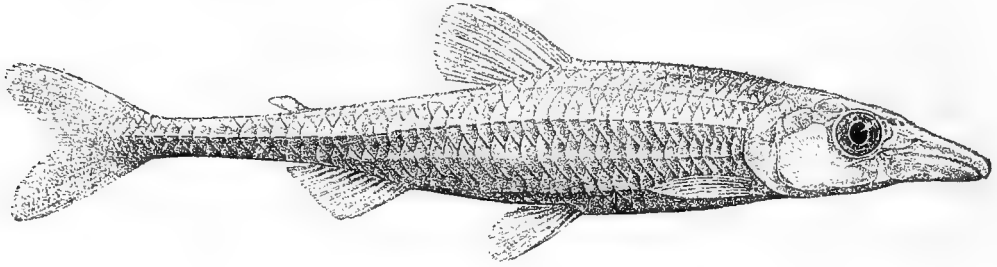
## 2. PHAGO INTERMEDIUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 77, pl. xxxiv. fig. 3 (1899), and Poiss. Bass. Congo, p. 178 (1901).

Depth of body 6 times in total length, length of head  $3\frac{1}{2}$  times. Head  $3\frac{1}{2}$  times as long as broad; snout a little longer than postocular part of head,  $2\frac{1}{2}$  times diameter of eye, which is  $5\frac{1}{2}$  times in length of head and  $1\frac{1}{3}$  times in interorbital width; mouth extending to anterior border of eye; 22 teeth on each side of upper jaw. Dorsal IV 8,

originating above first ray of ventral, at equal distance from end of snout and from caudal. Anal III 9. Caudal with rounded lobes. Caudal

Fig. 189.



*Phago intermedius*.  
Type (A. M. C.).

peduncle 5 times as long as deep. Scales obtusely keeled,  $47 \frac{1\frac{1}{2}}{3\frac{1}{2}}$ , 2 between dorsal fin and lateral line series, 6 round caudal peduncle. No markings (specimen bleached).

Total length 140 millim.

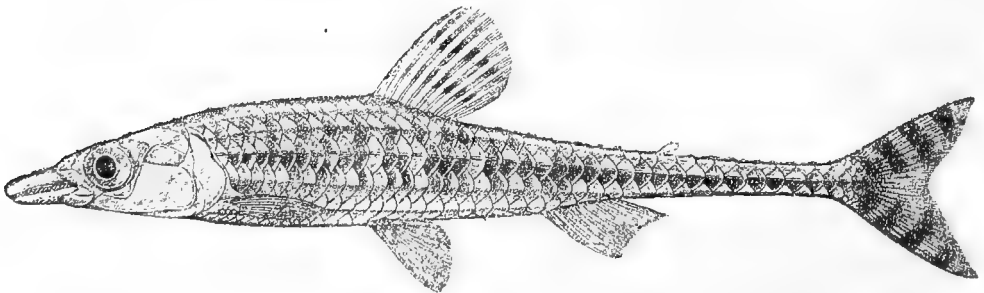
Congo (Stanley Pool).—Type in Congo Museum, Tervueren.

### 3. PHAGO BOULENGERI.

Schilthuis, Tijdschr. Ned. Dierk. Ver. (2) iii. 1891, p. 90; Bouleng. Poiss. Bass. Congo, p. 177 (1901).

Depth of body 6 to 7 times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head  $2\frac{2}{3}$  to 3 times as long as broad; snout as long as or a

Fig. 190.



*Phago boulengeri*.  
Type.

little shorter than postocular part of head,  $1\frac{1}{3}$  to  $1\frac{3}{4}$  times diameter of eye, which is 4 to  $4\frac{1}{2}$  times in length of head and equals interorbital width; mouth extending to below anterior fourth of eye; 17–19 teeth on each side of upper jaw. Dorsal III 9–10, originating above first ray



of ventral, nearer end of snout than caudal. Anal III 7-8. Pectoral a little more than  $\frac{2}{5}$  or nearly  $\frac{1}{2}$  length of head. Caudal with pointed lobes. Caudal peduncle 5 to 6 times as long as deep. Scales obtusely keeled, 42-45  $\frac{24}{33}$ , 2 between dorsal fin and lateral line series, 8 round caudal peduncle. Brown above, whitish beneath, often with alternating darker spots on the back and sides, or with a dark lateral band; dorsal and caudal orange or salmon-pink, usually with black bands, disposed horizontally on the former, obliquely on each lobe of the latter; paired fins and anal yellow or blackish.

Total length 160 millim.

Upper Congo.

|                 |                          |                                                 |
|-----------------|--------------------------|-------------------------------------------------|
| 1. Type.        | Kinshassa, Stanley Pool. | M. A. Greshoff (C.);<br>Utrecht University (E). |
| 2. Ad.          | Leopoldville, „          | Capt. Wilverth (C.).                            |
| 3. Skel.        | „ „                      | „                                               |
| 4. Ad.          | Bangala Province.        | M. De Meuse (C.).                               |
| 5. Ad.          | Irebu.                   | M. P. Delhez (C.).                              |
| 6. Ad.          | Kutu, Lake Leopold II.   | „                                               |
| 7, 8. Ad. & yg. | Monsembe.                | Rev. J. H. Weeks (P.).                          |
| 9. Ad.          | Stanley Falls.           | Rev. W. H. Bentley (C.).                        |

### 11. NEOBORUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 78 (1899), and Poiss. Bass. Congo, p. 179 (1901).

Snout long and narrow, pointed; mouth large; upper jaw movable upwards; maxillary very small, hidden under the præorbital when the mouth is closed; præmaxillary and dentary with a single series of teeth, the anterior large and canine-like, the laterals pointed, compressed, the point directed backwards, some with a small secondary cusp. Cheek partly naked; nostrils near the eye, close together, separated by a valvular flap; gill-membranes narrowly united to isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; a scaly process at base of ventral. Dorsal fin with 16 to 18 rays, behind vertical of base of ventrals; anal with 15 to 19 rays; adipose dorsal fin small. Vertebrae 43 (24+19).

Congo, Casamanza River.

Two species:—

Dorsal originating well behind vertical of

base of ventral; Sc. 98-110  $\frac{14-15}{11-13}$ . 1. *N. ornatus*, Blgr., p. 250.

Dorsal originating immediately behind

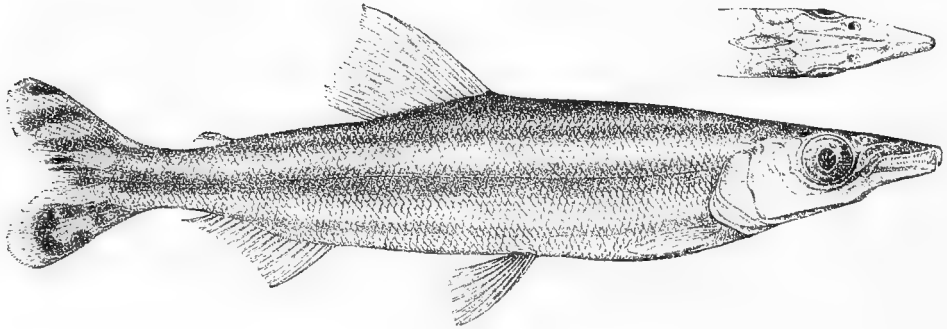
vertical of base of ventral; Sc. 90  $\frac{12}{12}$ . 2. *N. quadrilineatus*, Pellegr., p. 251.

## 1. NEOBORUS ORNATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 78, pl. xxxiv. fig. 4 (1899), and Poiss. Bass. Congo, p. 180 (1901).

Depth of body  $5\frac{1}{3}$  to  $6\frac{1}{3}$  times in total length, length of head  $3\frac{1}{4}$  to  $3\frac{2}{3}$  times. Head  $3\frac{1}{2}$  to 4 times as long as broad, 2 to  $2\frac{1}{2}$  times as long as deep, flat above; snout as long as or a little longer than postocular part of head; eye 5 to  $5\frac{1}{2}$  times in length of head, equal to or a little greater than interorbital width; upper jaw not quite extending to below anterior border of eye; 29–34 small teeth on each side in upper jaw, 22–27 in lower; 2 canines at extremity of upper jaw and 3 at extremity of lower; naked part of cheek double the width of suborbitals. Gill-rakers very small, almost rudimentary. Dorsal III 13–15, originating a little behind vertical of base of ventral, longest ray hardly  $\frac{2}{3}$  length of head. Anal III–IV 14–15. Pectoral shorter than ventral, not half length of head. Caudal forked, with rounded lobes, nearly entirely covered with small

Fig. 191.

*Neoborus ornatus.*Type (A. M. C.).  $\frac{5}{7}$ .

scales. Caudal peduncle twice as long as deep. Scales 98–110  $\frac{14-15}{11-13}$ , 8 or 9 between lateral line and root of ventral. Purplish grey above, silvery or greenish on the sides; three olive bands along the side, the median widest, along the lateral line; dorsal orange or grey; caudal orange, with 6 or 7 more or less regular longitudinal black stripes.

Total length 180 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

- |                      |                      |                        |
|----------------------|----------------------|------------------------|
| 1. One of the types. | Kutu, L. Leopold II. | M. P. Delhez (C.).     |
| 2. Skel.             | Bikoro, Upper Congo. | „                      |
| 3. Ad.               | Monsembe, „          | Rev. J. H. Weeks (P.). |
| 4. Hgr.              | Upper Congo.         | Brussels University.   |

## 2. NEOBORUS QUADRILINEATUS.

Pellegr. Bull. Mus. Paris, 1904, p. 219.

Distinguished from the preceding by the larger eye, 4 times in length of head, fewer teeth (21 above and 17-18 below, on each side), the dorsal originating immediately behind vertical of base of ventral, fewer anal rays (15), and larger scales,  $90 \frac{12}{12}$ . Pale yellow, with 4 parallel black stripes on each side; caudal bright yellow, each lobe with the tip and two cross-bars black; dorsal greyish, with the upper part of the anterior rays darker.

Total length 117 millim.

Casamanza River, Portuguese Guinea.—Type in Paris Museum.

## 12. ICHTHYOBORUS.

Günth. Cat. Fish. v. p. 362 (1864); Bouleng. Fish. Nile, p. 134 (1907).

Snout long and narrow, pointed; mouth large; upper jaw movable upwards; maxillary very small; præmaxillary and dentary with strong canine teeth in front, a series of small, compressed, more or less distinctly bicuspid teeth directed backwards on each side, and numerous minute, cardiform teeth on their inner surface. Cheek partly naked; nostrils near the eye, close together, separated by a valvular flap; gill-membranes narrowly attached to isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; a scaly process at base of ventral. Dorsal fin with 15 to 17 rays, behind vertical of base of ventrals; anal with 14 to 17 rays; adipose fin small. Vertebrae 47 (29+18).

Nile and Chad Basins.

## 1. ICHTHYOBORUS BESSE.

*Characinus besse*, Joannis, Mag. de Zool. 1835, iv. pl. x.

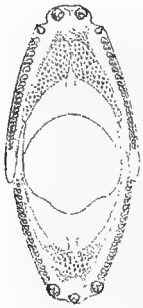
*Ichthyoborus microlepis*, Günth. Cat. Fish. v. p. 363 (1864), and Petherick's Trav. ii. p. 249, pl. ii. fig. A (1869).

*Ichthyoborus besse*, Günth. opp. citt. pp. 364, 250; Bouleng. Fish. Nile, p. 134, pl. xxi. figs. 1 & 2 (1907).

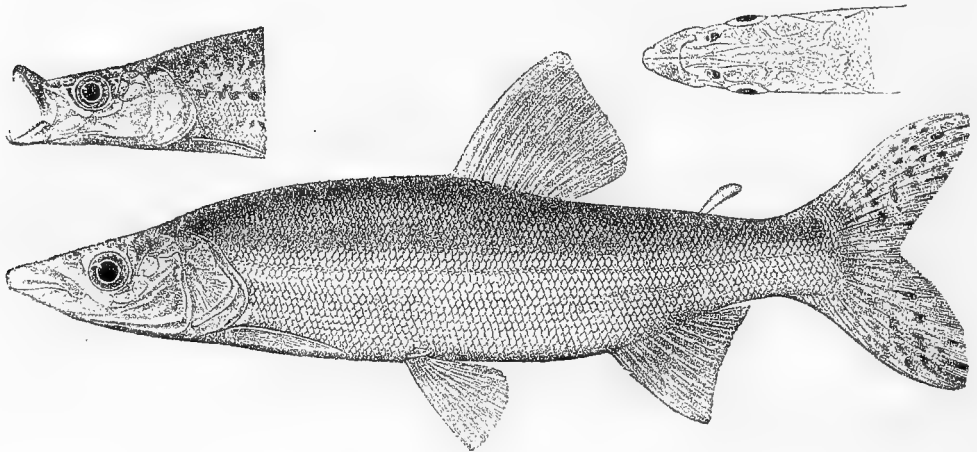
Depth of body  $4\frac{1}{3}$  to  $5\frac{1}{3}$  times in total length, length of head  $3\frac{1}{3}$  to 4 times. Head 3 to  $3\frac{1}{3}$  times as long as broad, flat above; snout a little shorter than postocular part of head,  $1\frac{1}{2}$  to 2 times as long as eye, which is  $4\frac{1}{3}$  (young) to 6 times in length of head and  $\frac{2}{3}$  to once interorbital width; upper jaw extending nearly to below anterior border of eye; 17-20 teeth on each side in upper jaw, 14-16 in lower; 2 canines at

extremity of upper jaw and 3 at extremity of lower; naked part of cheek about double the width of suborbital; upper surface of head rugose with fine striæ. Gill-rakers extremely short, rudimentary. Dorsal III 12-14, originating immediately behind vertical of base of ventrals, equally distant from occiput and from caudal, longest ray  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head.

Fig. 192.



Anal III 11-14. Pectoral about  $\frac{1}{2}$  length of head, as long as ventral. Caudal nearly entirely covered with small scales, deeply forked, lobes rounded or obtusely pointed. Caudal peduncle  $1\frac{2}{3}$  to 2 times as long as deep. Scales 91-112  $\frac{14-16}{14-16}$ , 10-12 between lateral line and root of ventral. Silvery, back pale olive; a greenish golden streak above lateral line; blackish spots and marblings sometimes present on back and sides; fins whitish, except the caudal, which is pale yellow with more or less numerous black spots.

*Ichthyoborus besse.*

White Nile (F. N.). 2065.

Total length 190 millim.

Lower Nile to White Nile; Chad Basin.—Types in Paris Museum.

|                       |                               |                                                       |
|-----------------------|-------------------------------|-------------------------------------------------------|
| 1-2. Types of         | Khartum.                      | J. Petherick, Esq. (P.).                              |
| <i>I. microlepis.</i> |                               |                                                       |
| 3. Ad.                | "                             | A. L. Butler, Esq. (P.).                              |
| 4-6. Ad.              | Between Khartum and Sobat.    | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 7. Ad.                | Goz Abu Gumah,<br>White Nile. | L. Loat, Esq. (C.).                                   |
| 8. Ad.                | North of Kaka, White Nile.    | "                                                     |
| 9-23, 24. Ad. & hgr.  | Fashoda, "                    | "                                                     |
| 25. Skel.             | " "                           | "                                                     |

|            |                                  |                                                      |
|------------|----------------------------------|------------------------------------------------------|
| 26-27. Ad. | Polkom, Baro R. (Sobat).         | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.) |
| 28. Ad.    | Mouth of Lake No,<br>White Nile. | L. Loat, Esq. (C.).                                  |
| 29. Hgr.   | Lake No, White Nile.             | „                                                    |
| 30. Ad.    | Fort Lamy, Shari River.          | Capt. G. B. Gosling (P.).                            |

13. **HEMISTICHODUS.**

Pellegr. Bull. Mus. Paris, 1900, p. 352.

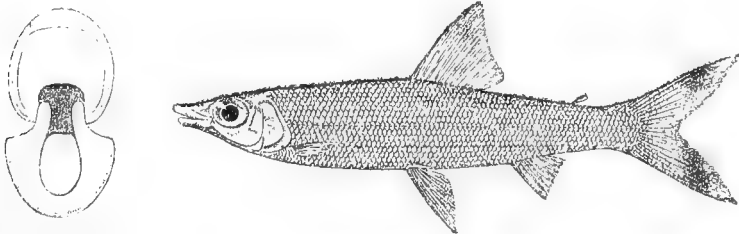
Snout moderately long; mouth large, both jaws freely movable vertically, the lower overlapping the upper on the sides; pharyngeal orifice much restricted; maxillary fused with præmaxillary; upper jaw toothless in front; sides of upper jaw bent inwards posteriorly, abutting against a large process of the mandible; teeth on sides of upper jaw and in lower forming a single series, very small, closely set, with bicuspid crowns with long slender shafts. Cheek covered by the suborbitals; nostrils on upper surface of snout, at a short distance from the eye, close together, separated by a valvular flap; gill-membranes free from isthmus. Body elongate, compressed. Scales small, strongly ciliated; lateral line straight, along the middle of the side; a scaly process at base of ventral. Dorsal with 13 to 15 rays, above ventrals; anal with 11 or 12 rays; adipose fin small.

Ogowe.

1. **HEMISTICHODUS VAILLANTI.**

Pellegr. l. c., and Bull. Soc. Philom. (9) ix. 1907, p. 24, pl. i. fig. 1.

Fig. 193.



*Hemistichodus vaillanti*, with enlarged view of open mouth.  
Ngomo.

Depth of body  $4\frac{1}{4}$  to  $5\frac{1}{4}$  times in total length, length of head  $3\frac{2}{3}$  to  $4\frac{1}{4}$  times. Snout rounded, flat above, projecting beyond lower jaw, as long as eye, which is 3 to  $3\frac{1}{2}$  times in length of head and nearly equals

interorbital width; mouth extending to below anterior border of eye; about 30-34 teeth on each side in each jaw. Gill-rakers very short. Dorsal III 10-12, originating at equal distance from end of snout and from caudal, longest ray  $\frac{3}{4}$  length of head. Anal III 8-9. Pectoral shorter than ventral, half length of head. Caudal forked, with pointed lobes, half covered with scales. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep. Scales 70-80  $\frac{9-10}{10-11}$ , 6 or 7 between lateral line and root of ventral. Silvery, brownish on the back; a blackish spot at the tip of the dorsal fin and one or two on each caudal lobe.

Total length 97 millim.

Ogowe River.—Type, in Paris Museum, examined.

|         |        |                    |
|---------|--------|--------------------|
| 1. Hgr. | Ngomo. | Rev. E. Haug (C.); |
|         |        | Paris Museum (E.). |

#### 14. NANNÆTHIOPS.

Günth. Proc. Zool. Soc. 1871, p. 669; Bouleng. Poiss. Bass. Congo, p. 182 (1901), and Fish. Nile, p. 137 (1907).

Mouth rather small, each jaw with two series of small, notched, bicuspid teeth; a few small teeth at the base of the maxillary bone. Check covered by the suborbitals; nostrils close together, separated by a valvular flap; gill-membranes free from the isthmus. Body moderately elongate, strongly compressed; belly rounded. Scales rather large, with strongly ciliated border; lateral line, if distinct, equally distant from the dorsal and the ventral outline; a scaly process at the base of the ventral. Dorsal fin with 13 to 15 rays, above the ventrals; anal fin with 10 rays; a very small adipose dorsal fin. Vertebrae 33 (20+13).

Tropical Africa.

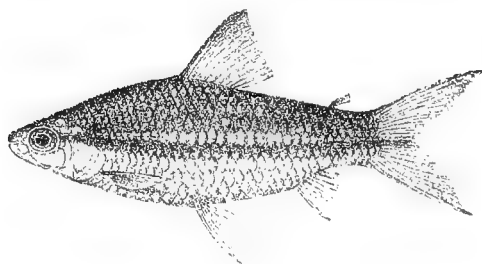
##### 1. NANNÆTHIOPS UNITÆNIATUS.

Günth. Proc. Zool. Soc. 1871, p. 670, pl. lxxv. fig. C; Sauv. Bull. Soc. Zool. France, 1882, p. 321; Vaill. Bull. Soc. Philom. (8) v. 1893, p. 13; Bouleng. Poiss. Bass. Congo, p. 182 (1901); Lönnb. Ann. & Mag. N. H. (7) xii. 1903, p. 38; Werner, Sitzb. Ak. Wien, cxv. i. 1906, p. 1129; Bouleng. Fish. Nile, p. 137, pl. xxi. fig. 3 (1907).

Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{2}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head about twice as long as broad, a little longer than deep, its upper surface rugose in the adult; snout rounded, shorter than eye,

which is  $2\frac{1}{2}$  to 3 times in length of head; interorbital width a little greater than diameter of eye; mouth terminal; maxillary extending to below anterior border of eye; 22 to 30 teeth in outer præmaxillary series. Gill-rakers short, 10 to 12 on lower part of anterior arch. Dorsal III 10-12, originating a little in advance of ventrals, its distance from eye equal to its distance from caudal; longest ray nearly equal to

Fig. 194.

*Nannæthiops unitaniatus.*

Type (F. N.).

length of head. Anal III 7. Pectoral about  $\frac{2}{3}$  length of head, shorter than ventral. Caudal forked, with pointed lobes. Caudal peduncle as long as deep. Scales 32-36  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4 between lateral line and base of ventral; lateral line sometimes restricted to a few of the anterior scales. Olive-brown above, yellowish beneath; a black lateral streak, sometimes narrowly edged with silvery, from eye to median rays of caudal; a blackish spot at tip of dorsal.

Total length 62 millim.

White Nile and Bahr-el-Gebel, Gold Coast, Niger, Cameroon, Gaboon, Congo.

|              |                              |                                       |
|--------------|------------------------------|---------------------------------------|
| 1. Yg.       | Fashoda, White Nile.         | L. Loat, Esq. (C.).                   |
| 2-4. Yg.     | Lake No,        ,,           | ,,                                    |
| 5-6. Hgr.    | Assini, Gold Coast.          | M. Chaper (C.);<br>Paris Museum (E.). |
| 7. Ad.       | Abo, Lower Niger.            | Dr. W. J. Ansorge (C.).               |
| 8. Ad.       | Ja R. at Bitye, S. Cameroon. | G. L. Bates, Esq. (C.).               |
| 9-14. Types. | Gaboon.                      |                                       |
| 15. Ad.      | Lambarene, Ogowe.            | Dr. W. J. Ansorge (C.).               |
| 16-17. Ad.   | Sette Cama, Gaboon.          |                                       |
| 18. Skel.    | ,,        ,,                 |                                       |

15. **NEOLEBIAS.**

Steind. Notes Leyd. Mus. xvi. 1894, p. 78 ; Bouleng. Poiss. Bass. Congo, p. 183 (1901).

Barely separable from the preceding by the absence of teeth on the maxillary bone. Lateral line absent or reduced to a few anterior tubules. Adipose fin minute or absent. Vertebrae 31 (18+13).

Liberia to Congo.

Two species :—

Depth of body  $2\frac{2}{3}$ – $3\frac{1}{2}$  times in total length ;

10 series of scales between dorsal and

ventral . . . . . 1. *N. unifasciatus*, Stdr., p. 256.

Depth of body  $3\frac{2}{3}$ –4 times in total length ;

9 series of scales between dorsal and

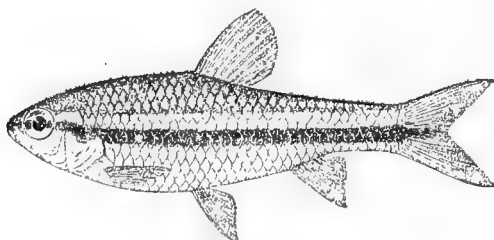
ventral . . . . . 2. *N. trilineatus*, Blgr., p. 257.

1. **NEOLEBIAS UNIFASCIATUS.**

Steind. l. c. pl. iv. figs. 3 & 4.

Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{2}$  times in total length, length of head 3 to  $3\frac{1}{2}$  times. Head twice as long as broad, slightly longer than deep, its upper surface rugose in the adult ; snout rounded, much shorter than eye, which is  $2\frac{1}{2}$  to 3 times in length of head and equals interorbital width ; mouth terminal ; maxillary extending to below anterior border or anterior third of eye ; 20 to 26 teeth in outer præmaxillary series.

Fig. 195.



*Neolebias unifasciatus.*

Ja River.

Gill-rakers short, about 10 on lower part of anterior arch. Dorsal III–IV 7–8, originating above ventral, at equal distance from end of snout and from caudal ; longest ray  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Anal III 6–7. Pectoral about  $\frac{3}{4}$  length of head, as long as ventral. Caudal forked, with pointed lobes. Caudal peduncle as long as deep or a



little longer. Scales 32-36 in longitudinal series, 12 in transverse series, 10 between dorsal and ventral; lateral line, if at all developed, restricted to 4 to 8 scales. Back pale brown; a blackish lateral band, edged above with yellow, extends from the eye to the base of the caudal; the parts below the lateral band uniform yellow; base of caudal orange.

Total length 45 millim.

Liberia, South Cameroon, Gaboon.—Types in Leyden Museum.

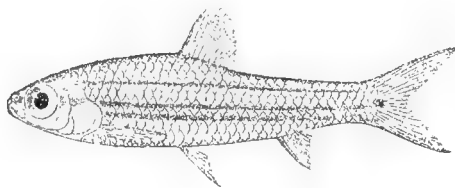
|                      |                                                |                         |
|----------------------|------------------------------------------------|-------------------------|
| 1. One of the types. | Robertsfort, Liberia.                          | Leyden Museum (E.).     |
| 2-14. Ad. & hgr.     | Ja R. (Congo System) at<br>Bitye, S. Cameroon. | G. L. Bates, Esq. (C.). |
| 15. Skel.            | " "                                            | "                       |
| 16-25. Ad. & hgr.    | Nyong R., S. Cameroon.                         | "                       |
| 26-27. Ad.           | Abanga R., Ogoe.                               | Dr. W. J. Ansorge (C.). |

## 2. NEOLEBIAS TRILINEATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 114 (1899), and Poiss. Bass. Congo, p. 184 (1901).

Depth of body equal to length of head,  $3\frac{2}{3}$  to 4 times in total length. Diameter of eye  $2\frac{1}{2}$  to  $2\frac{2}{3}$  times in length of head. Dorsal III 9-10. Anal III 7. 33-34 scales in longitudinal series, 11 in transverse series,

Fig. 196.



*Neolebias trilineatus.*

Type.  $\times 2$ .

9 between dorsal and ventral. Otherwise as in the preceding. Yellow, with three black lines on each side of the body, separated by silvery white bands; a round black spot, edged with white, on caudal peduncle, at base of caudal fin.

Total length 30 millim.

Congo (Stanley Pool).—Types in Congo Museum, Tervueren.

|                        |                     |                    |
|------------------------|---------------------|--------------------|
| 1-2. Two of the types. | Dolo, Stanley Pool. | M. P. Delhez (C.). |
|------------------------|---------------------|--------------------|

16. **DISTICHODUS.**

Müll. & Trosch. Hor. Ichthyol. i. p. 12 (1845); Cuv. & Val. Hist. Poiss. xxii. p. 172 (1849); Günth. Cat. Fish. v. p. 359 (1864); Bouleng. Poiss. Bass. Congo, p. 185 (1901), and Fish. Nile, p. 139 (1907).

Snout moderate or short; mouth small, inferior or subinferior, with small bicuspid teeth, usually forming two series in each jaw; maxillary toothless, moderately large. Cheek covered by the suborbitals; nostrils close together, separated by a valvular flap; gill-membranes attached to isthmus. Body short or moderately elongate, strongly compressed. Scales moderate or small, strongly ciliated; lateral line straight, equally distant from the dorsal and the ventral outlines, or nearer the former; a scaly process at base of ventral fin. Dorsal fin with 16 to 27 rays, above the ventrals; anal fin with 11 to 21 rays; a small or moderately large adipose dorsal fin. Vertebrae 41-51 (26-33+15-18).

Small scales cover the whole or the greater part of the caudal and adipose fins.

Nile and Tropical Africa.

*Synopsis of the Species.*

- I. Scales 37-57  $\frac{7-9}{10-12}$ ; D. 16-20; snout broad or feebly compressed.
- A. Base of anal at least as long as that of dorsal, which equals its distance from adipose fin; lobes of caudal short and rounded.
- A. 19-21; Sc. 37-39  $\frac{7}{10}$ , 7 between lateral line and ventral. . . . . 1. *D. affinis*, Gthr., p. 260.
- A. 21-22; Sc. 40-42  $\frac{9}{11-12}$ , 9 between lateral line and ventral . . . . . 2. *D. altus*, Blgr., p. 261.
- B. Base of anal shorter than that of dorsal.
- A. 16; Sc. 45  $\frac{9}{10}$ , 8 between lateral line and ventral; lobes of caudal rounded . . . . . 3. *D. noboli*, Blgr., p. 262.
- A. 14-16; Sc. 38-46  $\frac{6-8}{8-9}$ , 6-7 between lateral line and ventral; lobes of caudal pointed. . . . . 4. *D. notospilus*, Gthr., p. 262.
- A. 12-13; Sc. 53-57  $\frac{8}{10-11}$ , 6 between lateral line and ventral; lobes of caudal obtusely pointed . . . . . [p. 264.  
5. *D. hypostomatus*, Pellegr.,
- II. Scales 60-110  $\frac{9-20}{10-25}$ .
- A. Snout deeper than long, broad or feebly compressed.
1. Scales 60-85  $\frac{9-15}{13-17}$ , 9-14 between lateral line and ventral.
- a. D. 16-19; A. 11.

- Sc. 68-75  $\frac{9-10}{10-12}$ , 7-8 between lateral line and ventral . . . . . 6. *D. maculatus*, Blgr., p. 264.  
*b.* D. 22-27 ; A. 13-16.  
 $\alpha$ . Interorbital width  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times length of snout in adult.
- Sc. 68-75  $\frac{13}{19}$ , 13-14 between lateral line and ventral; caudal peduncle much deeper than long . . . . . 7. *D. petersii*, Pfeff., p. 265.
- Sc. 60-66  $\frac{10-12}{12-13}$ , 9-10 between lateral line and ventral; caudal peduncle much deeper than long . . . . . 8. *D. antonii*, Schilth., p. 266.
- Sc. 68-77  $\frac{13-14}{14-15}$ , 10 between lateral line and ventral; caudal peduncle as long as deep. 9. *D. atroventralis*, Blgr., p. 267.  
 $\beta$ . Interorbital width equal to or slightly greater than length of snout.
- Sc. 67-70  $\frac{13-14}{16}$ , 11-12 between lateral line and ventral; base of dorsal twice as long as its distance from adipose fin; maxillary not extending to below nostrils . . . . . 10. *D. mossambicus*, Peters, p. 268.
- Sc. 66-78  $\frac{13-15}{14-16}$ , 10-11 between lateral line and ventral; base of dorsal not twice as long as its distance from adipose fin; maxillary extending to below nostrils . . . . . 11. *D. fasciolatus*, Blgr., p. 270.
- Sc. 75-85  $\frac{15-16}{16-17}$ , 11-12 between lateral line and ventral; base of dorsal not twice as long as its distance from adipose fin; maxillary extending to below nostrils . . . . . 12. *D. engycephalus*, Gthr., p. 271.  
 2. Scales 80-110  $\frac{15-20}{16-25}$ , 13-20 between lateral line and root of ventral;  
 A. 13-15; interorbital width much greater than length of snout.
- D. 20-23; Sc. 80-91  $\frac{17-20}{22-25}$ , 18-20 between lateral line and ventral . . . . . 13. *D. brevipinnis*, Gthr., p. 272
- D. 22-26; Sc. 90-110  $\frac{18-20}{20-25}$ , 15-18 between lateral line and ventral . . . . . 14. *D. niloticus*, L., p. 273.
- D. 22-24; Sc. 83-98  $\frac{15-16}{16-20}$ , 13-15 between lateral line and ventral . . . . . 15. *D. rostratus*, Gthr., p. 275.  
 B. Snout deeper than long, strongly compressed.
- D. 24-25; A. 12-14; Sc. 60-68  $\frac{14-16}{14-16}$ , 11 between lateral line and ventral . . . . . 16. *D. sexfasciatus*, Blgr., p. 276.  
 C. Snout longer than deep, not compressed.
- D. 24-26; A. 13-14; Sc. 70-85  $\frac{15-18}{16-18}$ , 11-13 between lateral line and ventral . . . . . 17. *D. lusosso*, Schilth., p. 277.

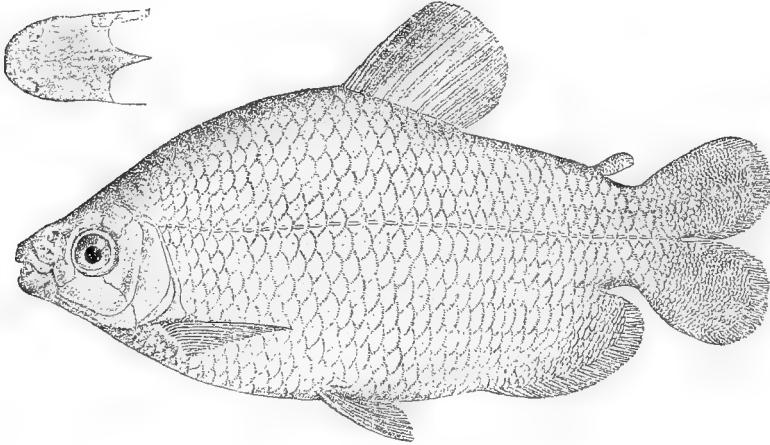
## 1. DISTICHODUS AFFINIS.

Günth. Ann. & Mag. N. H. (4) xii. 1873, p. 144 ; Bouleng. Poiss. Bass. Congo, p. 187 (1901).

*Distichodus abbreviatus*, Peters, Mon. Berl. Ac. 1876, p. 845.

Depth of body 2 to  $2\frac{2}{3}$  times in total length, length of head  $3\frac{1}{2}$  to 4 times. Head as long as deep or a little deeper than long,  $1\frac{3}{4}$  to 2 times as long as broad ; snout not compressed, as long as eye, which is 3 times in length of head ; interorbital width 2 to  $2\frac{1}{2}$  times in length of head ; maxillary extending to below nostrils ; teeth in two series in each jaw, outer series containing 20 teeth. Dorsal 16 (4 unbranched), equally

Fig. 197.

*Distichodus affinis.*Lower Congo.  $\frac{4}{6}$ .

distant from head and from caudal, its base equalling its distance from the small adipose fin. Anal 19-21 (3 unbranched), its base longer than that of dorsal. Pectoral  $\frac{3}{4}$  length of head. Caudal forked, with short rounded lobes. Caudal peduncle deeper than long. Scales 37-39  $\frac{7}{10}$ , 7 between lateral line and root of ventral. Silvery, back olive-brown ; anterior border of dorsal blackish.

Total length 120 millim.

Congo.

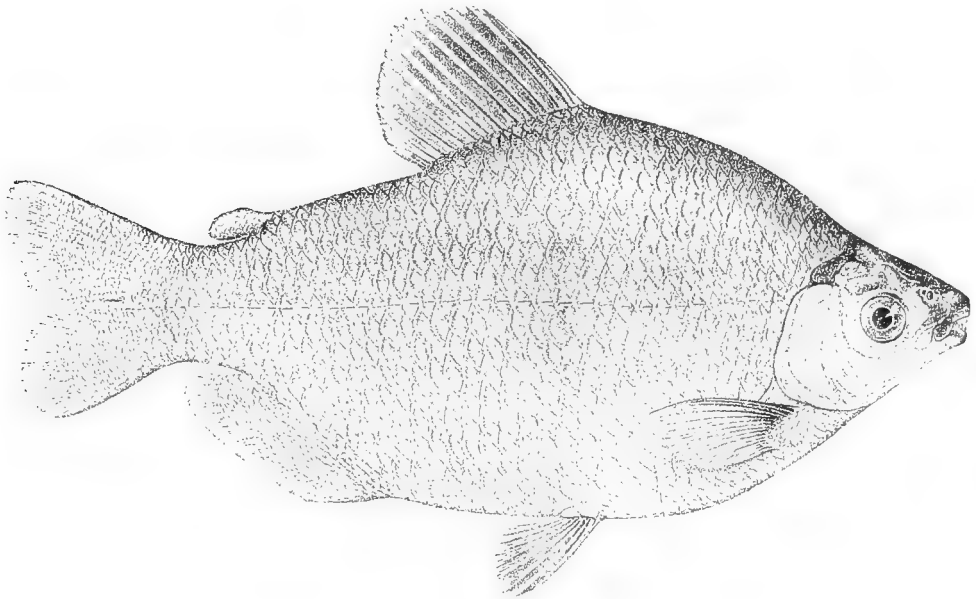
|               |                    |                            |
|---------------|--------------------|----------------------------|
| 1. Yg., type. | Boma, Lower Congo. | J. J. Bianconi, Esq. (C.). |
| 2. Hgr.       | " "                | Capt. Wilverth (C.).       |
| 3. Yg.        | " "                | M. P. Delhez (C.).         |
| 4. Ad.        | Lower Congo.       | M. F. Hens (C.).           |

## 2. DISTICHODUS ALTUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 80, pl. xxxv. fig. 1 (1899), and Poiss. Bass. Congo, p. 188 (1901); Pellegr. Bull. Mus. Paris, 1904, p. 311.

Depth of body 2 to  $2\frac{1}{5}$  times in total length, length of head 4 to  $4\frac{1}{2}$  times. Head a little deeper than long, twice as long as broad; snout broad, truncate, as long as or a little longer than eye, 3 times in length of head; interorbital width half length of head,  $1\frac{1}{2}$  to nearly 2 times diameter of eye; maxillary extending to below nostrils; teeth in two series in each jaw, outer series containing 18-22 teeth. Dorsal 17-18

Fig. 198.

*Distichodus altus.*Type (A. M. C.).  $\frac{2}{3}$ .

(4 unbranched), equally distant from eye and from caudal, its base equalling its distance from the small adipose fin. Anal 21-22 (3 unbranched), nearly entirely covered with scales, its base as long as that of dorsal. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal forked, with rounded lobes. Caudal peduncle a little deeper than long. Scales 40-42  $\frac{9}{11-12}$ , 9 between lateral line and root of ventral. Bronzy brown, each scale with a golden spot; lower surface of head and pectoral region whitish; fins blackish grey, caudal edged with pink.

Total length 180 millim.

Upper Congo (Lake Leopold II. and Alima River), Shari River.—  
Type in Congo Museum, Tervueren.

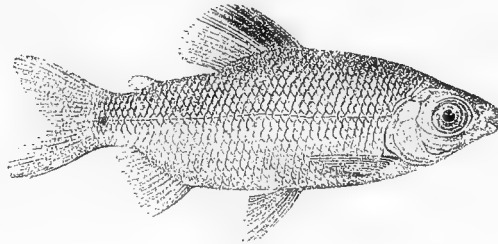
1. One of the types. Ibali, Lake Leopold II. M. P. Delhez (C.).

### 3. DISTICHODUS NOBOLI.

Bouleng. Ann. Mus. Congo, Zool. i. p. 81, pl. xxxv. fig. 2 (1899), and Poiss. Bass. Congo, p. 189 (1901).

Depth of body  $2\frac{4}{5}$  times in total length, length of head  $3\frac{1}{2}$  times. Head a little longer than deep; snout broad and rounded, a little shorter than eye, which is 3 times in length of head; interorbital width  $2\frac{1}{2}$  times in length of head; maxillary extending to below nostrils; teeth in two series in each jaw, outer series containing 16–18 teeth. Dorsal 20 (4 unbranched), a little nearer head than caudal, its base  $1\frac{1}{2}$  times its distance from adipose fin, which is small. Anal 16 (3 un-

Fig. 199.



*Distichodus noboli.*

Type (A. M. C.).

branched). Pectoral  $\frac{2}{3}$  length of head. Caudal forked, with rounded lobes. Caudal peduncle a little deeper than long. Scales  $45\frac{9}{10}$ , 8 between lateral line and root of ventral. Olive above, silvery beneath; dorsal red, with a large black blotch covering its anterior third; ventral, anal, and caudal red; a round black spot at root of caudal.

Total length 60 millim.

Upper Congo (Lake Leopold II.).—Type in Congo Museum, Tervueren.

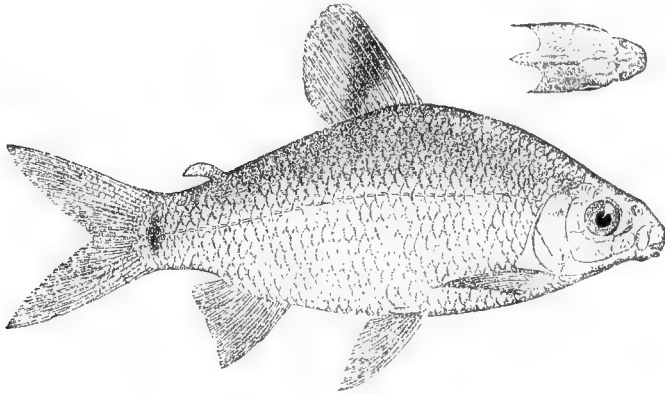
### 4. DISTICHODUS NOTOSPILUS.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 114; Bouleng. Poiss. Bass. Congo, p. 186 (1901).

Depth of body 2 to  $2\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to  $4\frac{1}{3}$  times. Head as long as deep,  $1\frac{3}{4}$  to 2 times as long as broad; snout

feebly compressed, as long as or a little longer than eye, which is 3 to 4 times in length of head; interorbital width  $2\frac{1}{3}$  to  $2\frac{2}{3}$  times in length of head; maxillary extending to below nostrils; teeth in two series in each jaw, outer series containing 16–20 teeth. Dorsal 16–20 (4–5 unbranched), equally distant from head and from caudal, or a little nearer former, its base equalling its distance from adipose fin, which is small. Anal 14–16 (3 unbranched), its base covered with scales and shorter than that of dorsal. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Caudal deeply

Fig. 200.

*Distichodus notospilus.*

Type.

forked, with pointed lobes. Caudal peduncle as long as deep. Scales 38–46  $\frac{6-8}{8-9}$ , 6–7 between lateral line and root of ventral. Silvery, back brown; a large black blotch or oblique band on dorsal (between 4th to 11th or 12th rays); a more or less distinct round blackish spot at base of caudal.

Total length 195 millim.

South Cameroon to Congo.

|                      |                                                |                         |
|----------------------|------------------------------------------------|-------------------------|
| 1–4, 5–6. Ad. & hgr. | Kribi R., S. Cameroon.                         | G. L. Bates, Esq. (C.). |
| 7. Skel.             | ” ”                                            | ”                       |
| 8. Hgr.              | Ja R. (Congo System) at<br>Bitye, S. Cameroon. | ”                       |
| 9–11. Types.         | Gaboon.                                        |                         |
| 12–14. Ad. & hgr.    | Lambarene, Ogowe.                              | Miss Kingsley (C.).     |
| 15–16. Ad.           | Komadekke ”                                    | Dr. W. J. Ansorge (C.). |
| 17–18. Hgr.          | Sette Cama, Gaboon.                            |                         |
| 19. Yg.              | Monsembe, Upper Congo.                         | Rev. J. H. Weeks (P.).  |

5 *DISTICHODUS HYPOSTOMATUS*.

Pellegr. Bull. Mus. Paris, 1900, p. 351.

Depth of body 3 times in total length, length of head  $4\frac{1}{2}$  times. Head a little longer than deep; snout feebly compressed, a little less than half length of head, strongly projecting beyond the mouth; eye 3 to 4 times in length of head, interorbital width  $2\frac{1}{2}$  times; maxillary extending to below nostrils; two series of teeth in each jaw, inner very feebly developed, outer series containing 18–20 teeth. Dorsal 18–19 (4 unbranched), originating at equal distance from head and from caudal. Anal 12–13 (4 unbranched). Pectoral nearly as long as head. Caudal forked, with obtusely pointed lobes. Scales 53–57  $\frac{8}{10-11}$ , 6 between lateral line and root of caudal. Brown above, whitish beneath, with 15–17 dark vertical bands extending to the ventral region; a rather indistinct dark spot at base of caudal.

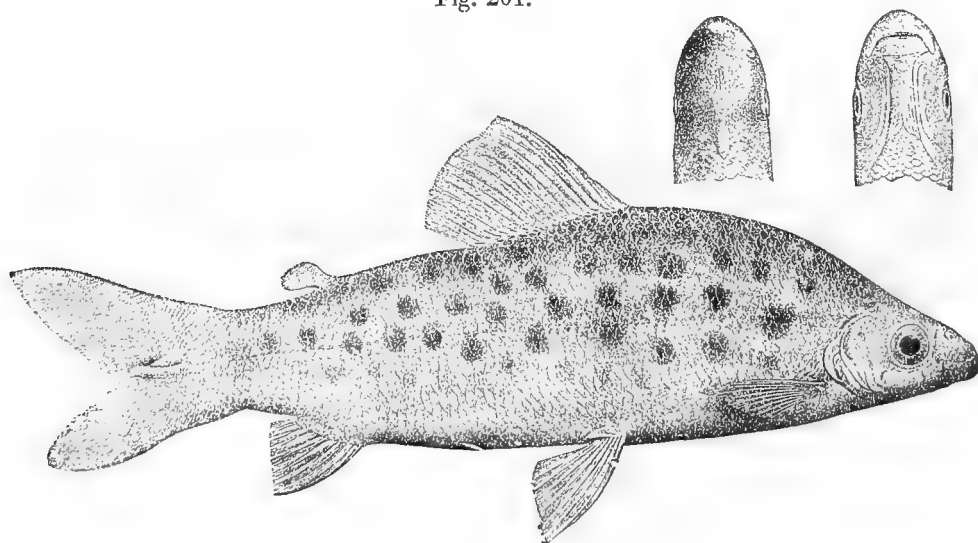
Total length 140 millim.

Ogowe.—Types, in Paris Museum, examined.

6. *DISTICHODUS MACULATUS*.

Bouleng. Ann. Mus. Congo, Zool. i. p. 27, pl. xiii. fig. 1 (1898), and Poiss. Bass. Congo, p. 190 (1901).

Fig. 201.



*Distichodus maculatus*.

Type (A. M. C.)  $\frac{1}{2}$ .

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to 5 times. Head a little longer than deep, twice as long as broad; snout



rounded, not compressed, projecting strongly beyond mouth, as long as or a little longer than eye, which is 3 to  $3\frac{1}{2}$  times in length of head and 2 to  $2\frac{1}{2}$  times in interorbital width; maxillary extending to below nostrils; teeth in two series in each jaw, outer series containing 22-24 teeth. Dorsal 16-19 (3-4 unbranched), equally distant from eye and from caudal, its base equal to or a little less than its distance from adipose fin. Anal 11 (3 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. Caudal forked, upper lobe pointed, lower rounded. Caudal peduncle as long as deep or slightly deeper than long. Scales 68-75  $\frac{9-10}{10-12}$ , 7-8 between lateral line and root of ventral. Olive above, whitish beneath; sides with large blackish round spots forming rather irregular oblique series across the body, 5 or 6 spots in each; small dark spots on dorsal.

Total length 310 millim.

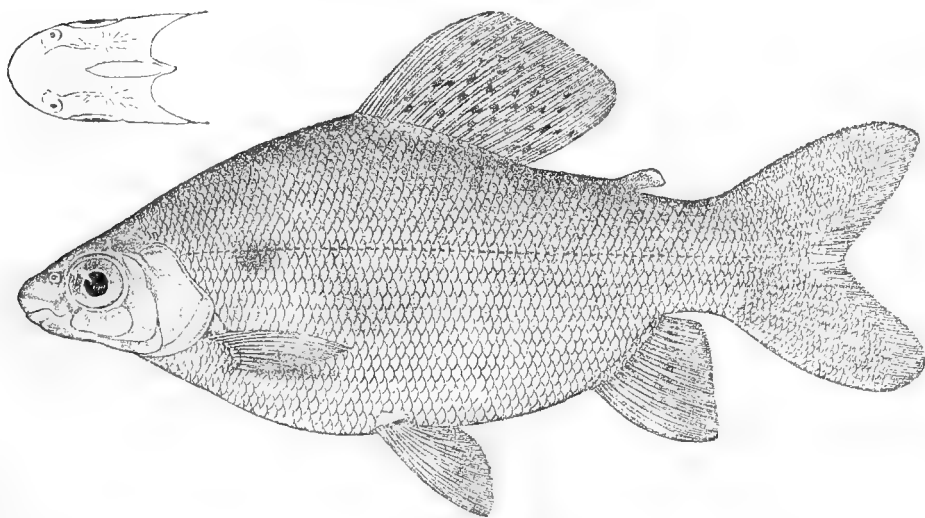
Congo (Manyanga, Stanley Pool, Uerre), Lake Bangwelu.—Type in Congo Museum, Tervueren.

1. Hgr. Lake Bangwelu. F. H. Melland, Esq. (P.).

#### 7. DISTICHODUS PETERSII.

Pfeff. Thierw. O.-Afr., Fische, p. 41 (1896).

Fig. 202.



*Distichodus petersii.*

Type.

Depth of body  $2\frac{1}{6}$  to barely  $2\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  times. Head a little longer than deep, twice as long as broad;

snout rounded, not compressed, projecting little beyond mouth, as long as eye, which is  $3\frac{1}{2}$  times in length of head and about  $1\frac{1}{2}$  times in inter-orbital width; maxillary extending to below nostrils; teeth in two series in each jaw, outer series containing 22–24 teeth. Dorsal 22 (4–5 unbranched), equally distant from occiput and from caudal, its base  $2\frac{1}{2}$  times its distance from adipose fin. Anal 16 (3–4 unbranched). Pectoral  $\frac{2}{3}$  length of head. Caudal forked, lobes obtusely pointed. Caudal peduncle much deeper than long. Scales 68–75  $\frac{13}{19}$ , 13–14 between lateral line and root of ventral. Silvery, back darker; a dark spot on the lateral line above the pectoral; dorsal with small dark spots.

Total length 115 millim.

Kingani River, East Africa.—Types in Berlin and Hamburg Museums.

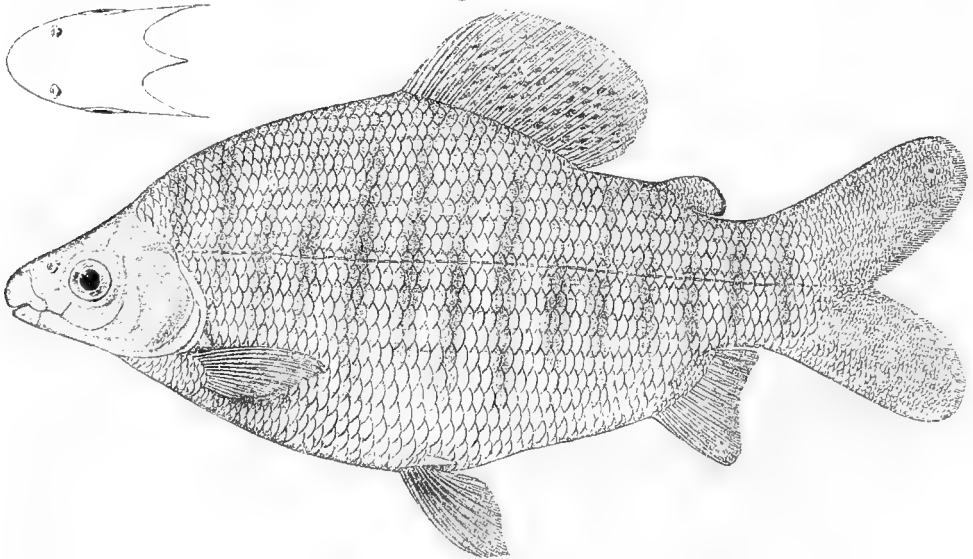
1. One of the types. Kingani R.

Dr. Stuhlmann (C.);  
Berlin Museum (E.).

#### 8. DISTICHODUS ANTONII.

Schilthuis, Tijdschr. Nederl. Dierk. Ver. (2) iii. 1891, p. 89; Bouleng. Ann. Mus. Congo, p. 191 (1901).

Fig. 203.



*Distichodus antonii.*  
Upper Congo.  $\frac{1}{2}$ .

Depth of body  $2\frac{1}{3}$  to  $2\frac{2}{3}$  times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times. Head about as long as deep,  $1\frac{1}{2}$  to 2 times as long as broad;

snout not compressed, projecting a little beyond mouth,  $1\frac{1}{4}$  to  $1\frac{2}{3}$  times as long as eye, which is  $3\frac{1}{2}$  (young) to  $5\frac{1}{2}$  times in length of head; interorbital width  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times length of snout, about  $\frac{1}{2}$  length of head; maxillary not extending quite to below nostrils; teeth in two series in each jaw, outer series containing 16 (young) to 26 teeth. Dorsal 22–25 (4–6 unbranched), equally distant from head and from caudal, or a little nearer latter. Adipose fin moderately large, separated from dorsal by a space equal to  $\frac{2}{3}$  to  $\frac{1}{2}$  base of latter. Anal 13–15 (3–4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, as long as ventral or a little longer. Caudal forked, lobes rounded. Caudal peduncle much longer than deep. Scales 60–66  $\frac{10-12}{12-13}$ , 9–10 between lateral line and root of ventral. Brown or olive above, whitish beneath; 10 to 14 more or less distinct dark vertical bars, disappearing with age; dorsal with numerous black dots.

Total length 550 millim.

Congo.

|                  |                          |                                                  |
|------------------|--------------------------|--------------------------------------------------|
| 1. Ad.           | Cataracts of Manyanga.   | Capt. Wilverth (C.).                             |
| 2. Yg., type.    | Kinshassa, Stanley Pool. | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 3–4. Yg.         | Kutu, L. Leopold II.     | M. P. Delhez (C.).                               |
| 5, 6. Ad. & yg.  | Monsembe, Upper Congo.   | Rev. J. H. Weeks (P.).                           |
| 7. Ad.           | New Antwerp, „           | Capt. Wilverth (C.).                             |
| 8–10. Ad. & hgr. | Upper Congo.             | Brussels University.                             |

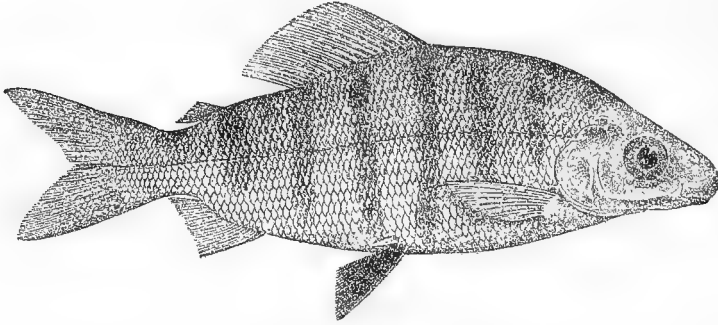
#### 9. DISTICHODUS ATROVENTRALIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 28, pl. xiii. fig. 2 (1898), and Poiss. Bass. Congo, p. 192 (1901).

Depth of body  $2\frac{1}{2}$  to  $2\frac{3}{4}$  times in total length, length of head  $3\frac{2}{3}$  to  $4\frac{2}{3}$  times. Head as long as deep or a little longer, about twice as long as broad; snout not compressed, projecting strongly beyond mouth, as long as eye in the young, twice as long in the adult; eye  $3\frac{1}{3}$  (young) to 5 times in length of head; interorbital width 1 to  $1\frac{1}{3}$  times length of snout,  $\frac{2}{3}$  length of head; maxillary extending to below nostrils or not quite so far; teeth in two series in each jaw, outer series containing 20 (young) to 36 teeth. Dorsal 22–24 (4–5 unbranched), equally distant from head and from caudal. Adipose fin small, separated from dorsal by a space equal to  $\frac{1}{2}$  to  $\frac{2}{3}$  base of latter. Anal 13–15 (3–4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{3}{5}$  to  $\frac{3}{4}$  length of head. Caudal forked, with rounded or obtusely pointed lobes. Caudal

peduncle as long as deep. Scales 68-77  $\frac{13-14}{14-15}$ , 10 between lateral line and root of ventral. Young greyish or purplish brown above, white

Fig. 204.

*Distichodus atroventralis.*

Type (A. M. C.).

below, with 6 to 9 continuous or interrupted dark vertical bars; dorsal with black dots; ventrals black or blackish; pectoral usually blackish at the end; adult uniform brown.

Total length 420 millim.

Congo.—Types in Congo Museum, Tervueren.

|                              |                                         |                                                  |
|------------------------------|-----------------------------------------|--------------------------------------------------|
| 1. Hgr.                      | Matadi, Lower Congo.                    | M. P. Delbez (C.).                               |
| 2. Yg.                       | Boma, Lower Congo.                      | Capt. Wilverth (C.).                             |
| 3. Yg., one of the<br>types. | Lake Bayari, „                          | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 4. Ad.                       | Dolo, Stanley Pool.                     | M. P. Delbez (C.).                               |
| 5. Yg.                       | Bikoro, Lake Tumba, Upper<br>Congo.     | „                                                |
| 6. Hgr.                      | Kutu, Lake Leopold II., Upper<br>Congo. | „                                                |
| 7. Hgr.                      | Upper Congo.                            | Brussels University.                             |

#### 10. DISTICHODUS MOSSAMBICUS.

Peters, Mon. Berl. Ac. 1852, p. 275, and Reise Mossamb. iv. p. 71, pl. xiii. fig. 1 (1868); Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 513.

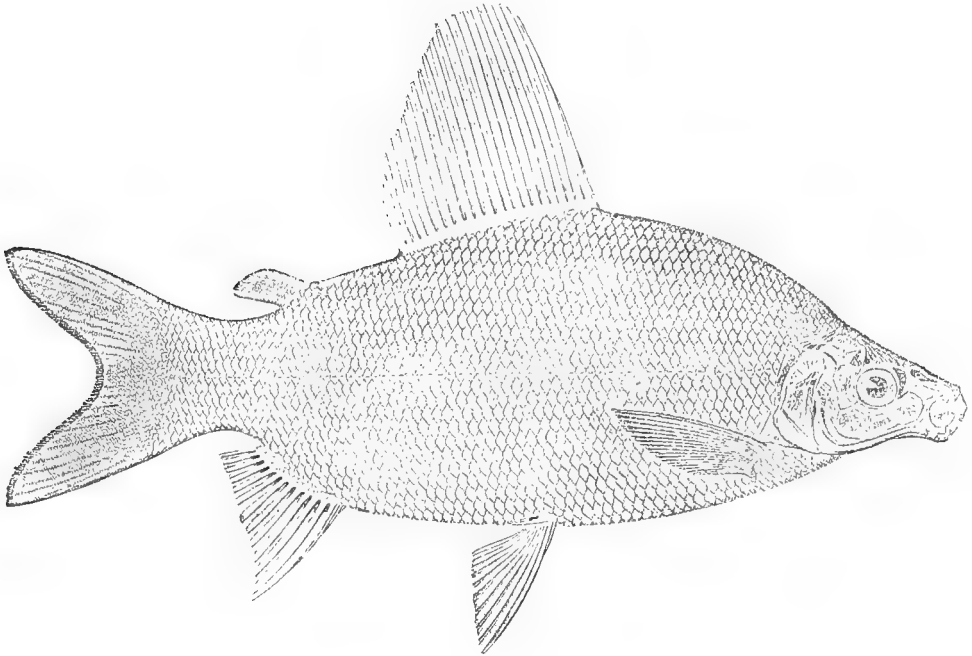
*Distichodus schenga*, Peters, ll. cc. pp. 276, 74, pl. xiii. fig. 2.

*Distichodus macrolepis*, Günth. Cat. Fish. v. p. 362 (1864).

Depth of body  $2\frac{2}{5}$  to 3 times in total length, length of head  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times. Head longer than deep, 2 to  $2\frac{1}{3}$  times as long as broad; snout feebly compressed, rounded, but little shorter than postocular part of head, about  $1\frac{1}{2}$  diameters of eye, which is 4 to  $4\frac{1}{2}$  times in length of head;

interorbital width  $2\frac{1}{2}$  to 3 times in length of head; maxillary not extending to below nostrils; teeth in one or two series in each jaw, those of the inner series, if present, very small; 14–18 teeth in outer series. Dorsal 23–27 (4 unbranched), equally distant from occiput and from caudal, its base twice as long as its distance from adipose fin. Anal 14–16 (4 unbranched), its base much shorter than that of dorsal.

Fig. 205.

*Distichodus mossambicus.*

Type, after Peters (Reise Mossamb.).  $\frac{1}{2}$ .

Pectoral shorter than head. Caudal forked, with obtusely pointed lobes. Caudal peduncle deeper than long. Scales 67–70  $\frac{13-14}{16}$ , 11 or 12 between lateral line and root of caudal. Silvery, olive-brown on the back; 6 or 7 very indistinct dark bars on the body, not extending much below lateral line; dorsal with dark dots.

Total length 300 millim.

Zambesi.—Types in Berlin Museum.

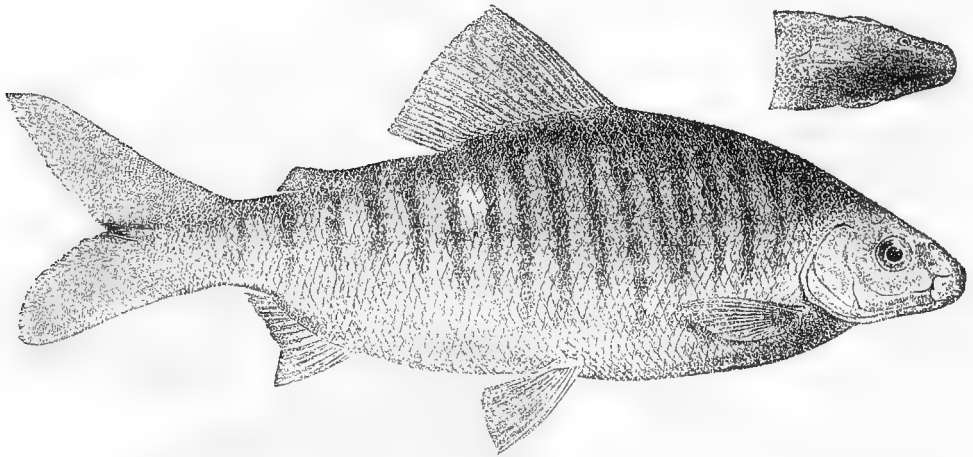
|                                                |                                  |                          |
|------------------------------------------------|----------------------------------|--------------------------|
| 1–2. Ad., skins.                               | Shiré River.                     | Dr. C. Livingstone (P.). |
| 3. Ad., skin, type of<br><i>D. macrolepis.</i> | „                                | Sir J. Kirk (P.).        |
| 4. Ad.                                         | Loangwa River,<br>N.W. Rhodesia. | S. A. Neave, Esq. (P.).  |

## 11. DISTICHODUS FASCIOLATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 27, pl. xiv. (1898), and Poiss. Bass. Congo, p. 193 (1901).

Depth of body  $2\frac{3}{5}$  to 3 times in total length, length of head 4 to 5 times. Head as long as deep or a little longer, about twice as long as broad; snout feebly compressed, rounded, strongly projecting beyond mouth,  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head, equal to interorbital width; eye  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times in length of snout,  $3\frac{1}{2}$  to  $4\frac{1}{2}$  times in length of head; maxillary extending to below nostrils; teeth in two series in each jaw, 20 to 30 in outer series. Dorsal 25-27 (4-5 unbranched), a little nearer head

Fig. 206.

*Distichodus fasciolatus.*Type (A. M. C.).  $\frac{1}{2}$ .

than caudal, its base not twice as long as its distance from adipose fin. Anal 14-16 (3-4 unbranched), its base much shorter than that of anal. Pectoral  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. Caudal forked, upper lobe longer and pointed, lower rounded or obtusely pointed. Caudal peduncle as long as deep or a little longer. Scales 68-78  $\frac{13-15}{14-16}$ , 10-11 between lateral line and root of ventral. Brown, silvery white beneath, with 18 to 20 dark vertical bars; young with a dark brown spot above the pectoral and another at root of caudal; dorsal with small blackish spots.

Total length 320 millim.

Congo.—Types in Congo Museum, Tervueren.

- |               |                        |                      |
|---------------|------------------------|----------------------|
| 1. Ad., type. | Boma, Lower Congo.     | Capt. Wilverth (C.). |
| 2. Ad., type. | Cataracts of Manyanga. | „                    |

|                  |                           |                                                  |
|------------------|---------------------------|--------------------------------------------------|
| 3-4. Yg., types. | Stanley Pool.             | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 5. Skel.         | Bolobo, Upper Congo.      | Rev. G. Grenfell (P.).                           |
| 6. Hgr., type.   | Monsembe, „               | Rev. J. H. Weeks (P.).                           |
| 7. Ad.           | „ „                       | „                                                |
| 8-10. Hgr. & yg. | Upper Congo.              | Brussels University.                             |
| 11. Yg.          | Lindi River, Upper Congo. | M. M. Storms (C.);<br>Brussels Museum (P.).      |
| 12. Ad.          | Banzville, Ubanghi.       | Capt. Royaux (C.).                               |

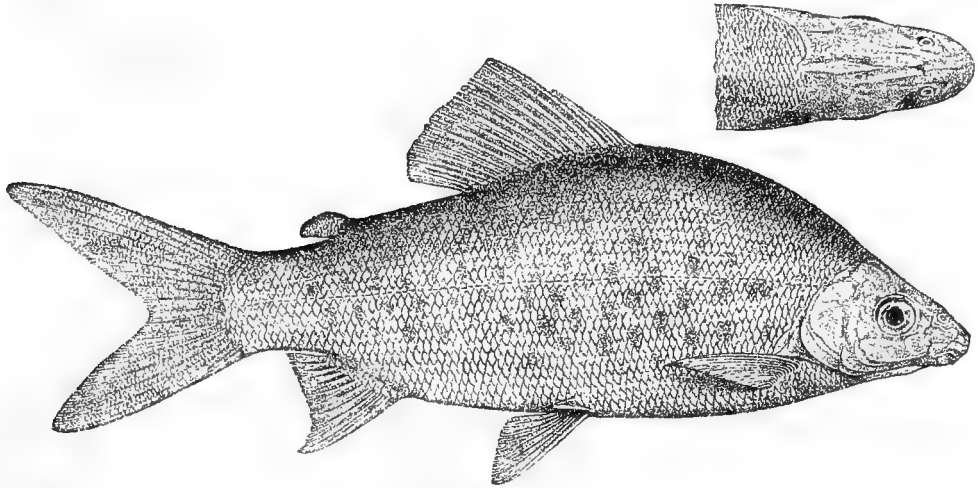
## 12. DISTICHODUS ENGYCEPHALUS.

Günth. Cat. Fish. v. p. 361 (1864), and Petherick's Trav. ii. p. 247 (1869);  
Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 513; Werner, Sitzb. Ak.  
Wien, cxv. i. 1906, p. 1129; Bouleng. Fish. Nile, p. 148, pl. xxiv. fig. 2  
(1907).

*Distichodus touteei*, Pellegr. Bull. Soc. Zool. France, xxxi. 1906, p. 109.

Depth of body  $2\frac{2}{5}$  to 3 times in total length, length of head 4 to 5  
times. Head but little longer than deep, 2 to  $2\frac{1}{2}$  times as long as broad;

Fig. 207.

*Distichodus engycephalus*.Type (F. N.).  $\frac{5}{6}$ .

snout feebly compressed, projecting very strongly beyond the mouth, its  
length equal to, or slightly less than, interorbital width; eye 3 (young) to  
5 times in length of head, interorbital width  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times; maxillary  
extending to below nostrils; teeth in two series in each jaw, outer series  
containing 18-22. Gill-rakers short, 15-18 on lower part of anterior

arch. Dorsal 23-25 (4-5 unbranched), equally distant from occiput and from caudal. Adipose fin small, equally distant from rayed dorsal and from caudal. Anal 13-14 (3-4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{2}{3}$  to  $\frac{4}{5}$  length of head. Caudal forked, with acutely pointed lobes. Caudal peduncle as long as deep or a little deeper. Scales 75-85  $\frac{15-16}{16-17}$ , 11-12 between lateral line and root of ventral. Brown above, silvery white below; sides with numerous round dark spots, disposed irregularly; dorsal with more or less distinct dark spots, which may form transverse series; young with a round dark spot at root of caudal.

Total length 270 millim.

Nile, Blue Nile, Bahr-el-Gebel, Niger.

|                   |                        |                          |
|-------------------|------------------------|--------------------------|
| 1. Ad.            | Cairo.                 | L. Loat, Esq. (C.).      |
| 2. Yg.            | Kosheh, Upper Nile.    | "                        |
| 3-4. Hgr., types. | Khartum.               | J. Petherick, Esq. (C.). |
| 5. Yg.            | Wad Medine, Blue Nile. | L. Loat, Esq. (C.).      |
| 6. Yg.            | Abo, Lower Niger.      | Dr. W. J. Ansorge (C.).  |
| 7. Yg.            | Agber, "               | "                        |

### 13. DISTICHODUS BREVIPINNIS.

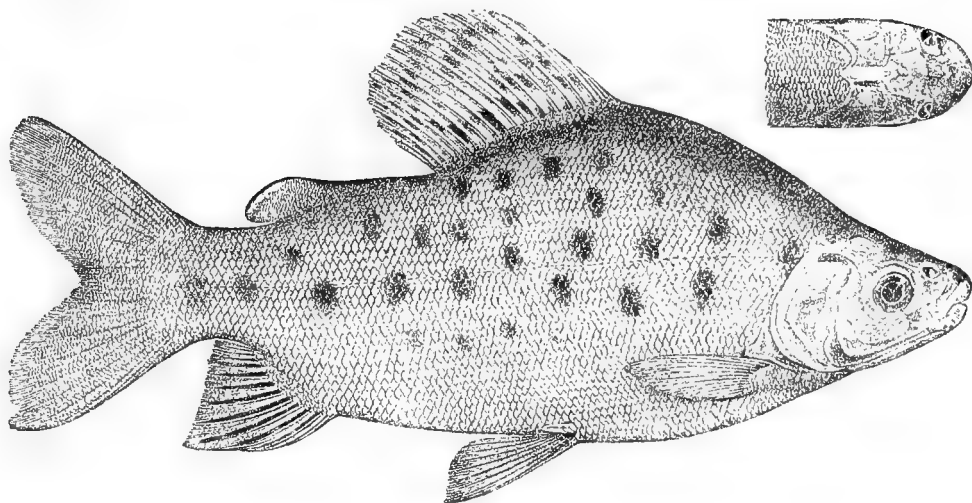
Günth. Cat. Fish. v. p. 360 (1864), and Petherick's Trav. ii. p. 247, pl. iii. fig. C (1869); Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 547, pl. iii. fig. 1; Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 513, and Fish. Nile, p. 146, pl. xxiv. fig. 1 (1907).

Depth of body  $2\frac{3}{5}$  to 3 times in total length, length of head 3 to 4 times. Head as long as or a little longer than deep,  $1\frac{1}{2}$  to 2 times as long as broad; snout broad, rounded, slightly projecting beyond mouth, its length about  $\frac{2}{7}$  to  $\frac{1}{3}$  that of head; eye 3 (young) to 6 times in length of head, interorbital width twice or a little more; width of mouth 3 or 4 times in length of head; teeth in two series, outer containing 20 (young) to 34; maxillary extending to below nostrils; upper surface of head with feeble striæ. Gill-rakers short, 14-16 on lower part of anterior arch. Dorsal 20-23 (4-6 unbranched), equally distant from occiput and from caudal; longest rays  $\frac{3}{4}$  to  $\frac{5}{6}$  length of head. Adipose fin rather large, its base as long as or a little shorter than its distance from dorsal. Anal 13-15 (3-4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{3}{5}$  to  $\frac{3}{4}$  length of head, as long as or slightly shorter than ventral. Caudal forked, with short rounded lobes. Caudal peduncle usually deeper than long. Scales 80-91  $\frac{17-20}{21-22}$ , 18-20 between



lateral line and root of ventral. Olive or dark grey above, white beneath, the sides with large round dark spots forming four or five irregular

Fig. 208.



*Distichodus brevipinnis.*  
White Nile (F. N.).  $\frac{5}{8}$ .

longitudinal series; fins greyish, except the pectoral, which is whitish; dorsal spotted with black; ventrals and anal sometimes blackish.

Total length 220 millim.

White Nile, Chad Basin, Senegal, Niger.

|                      |                         |                                 |
|----------------------|-------------------------|---------------------------------|
| 1-3. Types.          | Khartum.                | J. Petherick, Esq. (C.).        |
| 4-5. Hgr.            | Fashoda, White Nile.    | L. Loat, Esq. (C.).             |
| 6. Yg.               | Yo River, Lake Chad.    | Capt. G. B. Gosling (P.).       |
| 7-8. Hgr.            | Kaëdi, Senegal.         | M. P. Delhez (C.).              |
| 9. Ad., head & tail. | Jebba, Upper Niger.     | Capt. G. F. Abadie (P.).        |
| 10-11. Yg.           | Agberi, Lower Niger.    | Dr. W. J. Ansorge (C.).         |
| 12. Yg.              | Assay, „                | J. S. Budgett, Esq. (P.).       |
| 13-14. Hgr.          | Benue River, N. of Ibi. | H. L. Norton Traill, Esq. (C.). |

#### 14. DISTICHODUS NILOTICUS.

*Salmo niloticus*, part., Linn. in Hasselq. Reise Palæ-t. p. 422 (1762).

*Salmo ægyptiacus*, part., Gmel. Syst. Nat. i. p. 1386 (1788).

*Characinus nefasch*, part., Lacep. Hist. Poiss. v. p. 274 (1803); Geoffr. Descr. Egypte, Poiss. p. 44 (1809).

*Citharinus nefasch*, part., Rüpp. Besch. n. Fische Nil, p. 5 (1829).

*Distichodus niloticus*, Müll. & Trosch. Hor. Ichthyol. i. p. 12, pl. i. fig. 3 (1845); Günth. Cat. Fish. v. p. 360 (1864), and Petherick's Trav. ii. p. 246 (1869);

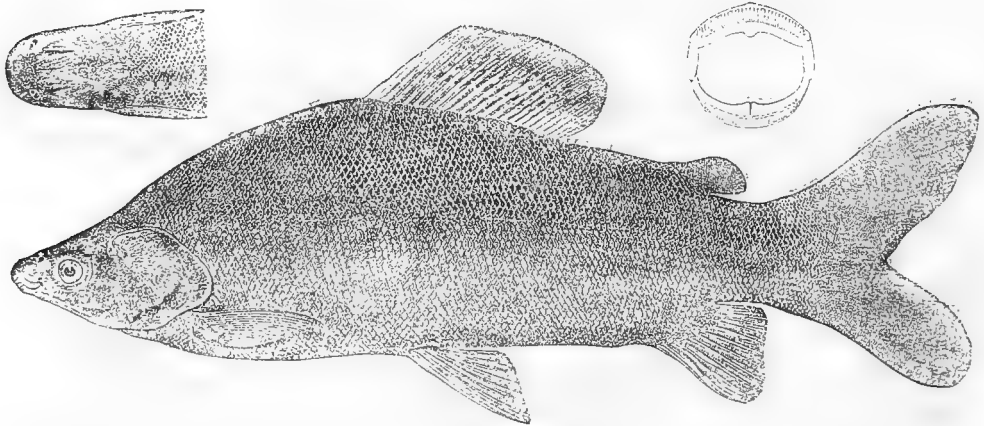
Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 513, and Fish. Nile, p. 141, pl. xxii. & pl. xxiii. fig. 1 (1907):

*Distichodus nefasch*, part., Cuv. & Val. Hist. Poiss. xxii. p. 175 (1849).

*Distichodus rodolphi*, Günth. Proc. Zool. Soc. 1896, p. 223; Vincig. Ann. Mus. Genova, (2) xix. 1898, p. 258; Fowler, Proc. Ac. Philad. 1906, p. 467, fig.

Depth of body  $2\frac{1}{2}$  to  $3\frac{3}{5}$  times in total length, length of head  $3\frac{1}{4}$  (young) to  $5\frac{1}{8}$  times. Head  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep,  $1\frac{2}{3}$  to  $2\frac{1}{2}$  times as long as broad; snout rounded, somewhat depressed, projecting more or less beyond mouth, its length less than interorbital width; diameter of eye 3 (young) to 6 times in length of head, interorbital width  $2\frac{1}{4}$  to 3 times; width of mouth  $3\frac{3}{4}$  to  $4\frac{2}{3}$  times in length of head; teeth in two series in each jaw, outer series containing 24 (young) to 36; maxillary extending to below nostrils; upper surface of head and opercle more or less rugose with radiating striæ. Gill-rakers short, 17–20 on lower part of anterior arch. Dorsal 22–26 (3–6 unbranched), equally distant from occiput and from caudal fin, or a little nearer the former; longest rays

Fig. 209.



*Distichodus niloticus*.

Lower Nile (F. N.).  $\frac{1}{4}$ .

$\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Adipose fin small, nearly equally distant from dorsal and from caudal. Anal 13–15 (3–4 unbranched), its base much shorter than that of anal. Pectoral  $\frac{3}{5}$  to  $\frac{5}{8}$  length of head, as long as or slightly shorter than ventral. Caudal forked, with rounded lobes. Caudal peduncle as long as deep or slightly deeper than long. Scales 90–110  $\frac{18-20}{20-25}$ , 15–18 between lateral line and root of ventral. Purplish grey above, silvery white below; young with 10–13 vertical dark bars on the body, a round blackish spot above the pectoral fin, on or below the lateral line, and another at the base of the caudal fin; these markings

disappearing gradually with age; vertical fins greyish, sometimes blackish at the edge, the dorsal with numerous small round darker spots.

Total length 700 millim.

Nile, White Nile, Lake Rüdöf.

|                                       |                               |                           |
|---------------------------------------|-------------------------------|---------------------------|
| 1. Ad.                                | Nile.                         | Dr. Rüppell (C.).         |
| 2, 3-4. Ad. & yg.                     | Lower Nile.                   | J. Petherick, Esq. (C.).  |
| 5. Ad.                                | Beni Souef, Lower Nile.       | L. Loat, Esq. (C.).       |
| 6. Yg.                                | Near Luxor.                   | "                         |
| 7. Yg.                                | Between Luxor and Assuan.     | "                         |
| 8-14. Ad. & yg.                       | White Nile.                   | J. Petherick, Esq. (C.).  |
| 15. Skel.                             | "                             | "                         |
| 16. Hgr.                              | Jebelain, White Nile.         | L. Loat, Esq. (C.).       |
| 17-23. Hgr. & yg.                     | Fashoda, "                    | "                         |
| 24. Ad.                               | Mouth of Lake No, White Nile. | "                         |
| 25. Yg.                               | Lake No, White Nile.          | "                         |
| 26. Yg., type of <i>D. rodolphi</i> . | Lake Rudolf.                  | Dr. Donaldson Smith (C.). |

#### 15. DISTICHODUS ROSTRATUS.

*Salmô niloticus*, part., Linn. in Hasselq. Reise Palæst. p. 422 (1762).

*Salmô ægyptiacus*, part., Gmel. Syst. Nat. i. p. 1386 (1788).

*Characinus nefasch*, part., Lacep. Hist. Poiss. v. p. 274 (1803); Geoffr. Descr. Egypte, Poiss. p. 44, pl. v. fig. 1 (1809).

*Citharinus nefasch*, part., Rüpp. Besch. n. Fische Nil, p. 5 (1829).

*Distichodus nefasch*, part., Cuv. & Val. Hist. Poiss. xxii. p. 175 (1849).

*Distichodus rostratus*, Günth. Cat. Fish. v. p. 360 (1864), and Petherick's Trav. ii. p. 246, pl. iii. fig. B (1869); Bouleng. Ann. & Mag. N. H. (7) viii. 1901, p. 513, and Fish. Nile, p. 143, pl. xxiii. fig. 2 (1907).

*Distichodus martini*, Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 549, pl. iii. fig. 2.

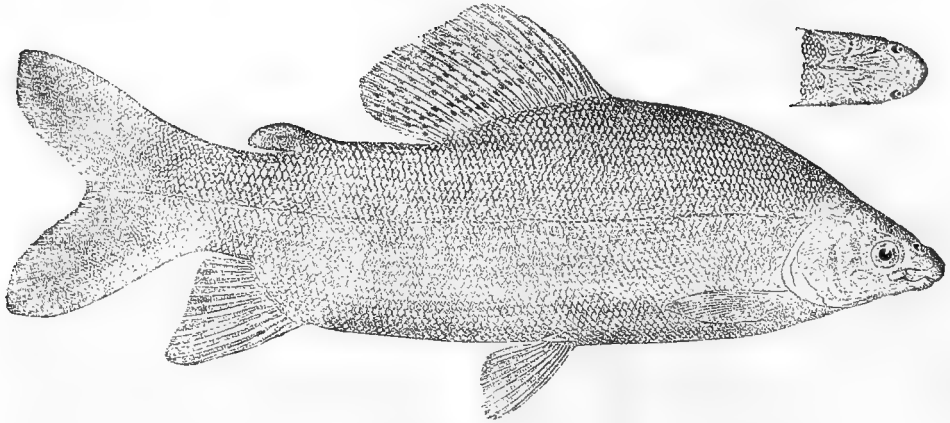
Very nearly related to the preceding, differing only in the somewhat larger scales, 83-98  $\frac{15-16}{16-20}$ , 13-15 between lateral line and ventral. Coloration also the same.

Total length 620 millim.

Lower Nile to Victoria Nile, Lake Chad, Senegal, Niger.

|                 |                           |                           |
|-----------------|---------------------------|---------------------------|
| 1. Type:        | Lower Nile.               | J. Petherick, Esq. (C.).  |
| 2. Yg.          | Beni Souef, Lower Nile.   | L. Loat, Esq. (C.).       |
| 3-4. Hgr. & yg. | Near Luxor.               | "                         |
| 5. Yg.          | Kosheh, Upper Nile.       | "                         |
| 6. Hgr.         | Gondokoro, Bahr-el-Gebel. | "                         |
| 7. Head of ad.  | Fajao, Victoria Nile.     | J. S. Budgett, Esq. (P.). |
| 8. Hgr.         | Lake Chad.                | Capt. G. B. Gosling (P.). |

Fig. 210.

*Distichodus rostratus.*Type (F. N.).  $\frac{3}{8}$ .

|                    |                         |                                 |
|--------------------|-------------------------|---------------------------------|
| 9. Ad.             | St. Louis, Senegal.     | M. P. Delhez (C.).              |
| 10. Type, stuffed. | Niger.                  | Mr. J. T. Dalton (C.).          |
| 11. Ad.            | "                       | W. A. Forbes, Esq. (P.).        |
| 12. Yg.            | Jebba, Upper Niger.     | Capt. G. F. Abadie (P.).        |
| 13. Hgr.           | Mureji, "               | J. S. Budgett, Esq. (P.).       |
| 14-15. Yg.         | Abo, Lower Niger.       | Dr. W. J. Ansorge (C.).         |
| 16-25. Yg.         | Agberi, "               | "                               |
| 26. Hgr.           | Benue River, N. of Ibi. | H. L. Norton Traill, Esq. (C.). |

## 16. DISTICHODUS SEXFASCIATUS.

Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 425, and Poiss. Bass. Congo, p. 194 (1904).

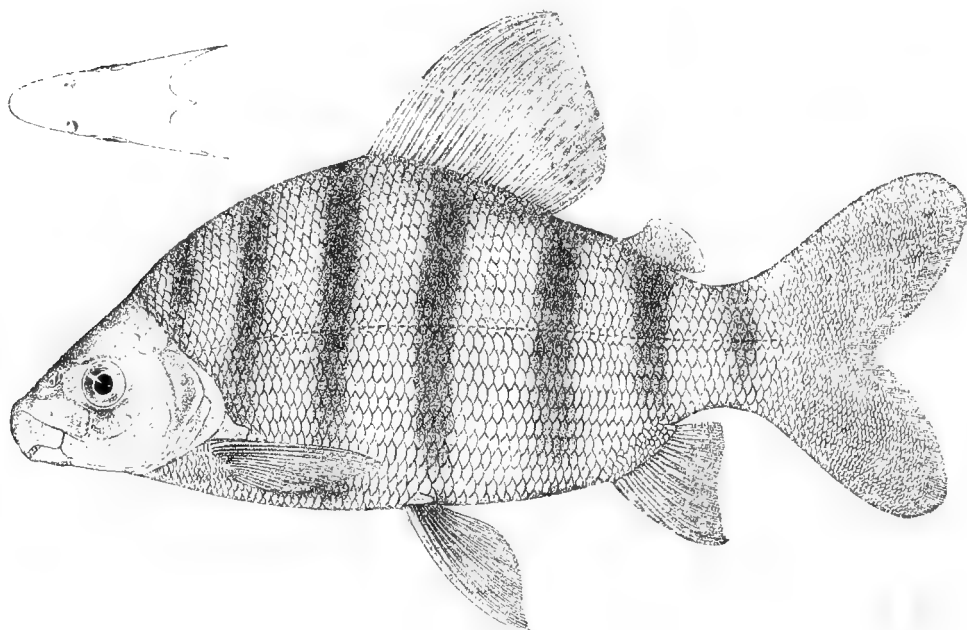
Depth of body  $2\frac{1}{4}$  to  $2\frac{1}{2}$  times in total length, length of head  $3\frac{1}{3}$  to 4 times. Head as long as deep, 2 to  $2\frac{1}{2}$  times as long as broad; snout strongly compressed, deeper than long, truncate at the end and scarcely projecting beyond mouth, its length equal to or slightly greater than interorbital width and  $1\frac{1}{2}$  to 2 times diameter of eye, which is 4 to 5 times in length of head; maxillary extending to below nostrils; teeth in two series in each jaw, 12 to 14 in outer series. Dorsal 24-25 (5 unbranched), equally distant from head and from caudal, separated from adipose by a space equal to  $\frac{1}{4}$  to  $\frac{3}{5}$  its base. Anal 12-14 (3-4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{3}{4}$  to  $\frac{5}{8}$  length of head. Caudal forked, lobes rounded. Caudal peduncle a little deeper than long. Scales 60-68  $\frac{14-16}{14-16}$ , 11 between lateral line and root of ventral.

Red or reddish brown, belly silvery white; 6 or 7 broad blackish vertical bars on the body.

Total length 210 millim.

Congo.

Fig. 211.



*Distichodus sexfasciatus.*

New Antwerp.  $\frac{5}{2}$ .

|          |                              |                          |
|----------|------------------------------|--------------------------|
| 1. Ad.   | Leopoldville, Stanley Pool.  | Capt. Wilverth (C.).     |
| 2. Ad.   | Coquilhatville, Upper Congo. | M. P. Delhez (C.).       |
| 3. Hgr.  | Kutu, Lake Leopold II.       | "                        |
| 4. Ad.   | New Antwerp, Upper Congo.    | Capt. Wilverth (C.).     |
| 5. Hgr.  | Monsembe, "                  | Rev. J. H. Weeks (P.).   |
| 6. Hgr.  | Upper Congo.                 | Brussels University.     |
| 7. Type. | Stanley Falls.               | Rev. W. H. Bentley (C.). |

#### 17. DISTICHODUS LUSOSSO.

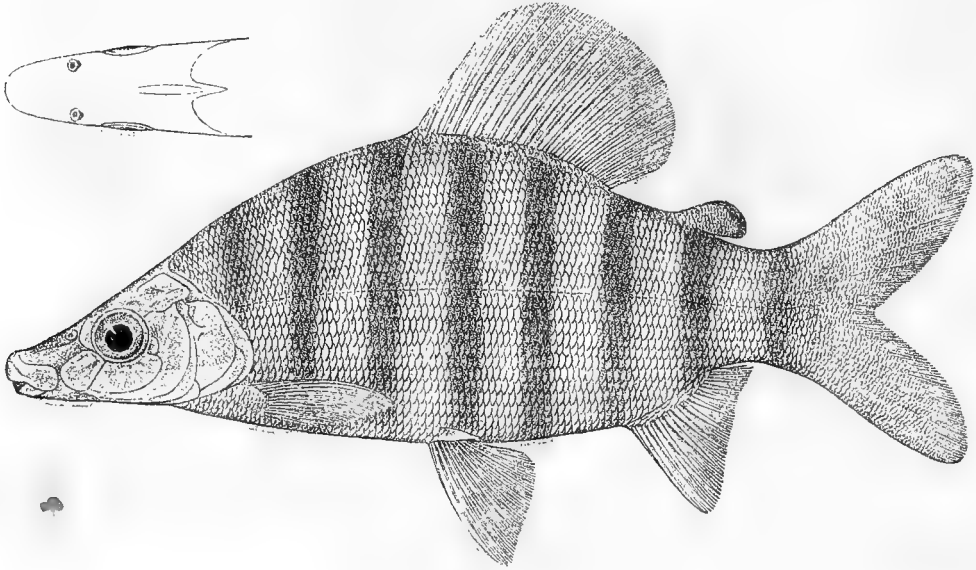
Schilthuis, Tijdschr. Ned. Dierk. Ver. (2) iii. 1891, p. 90; Bouleng. Poiss. Bass. Congo, p. 195 (1901).

*Distichodus leptorhynchus*, Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 425.

Depth of body  $2\frac{1}{2}$  to  $3\frac{1}{4}$  times in total length, length of head 3 to  $3\frac{1}{2}$  times. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep,  $2\frac{1}{2}$  to 3 times as long as broad; snout rounded, not compressed, longer than deep, its length greater than interorbital width,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  diameters of eye, which is 4 to 6 times

in length of head; maxillary not extending to below nostrils; 12-18 teeth in each jaw, inner teeth very small or absent. Dorsal 25-26 (4-5 unbranched), equally distant from head and from caudal, separated from adipose fin by a space equal to  $\frac{1}{3}$  to  $\frac{2}{5}$  its base. Anal 13-14 (3-4 unbranched), its base much shorter than that of dorsal. Pectoral  $\frac{2}{5}$  to  $\frac{2}{3}$  length of head. Caudal forked, lobes rounded. Caudal peduncle

Fig. 212.

*Distichodus lusosso.*Type.  $\frac{5}{8}$ .

as long as deep or a little deeper than long. Scales 70-85  $\frac{15-17}{15-17}$ , 11-13 between lateral line and root of ventral. Orange or red, with 6 to 8 blackish bands across the body; dorsal dotted with blackish in the young.

Total length 380 millim.

Congo.

|                                              |                             |                                                  |
|----------------------------------------------|-----------------------------|--------------------------------------------------|
| 1-2. Ad. & hgr.                              | Cataracts of Manyanga.      | Capt. Wilverth (C.).                             |
| 3. Hgr., type.                               | Kinshassa, Stanley Pool.    | M. A. Greshoff (C.);<br>Utrecht University (E.). |
| 4-5. Yg.                                     | Leopoldville, Stanley Pool. | Capt. Wilverth (C.).                             |
| 6, 7. Ad. & yg.                              | Monsembe, Upper Congo.      | Rev. J. H. Weeks (P.).                           |
| 8. Skel.                                     | " "                         | "                                                |
| 9. Yg., type of<br><i>D. leptorhynchus</i> . | Stanley Falls.              | Rev. W. H. Bentley (C.).                         |
| 10-11. Hgr. & yg.                            | Banzville, Ubanghi.         | Capt. Royaux (C.).                               |

17. NANNOCHARAX.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 112; Bouleng. Poiss. Bass. Congo, p. 196 (1901), and Fish. Nile, p. 150 (1907),

Snout short; mouth very small, inferior, each jaw with a single series of small, notched, bicuspid teeth; maxillary toothless, moderately large. Cheek covered by the suborbitals; nostrils close together, near the eye, separated by a valvular flap; gill-membranes free on the sides only. Body more or less elongate, cylindrical or compressed. Scales small, strongly ciliated; lateral line straight, equally distant from the dorsal and the ventral outlines; a scaly process at base of ventral fin. Dorsal fin with 12 to 15 rays, above the ventrals; anal fin with 10 or 11 rays; a small adipose dorsal fin. Vertebrae 43-44 (21-22+22.)

Nile and Tropical Africa.

*Synopsis of the Species.*

I. Dorsal originating above ventrals, with 9 to 11 branched rays.

A. Lateral line complete.

1. Not more than 50 scales in lateral line,  $4\frac{1}{2}$  or 5 in transverse series above lateral line; length of head  $3\frac{2}{3}$  to  $4\frac{1}{2}$  times in total length.

Head deeper than broad; depth of body  $4\frac{1}{2}$  to 5 times in total length; pectoral as long as head, extending beyond root of ventral; Sc. 37-38  $\frac{4\frac{1}{2}}{6\frac{3}{2}}$  . . . . .

1. *N. brevis*, Blgr., p. 280.

Head deeper than broad; depth of body  $3\frac{3}{4}$  to  $4\frac{1}{4}$  times in total length; pectoral much shorter than head, not reaching root of ventral; Sc. 38-40  $\frac{4\frac{1}{2}}{6\frac{3}{2}}$  . . . . .

2. *N. parvus*, Pellegr., p. 281.

Head not deeper than broad; depth of body 5 to  $5\frac{1}{2}$  times in total length; pectoral as long as head, extending beyond root of ventral; Sc. 42-49  $\frac{4\frac{1}{2}-5}{6\frac{1}{2}-7\frac{1}{2}}$  . . . . .

3. *N. fasciatus*, Günth., p. 281.

2. 47 scales or more in lateral line,  $5\frac{1}{2}$  or 6 in transverse series above lateral line; length of head 4 to 5 times in total length.

Head deeper than broad; depth of body 5 to  $5\frac{1}{2}$  times in total length; pectoral as long as head or slightly shorter, extending a little beyond origin of ventral; Sc. 47-55

$\frac{5\frac{1}{2}-6}{6\frac{1}{2}-7\frac{1}{2}}$

A. *N. intermedius*, Blgr., p. 282.

Head not deeper than broad ; depth of body

5 to 6 times in total length ; pectoral

shorter than head ; Sc. 50-55  $\frac{5\frac{1}{2}}{7\frac{1}{2}}$  . . . 5. *N. niloticus*, Joann., p. 283.

Head not deeper than broad ; depth of body

$6\frac{1}{2}$  to  $7\frac{1}{2}$  times in total length ; pectoral

shorter than head ; Sc. 52-57  $\frac{5\frac{1}{2}}{7\frac{1}{2}}$  . . . 6. *N. elongatus*, Blgr., p. 284.

B. Lateral line incomplete, reduced to a few tubules ; Sc. 50  $\frac{6\frac{1}{2}}{8\frac{1}{2}}$  ; length of head 3 times in total length . . . 7. *N. ocellicauda*, Blgr., p. 285.

II. Dorsal originating well in advance of ventrals, with 11 or 12 branched rays ;

head deeper than broad, 4 to  $4\frac{1}{2}$  times in total length ; depth of body

$4\frac{1}{3}$  to 5 times in total length ; pectoral shorter than head.

Sc. 48-49  $\frac{5\frac{1}{2}-6}{7\frac{1}{4}}$  . . . . . 8. *N. tænia*, Blgr., p. 286.

Sc. 52  $\frac{7\frac{1}{2}}{10\frac{1}{2}}$  . . . . . 9. *N. dimidiatus*, Pellegr., p. 286.

### 1. NANNOCHARAX BREVIS.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 27, pl. viii. fig. 2 (1902).

Depth of body  $4\frac{1}{2}$  to 5 times in total length, length of head 4 times. Head deeper than broad ; snout as long as eye, which is a little more than 3 times in length of head and equals interorbital width. Dorsal III 10, originating above base of ventral, situated a little nearer end of snout than caudal, longest ray equal to or a little greater than length of head. Anal III 6. Pectoral as long as head, extending beyond root

Fig. 213.



*Nannocharax brevis*.

Type (A. M. C.).

of ventral. Caudal forked, with pointed lobes. Caudal peduncle twice as long as deep. Scales 37-38  $\frac{4\frac{1}{2}}{6\frac{1}{4}}$ , 4 between lateral line and root of ventral. Olive above, yellowish beneath ; 5 large brown spots across the back, and two bars of the same colour on the caudal peduncle ; a series of dark spots on each side ; a black spot at base of caudal fin and a blackish spot or bar across each lobe of the latter.

Total length 45 millim.

Upper Congo.—Type in Congo Museum, Tervueren.



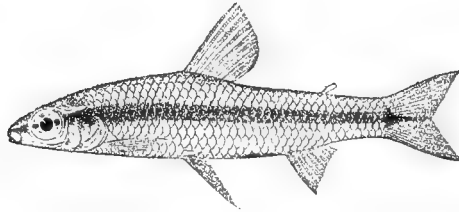
- |                      |                      |                                              |
|----------------------|----------------------|----------------------------------------------|
| 1. One of the types. | Banzyville, Ubanghi. | Capt. Royaux (C.).                           |
| 2. Ad.               | Lindi River.         | M. M. Storms (C.) ;<br>Brussels Museum (P.). |

## 2. NANNOCHARAX PARVUS.

Pellegr. Bull. Mus. Paris, 1906, p. 469, and Bull. Soc. Philom. (9) ix. 1907, p. 25.

Depth of body  $3\frac{3}{4}$  to  $4\frac{1}{4}$  times in total length, length of head  $3\frac{2}{3}$  to 4 times. Head deeper than broad; snout a little shorter than eye, which is about 3 times in length of head and exceeds interorbital width. Dorsal III 10–11, originating above base of ventral, situated a little nearer caudal than end of snout, longest ray equal to length of head. Anal III 8–9. Pectoral  $\frac{2}{3}$  length of head, not reaching root of ventral.

Fig. 214.

*Nannocharax parvus.*Type.  $\times \frac{3}{2}$ .

Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales 38–40  $\frac{4\frac{1}{2}}{6\frac{1}{2}}$ , 4 between lateral line and root of ventral. Olive-brown above, yellowish white beneath; a black lateral band, extending from snout to median rays of caudal.

Total length 40 millim.

Ogowe and Ubanghi.—Types in Paris Museum.

- |                      |               |                                           |
|----------------------|---------------|-------------------------------------------|
| 1. One of the types. | Ngomo, Ogowe. | Rev. E. Haug (C.) ;<br>Paris Museum (E.). |
|----------------------|---------------|-------------------------------------------|

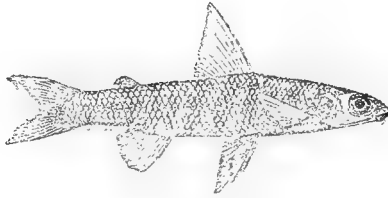
## 3. NANNOCHARAX FASCIATUS.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 112, pl. iii. fig. A ; Bouleng. Poiss. Bass. Congo, p. 196 (1901).

Depth of body 5 to  $5\frac{1}{2}$  times in total length, length of head  $3\frac{2}{3}$  to  $4\frac{1}{2}$  times. Head as broad as deep; snout about as long as eye, which is a little more than 3 times in length of head and equals or a little exceeds interorbital width. Dorsal III 9–10, originating above base of ventral, situated at equal distance from end of snout and from caudal, longest ray as long as head. Anal III 7–8. Pectoral as long as head, extending

beyond root of ventral. Caudal forked, with pointed lobes. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep. Scales 42-49  $\frac{4\frac{1}{2}-5}{6\frac{1}{2}-7\frac{1}{4}}$ , 4 between lateral line and root of ventral. Yellowish, with 8 to 10 brown bars

Fig. 215.



*Nannocharax fasciatus.*  
Type, after Günther (l. c.).

across the back, more or less confluent with similar bars on the sides of the body; these bars sometimes very irregular; 2 or 3 brown bars across the dorsal, one on the ventral, and one on the anal; a brown spot at the base of the caudal and one or two brown bars across each lobe of this fin.

Total length 75 millim.

Gold Coast to Congo.

|                 |                        |                                                     |
|-----------------|------------------------|-----------------------------------------------------|
| 1-5. Ad. & hgr. | Akropong, Gold Coast.  | R. B. N. Walker, Esq. (C.);<br>Dr. A. Günther (P.). |
| 6-7, 8-10. Ad.  | Kribi R., S. Cameroon. | G. L. Bates, Esq. (C.).                             |
| 11. Type.       | Gaboon.                |                                                     |

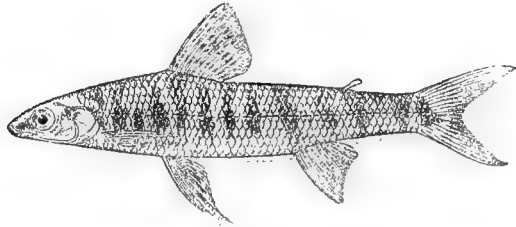
#### 4. NANNOCHARAX INTERMEDIUS.

Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 437.

Depth of body 5 to  $5\frac{1}{2}$  times in total length, length of head  $4\frac{1}{3}$  to  $4\frac{1}{2}$  times. Head deeper than broad; snout as long as or a little shorter than eye, which is 3 to  $3\frac{1}{2}$  times in length of head and equals or slightly exceeds interorbital width. Dorsal III 10-11, originating above base of ventral, situated nearer end of snout than caudal, longest ray as long as head. Anal III 7-8. Pectoral as long as head or slightly shorter, reaching a little beyond origin of ventral. Caudal forked, with sharply pointed lobes. Caudal peduncle twice as long as deep. Scales 47-55  $\frac{5\frac{1}{2}-6}{6\frac{1}{2}-7\frac{1}{2}}$ , 5 between lateral line and root of ventral. Yellowish, with 10 to 13 brown cross-bars, which are darker on the sides; these bars sometimes irregular or broken up into spots; a dark blotch at the base

of the caudal, which is traversed by a greyish bar; dorsal with small dark spots forming transverse series.

Fig. 216.

*Nannocharax intermedius.*

Type.

Total length 65 millim.

South Cameroon.

|                  |                    |                         |
|------------------|--------------------|-------------------------|
| 1-4. Types.      | Kribi River.       | G. L. Bates, Esq. (C.). |
| 5. Ad.           | Nyong River.       | „                       |
| 6-16. Ad. & hgr. | Ja River at Bitye. | „                       |

#### 5. NANNOCHARAX NILOTICUS.

*Coregonus niloticus*, Joannis, Mag. Zool. 1835, iv. pl. vii.

*Nannocharax niloticus*, Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 113; Bouleng.

Poiss. Bass. Congo, p. 198 (1901); Werner, Sitzb. Ak. Wien, cxv. i. 1906,

p. 1129, pl. iii. fig. 10; Bouleng. Fish. Nile, p. 150, pl. xxi. fig. 4 (1907).

? *Nannocharax niloticus*, var. *lateralis*, Werner, t. c. p. 1130, pl. iii. fig. 1.

Depth of body 5 to 6 times in total length, length of head 4 to 5 times. Head as deep as broad; snout nearly as long as or a little shorter than eye, which is 3 times or nearly 3 times in length of head; interorbital width slightly less than diameter of eye. Dorsal III 9-10, originating above base of ventrals, situated at equal distance from end of snout and from caudal or a little nearer former, longest ray  $\frac{3}{4}$  to once length of head. Anal III 7-8. Pectoral shorter than head, not reaching, or just reaching, root of ventral. Caudal forked, lobes acutely pointed. Caudal peduncle 2 to  $2\frac{1}{2}$  times as long as deep. Scales 50-55  $\frac{5\frac{1}{2}}{7\frac{1}{2}}$ , 5 between lateral line and root of ventral. Pale olive above, white below; a silvery lateral streak just below lateral line; 8 to 12 brown bars across the back, and a series of 6 to 8 round, oval, or square, more or less distinct brown spots along lateral line; small vertical bars sometimes present below lateral line; a small dark spot on base of caudal; three

more or less distinct longitudinal dark streaks on the snout; fins white, dorsal sometimes dusky.

Total length 52 millim.

Lower Nile to Blue Nile and Bahr-el-Gebel.

Fig. 217.



*Nannocharax niloticus*.  
White Nile (F. N.).

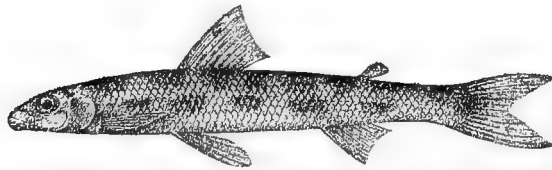
|                      |                           |                       |
|----------------------|---------------------------|-----------------------|
| 1. Ad.               | Beni Souef, Lower Nile.   | L. Loat, Esq. (C.).   |
| 2-31. Ad. & hgr.     | Near Luxor.               | "                     |
| 32. Skel.            | "                         | "                     |
| 33. Ad.              | Assuan.                   | "                     |
| 34-35. Ad.           | Rosaires, Blue Nile.      | Capt. S. Flower (P.). |
| 36-37. Ad.           | Kaka, White Nile.         | L. Loat, Esq. (C.).   |
| 38-47, 48-67, 68-87. | Gondokoro, Bahr-el-Gebel. | "                     |
| Ad. & hgr.           |                           |                       |

#### 6. NANNOCHARAX ELONGATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 131, pl. xlvi. fig. 3 (1900), and Poiss. Bass. Congo, p. 197 (1901).

Depth of body  $6\frac{1}{2}$  to  $7\frac{1}{2}$  times in total length, length of head  $4\frac{1}{2}$  to 5 times. Body cylindrical. Head as broad as deep; snout as long as eye, which is a little more than 3 times in length of head and equals

Fig. 218.



*Nannocharax elongatus*.  
Type (A. M. C.).

interorbital width. Dorsal III 10, originating above base of ventral, situated nearer end of snout than caudal, longest ray as long as head. Anal III 7. Pectoral a little shorter than head, reaching origin of ventral. Caudal forked, with pointed lobes. Caudal peduncle 2 to

$2\frac{1}{2}$  times as long as deep. Scales 52–57  $\frac{5\frac{1}{2}}{7\frac{3}{4}}$ , 4–5 between lateral line and root of ventral. Yellowish, with 8 or 9 brown bars across the back, alternating with a series of more or less distinct large dark spots on each side of the body, on the lateral line; a small brown spot between the anterior rays of the dorsal, a larger one at the base of the caudal, and one or two small ones on each lobe of this fin.

Total length 68 millim.

Upper Congo.—Types in Congo Museum, Tervueren.

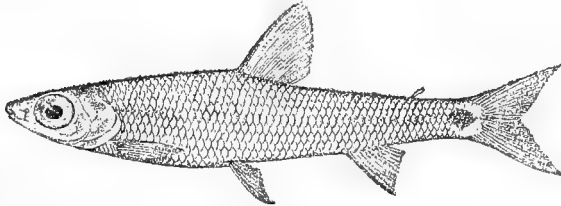
- 1–2. Two of the types. Between New Antwerp and Major Weyns (C.).  
Stanley Falls.
3. Ad. Lindi River. M. M. Storms (C.);  
Brussels Museum (P.).

#### 7. NANNOCHARAX OCELLICAUDA.

Bouleng. Ann. & Mag. N. H. (7) xx, 1907, p. 485.

Depth of body  $4\frac{1}{2}$  to 5 times in total length, length of head 4 times. Head twice as long as broad, deeper than broad; snout rounded, feebly projecting, a little shorter than eye, which equals length of postorbital part of head and interorbital width. Gill-rakers short and few. Dorsal III 9–10, originating above root of ventrals, equally distant from eye and from root of caudal; longest ray about  $\frac{3}{4}$  length of head. Anal III 9. Pectoral much shorter than head, not reaching root of

Fig. 219.



*Nannocharax ocellicauda.*

Type.  $\times \frac{2}{3}$ .

ventral. Lobes of caudal acutely pointed. Caudal peduncle once and  $\frac{1}{2}$  as long as deep. Scales 50  $\frac{6\frac{1}{2}}{8\frac{1}{2}}$ , 5 between lateral line series and root of ventral; lateral line incomplete, reduced to a few tubules. Yellowish in spirit, with a large black, light-edged ocellus at the root of the caudal fin; vertical fins greyish, dorsal black-edged in front.

Total length 55 millim.

South Cameroon.

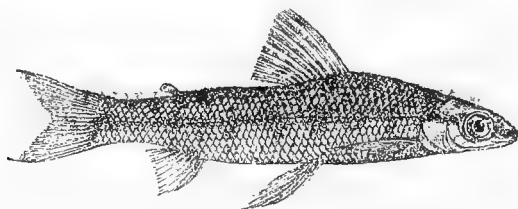
- 1–2. Types. Ja River (Congo System). G. L. Bates, Esq. (C.).

## 8. NANNOCHARAX TÆNIA.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 28, pl. viii. fig. 3 (1902).

Depth of body  $4\frac{2}{3}$  to 5 times in total length, length of head 4 times. Head deeper than broad; snout as long as eye, which is  $3\frac{1}{3}$  times in length of head and equals interorbital width. Dorsal III 11-12, originating well in advance of ventrals, situated at equal distance from end of snout and from caudal, longest ray  $\frac{4}{5}$  length of head. Anal III 8. Pectoral a little shorter than head, not reaching ventral. Caudal

Fig. 220.



*Nannocharax tænia.*

Type (A. M. C.).

forked, with pointed lobes. Caudal peduncle nearly twice as long as deep. Scales 48-49  $\frac{5\frac{1}{2}-6}{7\frac{1}{2}}$ , 5 between lateral line and root of caudal. Yellowish, with about 10 brown cross-bars on the back and sides; a greyish lateral band from end of snout to caudal; a blackish spot at base of caudal, another, smaller, on each lobe of this fin, and a blackish line along the ventral.

Total length 60 millim.

Ubanghi.—Type in Congo Museum, Tervueren.

1. One of the types:                   Banzÿville.                   Capt. Royaux (C.).

## 9. NANNOCHARAX DIMIDIATUS.

Pellegr. Bull. Mus. Paris, 1904, p. 220.

Depth of body nearly equal to length of head,  $4\frac{1}{3}$  times in total length. Head once and  $\frac{1}{2}$  as long as deep; snout slightly shorter than eye, which is hardly 3 times in length of head and a little exceeds interorbital width. Dorsal III 12, originating in advance of ventrals, a little nearer end of snout than caudal, longest ray as long as head. Anal III 8. Pectoral  $\frac{3}{4}$  length of head, not reaching ventral. Caudal forked. Caudal peduncle a little longer than deep. Scales 52  $\frac{7\frac{1}{2}}{10\frac{1}{4}}$ , 6 between lateral line

and root of ventral. Greyish, scales on back edged with darker; a broad dark lateral band, from the upper part of the gill-cover to the caudal; a black dot on the upper part of the front of the dorsal.

Total length 54 millim.

Casamanza River, Portuguese Guinea.—Type in Paris Museum.

### 18. XENOCHARAX.

Günth. Ann. & Mag. N. H. (3) xx. 1867, p. 114; Bouleng. Poiss. Bass. Congo, p. 198 (1901).

Snout short; mouth wide, terminal; teeth very small, bicuspid, in two series in the præmaxillaries, in three in the lower jaw, in one at the base of the maxillary, which is moderately large. Cheek partly naked; nostrils close together, separated by a valvular flap; gill-membranes free from isthmus. Body rather short, strongly compressed. Scales small, strongly ciliated; lateral line straight, following the middle of the side; a scaly process at base of ventral fin. Dorsal fin with 20 to 22 rays, above the ventrals; anal with 14 to 16 rays; a small adipose dorsal fin.

South Cameroon to Congo.

Two species:—

Dorsal originating a little in advance of ventrals . . . . . 1. *X. spilurus*, Gthr., p. 287.  
Dorsal originating above ventrals . . . . . 2. *X. crassus*, Pellegr., p. 288.

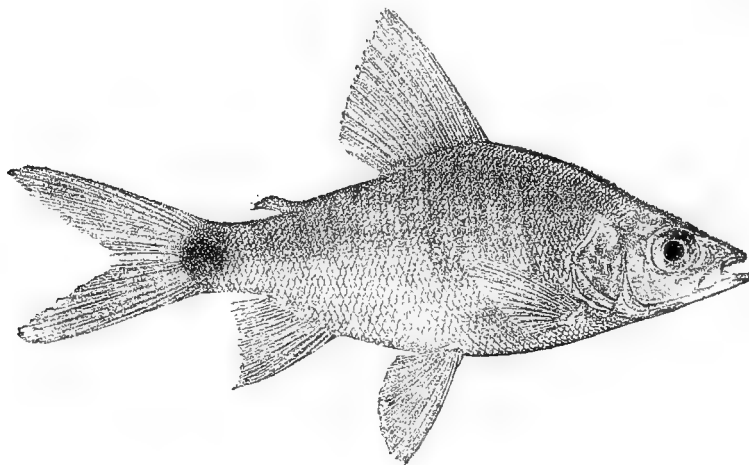
### 1. XENOCHARAX SPILURUS.

Günth. l. c. pl. iii. fig. B; Bouleng. op. c. p. 200.

Depth of body  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in total length, length of head 3 to 4 times. Head broad and flat above, raised at the occiput; snout nearly twice as broad as long, as long as or a little shorter than eye, which is lateral and  $2\frac{2}{3}$  (young) to 4 times in length of head; interorbital width 2 to 3 times in length of head; maxillary extending to below anterior border of eye. Gill-rakers rather long, slender, 10–13 on lower part of anterior arch. Dorsal 20–22 (4–5 unbranched), originating a little in advance of ventrals, longest rays  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head. Adipose fin scaly at base. Anal 14–16 (4 unbranched). Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head. Caudal forked, with long, pointed lobes. Caudal peduncle nearly as long as deep. Scales 68–77  $\frac{12-14}{14-18}$ , 10–12 between lateral line and ventral. Silvery, greenish or blackish olive above; young with

numerous narrow vertical dark bars and a large blackish spot on caudal peduncle, at base of caudal fin.

Fig. 221.

*Xenocharax spilurus.*

Type, after Günther (Ann. Mag. N. H. 1867).

Total length 260 millim.

South Cameroon, Gaboon, Congo.

|                    |                                     |                         |
|--------------------|-------------------------------------|-------------------------|
| 1-3. Ad. & hgr.    | Kribi River, S. Cameroon.           | G. L. Bates, Esq. (C.). |
| 4-5. Types.        | Gaboon.                             |                         |
| 6-9. Hgr. & yg.    | Talagouga, Ogowe.                   | Miss Kingsley (C.).     |
| 10. Ad.            | Komadekke, "                        | Dr. W. J. Ansorge (C.). |
| 11. Ad.            | Ibali, L. Leopold II., Upper Congo. | M. P. Delhez (C.).      |
| 12. Ad.            | Kutu, " "                           | " "                     |
| 13-14. Hgr. & yg.  | Bikoro, Lake Tumba, "               | " "                     |
| 15. Skel.          | " " "                               | " "                     |
| 16, 17. Ad. & hgr. | Monsembe, Upper Congo.              | Rev. J. H. Weeks (P.).  |

## 2. XENOCHARAX CRASSUS.

Pellegr. Bull. Mus. Paris, 1900, p. 100.

Very closely allied to the preceding, but depth of body not quite  $2\frac{1}{2}$  times in total length, dorsal originating above ventrals, and a large black spot on anterior part of dorsal.

Total length 200 millim.

Upper Congo (Alima River).—Type in Paris Museum.



## 19. CITHARIDIUM.

Bouleng. Ann. & Mag. N. H. (7) ix. 1902, p. 141.

Snout short; mouth wide, terminal, with a marginal series of very minute pointed teeth; maxillary very small, toothless. Cheek partly naked; nostrils close together, separated by a valvular flap; gill-membranes free from isthmus. Body short, strongly compressed. Scales moderately large, strongly denticulate; lateral line straight, nearer the dorsal than the ventral outline; a scaly process at base of ventral fin. Dorsal fin with 17-18 rays, above the ventrals; anal with 20-21 rays; a rather large adipose dorsal fin.

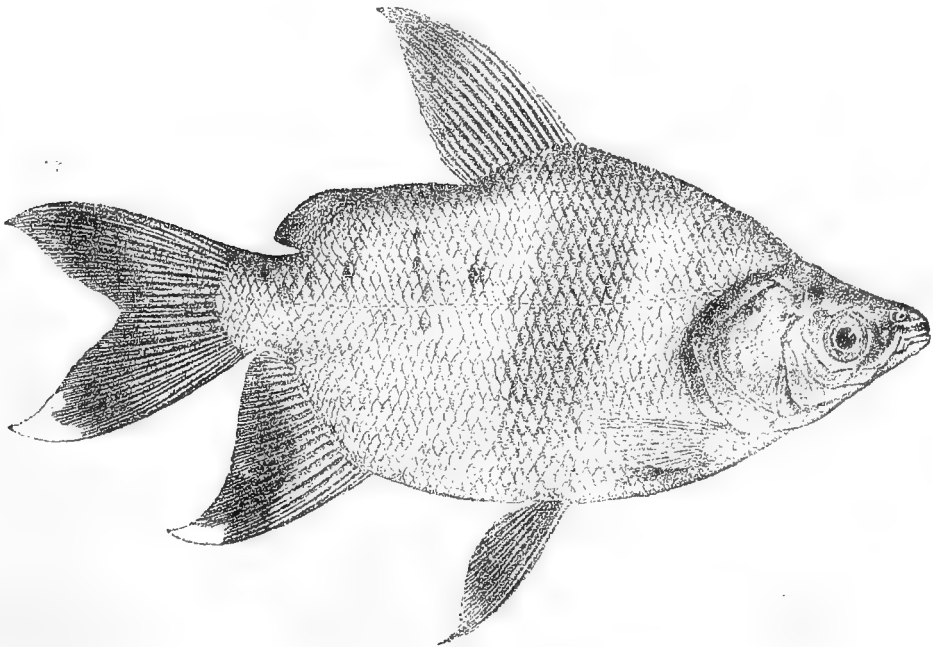
Niger.

## 1. CITHARIDIUM ANSORGII.

Bouleng. l. c. pl. iii.

Depth of body twice in total length, length of head 3 times. Head twice as long as broad, flattened above, raised at the occiput; snout

Fig. 222.



*Citharidium ansorgii*.

Type (Ann. & Mag. N. H. 1902).  $\frac{5}{7}$ .

twice as broad as long, not projecting beyond lower jaw, as long as eye, which is infero-lateral,  $3\frac{2}{3}$  to 4 times in length of head and 2 to  $2\frac{1}{4}$  times.

in interorbital width; a narrow adipose lid in front of and behind the eye. Gill-rakers very short, closely set. Dorsal 17-18 (4 unbranched), originating at equal distance from end of snout and from caudal, pointed, longest ray nearly as long as head. Adipose fin scaly, as long as its distance from dorsal. Anal 20-21 (3 unbranched), pointed in front. Pectoral half length of head, shorter than ventral. Caudal forked, with pointed lobes. Caudal peduncle a little deeper than long. Scales  $51 \frac{12}{14}$ , 12 between lateral line and root of ventral, each scale bearing 6-10 raised lines ending in a spine. Brown above, bright yellow beneath; an oblique blackish band from in front of the dorsal to the base of the ventral; upper surface of head and opercular fold black; pectorals yellow, ventrals black; dorsal, anal, and caudal grey at the base, black at the end.

Total length 130 millim.

Lower Niger.

|          |             |                         |
|----------|-------------|-------------------------|
| 1. Type. | Lake Oguta. | Dr. W. J. Ansorge (P.). |
| 2. Yg.   | Abo.        | „ (C.).                 |

## 20. CITHARINUS.

Cuv. Règne Anim. ii. p. 168 (1817), part.; Cuv. & Val. Hist. Poiss. xxii. p. 94 (1849), part.; Müll. & Trosch. Hor. Ichthyol. iii. p. 8 (1845); Günth. Cat. Fish. v. p. 302 (1864); Bouleng. Poiss. Bass. Congo, p. 201 (1901), and Fish. Nile, p. 152 (1907).

Snout short; mouth wide, straight, terminal or subinferior, with minute pointed teeth inserted on the labial margin; maxillary small, toothless. Cheek partly naked; nostrils close together, separated by a valvular flap; gill-membranes free from isthmus. Body short, very strongly compressed. Scales moderate or small, not denticulate; lateral line straight, equally distant from the dorsal and the ventral outlines, or nearer the former; a scaly process at base of ventral fin. Dorsal fin with 17-23 rays, above or behind the vertical of the ventrals; anal with 20-31 rays; a small or rather large adipose dorsal fin. Vertebrae 42-44 (24-25 + 18-19).

Small scales cover the adipose fin, at least at the base. An accessory branchial organ, behind the fourth gill.

Nile and Tropical Africa.

*Synopsis of the Species.*

- I. Base of adipose fin shorter than its distance from the dorsal ; Dorsal 17-21 ; Anal 25-31.
- Sc. 77-90  $\frac{20-25}{20-25}$ , 17-21 between lateral line and ventral ; dorsal originating behind vertical of base of ventral ; snout projecting a little beyond lower jaw . . . . . 1. *C. citharus*, Geoffr., p. 291.
- Sc. 60-66  $\frac{15-16}{16-18}$ , 13-14 between lateral line and ventral ; dorsal originating above last ray of ventral ; snout projecting a little beyond lower jaw . . . . . 2. *C. congicus*, Blgr., p. 293.
- Sc. 55-60  $\frac{13-14}{16-18}$ , 10-12 between lateral line and root of ventral ; dorsal originating above last ray of ventral ; snout not projecting beyond lower jaw . . . . . 3. *C. macrolepis*, Blgr., p. 294.
- II. Base of adipose fin at least nearly as long as its distance from the dorsal ; Dorsal 20-23 ; Anal 20-27.
- Sc. 63-71  $\frac{16-18}{18-20}$ , 14-16 between lateral line and root of ventral ; dorsal originating just behind vertical of base of ventral ; snout projecting a little beyond lower jaw . . . . . 4. *C. latus*, M. & T., p. 295.
- Sc. 53-59  $\frac{14-15}{14-16}$ , 10-12 between lateral line and root of ventral ; dorsal originating above base of ventral ; snout projecting rather strongly beyond lower jaw . . . . . 5. *C. gibbosus*, Blgr., p. 297.

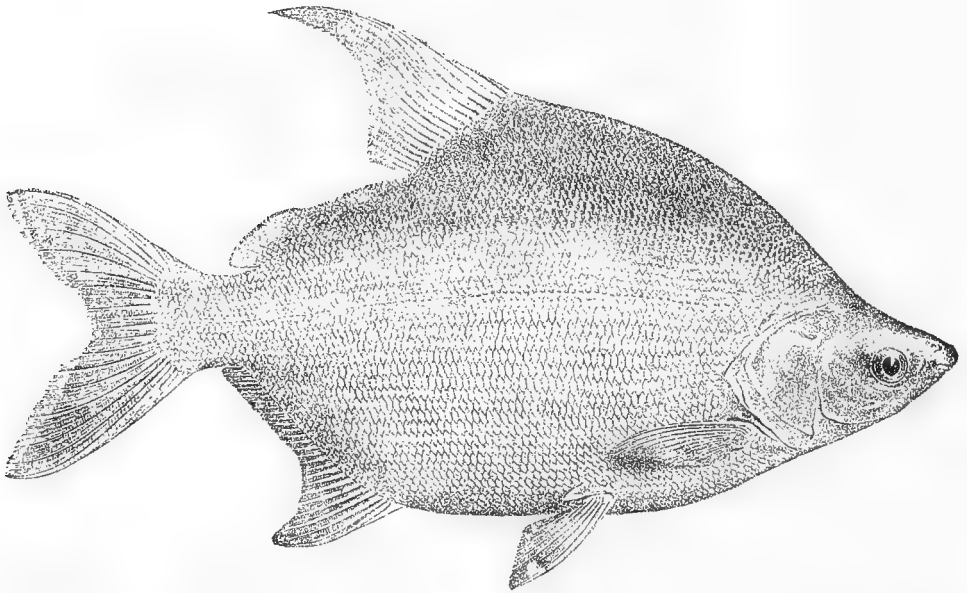
## 1. CITHARINUS CITHARUS.

- Serrasalmus citharus*, Geoffr. Descr. Egypte, Poiss. p. 40, pl. v. figs. 2 & 3 (1809).  
*Citharinus geoffroyi*, Cuv. Règne Anim. 2nd ed. ii. p. 313 (1829) ; Müll. & Trosch. Hor. Ichthyol. i. p. 9 (1845) ; Cuv. & Val. Hist. Poiss. xxii. p. 95 (1849) ; Günth. Cat. Fish. v. p. 302 (1864), and Petherick's Trav. ii. p. 240 (1869) ; Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 538 ; Bouleng. Ann. Mus. Congo, Zool. i. p. 93 (1899).  
*Distichodus marnoi*, Steind. Sitzb. Ak. Wien, lxxxiii. i. 1881, p. 200.  
*Citharinus citharus*, Bouleng. Proc. Zool. Soc. 1905, i. p. 151 ; Fowler, Proc. Ac. Philad. 1906, p. 319 ; Bouleng. Fish. Nile, p. 153, pl. xxv. (1907).

Depth of body  $1\frac{4}{5}$  to  $2\frac{1}{3}$  times in total length, length of head 3 to 4 times. Head 2 to  $2\frac{1}{3}$  times as long as broad, upper profile deeply concave ; snout short,  $1\frac{3}{4}$  to 2 times as broad as long, a little longer than eye in adult, a little shorter in young, projecting slightly beyond mouth ;

eye  $3\frac{1}{2}$  (young) to 6 times in length of head; a narrow adipose lid in front of and behind eye; interorbital width  $2\frac{1}{4}$  to  $2\frac{1}{2}$  times in length of head. Gill-rakers short, fine, closely set, about 50 on lower part of anterior arch. Dorsal 17-20 (3-5 unbranched), originating behind vertical of base of ventral and nearer caudal than end of snout; anterior branched rays more or less produced, often longer than head. Adipose fin moderately large, its base  $\frac{1}{2}$  to  $\frac{4}{5}$  its distance from dorsal. Anal 25-31 (3-4 unbranched); anterior rays forming a produced, pointed lobe, measuring  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head. Pectoral  $\frac{3}{5}$  to  $\frac{3}{4}$  length of head, reaching, or nearly reaching, ventral. Caudal deeply forked, with

Fig. 223.

*Citharinus citharus.*Lower Nile (F. N.).  $\frac{1}{4}$ .

pointed lobes. Caudal peduncle as long as deep or slightly deeper than long. Scales 77-90  $\frac{20-25}{20-25}$ , 17-21 between lateral line and root of ventral. Silvery, the back greenish or purplish grey; pectoral white, other fins grey, usually with some bright red on the ventral, the anal, and the lower lobe of the caudal; adipose fin sometimes edged with black; young often with dark longitudinal lines running between the series of scales

Total length 480 millim.

Lower Nile to Blue Nile and White Nile, Chad Basin, Senegal, Gambia, Niger.—Type in Paris Museum.

|                    |                                  |                                       |
|--------------------|----------------------------------|---------------------------------------|
| 1. Hgr.            | Lower Nile.                      | Dr. Rüppell (C.).                     |
| 2. Hgr.            | Near Cairo.                      | Capt. S. Flower (P.).                 |
| 3. Ad.             | Biba, Lower Nile.                | L. Loat, Esq. (C.).                   |
| 4. Ad.             | Near Island of Arko, Upper Nile. | "                                     |
| 5-6. Ad. & yg.     | Khartum.                         | J. Petherick, Esq. (C.). <sup>1</sup> |
| 7. Skel.           | "                                | "                                     |
| 8-10. Yg.          | Wad Medine, Blue Nile.           | L. Loat, Esq. (C.).                   |
| 11-16. Yg.         | Mangara, White Nile.             | "                                     |
| 17. Yg.            | Jebelain, "                      | "                                     |
| 18. Hgr.           | Mouth of Lake No, White Nile.    | "                                     |
| 19-24. Hgr. & yg.  | Lake No, White Nile.             | "                                     |
| 25-26. Yg.         | Yo R., Lake Chad.                | Capt. G. B. Gosling (P.).             |
| 27-28. Ad. & hgr.  | St. Louis, Senegal.              | M. P. Delhez (C.).                    |
| 29-31. Ad. & yg.   | Gambia.                          | J. S. Budgett, Esq. (P.).             |
| 32. Ad.            | "                                | Lord Derby (P.).                      |
| 33-42. Yg.         | Agberi, Lower Niger.             | Dr. W. J. Ansorge (C.).               |
| 43. Yg.            | Assay, "                         | J. S. Budgett, Esq. (P.).             |
| 44, 45. Ad. & hgr. | Niger.                           | Mr. J. T. Dalton (C.).                |
| 46. Ad.            | "                                | W. A. Forbes, Esq. (P.).              |
| 47. Skull.         | "                                | "                                     |
| 48. Yg.            | Benue R., North of Ibi.          | H. L. Norton Traill, Esq. (C.).       |

## 2. CITHARINUS CONGICUS.

Bouleng. Ann. & Mag. N. H. (6) xx. 1897, p. 424, and Poiss. Bass. Congo, p. 202 (1901).

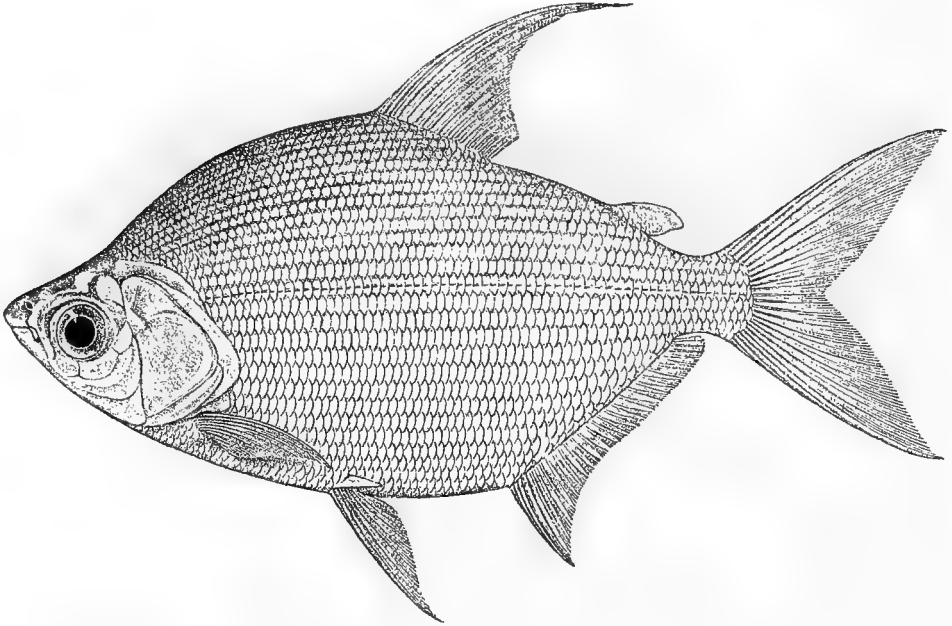
Depth of body  $1\frac{5}{8}$  to 2 times in total length, length of head 3 to  $3\frac{3}{4}$  times. Head twice as long as broad, upper profile feebly concave; snout short, not twice as broad as long, a little longer than eye in adult, projecting slightly beyond mouth; eye  $3\frac{1}{2}$  (young) to 5 times in length of head; a narrow adipose lid in front of and behind eye; interorbital width  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head. Gill-rakers extremely short, 30-40 on lower part of anterior arch. Dorsal 18-21 (4-5 unbranched), originating above last ray of ventral, falciform, anterior rays produced, at least as long as head. Adipose fin not or but little longer than deep, its base  $\frac{1}{3}$  to  $\frac{1}{2}$  its distance from dorsal. Anal 25-30 (3 unbranched), pointed, anterior rays produced. Pectoral  $\frac{3}{4}$  to  $\frac{5}{8}$  length of head, reaching ventral. Caudal deeply forked. Caudal peduncle a little longer than deep. Scales

60-66  $\frac{15-16}{16-18}$ , 13-14 between lateral line and root of ventral. Silvery, bluish grey on the back.

Total length 390 millim.

Congo.

Fig. 224.



*Citharinus congicus.*

Type.  $\frac{5}{8}$ .

|           |                        |                          |
|-----------|------------------------|--------------------------|
| 1. Type.  | Stanley Falls.         | Rev. W. H. Bentley (C.). |
| 2, 3. Ad. | Monsembe, Upper Congo. | Rev. J. H. Weeks (P.).   |
| 4. Hgr.   | Bolobo, „              | Rev. G. Grenfell (P.).   |

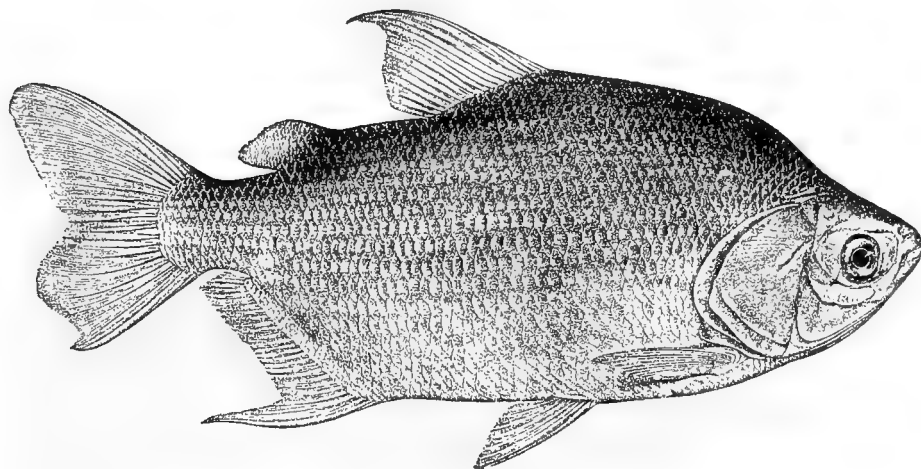
### 3. CITHARINUS MACROLEPIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 93, pl. xxxviii. (1899), and Poiss. Bass. Congo, p. 203 (1901).

Depth of body 2 to  $2\frac{1}{3}$  times in total length, length of head 3 to 4 times. Head about twice as long as broad, upper profile feebly concave; snout short, broadly truncate, twice as broad as long, as long as or a little shorter than eye, not projecting beyond lower jaw; eye  $3\frac{1}{2}$  (young) to 5 times in length of head; a narrow adipose lid in front of and behind eye; interorbital width about half length of head. Gill-rakers very short, about 50 on lower part of anterior arch. Dorsal 17-19 (4-5 unbranched), originating above last ray of ventral, falciform, anterior rays

at least as long as head. Adipose fin much longer than deep, its base  $\frac{2}{3}$  to  $\frac{3}{4}$  its distance from dorsal. Anal 25-29 (3-4 unbranched), pointed, anterior rays produced. Pectoral about  $\frac{2}{3}$  length of head, reaching, or nearly reaching, ventral. Caudal forked. Caudal peduncle

Fig. 225.

*Citharinus macrolepis.*Type (A. M. C.).  $\frac{1}{4}$ .

as long as deep or a little longer. Scales 55-60  $\frac{13-14}{16-18}$ , 10-12 between lateral line and root of ventral. Silvery, bluish grey on the back.

Total length 750 millim.

Congo.—Types in Congo Museum, Tervueren.

- |                            |                        |                        |
|----------------------------|------------------------|------------------------|
| 1. Hgr., one of the types. | Boma, Lower Congo.     | M. P. Delhez (C.).     |
| 2. Ad.,                    | „                      | Cataracts of Manyanga. |
| 3, 4. Ad.                  | Monsembe, Upper Congo. | Capt. Wilverth (C.).   |
|                            |                        | Rev. J. H. Weeks (P.). |

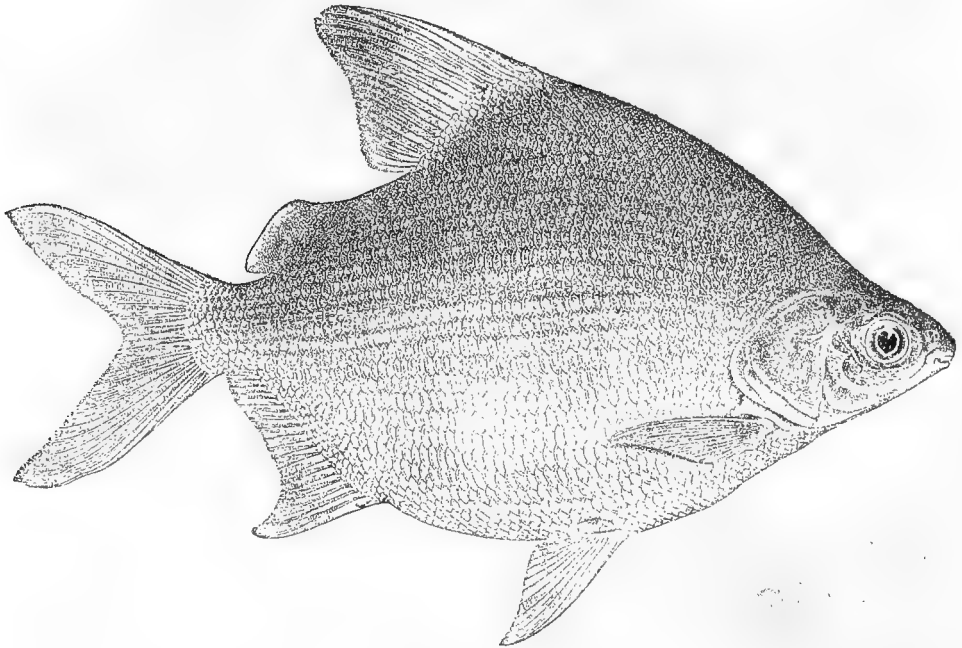
#### 4. CITHARINUS LATUS.

Müll. & Trosch. Hor. Ichthyol. i. p. 9 (1845); Steind. Sitz. Ak. Wien, lxi. i. 1870, p. 539; Pfeff. Thierw. O.-Afr., Fische, p. 42 (1896); Bouleng. Ann. Mus. Congo, Zool. i. p. 93 (1899), and Fish. Nile, p. 156, pl. xxvi. (1907).

Depth of body  $1\frac{3}{5}$  to 2 times in total length, length of head  $3\frac{1}{5}$  to 4 times. Head  $1\frac{1}{5}$  to 2 times as long as broad, its upper profile more or less concave; snout as long as or slightly longer than eye in adult, shorter in young, projecting slightly beyond mouth; diameter of eye  $2\frac{1}{3}$  (young) to  $4\frac{1}{2}$  times in length of head; a narrow adipose lid in front of and behind eye; interorbital width  $2\frac{1}{7}$  to  $2\frac{1}{2}$  times in length of head.

Gill-rakers short, fine, closely set, 60-80 on lower part of anterior arch. Dorsal 20-22 (4-5 unbranched), originating behind vertical of base of ventral and nearer caudal than end of snout; anterior branched rays more or less produced, as long as or longer than head. Adipose fin rather large, its base  $1\frac{1}{6}$  to  $2\frac{1}{2}$  times its distance from dorsal. Anal 23-26 (3-4 unbranched); anterior rays forming a produced, pointed lobe, measuring  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head. Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length

Fig. 226.



*Catharinus latus.*  
Gondokoro (F. N.).  $\frac{1}{3}$ .

of head, reaching, or not quite reaching, base of ventral. Caudal deeply forked, with pointed lobes. Caudal peduncle deeper than long. Scales 63-71  $\frac{16-18}{18-20}$ , 14-16 between lateral line and root of ventral. Grey above, silvery white below; horizontal dark grey lines may run between the series of scales; some reddish or orange may be present on the ventral, anal, and caudal fins.

Total length 420 millim.

Lower Nile to Bahr-el-Gebel, Senegal, Niger, Old Calabar, Kingani River (East Africa).—Type in Berlin Museum.



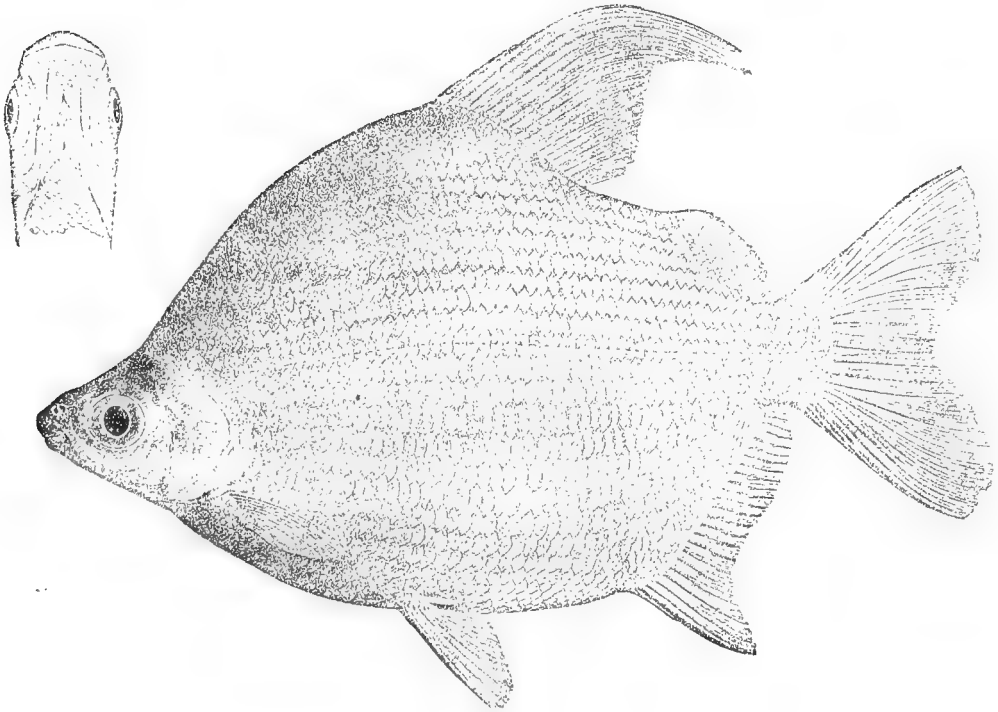
|                 |                           |                                               |
|-----------------|---------------------------|-----------------------------------------------|
| 1-3. Hgr. & yg. | Beni Souef, Lower Nile.   | L. Loat, Esq. (C.).                           |
| 4-5. Yg.        | Mangara, Upper Nile.      | " "                                           |
| 6. Skel.        | " "                       | " "                                           |
| 7-9. Ad. & yg.  | Gondokoro, Bahr-el-Gebel. | " "                                           |
| 10. Yg.         | Kaëdi, Senegal.           | M. P. Delhez (C.).                            |
| 11. Ad.         | Lokoja, Upper Niger.      | J. S. Budgett, Esq. (P.).                     |
| 12-13. Ad.      | Niger.                    | Mr. J. T. Dalton (C.).                        |
| 14. Yg.         | Benue R., North of Ibi.   | H. L. Norton Traill, Esq. (C.).               |
| 15. Yg.         | Old Calabar.              | Dr. Jackson (C.);<br>Hon. W. Rothschild (P.). |

## 5. CITHARINUS GIBBOSUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 94, pl. xxxix. (1899), and Poiss. Bass. Congo, p. 204 (1901).

Depth of body  $1\frac{2}{3}$  to 2 times in total length, length of head  $3\frac{1}{4}$  to 4 times. Head about twice as long as broad, upper profile more or less

Fig. 227.

*Citharinus gibbosus.*Type (A. M. C.).  $\frac{1}{2}$ .

concave, nape strongly raised in adult; snout short, not twice as broad as long, as long as or a little longer than eye, its anterior outline

forming an open angle, and projecting rather strongly beyond the mouth; eye 3 (young) to  $4\frac{1}{2}$  times in length of head; adipose eyelid barely distinct; interorbital width half, or less than half, length of head. Gill-rakers very short and fine, 65–75 on lower part of anterior arch. Dorsal 20–23 (4–5 unbranched), originating above base of ventral, anterior branched rays produced, longer than head. Adipose fin much longer than deep, its base nearly as long as or longer than its distance from dorsal. Anal 22–27 (3–4 unbranched). Pectoral  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head, not reaching ventral. Caudal forked. Caudal peduncle deeper than long. Scales 53–59  $\frac{14-15}{14-16}$ , 10–12 between lateral line and root of ventral. Silvery, bluish grey on the back, with darker lines between the series of scales.

Total length 520 millim.

Congo, Lake Tanganyika.—Types in Congo Museum, Tervueren.

|                            |                              |                            |
|----------------------------|------------------------------|----------------------------|
| 1. Yg., one of the types.  | Banana, Lower Congo.         | Capt. Wilverth (C.).       |
| 2. Yg.                     | Loango, „ „                  | M. De Meuse (C.).          |
| 3. Hgr., one of the types. | Stanley Pool.                | M. P. Delhez (C.).         |
| 4, 5–6. Ad. & yg.          | Monsembe, Upper Congo.       | Rev. J. H. Weeks (C.).     |
| 7. Ad.                     | Upper Congo.                 | Brussels University.       |
| 8. Yg.                     | Uerre River.                 | M. De Bauw (C.).           |
| 9–11. Ad. & hgr.           | Near Kalambo, L. Tanganyika. | Prof. J. E. S. Moore (C.). |
| 12. Ad.                    | Niamkolo, L. Tanganyika.     | Dr. W. A. Cunnington (C.). |

## Fam. 2. CYPRINIDÆ.

Mouth usually more or less protractile, toothless, bordered by the præmaxillaries and the maxillaries, or, more frequently, by the præmaxillaries only. Parietal bones united in a sagittal suture, or separated by a fontanelle; opercular bones well developed; symplectic present. Lower pharyngeal bones falciform, subparallel to the branchial arches, provided with teeth arranged in one, two, or three series, and often remarkably specialised. Ribs mostly sessile; no parapophyses in the thoracic region; epipleurals and epineurals, mostly free, floating. Pectoral fins inserted very low down, folding like the ventrals. Body naked or scaly. No adipose dorsal fin.

Brain-case produced forward to the nasal capsule. Branchiostegal rays reduced to three; branchiostegal membrane usually more or less extensively grown to the isthmus.

Fresh waters of Europe, Asia, Africa, and North and Central America.

*Synopsis of the Genera.*

- I. CYPRININÆ. Barbels not more than two pairs, if present; pharyngeal teeth large, in small number, working against a sclerous plate attached to a ventral process of the basioccipital, which extends under the anterior vertebræ; air-bladder usually large and divided into an anterior and a posterior chamber, not surrounded by a bony capsule.
- A. Anal with not more than 7 branched rays.
1. Suborbitals narrow, not covering the cheek; lateral line running along the middle, or nearly the middle, of the side of the caudal region of the body.
- Mouth inferior, with much-developed lips forming a sort of sucker and furnished on the inner side with a sharp cutting-edge covered with a horny sheath; dorsal fin originating well in advance of the ventrals. . . . . 1. *Labeo*, Cuv., p. 300.
- Mouth inferior; a more or less developed suctorial disk on the chin, usually bordered by the lower labial fold; gill-openings restricted to the sides; dorsal fin originating well in advance of the ventrals. . . . . 2. *Discognathus*, Heck., p. 343.
- Mouth inferior, without lips, the lower jaw completely exposed and showing a sharp cutting-edge covered with a horny sheath; dorsal fin originating above or a little in advance of the ventrals. . . . . 3. *Varicorhinus*, Rüpp., p. 352.
- Mouth terminal or inferior, with more or less developed lips, with or without a sharp edge; dorsal fin originating above or a little behind or a little in advance of the ventrals. . . . . 4. *Barbus*, Cuv.\*
2. Suborbitals large, covering the cheek; lateral line running along the lower part of the caudal region of the body.
- Mouth terminal, lower jaw prominent; dorsal fin behind the ventrals. . . . . 5. *Rasbora*, Blkr.
- B. Anal with 8 or more branched rays; mouth terminal.
1. Suborbitals narrow, not covering the cheek.
- Dorsal fin above or behind the ventrals; anal with 8 to 14 branched rays. . . . . 6. *Leuciscus*, Cuv.
2. Suborbitals large, covering the cheek.
- a. Anal with 8 or 9 branched rays; lateral line in the middle of the caudal peduncle.
- Dorsal fin above the ventrals. . . . . 7. *Leptocypris*, Blgr.

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\* This and the following genera will be dealt with in the second volume.

*b.* Anal with 10 or more branched rays; lateral line on lower part of caudal peduncle.

Dorsal fin originating in advance of the origin of the anal; belly, in front of the ventrals, rounded . . . . . 8. *Barilius*, Ham. Buch.

Dorsal fin originating above or a little behind the origin of the anal; belly, in front of the ventrals, rounded . . . . . 9. *Neobola*, Vincig.

Dorsal fin originating behind the origin of the anal; belly keeled between the very large pectoral fins . . . . . 10. *Chelæthiops*, Blgr.

II. COBITINÆ. Barbels three pairs or more; pharyngeal teeth small; anterior part of the air-bladder divided into a right and left chamber, separated by a constriction and enclosed in a bony capsule, the posterior part free or absent; scales minute or absent.

Three pairs of barbels, none at the lower jaw; dorsal fin opposite to the ventrals . . . 11. *Nemachilus*, Van Hass.

### 1. LABEO.

Cuv. Règne Anim. ii. p. 194 (1817); Cuv. & Val. Hist. Poiss. xvi. p. 335 (1842); Heckel, Russegger's Reise, ii. p. 1024 (1843); Günth. Cat. Fish. vii. p. 45 (1868); Bouleng. Poiss. Bass. Congo, p. 209 (1901), and Fish. Nile, p. 160 (1907).

*Abrostomus*, A. Smith, Ill. Zool. S. Africa, Fish. (1841).

*Tylognathus*, Heckel, t. c. p. 1027; Günth. t. c. p. 62.

*Rohitichthys*, Bleek. Atlas Ichth. iii. p. 25 (1863).

Body more or less compressed, covered with small, moderate, or large scales. Lateral line nearly equally distant from the back and from the belly or a little nearer the latter. Mouth moderate or large, protractile, inferior, with more or less developed lips forming a sort of sucker and furnished on the inner side with a sharp cutting-edge covered with a horny layer; barbels present or absent. Suborbitals not covering the cheek. Dorsal with 11 to 26 rays, 8 to 23 of which are branched, originating in advance of the ventrals. Anal short, with 7 or 8 rays. A scaly process at the base of the ventrals. Pharyngeal teeth in three series (3, 3, 5—5, 3, 3), with the crowns spoon-shaped and close together.

Southern Asia and Africa.

*Synopsis of the Species.*

- I. Barbels absent, or one on each side, often very small and hidden under the folds at the side of the mouth.
- A. Inner surface of lips not bearing transverse plicæ\* ; eyes perfectly lateral, visible from above and from below ; snout hardly as long as, or shorter than, postocular part of head.
1. Dorsal with 12-17 branched rays ; Sc. 40-45  $\frac{7-9\frac{1}{2}}{6\frac{1}{2}-10\frac{1}{2}}$ .
- D. III 14-17, upper edge usually concave ;
- Sc. 41-45  $\frac{8\frac{1}{2}-9\frac{1}{2}}{8\frac{1}{2}-10\frac{1}{2}}$ , 5-6, 18-22 † . . . . 1. *L. niloticus*, Forsk., p. 304.
- D. III 12-14, upper edge straight or convex ;
- Sc. 40-44  $\frac{7-7\frac{1}{2}}{6\frac{1}{2}-8\frac{1}{2}}$ , 4-5, 16-20 . . . . . 2. *L. horie*, Heck., p. 306.
2. Dorsal with 11-15 branched rays, longest ray much longer than head ;
- Sc. 36-40  $\frac{5\frac{1}{2}-6\frac{1}{2}}{5\frac{1}{2}-7\frac{1}{2}}$ .
- D. III 12-15, upper edge straight or convex ;
- Sc. 37-40  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}}$ , 4, 16 ; depth of body  $3\frac{1}{3}$ -4 times in total length . . . . . 3. *L. senegalensis*, C. & V., p. 308.
- D. III-IV 11-13, upper edge convex ; Sc. 36-39  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ ,  $3\frac{1}{2}$ - $4\frac{1}{2}$ , 16-18 ; depth of body  $3-3\frac{1}{4}$  times in total length . . . . . 4. *L. altivelis*, Peters, p. 309.
- D. III 12, falciform, upper edge concave ;
- Sc. 36  $\frac{5\frac{1}{2}}{5\frac{1}{2}}$ ,  $3\frac{1}{2}$ , 16 ; depth of body 3 times in total length . . . . . 5. *L. weeksii*, Blgr., p. 310.
3. Dorsal with 9-12 branched rays, longest ray not much longer than head ;
- Sc. 36-41  $\frac{5\frac{1}{2}-8\frac{1}{2}}{5\frac{1}{2}-8\frac{1}{2}}$ .
- a. Depth of body  $3-3\frac{1}{2}$  times in total length ; caudal peduncle as long as deep or deeper than long.
- D. III 9-12, upper edge not or but feebly notched ; Sc. 36-37  $\frac{5\frac{1}{2}-6\frac{1}{2}}{5\frac{1}{2}-6\frac{1}{2}}$ , 3, 16-18. . . . 6. *L. lineatus*, Blgr., p. 311.
- D. III 11-12, upper edge notched ; Sc. 38-39  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 5, 18 . . . . . 7. *L. rosæ*, Stdr., p. 312.
- b. Depth of body  $3\frac{1}{2}-4\frac{1}{4}$  times in total length ; caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep.
- D. III 10-12, upper edge notched ; Sc. 38-40  $\frac{6\frac{1}{2}}{6\frac{1}{2}-7}$ , 4-5, 16-18. . . . . 8. *L. mesops*, Gthr., p. 313.
- D. III 9-10, upper edge notched ; Sc. 40-41  $\frac{8\frac{1}{2}-9\frac{1}{2}}{8\frac{1}{2}}$ , 4-5, 18-22 . . . . . 9. *L. ruddi*, Blgr., p. 314.

\* These plicæ, formed of confluent papillæ, must not be confounded with the ridge of the mouth proper, with which, when present, they run parallel.

† The figures following those of the transverse series refer to the number of scales between lateral line and ventral fin and round caudal peduncle.

B. Inner surface of lips bearing transverse plicæ formed by series of papillæ.

1. Eyes perfectly lateral, visible from above and from below, or nearly perfectly lateral.

a. Dorsal fin with straight or convex upper edge (or slightly concave in the young).

α. No barbel.

D. III 12-13; Sc. 36-38  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 4, 16; caudal

peduncle nearly twice as deep as long . . . 10. *L. velifer*, Blgr., p. 315.

β. A small barbel.

D. III 12-13; Sc. 37  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4, 16; caudal peduncle

much deeper than long . . . . . 11. *L. longipinnis*, Blgr., p. 316.

D. III 11-14; Sc. 36-40  $\frac{6\frac{1}{2}-7\frac{1}{2}}{6\frac{1}{2}-8\frac{1}{2}}$ , 4-5 $\frac{1}{2}$ , 16-18;

caudal peduncle as long as deep or a little

deeper than long . . . . . 12. *L. coubie*, Rüpp., p. 317.

D. IV 11; Sc. 38-39  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4 $\frac{1}{2}$ , 16; caudal

peduncle as long as deep . . . . . 13. *L. congoro*, Peters, p. 319.

b. Dorsal with concave upper edge.

α. Depth of body not 4 times in total length.

D. III 11-12; Sc. 39-40  $\frac{7\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 5, 16-18;

diameter of eye 2 $\frac{1}{2}$ -3 times in interorbital

width . . . . . 14. *L. neumanni*, Blgr., p. 320.

D. III 10-11; Sc. 35-37  $\frac{5\frac{1}{2}-6\frac{1}{2}}{7\frac{1}{2}}$ , 4, 16; diameter

of eye not twice in interorbital width . . . 15. *L. gregorii*, Gthr., p. 321.

β. Depth of body at least 4 times in total length.

D. III 10; Sc. 36-39  $\frac{6\frac{1}{2}}{6\frac{1}{2}}$ , 4-5, 16-20; diameter

of eye 2 $\frac{1}{4}$  times in interorbital width . . . 16. *L. darlingi*, Blgr., p. 321.

D. III 9-10; Sc. 38-39  $\frac{6\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ , 4 $\frac{1}{2}$ -5, 16-18;

diameter of eye at least 3 times in inter-

orbital width . . . . . 17. *L. victorianus*, Blgr., p. 322.

2. Eyes supero-lateral, entirely or nearly entirely visible from above.

a. Dorsal with straight or convex or slightly concave upper edge; caudal peduncle not longer than deep. [p. 323.]

D. IV 10; Sc. 36  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4, 16 . . . . . 18. *L. fuelleborni*, Hilg. & Papp.,

D. III-IV 9-11; Sc. 32-34  $\frac{4\frac{1}{2}}{6\frac{1}{2}}$ , 3, 12 . . . . . 19. *L. brachypoma*, Gthr., p. 324.

D. III 10; Sc. 38-39  $\frac{6\frac{1}{2}-7\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ , 4, 16-18 . . . . . 20. *L. macrostoma*, Blgr., p. 325.

b. Dorsal with concave upper edge, with 11 or 12 branched rays; caudal peduncle as long as deep.

Sc. 35-38  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4, 16 . . . . . 21. *L. cyclophynchus*, Blgr., p. 326.

c. Dorsal with concave upper edge, with 8-11 branched rays.

α. 20-22 scales round caudal peduncle.

D. III 11; Sc. 39  $\frac{7\frac{1}{2}-8\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 5, 20; caudal peduncle

deeper than long . . . . . 22. *L. fulcipinnis*, Blgr., p. 327

- D. III 10; Sc. 39  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4, 22; caudal peduncle longer than deep. . . . . 23. *L. kirkii*, Blgr., p. 328.  
 β. 16-18 scales round caudal peduncle.  
 \* Caudal peduncle longer than deep.
- D. III 9-11; diameter of eye  $5\frac{1}{2}$ -8 times in length of head; Sc. 38-42  $\frac{6\frac{1}{2}-7\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ , 4-5, 16-18 . . . . . 24. *L. forskalii*, Rüpp., p. 329.
- D. III 8-10; diameter of eye 4-7 times in length of head; Sc. 35-39  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 3-4, 16-18 . . . . . 25. *L. cylindricus*, Peters, p. 331.  
 \*\* Caudal peduncle as long as deep or little deeper than long;  
 D. III 10; Sc. 37-39  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4, 16.
- Diameter of eye 7 times in length of head in adult; snout pointed, ending in a turned-up appendage. . . . . 26. *L. nasus*, Blgr., p. 333.
- Diameter of eye 4-5 $\frac{1}{2}$  times in length of head; snout obtusely pointed . . . . . 27. *L. greenii*, Blgr., p. 334.  
 γ. 12 scales round caudal peduncle; D. III 10 (rarely 9 or 11).  
 \* Caudal peduncle 1 $\frac{1}{3}$ -1 $\frac{2}{3}$  times as long as deep; Sc. 34-39  $\frac{4\frac{1}{2}-5\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ .
- Head 1 $\frac{1}{2}$  times as long as broad; 4 series of scales between lateral line and ventral. . . . . 28. *L. lukulæ*, Blgr., p. 335.
- Head 1 $\frac{1}{4}$ -1 $\frac{1}{3}$  times as long as broad; 3 series of scales between lateral line and ventral. . . . . 29. *L. annectens*, Blgr., p. 336.  
 \*\* Caudal peduncle not or but slightly longer than deep; Sc. 33-35  $\frac{4\frac{1}{2}}{5\frac{1}{2}-6\frac{1}{2}}$ , 2 $\frac{1}{2}$ -3, 12.
- Longest ray of dorsal 1 $\frac{2}{3}$ -1 $\frac{3}{4}$  times as long as head; diameter of eye 2 $\frac{3}{4}$ -3 times in interorbital width . . . . . 30. *L. chariensis*, Pellegr., p. 337.
- Longest ray of dorsal as long as or a little shorter than head; diameter of eye 1 $\frac{2}{3}$ -2 times in interorbital width. . . . . 31. *L. parvus*, Blgr., p. 337.
- Longest ray of dorsal as long as or a little longer than head; diameter of eye 1 $\frac{1}{4}$ -1 $\frac{1}{2}$  times in interorbital width. . . . . 32. *L. obscurus*, Pellegr., p. 338.
- II. Two barbels on each side; dorsal with concave upper edge.  
 A. Eyes perfectly lateral, or nearly perfectly lateral; barbels not longer than eye.
- D. III 8-10; Sc. 58-65  $\frac{13\frac{1}{2}-15\frac{1}{2}}{15\frac{1}{2}-16\frac{1}{2}}$ , 9-10, 30-34 . . . . . 33. *L. umbratus*, A. Smith, p. 339.
- D. IV 10-11; Sc. 44-50  $\frac{8\frac{1}{2}-9\frac{1}{2}}{10\frac{1}{2}-11\frac{1}{2}}$ , 6-7, 20-24 . . . . . 34. *L. capensis*, A. Smith, p. 340.
- D. IV 10; Sc. 36  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4, 16 . . . . . 35. *L. ansorgii*, Blgr., p. 341.
- B. Eyes supero-lateral; barbels longer than eye in the adult.
- D. III 10-11; Sc. 40-41  $\frac{7\frac{1}{2}-8\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 6, 20-22 . . . . . 36. *L. barbatus*, Blgr., p. 342.

## 1. LABEO NILOTICUS.

*Cyprinus niloticus*, Forskål, Descr. Anim. p. 71 (1775); Geoffr. Descr. Egypte, Poiss. pl. ix. fig. 2 (1809).

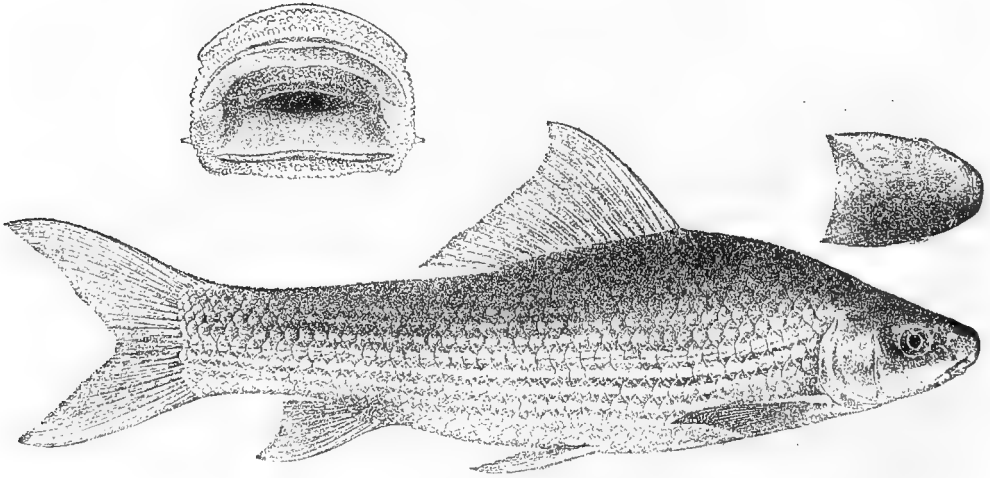
*Labeo niloticus*, I. Geoffr. op. cit. p. 282 (1827); Vincig. Ann. Mus. Genova, xxxix. 1898, p. 259; Bouleng. Fish. Nile, p. 163, pl. xxvii. fig. 1 (1907).

*Labeo niloticus*, part., Cuv. & Val. Hist. Poiss. xvi. p. 338 (1842); Günth. Cat. Fish. vii. p. 47 (1868), and Petherick's Trav. ii. p. 259 (1869).

*Labeo vulgaris*, Heckel, Russegger's Reise Egypt. iii. p. 303, pl. xx. fig. 3 (1846).

Body strongly compressed, its depth  $3\frac{1}{4}$  (adult) to  $4\frac{1}{3}$  times (young) in total length. Head nearly 5 to  $5\frac{1}{4}$  times in total length in adult, 4 to  $4\frac{1}{2}$  times in young, its width  $\frac{2}{3}$  to  $\frac{3}{4}$  its length; snout broadly rounded; eye nearer end of snout than posterior border of head, perfectly lateral,  $4\frac{1}{2}$  to 6 times in length of head in adult, 3 to 4 times in young; interorbital width  $\frac{1}{2}$  to  $\frac{2}{5}$  length of head; width of mouth,

Fig. 228.



*Labeo niloticus*.  
Nile Delta (F. N.).  $\frac{1}{3}$ .

with lips,  $2\frac{2}{3}$  to 4 times in length of head; both lips with several rows of rounded or subconical papillæ, those of the outer row forming a distinct fringe; edge of rostral flap entire; a minute barbel, more or less hidden under folds of skin; tubercles on the snout, or their pore-like scars, numerous but very small. Dorsal III 14-17, equally distant from nostrils or end of snout and from caudal, upper edge usually more or less distinctly concave, rarely straight or slightly convex, last



simple ray and first branched ray usually longest and as long as or longer than head. Anal III 5, not reaching root of caudal. Pectoral nearly as long as or a little longer than head, not reaching ventral, the first ray of which falls below 6th or 7th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle but little longer than deep in adult,  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep in young. Scales 41-45  $\frac{8\frac{1}{2}-9\frac{1}{2}}{8\frac{1}{2}-10\frac{1}{2}}$ , 5-6 between lateral line and root of ventral, 18-22 (usually 20) round caudal peduncle. Greyish, brownish, olive, or steel-blue above, silvery white beneath; a more or less distinct dark bar behind the gill-opening; ill-defined dark longitudinal lines may run between the series of scales below the lateral line.

Total length 470 millim.

Nile, Blue Nile, White Nile, Lake Stephanie (Sagan River), Omo.

|                       |                             |                          |
|-----------------------|-----------------------------|--------------------------|
| 1-6, 7-20. Ad., hgr., | Lower Nile.                 | J. Petherick, Esq. (C.). |
| & yg.                 |                             |                          |
| 21, 22. Skels.        | "                           | "                        |
| 23-26. Yg.            | Near Ghet-el-Nassara,       | L. Loat, Esq. (C.).      |
|                       | L. Menzaleh.                |                          |
| 27-30. Yg.            | Bahr-el-Tavilah, L. Men-    | ..                       |
|                       | zaleh.                      |                          |
| 31-39. Ad. & hgr.     | Samannud, Damietta Nile.    | ..                       |
| 40. Ad.               | Lake Edku.                  | ..                       |
| 41, 42. Skels.        | Lower Nile.                 | ..                       |
| 43-47. Ad. & yg.      | Rosetta Nile, near Barrage. | ..                       |
| 48. Ad.               | Nile at Cairo.              | ..                       |
| 49-51. Yg.            | Canal near Cairo.           | ..                       |
| 52-55. Hgr. & yg.     | Beni Souef, Lower Nile.     | ..                       |
| 56-57. Hgr.           | Birket Karun, Fayum.        | ..                       |
| 58. Hgr.              | Bahr Selah, "               | ..                       |
| 59. Yg.               | Between Abu Tig and Assiut, | ..                       |
|                       | Lower Nile.                 |                          |
| 60, 61-77. Hgr. & yg. | Near Luxor.                 | ..                       |
| 78-97. Yg.            | Between Luxor and Assuan.   | ..                       |
| 98-105. Hgr. & yg.    | Assuan.                     | ..                       |
| 106-115. Yg.          | Near Assuan.                | ..                       |
| 116. Ad.              | Korosko, Upper Nile.        | ..                       |
| 117. Yg.              | Derr, "                     | ..                       |
| 118. Ad.              | Ibrim, "                    | ..                       |
| 119-120. Ad.          | Anebi, "                    | ..                       |
| 121. Ad.              | Wady Halfa, "               | ..                       |
| 122. Ad.              | Kosheh, "                   | ..                       |

|                     |                                      |                                                      |
|---------------------|--------------------------------------|------------------------------------------------------|
| 123, 124. Ad. & yg. | Khartum.                             | J. Petherick, Esq. (C.).                             |
| 125-130. Yg.        | Wad Medine, Blue Nile.               | L. Loat, Esq. (C.).                                  |
| 131. Yg.            | Rosaires, „                          | Capt. S. Flower (P.).                                |
| 132-134. Hgr.       | Sagan R. at Wando,<br>2800 ft.       | Mr. P. C. Zaphiro (C.);<br>W.N. McMillan, Esq. (P.). |
| 135-136. Ad.        | Ergino R. (Omo) at Malo,<br>3000 ft. | „                                                    |

## 2. LABEO HORIE.

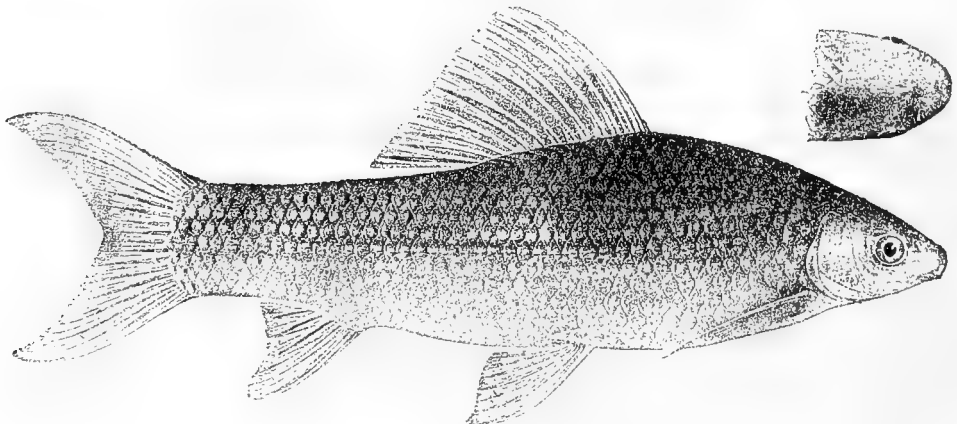
*Chondrostoma dembensis* (non Rüpp.), Cuv. & Val. Hist. Poiss. xvii. p. 398 (1844).

*Labeo horie*, Heckel. Russegger's Reise Egypt. iii. p. 304, pl. xxi. fig. 1 (1846);  
Bouleng. Fish. Nile, p. 167, pl. xxviii. & pl. xxxi. fig. 1 (1907).

*Labeo niloticus*, part., Günth. Cat. Fish. vii. p. 47 (1868), and Petherick's Trav.  
ii. p. 259 (1869).

Body strongly compressed, its depth  $3\frac{1}{3}$  to 4 times in total length. Head 5 to  $5\frac{2}{3}$  times in total length in adult, 4 to 5 times in young, its

Fig. 229.

*Labeo horie*.Upper Nile (F. N.).  $\frac{1}{2}$ .

width  $\frac{2}{3}$  to  $\frac{4}{5}$  its length; snout broadly rounded, about  $\frac{1}{3}$  length of head; eye nearly perfectly lateral, 5 to  $5\frac{2}{3}$  times in length of head in adult, 3 to 4 times in young; interorbital width  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head; width of mouth, with lips,  $2\frac{1}{2}$  to 3 times in length of head; both lips with several rows of papillæ, those of outer row long and conical and forming a strong fringe on upper lip; edge of rostral flap entire; a minute barbel hidden under folds of skin; tubercles on snout, or their pore-like scars, very small or absent. Dorsal III 12-14 (usually 13), equally distant from anterior border or centre of eye and from caudal,

its upper edge straight or slightly convex, anterior branched rays longest, always longer, and often much longer, than head. Anal III 5, often reaching root of caudal. Pectoral nearly as long as or a little longer than head, not reaching ventral, the first ray of which falls below 4th or 5th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle not or but slightly longer than deep. Scales 40-44  $\frac{7-7\frac{1}{2}}{6\frac{1}{2}-8\frac{1}{2}}$ , 4-5 between lateral line and root of ventral, 16-18 (rarely 20) round caudal peduncle. Greyish, olive, greenish brown, or steel-blue above, pale golden or silvery beneath; ill-defined, dark longitudinal lines sometimes present, running between the series of scales; young with a more or less distinct, always ill-defined, round dark spot on the side, involving the series of scales bearing the lateral line, above the pectoral fin.

Total length 570 millim.

Nile, Blue Nile, White Nile, Lake Albert.—Types in Vienna Museum.

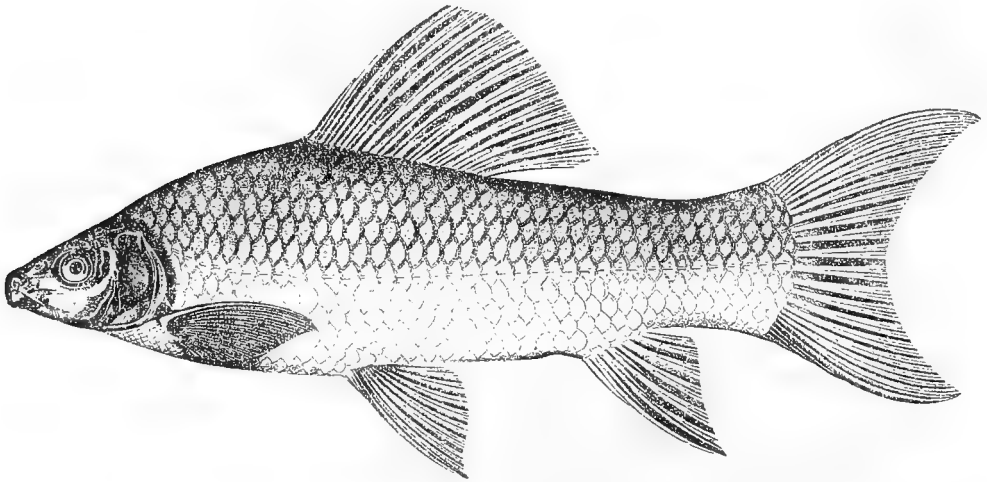
|                                |                                            |                                                       |
|--------------------------------|--------------------------------------------|-------------------------------------------------------|
| 1-3. Ad. & yg.                 | Lower Nile.                                | J. Petherick, Esq. (C.).                              |
| 4-6. Yg.                       | Near Ghet-el-Nassara,<br>L. Menzaleh.      | L. Loat, Esq. (C.).                                   |
| 7. Hgr.                        | Samannud, Damietta Nile.                   | "                                                     |
| 8-9. Hgr.                      | Rosetta Nile, near Barrage.                | "                                                     |
| 10. Skel.                      | " "                                        | "                                                     |
| 11. Yg.                        | Barrage N. of Cairo.                       | "                                                     |
| 12. Yg.                        | Near Cairo.                                | "                                                     |
| 13-15. Ad. & yg.               | Beni Souef, Lower Nile.                    | "                                                     |
| 16. Ad.                        | Bahr Selah, Fayum.                         | "                                                     |
| 17. Ad.                        | Between Assiut and Abu Tig,<br>Lower Nile. | "                                                     |
| 18-19. Yg.                     | Near Luxor.                                | "                                                     |
| 20-21. Ad.                     | Ibrim, Upper Nile.                         | "                                                     |
| 22. Hgr.                       | Upper Nile.                                | J. Petherick, Esq. (C.).                              |
| 23, 24-25. Ad., hgr.,<br>& yg. | Khartum.                                   | "                                                     |
| 26. Hgr.                       | Omdurman.                                  | L. Loat, Esq. (C.).                                   |
| 27. Hgr.                       | Wad Medine, Blue Nile.                     | "                                                     |
| 28. Hgr.                       | Fashoda, White Nile.                       | "                                                     |
| 29-34. Hgr. & yg.              | Polkom, Baro R. (Sobat).                   | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 35. Ad.                        | Mouth of Lake No, White<br>Nile.           | L. Loat, Esq. (C.).                                   |
| 36. Ad.                        | Butyaba, Lake Albert.                      | J. S. Budgett, Esq. (P.).                             |

## 3. LABEO SENEGALENSIS.

Cuv. & Val. Hist. Poiss. xvi. p. 346, pl. cccclxxxvi. (1842); Steind. Sitzb. Ak. Wien, lxi. 1870, p. 560, pl. vi. & pl. viii. fig. 1; Bouleng. Fish. Nile, p. 169 (1907).

Extremely closely related to the preceding, differing only in the larger scales, of which there are 37-40 (usually 38-39) in the lateral line, and  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}}$  in transverse series; 4 series of scales between lateral

Fig. 230.

*Labeo senegalensis.*

Senegal, after Steindachner (*l. c.*)  $\frac{1}{4}$ .

line and root of ventral, 16 round caudal peduncle. 12-15 branched rays in dorsal.

Total length 500 millim.

Senegal, Gambia, Niger, Chad Basin.—Type in Paris Museum.

|                        |                      |                                |
|------------------------|----------------------|--------------------------------|
| 1. Ad.                 | St. Louis, Senegal.  | M. P. Delhez (C.).             |
| 2-10. Ad., hgr., & yg. | Kaëdi, "             | "                              |
| 11. Ad.                | Gambia.              | J. S. Budgett, Esq. (P.).      |
| 12. Hgr.               | Lokoja, Upper Niger. | "                              |
| 13-14. Yg.             | Abo, Lower Niger.    | Dr. W. J. Ansorge (C.).        |
| 15-16. Hgr.            | Benue R., N. of Ibi. | H. L. Norton Trail, Esq. (C.). |
| 17, 18. Ad.            | Lake Chad.           | Capt. G. B. Gosling (P.).      |
| 19-20. Yg.             | Fort Lamy, Shari R.  | "                              |

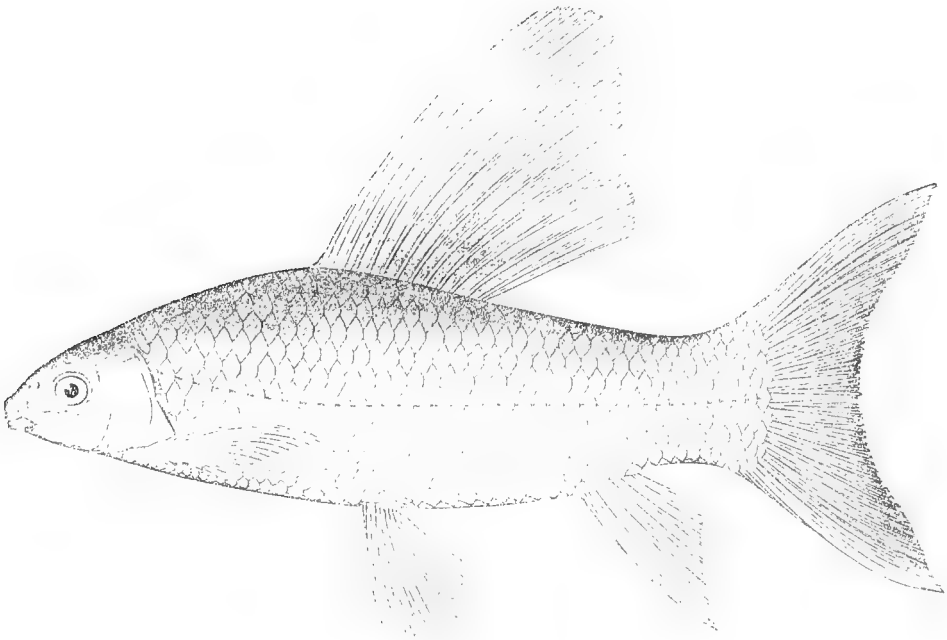
## 4. LABEO ALTIVELIS.

Peters, Mon. Berl. Ac. 1852, p. 683, and Reise Mossamb. iv. p. 43, pl. viii. (1868).

*Labeo coubie*, part., Günth. Cat. Fish. vii. p. 48 (1868).

Body strongly compressed, its depth 3 to  $3\frac{1}{4}$  times in total length. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad,  $4\frac{1}{2}$  to 5 times in total length; snout rounded, moderately prominent; eye perfectly lateral, in middle of head, 4 to 6 times in length of head; interorbital width  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head; width of mouth, with lips,  $2\frac{1}{2}$  to 3 times in length of head; both lips with several rows of papillæ, those of the outer row large and subconical, forming a strong fringe; edge of rostral flap entire; a minute barbel, hidden under folds of skin; tubercles on snout very

Fig. 231.



*Labeo altivelis*.

Type, after Peters (Reise Mossamb.).  $\frac{1}{2}$ .

small or absent. Dorsal III–IV 11–13, equally distant from head or eye and from caudal, its upper edge convex, longest rays  $1\frac{1}{2}$  to  $2\frac{1}{3}$  times length of head. Anal III 5, reaching, or nearly reaching, root of caudal. Pectoral as long as head or slightly shorter, not reaching ventral, the first ray of which falls below 3rd or 4th branched ray of dorsal. Caudal deeply emarginate, crescentic. Caudal peduncle as long as deep

or a little deeper than long. Scales 36-39  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ ,  $3\frac{1}{2}-4\frac{1}{2}$  between lateral line and root of ventral, 16-18 round caudal peduncle. Olive above, yellowish beneath, with or without pink streaks along the series of scales; fins grey.

Total length 400 millim.

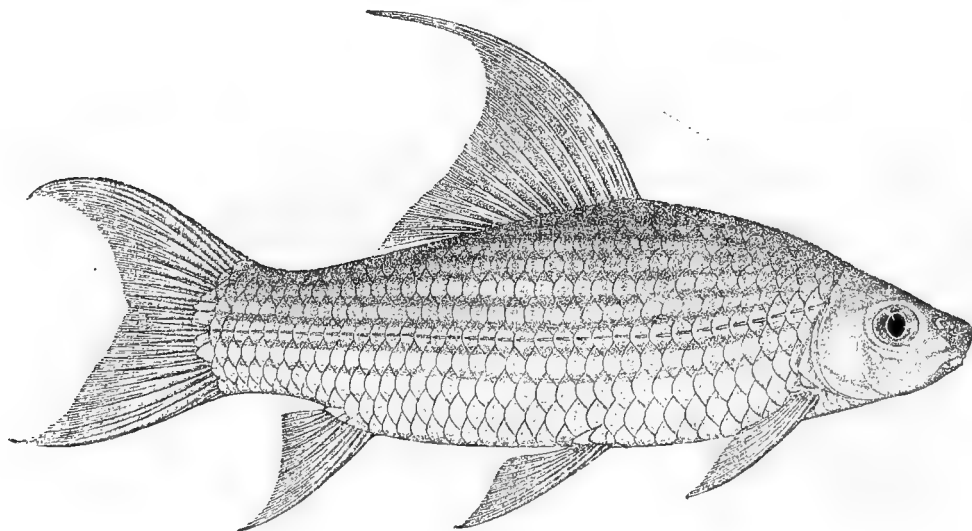
Zambesi, Lake Nyassa, Lake Bangwelu.—Type in Berlin Museum.

|                   |                   |                                              |
|-------------------|-------------------|----------------------------------------------|
| 1-3. Yg.          | Tete, Zambesi.    | Mr. C. Grant (C.);<br>C. D. Rudd, Esq. (P.). |
| 4. Ad.            | Chiromo, Shiré R. | R. MacDonald, Esq. (P.).                     |
| 5-7. Ad. & hgr.   | „ „               | C. B. C. Storey, Esq. (P.).                  |
| 8, 9. Ad., skins. | Shiré R.          | Sir J. Kirk (P.).                            |
| 10-13. Hgr.       | Lake Bangwelu.    | F. H. Melland, Esq. (P.).                    |

#### 5. LABEO WEEKSII, sp. n.

Body strongly compressed, its depth 3 times in total length. Head  $4\frac{1}{2}$  times in total length, its width  $\frac{2}{3}$  its length; snout rounded;

Fig. 232.



*Labeo weeksii.*

Type.  $\frac{1}{2}$ .

eye perfectly lateral, in middle of head,  $3\frac{1}{2}$  times in length of head,  $1\frac{3}{4}$  times in interorbital width; width of mouth, with lips,  $2\frac{2}{3}$  times in length of head; both lips with several rows of conical papillæ, the outer forming a strong fringe; edge of rostral flap entire; a minute barbel, partly hidden under folds of skin; scars of small tubercles on the snout. Dorsal III 12, equally distant from occiput and from caudal,

notched, falciform, last unbranched ray and first branched ray twice length of head. Anal III 5, reaching root of caudal. Pectoral as long as head, not reaching ventral, the first ray of which falls below second branched ray of dorsal. Caudal notched, crescentic. Caudal peduncle slightly deeper than long. Scales  $36 \frac{5\frac{1}{2}}{5\frac{1}{2}}$ ,  $3\frac{1}{2}$  between lateral line and root of ventral, 16 round caudal peduncle. Yellowish, with dark brown lines running between the series of scales.

Total length 225 millim.

Upper Congo.

1. Type.

Monsembe.

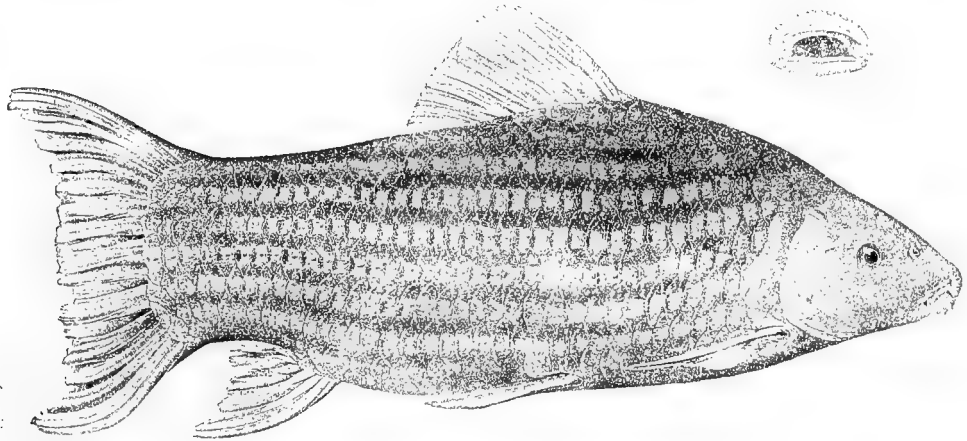
Rev. J. H. Weeks (P.).

#### 6. LABEO LINEATUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 34, pl. xviii. (1898), and Poiss. Bass. Congo, p. 213 (1901).

Body strongly compressed, its depth 3 to  $3\frac{1}{2}$  times in total length. Head 4 to 5 times in total length, its width about  $\frac{2}{3}$  its length; snout rounded; eye perfectly lateral, in middle of head or a little nearer

Fig. 233.



*Labeo lineatus.*

Type (A. M. C.).  $\frac{1}{2}$ .

posterior border,  $3\frac{1}{2}$  (young) to 6 times in length of head, 2 to  $4\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $2\frac{2}{3}$  to 3 times in length of head; both lips with several rows of conical papillæ, the outer forming a fringe; edge of rostral flap entire or feebly denticulate; a minute barbel, more or less hidden under folds of skin; tubercles on snout, or their pore-like scars, small, if present. Dorsal III 9-12, equally distant from snout or eye and from caudal, upper edge not or

but feebly notched, usually a little convex, longest ray as long as or a little longer than head. Anal II-III 5, reaching, or nearly reaching, root of caudal. Pectoral nearly as long as head, not reaching ventral, the first ray of which falls below 2nd, 3rd, or 4th branched ray of dorsal. Caudal emarginate, crescentic. Caudal peduncle deeper than long. Scales 36-37  $\frac{5\frac{1}{2}-6\frac{1}{2}}{5\frac{1}{2}-6\frac{1}{2}}$ , 3 between lateral line and root of ventral, 16-18 round caudal peduncle. Body striped with dark green and pink, the pink occupying the middle of each scale; belly white; fins olive; young with sharply defined dark longitudinal lines on the body and a large black spot at the base of the caudal fin.

Total length 650 millim.

Congo.—Types in Congo Museum, Tervueren.

|                           |                                           |                          |
|---------------------------|-------------------------------------------|--------------------------|
| 1. Ad., one of the types. | Matadi, Lower Congo.                      | Capt. Wilverth (C.).     |
| 2-3. Ad. & yg.            | Boma, „                                   | M. P. Delhez (C.).       |
| 4. Yg., one of the types. | New Antwerp, Upper Congo.                 | Capt. Wilverth (C.).     |
| 5, 6-7, 8. Ad. & yg.      | Monsembe, Upper Congo.                    | Rev. J. H. Weeks (P.).   |
| 9. Ad., one of the types. | Stanley Falls.                            | Rev. W. H. Bentley (C.). |
| 10. Yg.                   | Upper Congo.                              | Brussels University.     |
| 11. Yg.                   | Banzville, Ubanghi.                       | Capt. Royaux (C.).       |
| 12. Hgr.                  | Kwango R., at Fort Don Carlos I., Angola. | Dr. W. J. Ansorge (C.).  |

#### 7. LABEO ROSÆ.

Steind. Sitzb. Ak. Wien, ciii. i. 1894, p. 457, pl. v. fig. 1.

Body strongly compressed, its depth 3 to  $3\frac{1}{2}$  times in total length. Head  $4\frac{1}{2}$  to 5 times in total length, its width about  $\frac{2}{3}$  its length; snout rounded; eye perfectly lateral, in middle of head, 4 to  $4\frac{1}{2}$  times in length of head, about  $\frac{1}{2}$  interorbital width; width of mouth, with lips, 3 times in length of head; both lips with several rows of conical papillæ, the outer forming a fringe; edge of rostral flap entire; a minute barbel, more or less hidden under folds of skin; small tubercles on the snout. Dorsal III 11-12, equally distant from anterior border or centre of eye and from caudal, notched, longest ray a little longer than head. Anal III 5, nearly reaching root of caudal. Pectoral as long as head, not reaching ventral, the first ray of which falls below 3rd or 4th branched ray of dorsal. Caudal deeply notched, crescentic. Caudal peduncle as long

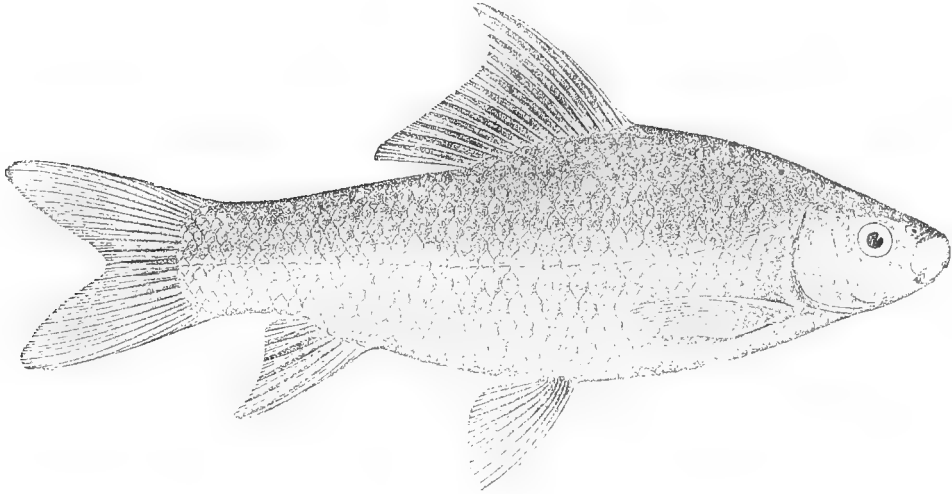


as deep. Scales 38–39  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 5 between lateral line and root of ventral, 18 round caudal peduncle. Grey above, silvery white beneath.

Total length 300 millim.

Limpopo System.—Type in Vienna Museum.

Fig. 234.



*Labeo rosee.*

Type, after Steindachner (*l. c.*).  $\frac{3}{4}$ .

1–2. Ad.

Klein Letaba R., tributary of  
Olifant R., Transvaal.

Mr. C. Grant (C.);

C. D. Rudd, Esq. (P.).

#### 8. LABEO MESOPS.

Günth. Cat. Fish. vii. p. 51 (1868).

*Labeo coubie*, part., Günth. t. c. p. 48.

Body strongly compressed, its depth  $3\frac{1}{2}$  to  $4\frac{1}{4}$  times in total length. Head 4 to 5 times in total length, its width  $\frac{2}{3}$  its length; snout rounded; eye perfectly lateral, in middle of head,  $4\frac{1}{2}$  to 5 times in length of head; interorbital width  $\frac{2}{5}$  length of head; width of mouth, with lips,  $2\frac{1}{2}$  to 3 times in length of head; both lips with several rows of papillæ, those of the outer row conical and forming a fringe; edge of rostral flap entire; a minute barbel hidden under folds of skin; tubercles on snout small. Dorsal III 10–12, equally distant from centre or anterior border of eye and from caudal, notched, longest ray as long as head. Anal III 5, not reaching caudal. Pectoral as long as head, not reaching ventral, the first ray of which falls below 4th or 5th ray of dorsal. Caudal emarginate, crescentic. Caudal peduncle  $1\frac{1}{2}$  times as long as

deep. Scales 38-40  $\frac{6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 4-5 between lateral line and root of caudal, 16-18 round caudal peduncle. Olive-brown above, lighter beneath.

Total length 390 millim.

Lake Nyassa and Shiré River.

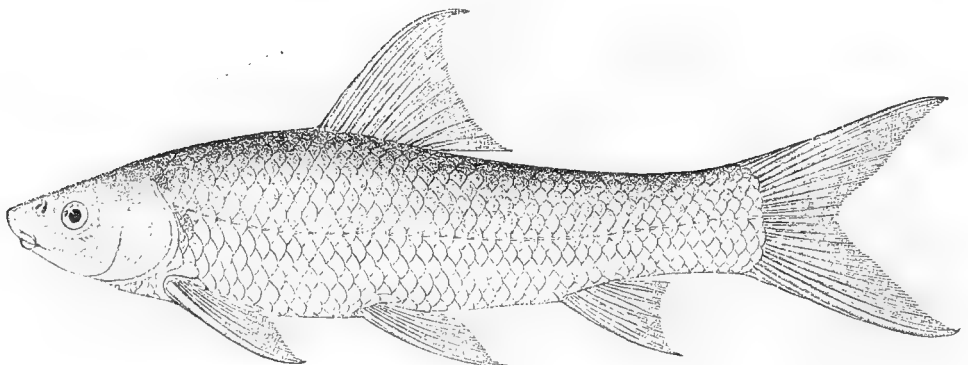
|                |                                      |                                                     |
|----------------|--------------------------------------|-----------------------------------------------------|
| 1. Skin, type. | Pomolombe Lake, near<br>Lake Nyassa. | Sir J. Kirk (P.).                                   |
| 2. Ad., skin.  | Shiré River.                         | Dr. C. Livingstone (C.).                            |
| 3. Yg., skin.  | "                                    | Sir J. Kirk (P.).                                   |
| 4. Ad., skin.  | Upper Shiré River.                   | A. Whyte, Esq. (C.);<br>Sir H. H. Johnston (P.).    |
| 5-6. Ad.       | " "                                  | Dr. Percy Randall (C.);<br>Sir H. H. Johnston (P.). |
| 7. Ad.         | Lake Nyassa.                         | Prof. J. E. S. Moore (C.).                          |
| 8. Ad.         | "                                    | Capt. E. L. Rhoades (P.).                           |

### 9. LABEO RUDDI.

Bouleng. Ann. & Mag. N. H. (7) xix. 1907, p. 392.

Body strongly compressed, its depth  $3\frac{2}{3}$  to  $4\frac{1}{4}$  times in total length. Head  $4\frac{1}{3}$  to  $4\frac{1}{2}$  times in total length; snout rounded,  $\frac{1}{3}$  length of head;

Fig. 235.



*Labeo ruddi.*

Dwaars R.  $\frac{1}{2}$ .

eye perfectly lateral,  $4\frac{1}{2}$  to 5 times in length of head; interorbital width  $\frac{1}{2}$  length of head; width of mouth, with lips,  $3\frac{1}{2}$  times in length of head; both lips with a fringe of conical papillæ; edge of rostral flap entire; barbels absent or very minute; tubercles on snout small and few, if present. Dorsal III 9-10, equally distant from anterior border of eye and from caudal, upper edge concave, longest ray as long as or a little longer than head. Anal III 5, not reaching caudal. Pectoral a

little shorter than head, not reaching ventral, which is inserted below middle of dorsal. Caudal deeply notched, crescentic. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep. Scales 40-41  $\frac{8\frac{1}{2}-9\frac{1}{2}}{8\frac{1}{2}}$ , 4-5 between lateral line and ventral, 18-22 round caudal peduncle. Dark olive-brown above, whitish beneath.

Total length 260 millim.

Limpopo System.

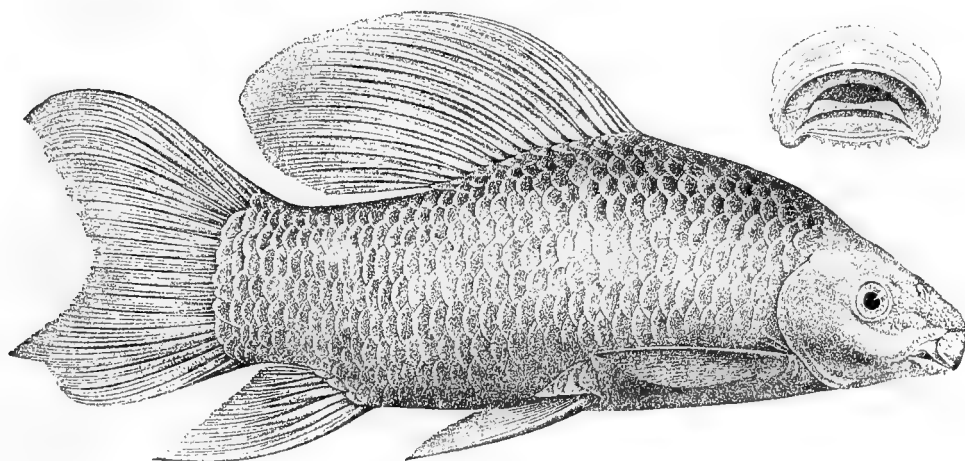
- |             |                                                      |                                              |
|-------------|------------------------------------------------------|----------------------------------------------|
| 1-4. Types. | Klein Letaba, tributary of<br>Olifant R., Transvaal. | Mr. C. Grant (C.);<br>C. D. Rudd, Esq. (P.). |
| 5. Ad.      | Dwaars R., Transvaal.                                | Dr. J. D. F. Gilchrist (P.).                 |

10. LABEO VELIFER.

Bouleng. Ann. Mus. Congo, Zool. i. p. 34, pl. xvi. (1898), and Poiss. Bass. Congo, p. 211 (1901).

Body strongly compressed, its depth  $2\frac{1}{3}$  to  $2\frac{2}{3}$  times in total length. Head 4 to  $4\frac{1}{3}$  times in total length, nearly as broad as long; snout broad, rounded; eye perfectly lateral, in middle of head,  $4\frac{1}{2}$  to 5 times in length

Fig. 236.



*Labeo velifer.*

Type (A. M. C.).  $\frac{1}{3}$ .

of head, 4 to  $4\frac{1}{2}$  times in interorbital width; width of mouth, with lips, nearly half length of head; lips with plicæ on inner surface, upper entire, lower with papillæ forming a fringe; edge of rostral flap denticulate; no barbel; snout with numerous tubercles. Dorsal III 12-13, equally distant from head and from caudal, very convex, longest rays much longer than head. Anal II 5, extending much beyond root

of caudal. Pectoral as long as head, reaching or narrowly separated from ventral, the first ray of which falls below 2nd or 3rd branched ray of dorsal. Caudal notched. Caudal peduncle nearly twice as deep as long. Scales 36–38  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Olive-brown.

Total length 420 millim.

Congo.—Types in Congo Museum, Tervueren.

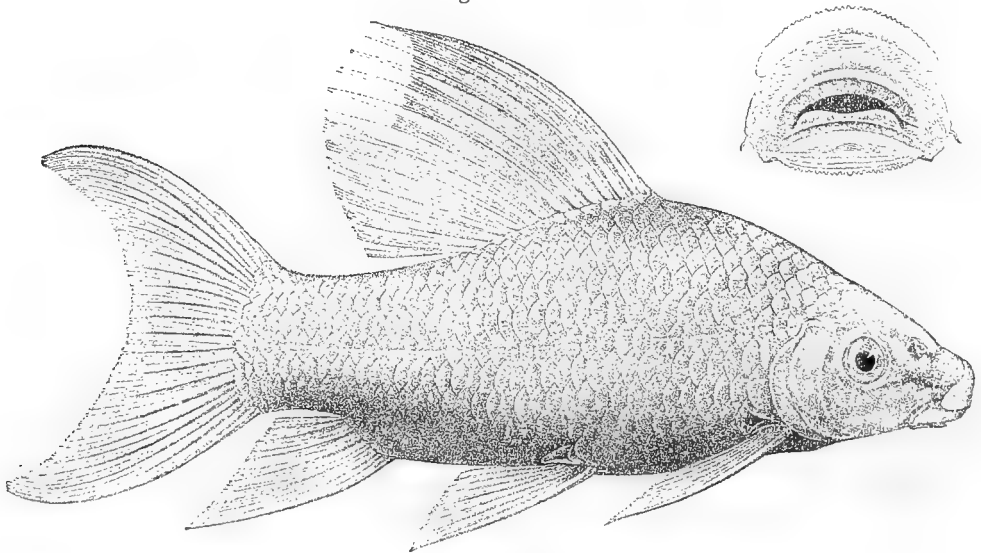
- |                      |                           |                        |
|----------------------|---------------------------|------------------------|
| 1. One of the types. | New Antwerp, Upper Congo. | Capt. Wilverth (C.).   |
| 2. Ad.               | Monsembe, „               | Rev. J. H. Weeks (P.). |

#### 11. LABEO LONGIPINNIS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 33, pl. xvii. fig. 1 (1898), and Poiss. Bass. Congo, p. 212 (1901).

Body strongly compressed, its depth  $2\frac{1}{2}$  to nearly 3 times in total length. Head 4 times in total length,  $\frac{3}{4}$  as broad as long; snout broad,

Fig. 237.



*Labeo longipinnis.*

Type (A. M. C.).  $\frac{5}{7}$ .

rounded; eye perfectly lateral, in middle of head,  $4\frac{1}{2}$  to 5 times in length of head,  $3\frac{1}{3}$  to 4 times in interorbital width; width of mouth, with lips, nearly twice in length of head; lips with plicæ on inner surface, upper entire, lower bordered by a series of conical papillæ; edge of rostral flap denticulate; a small barbel hidden under folds of skin; snout with numerous tubercles. Dorsal III 12–13, equally

distant from occiput and from caudal, convex, longest rays much longer than head. Anal II 5, extending much beyond root of caudal. Pectoral as long as head, reaching ventral, the first ray of which falls under 3rd or 4th branched ray of dorsal. Caudal notched, crescentic. Caudal peduncle deeper than long. Scales  $37\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Dark purple, scales edged with dark green.

Total length 170 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

## 12. LABEO COUBIE.

Rüpp. Fortsetz. Beschr. n. Fische Nil, p. 11, pl. iii. fig. 1 (1832); Cuv. & Val. Hist. Poiss. xvi. p. 344 (1843); Bouleng. Fish. Nile, p. 170, pls. xxix., xxx., & xxxi. fig. 2 (1907).

*Labeo niloticus*, part., Cuv. & Val. t. c. p. 338.

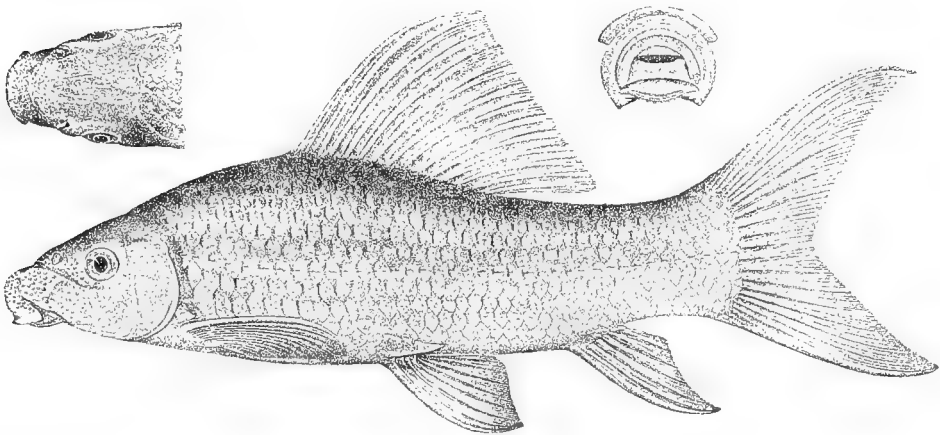
*Labeo selti*, Cuv. & Val. t. c. p. 345; Steind. Sitzb. Ak. Wien, lxi. i. 1870, p. 562, pl. vii. fig. 1.

*Labeo niloticus*, Heckel, Russegger's Reise Egypt. iii. p. 300, pl. xx. fig. 1 (1846); Peters, Reise Mossamb. iv. p. 46 (1868).

*Labeo coubie*, part., Günth. Cat. Fish. vii. p. 48 (1868), and Petherick's Trav. ii. p. 260 (1869).

? *Labeo steindachneri*, Pfeff. Thierw. O.-Afr., Fische, p. 51 (1896).

Fig. 238.



*Labeo coubie.*

Upper Nile (F. N.).  $\frac{1}{3}$ .

Body strongly compressed, its depth 3 to  $3\frac{2}{3}$  times in total length. Head  $4$  to  $4\frac{3}{4}$  times in total length in adult, 3 to 4 times in young, its width  $\frac{2}{5}$  to  $\frac{3}{4}$  its length; snout rounded, often more or less swollen,  $\frac{2}{5}$  to

$\frac{1}{2}$  length of head, at least as long as and often longer than postocular part of head; eye nearly perfectly lateral,  $4\frac{1}{2}$  to 7 times in length of head in adult, 3 to 4 times in young; interorbital width  $\frac{1}{2}$  to  $\frac{2}{5}$  length of head; width of mouth, with lips, 2 to 3 times in length of head; lips not distinctly fringed on the edge, with small papillæ forming transverse plicæ on inner side; rostral flap large, completely detached at the sides, its edge entire or feebly denticulate; a minute barbel, usually hidden under folds of skin; tubercles on the snout, or their crater-like scars, much developed in adult. Dorsal III 12-13 (rarely 11 or 14), equally distant from anterior or posterior border of the eye and caudal, its upper edge straight or more or less convex in adult, straight or slightly concave in young; except in very young specimens, longest rays more or less exceeding length of head. Anal III 5, reaching root of caudal, or beyond. Pectoral nearly as long as or a little longer than head, not reaching ventral, the first ray of which falls below 4th or 5th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle as long as deep or a little deeper than long. Scales 36-40  $\frac{6\frac{1}{2}-7\frac{1}{2}}{6\frac{1}{2}-8\frac{1}{2}}$ , 4-5 $\frac{1}{2}$  between lateral line and root of ventral, 16-18 round caudal peduncle. Brown or brownish olive above, the scales often darker at the base, with or without a very indistinct darker lateral band; young often with dark longitudinal lines running between the series of scales, and constantly with a large round dark blotch on the caudal peduncle.

Total length 430 millim.

Lower Nile to Victoria Nile; Senegal to Old Calabar; Kingani R. (?).—Types in Senckenberg Museum, Frankfort (M.).

|                        |                               |                          |
|------------------------|-------------------------------|--------------------------|
| 1. One of the types.   | Cairo.                        | Dr. Rüppell (C.).        |
| 2. Hgr.                | Beni Souef, Lower Nile.       | L. Loat, Esq. (C.).      |
| 3. Yg.                 | Near Luxor.                   | "                        |
| 4-5. Yg.               | Assuan.                       | "                        |
| 6. Ad.                 | Abu Hoor, Upper Nile.         | "                        |
| 7-13. Ad., hgr., & yg. | Near Kosheh, "                | "                        |
| 14. Skel.              | " "                           | "                        |
| 15. Ad.                | Hannek, Third Cataract.       | "                        |
| 16-23. Hgr. & yg.      | Khartum.                      | J. Petherick, Esq. (C.). |
| 24. Hgr.               | Sennar, Blue Nile.            | L. Loat, Esq. (C.).      |
| 25. Yg.                | Mouth of Lake No, White Nile. | "                        |
| 26. Hgr.               | Gondokoro, Bahr-el-Gebel.     | J. Petherick, Esq. (C.). |
| 27. Yg.                | " "                           | L. Loat, Esq. (C.).      |

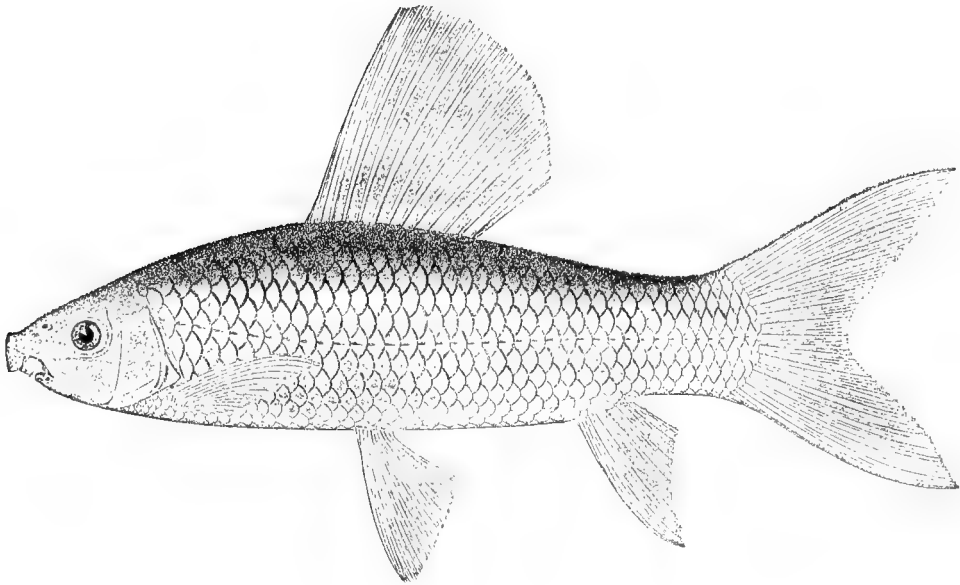
|                   |                       |                                 |
|-------------------|-----------------------|---------------------------------|
| 28. Ad.           | Fajao, Victoria Nile. | J. S. Budgett, Esq. (P.).       |
| 29-31. Ad. & yg.  | McCarthy Id., Gambia. | „                               |
| 32. Yg.           | Jebba, Upper Niger.   | Dr. C. Christy (P.).            |
| 33. Ad.           | Mureji, „             | J. S. Budgett, Esq. (P.).       |
| 34-35. Yg.        | Abo, Lower Niger.     | Dr. W. J. Ansorge (C.).         |
| 36-41. Yg.        | Agberi, „             | „                               |
| 42-44. Hgr. & yg. | Benue R., N. of Ibi.  | H. L. Norton Traill, Esq. (C.). |
| 45-46. Hgr.       | Warri, Old Calabar.   | Miss Kingsley (C.).             |

13. LABEO CONGORO.

Peters, Mon. Berl. Ac. 1852, p. 683, and Reise Mossamb. iv. p. 45, pl. ix. (1868).

General proportions and structure of mouth as in *L. coubie*. Dorsal IV 11, longest rays about once and  $\frac{1}{2}$  length of head. Scales 38-39  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ ,

Fig. 239.



*Labeo congoro.*

Type, after Peters (Reise Mossamb.).  $\frac{1}{2}$ .

$4\frac{1}{2}$  between lateral line and root of caudal, 16 round caudal peduncle. Golden above, darker on the back, silvery white beneath; dorsal bluish black, anal and caudal reddish black.

Total length 330 millim.

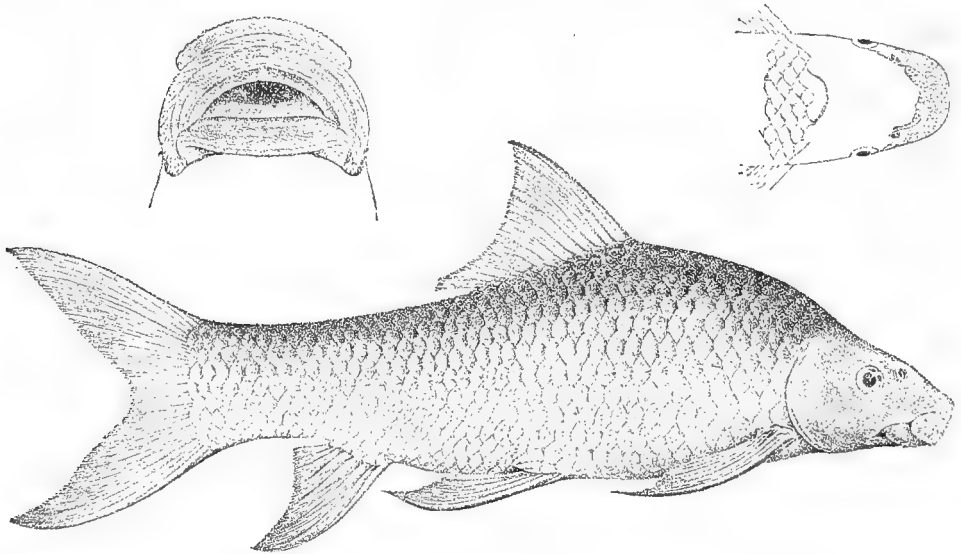
Zambesi.—Types in Berlin Museum.

## 14. LABEO NEUMANNI.

Bouleng. Proc. Zool. Soc. 1903, ii. p. 329, pl. xxix.

Body strongly compressed, its depth  $3\frac{1}{4}$  to  $3\frac{3}{4}$  times in total length. Head  $4\frac{1}{3}$  to  $4\frac{3}{4}$  times in total length,  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as broad; snout rounded, its length  $\frac{2}{3}$  to a little less than  $\frac{1}{2}$  that of head; eye perfectly lateral,  $4\frac{1}{3}$  to  $5\frac{1}{2}$  times in length of head; interorbital width  $\frac{1}{2}$  length of head; width of mouth, with lips,  $\frac{2}{3}$  to  $\frac{1}{2}$  length of head; lips with small papillæ forming transverse plicæ; lower lip with a fringe of conical papillæ; rostral flap large, with denticulate edge; a minute barbel in the corner of the mouth, hidden under folds of skin. Dorsal

Fig. 240.



*Labeo neumanni.*

Type (P. Z. S. 1903).  $\frac{5}{7}$ .

III 11-12, a little nearer end of snout than caudal, its upper edge concave, longest ray as long as or slightly longer than head. Anal III 5, reaching or nearly reaching root of caudal. Pectoral as long as or a little longer than head, not quite reaching ventral, the first ray of which falls below 4th or 5th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as deep. Scales 39-40  $\frac{7\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 5 between lateral line and root of ventral, 16-18 round caudal peduncle. Olive above, whitish beneath; fins greyish.



Total length 320 millim.

Modjo and Wabbi Rivers (Webi Shebeli), S. Ethiopia.

1-2. Types.

Modjo R.

Prof. O. Neumann and

Baron C. von Erlanger (C.).

15. LABEO GREGORII.

Günth. Proc. Zool. Soc. 1894, p. 90, pl. x. fig. B.

*Labeo bottegi*, Vincig. Ann. Mus. Genova, (2) xvii. 1897, p. 358.

Body strongly compressed, its depth  $3\frac{1}{4}$  to  $3\frac{1}{2}$  times in total length. Head 4 to  $4\frac{1}{4}$  times in total length,  $1\frac{1}{2}$  times as long as broad; snout obliquely truncate, strongly projecting; eye perfectly lateral, in middle of head, 3 to  $3\frac{1}{2}$  times in length of head,  $1\frac{1}{2}$  to  $1\frac{3}{8}$  times in interorbital width; lips with small papillæ forming transverse plicæ; lower lip with a fringe of conical papillæ; rostral flap with entire edge; a small barbel, hidden in folds of skin; small tubercles on snout. Dorsal III 10-11, equally distant from centre or anterior border of eye and from caudal, upper edge concave, longest ray as long as head. Anal III 5, reaching root of caudal. Pectoral as long as head, not reaching ventral, the first ray of which falls below 5th branched ray of dorsal. Caudal deeply notched, crescentic. Caudal peduncle slightly longer than deep. Scales 35-37  $\frac{5\frac{1}{2}-6\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Silvery, brownish on the back.

Total length 125 millim.

Tana and Rovuma Rivers, East Africa.

1. Type.

Tana R. at Merifano.

Prof. J. W. Gregory (P.).

2, 3. Yg.

Rovuma R.

Sir J. Kirk (P.).

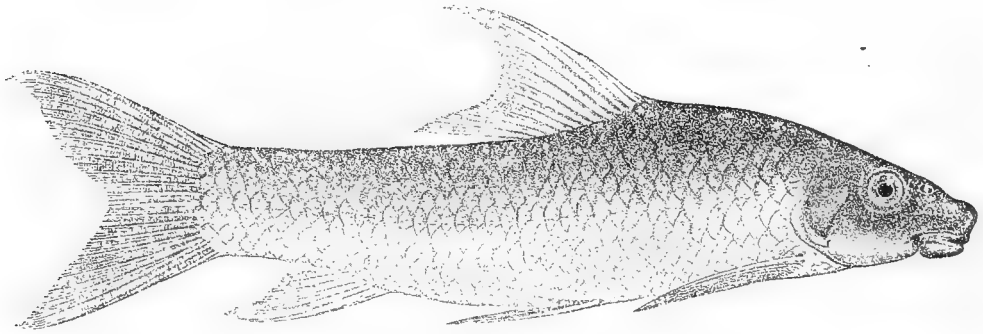
16. LABEO DARLINGI.

Bouleng. Proc. Zool. Soc. 1902, ii. p. 13, pl. ii. fig. 1.

Body strongly compressed, its depth nearly equal to length of head and contained 4 times in total length. Head  $1\frac{1}{2}$  times as long as broad; snout rounded, strongly projecting beyond mouth, with scars of small tubercles; eye nearly perfectly lateral, in middle of head, its diameter  $4\frac{1}{2}$  times in length of head,  $2\frac{1}{4}$  times in width of interorbital region, which is flat; width of mouth, with lips,  $\frac{2}{3}$  that of head; rostral flap and anterior border of lip not denticulated; lower lip with a series of papillæ forming a denticulation; inner surface of lip with numerous transverse plicæ, formed of closely-set obtuse papillæ; a minute barbel, hidden in folds at side of mouth. Dorsal II 10, with strongly

notched upper border, equally distant from nostril or end of snout and from caudal; longest ray equal to or exceeding length of head. Anal II 5, longest ray nearly as long as the head and reaching root of caudal. Pectoral as long as head, not reaching ventral. Ventral nearly reaching vent, first ray falling under 7th of dorsal. Caudal deeply forked. Caudal peduncle scarcely longer than deep. Scales

Fig. 241.

*Labeo darlingi.*Type (P. Z. S. 1902).  $\frac{5}{7}$ .

36–39  $\frac{6\frac{1}{2}}{6\frac{1}{2}}$ , 4–5 between the lateral line and root of ventral, 16–20 round caudal peduncle. Olive-brown above, whitish beneath; fins dark.

Total length 160 millim.

Zambesi (Mazoe River) and Limpopo (Olifants River) Systems.

- |          |                                                       |                                              |
|----------|-------------------------------------------------------|----------------------------------------------|
| 1. Type. | Mazoe R., near Salisbury,<br>Mashonaland.             | J. ff. Darling, Esq. (P.).                   |
| 2. Yg.   | ” ”                                                   | ”                                            |
| 3. Ad.   | Klein Letaba (affluent of<br>Olifants R.), Transvaal. | Mr. C. Grant (C.);<br>C. D. Rudd, Esq. (P.). |

#### 17. LABEO VICTORIANUS.

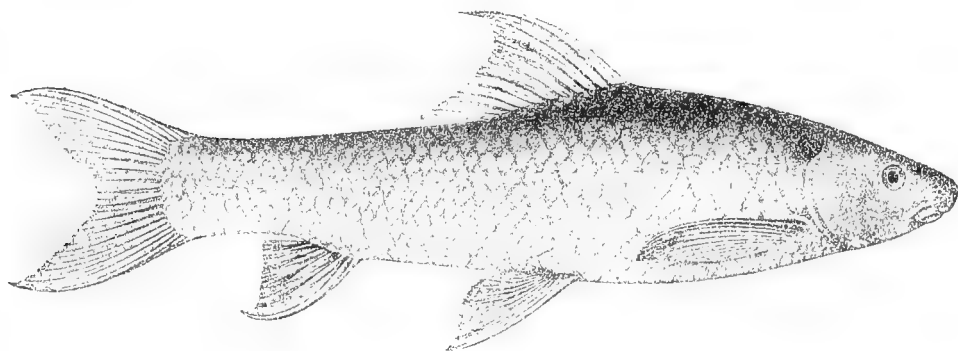
*Labeo forskalii* (non Rüpp.), Hilgend. Sitzb. Ges. naturf. Fr. Berl. 1888, p. 78.

*Labeo victorianus*, Bouleng. Proc. Zool. Soc. 1901, ii. p. 159, and Fish. Nile, p. 174, pl. xxxii. fig. 1 (1907).

Body compressed, its depth equal to or a little greater than length of head, 4 to  $4\frac{3}{4}$  times in total length. Head about  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad; snout rounded, with small horny warts in the adult, its length about  $\frac{1}{3}$  to  $\frac{2}{5}$  that of head; eye perfectly lateral, in middle or a little anterior to middle of head, 5 (young) to  $6\frac{2}{3}$  times in length of head; interorbital width  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head; width of mouth about  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head; lips not distinctly fringed on the edge with small

papillæ forming transverse plicæ on inner side; rostral flap moderately large, with entire edge; a minute barbel, hidden under folds of skin. Dorsal III 9-10, equally distant from end of snout and from caudal, or a little nearer latter, upper edge strongly concave, last simple ray longest and nearly as long as head. Anal III 5, not reaching root of caudal. Pectoral nearly as long as or a little shorter than head, not reaching

Fig. 242.

*Labeo victoriana*.Type (F. N.).  $\frac{1}{2}$ .

ventral, the first ray of which falls below 4th or 5th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle about once and  $\frac{1}{2}$  as long as deep. Scales 38-39  $\frac{6\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ ,  $4\frac{1}{2}$ -5 between lateral line and root of ventral, 16-18 round caudal peduncle. Olive or dark steel-grey above, whitish beneath; fins greyish, dorsal sometimes yellow at the base, dorsal, anal, and ventral sometimes tinged with orange; a more or less distinct black spot behind the upper part of the gill-cover.

Total length 325 millim.

Lake Victoria.

|                        |                |                          |
|------------------------|----------------|--------------------------|
| 1-3. Types.            | Lake Victoria. | Sir H. H. Johnston (P.). |
| 4. Ad.                 | Near Entebbe.  | Mrs. E. A. Minchin (P.). |
| 5. Ad.                 | Entebbe.       | Mr. E. Degen (C.).       |
| 6. Ad.                 | Kimmi Id.      | "                        |
| 7-13. Ad., hgr., & yg. | Bunjako.       | "                        |

#### 18. LABEO FUELLEBORNI.

*Labeo victoriana fuelleborni*, Hilgendorf & Pappenheim, Sitz. Ges. naturf. Fr. Berl. 1903, p. 268.

*Labeo fuelleborni*, Boulenger, Ann. & Mag. N. H. (7) xvi. 1905, p. 42.

Stated to differ from *L. victoriana* in the following points:—Head

not quite once and  $\frac{1}{2}$  as long as broad; eye more supero-lateral; width of mouth  $\frac{1}{2}$  length of head. Dorsal with straight upper edge. Caudal peduncle not longer than deep. Scales  $36\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 4 between lateral line and root of ventral. Olive, scales with dark edges forming a network; a dark spot behind the gill-opening; dorsal blackish.

Total length 300 millim.

Lake Rukwa.—Type in Berlin Museum.

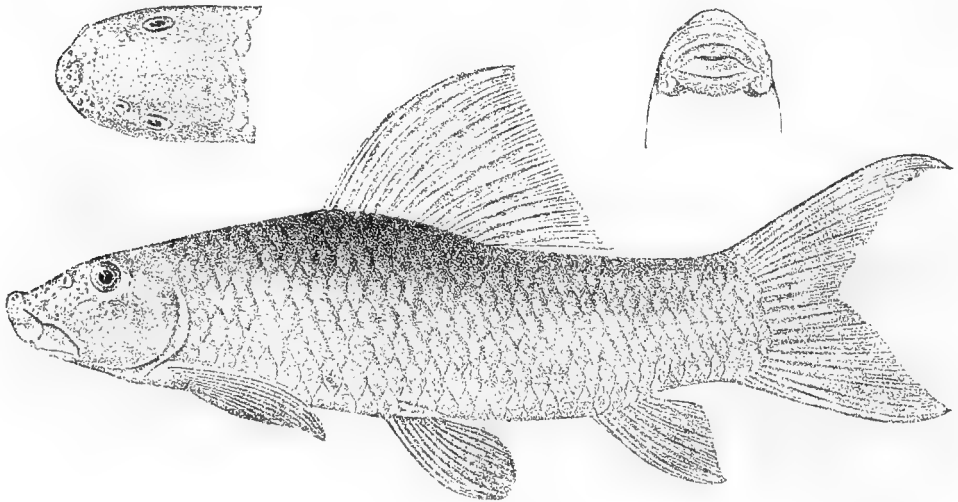
#### 19. LABEO BRACHYPOMA.

Günth. Cat. Fish. vii. p. 50 (1866); Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 261.

*Labeo walkeri*, Günth. Proc. Zool. Soc. 1902, ii. p. 338, pl. xxxiii.

Body strongly compressed, its depth 3 to  $3\frac{2}{3}$  times in total length. Head 4 to  $4\frac{1}{4}$  times in total length,  $1\frac{1}{3}$  to  $1\frac{2}{5}$  times as long as broad;

Fig. 243.



*Labeo brachypoma*.

Type of *L. walkeri*, after Günther (P. Z. S. 1902).  $\frac{5}{3}$ .

snout rounded, slightly projecting; eye supero-lateral, in second half of head, 4 to 5 times in length of head, 2 to  $2\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $\frac{1}{2}$  to  $\frac{2}{5}$  length of head; lips feebly fringed, with transverse plicæ on inner side; rostral flap entire; a small barbel, hidden in folds of skin; snout with large tubercles. Dorsal III–IV 9–11, equally distant from centre of eye or nostrils and from caudal, upper edge straight or convex. longest ray  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times length of head. Anal

II 5, reaching root of caudal. Pectoral as long as or slightly longer than head, not reaching ventral, the first ray of which falls below 3rd or 4th branched ray of dorsal. Caudal deeply notched, crescentic when fully spread out. Caudal peduncle as long as deep or slightly deeper than long. Scales 32-34  $\frac{4\frac{1}{2}}{6\frac{1}{2}}$ , 3 between lateral line and root of caudal, 12 round caudal peduncle. Dark olive-brown, lighter beneath.

Total length 290 millim.

Lagos, Gold Coast.

1-3. Ad. & hgr., types.

Lagos.

H. T. Ussher, Esq. (C.).

4-6. Hgr. & yg., types  
of *L. walkeri*.

Nyankoma, Gold Coast.

R. B. N. Walker, Esq. (C.);

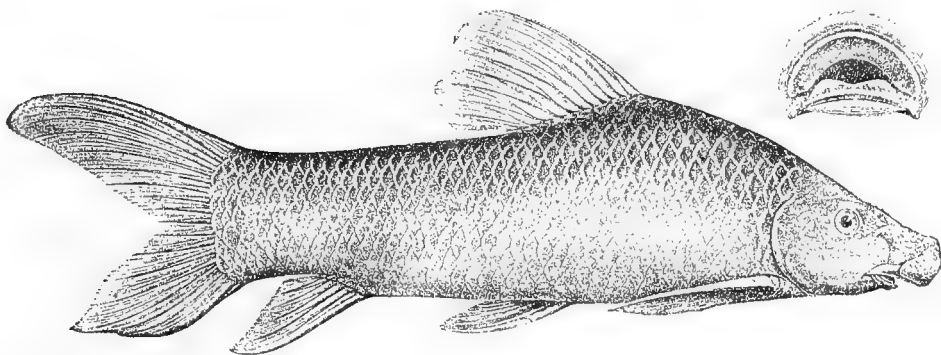
Dr. A. Günther (P.).

20. LABEO MACROSTOMA.

Bouleng. Ann. Mus. Congo, Zool. i. p. 36, pl. xix. fig. 1 (1898), and Poiss. Bass. Congo, p. 216 (1901).

Body strongly compressed, its depth  $3\frac{1}{5}$  to  $4\frac{1}{2}$  times in total length. Head 4 to  $4\frac{1}{3}$  times in total length, its width  $\frac{2}{3}$  its length; snout rather

Fig. 244.



*Labeo macrostoma*.  
Type (A. M. C.).  $\frac{1}{4}$ .

pointed, very prominent, swollen at the end in adult; eye supero-lateral, in second half of head, 4 (young) to 6 times in length of head, 2 to 4 times in interorbital width; width of mouth, with lips,  $1\frac{2}{3}$  to 2 times in length of head; upper lip entire, lower fringed with small papillæ, both with transverse plicæ on inner surface; edge of rostral flap denticulate; a minute barbel hidden under folds of skin; snout of adult nearly entirely covered with spinose tubercles. Dorsal III 10, a little

nearer caudal than end of snout, upper edge not or but feebly notched in adult, more distinctly in young, longest rays as long as or longer than head. Anal II 5, extending beyond root of caudal. Pectoral as long as head, not reaching ventral, the first ray of which is below 9th or 10th ray of dorsal. Caudal deeply forked. Caudal peduncle nearly as long as deep. Scales 38-39  $\frac{6\frac{1}{2}-7\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16-18 round caudal peduncle. Brown or dark purplish above, the scales edged with green; dorsal and anal pink, pectorals and ventrals dark purple, caudal pale yellow at the base, pink at the end.

Total length 590 millim.

Congo.—Types in Congo Museum, Tervueren.

- |                              |                                             |                         |
|------------------------------|---------------------------------------------|-------------------------|
| 1. Ad., one of the<br>types. | Matadi, Lower Congo.                        | Capt. Wilwerth (C.).    |
| 2. Hgr.                      | Cataracts of Yelala, near<br>Matadi.        | M. P. Delhez (C.).      |
| 3-5. Ad. & yg.               | Kwango R. at Fort Don<br>Carlos I., Angola. | Dr. W. J. Ansorge (C.). |

## 21. LABEO CYCLORHYNCHUS.

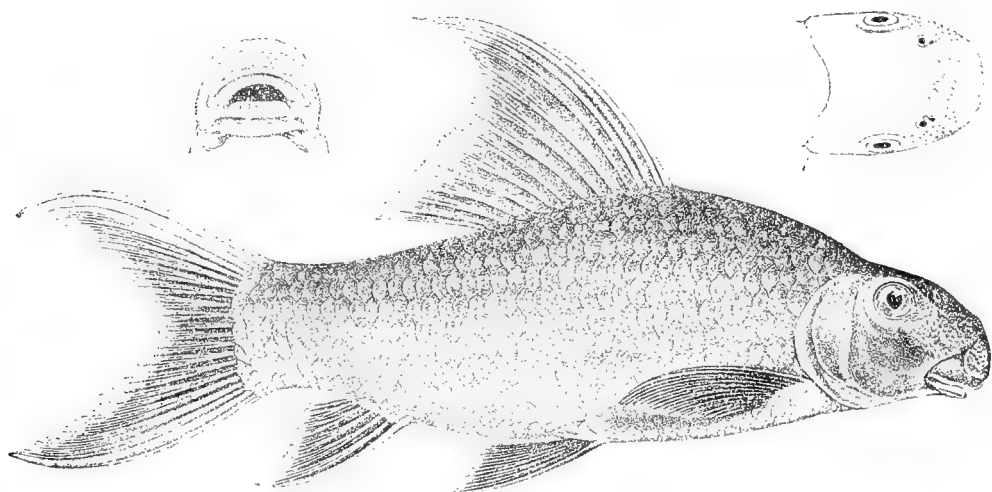
Bouleng. Ann. Mus. Congo, Zool. i. p. 98, pl. xl. fig. 1 (1899), and Poiss. Bass. Congo, p. 214 (1901).

*Labeo cyclorhynchus*, var. *variegata*, Pellegr. Bull. Mus. Paris, 1901, p. 332.

Body strongly compressed, its depth 3 to  $3\frac{1}{4}$  times in total length. Head  $3\frac{3}{4}$  to 4 times in total length,  $1\frac{1}{8}$  to  $1\frac{2}{5}$  times as long as broad; snout broad and rounded, projecting very little beyond mouth; eye supero-lateral, in middle of head, 3 (young) to  $4\frac{1}{2}$  times in length of head,  $1\frac{1}{2}$  to  $2\frac{2}{3}$  times in interorbital width; width of mouth, with lips,  $1\frac{3}{4}$  times in length of head; lips feebly fringed, with feeble plicæ on the inner surface; rostral flap feebly denticulate; a small barbel, nearly hidden in folds of skin; small tubercles on sides of snout. Dorsal III 11-12, equally distant from eye and from caudal, upper border concave, longest ray  $1\frac{2}{3}$  times length of head. Anal III 5, reaching root of caudal. Pectoral not reaching ventral, the first ray of which falls below 4th branched ray of dorsal. Caudal deeply notched, crescentic. Caudal peduncle as long as deep. Scales 35-38  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of caudal, 16 round caudal peduncle. Dark brown above, greyish beneath, each scale with a crimson spot; vertical fins dark grey. Young

yellowish, with dark brown spots and marblings, and with black markings on the fins.

Fig. 245.



*Labeo cyclorhynchus*.  
Type (A. M. C.).  $\frac{2}{7}$ .

Total length 160 millim.

Upper Congo.—Type in Congo Museum, Tervueren.

1-3. Yg.

Monsembe.

Rev. J. H. Weeks (P.).

## 22. LABEO FALCIPINNIS.

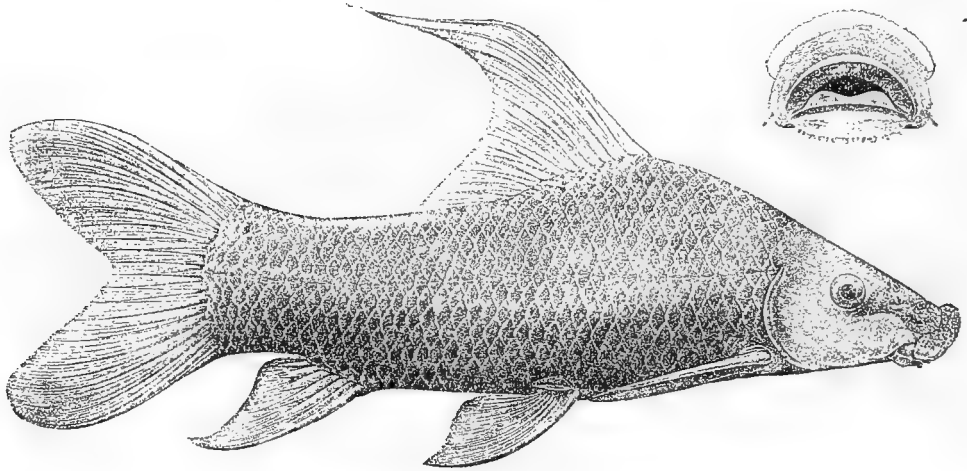
*Labeo falcifer* (non C. & V.), Bouleng. Ann. Mus. Congo, Zool. i. p. 35, pl. xvii. fig. 2 (1898), and Poiss. Bass. Congo, p. 215 (1901).

*Labeo falcipinnis*, Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 360.

Body strongly compressed, its depth 3 to 4 times in total length. Head 4 times in total length, its width  $\frac{2}{3}$  its length; snout rounded, a little swollen at the end; eye in second half of head, supero-lateral, 4 to 5 times in length of head,  $2\frac{1}{8}$  to 3 times in interorbital width; width of mouth, with lips,  $\frac{2}{5}$  or  $\frac{1}{2}$  length of head; lips with a marginal fringe of papillæ, and with transverse plicæ on inner surface; edge of rostral flap strongly denticulate; a small barbel hidden under folds of skin; large spinose tubercles on snout. Dorsal III 11, falciform, equally distant from anterior border of eye and from caudal, longest ray  $1\frac{2}{3}$  times length of head. Anal III 5, reaching beyond root of caudal. Pectoral as long as head, not quite reaching ventral, the first ray of which is below

9th of dorsal. Caudal deeply notched. Caudal peduncle deeper than long. Scales  $39 \frac{7\frac{1}{2}-8\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 5 between lateral line and root of ventral, 20 round caudal peduncle. Uniform brownish above, whitish beneath.

Fig. 246.

*Labeo fulcipinnis.*Type (A. M. C.).  $\frac{1}{4}$ .

Total length 460 millim.

Congo.—Types in Congo Museum, Tervueren.

- |                      |                           |                        |
|----------------------|---------------------------|------------------------|
| 1. One of the types. | New Antwerp, Upper Congo. | Capt. Wilverth (C.).   |
| 2. Ad.               | Monsembe, „               | Rev. J. H. Weeks (P.). |

### 23. LABEO KIRKII.

*Labeo forskalii*, part., Günth. Cat. Fish. vii. p. 50 (1868).

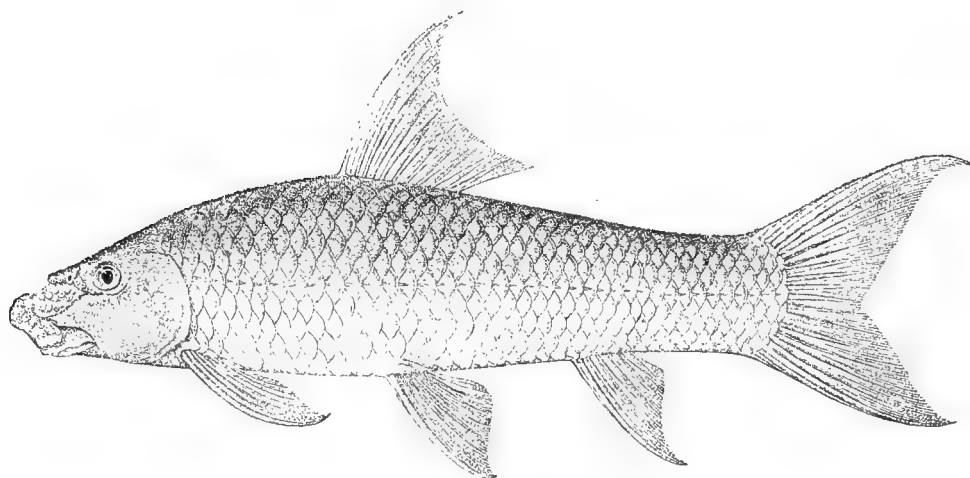
*Labeo kirkii*, Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 360.

Body moderately compressed, its depth equal to length of head and 4 times in total length. Head  $\frac{2}{3}$  as broad as long; snout obtusely pointed, strongly projecting, with a strong curved transverse groove above, its length  $\frac{1}{2}$  that of head; eye supero-lateral, 6 times in length of head,  $2\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $\frac{3}{8}$  length of head; lips strongly developed, upper straight-edged, lower expanded and bordered in front by a fringe of papillæ, the posterior border festooned; inner surface of lips with small papillæ forming numerous transverse plicæ; rostral flap large, with denticulate edge; snout with crater-like scars of large tubercles. Dorsal III 10, equally distant from nostrils and from caudal, upper edge concave, longest ray a little longer



than head. Anal III 5, nearly reaching root of caudal. Pectoral as long as head, not reaching ventral, the first ray of which falls below 4th branched ray of dorsal. Caudal deeply emarginate. Caudal peduncle

Fig. 247.

*Labeo kirkii*.Type.  $\frac{1}{2}$ .

a little longer than deep. Scales  $39 \frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 22 round caudal peduncle. Dark brown above, lighter beneath.

Total length 240 millim.

Rovuma River, East Africa.

1. Type.

Rovuma R.

Sir J. Kirk (P.).

#### 24. LABEO FORSKALII.

*Cyprinus niloticus*, var. *b*, Forskål, Deser. Anim. p. 71 (1775).

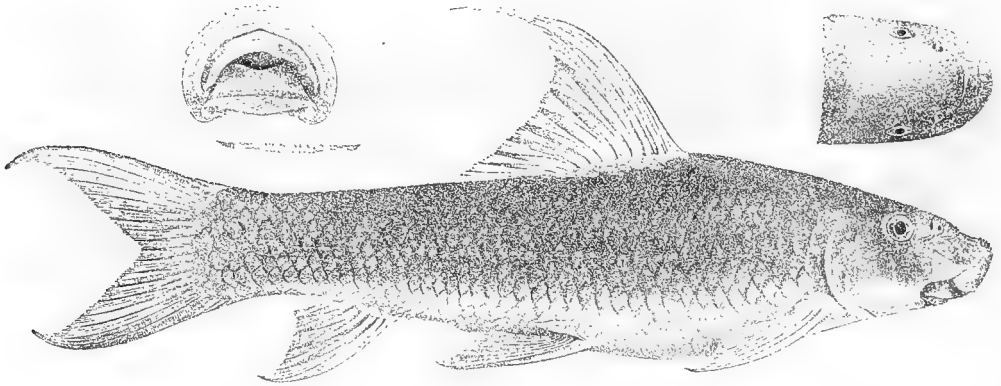
*Labeo forskalii*, Rüpp. Mus. Senckenb. ii. p. 18, pl. iii. fig. 1 (1835); Cuv. & Val. Hist. Poiss. xvi. p. 343 (1842); Heckel, Russegger's Reise Egypt. iii. p. 301, pl. xx. fig. 2 (1846); Bouleng. Fish. Nile, p. 176, pl. xxvii. fig. 2 & pl. xxxi. fig. 3 (1907).

*Labeo forskalii*, part., Günth. Cat. Fish. vii. p. 50 (1868), and Petherick's Trav. ii. p. 260 (1869).

Body more or less compressed, its depth  $3\frac{1}{3}$  to  $4\frac{1}{4}$  times in total length. Head 4 to 5 times in total length, its width  $\frac{2}{3}$  to  $\frac{4}{5}$  its length; snout rounded, strongly projecting, more or less swollen, often with a more or less distinct curved transverse groove above, its length about half, or a

little more than half, length of head; eye small, supero-lateral,  $5\frac{1}{2}$  to 8 times in length of head (4 or 5 times in very young); interorbital width  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head; width of mouth  $\frac{2}{5}$  to  $\frac{3}{5}$  length of head; lips strongly developed, upper straight-edged, lower more or less expanded and bordered in front by a fringe of papillæ, the posterior border being more or less distinctly festooned; inner surface of lips with small papillæ forming numerous transverse plicæ; rostral flap large, completely

Fig. 248.



*Labeo forskalii.*  
Upper Nile (F. N.).  $\frac{1}{2}$ .

detached at the sides, its edge entire or more or less distinctly festooned; a minute barbel, concealed under folds of skin; horny tubercles on the snout, or their crater-like scars, much developed in adult, more so in males than in females. Dorsal III 10 (rarely 9 or 11) rays, equally distant from end of snout or nostrils and from caudal, upper edge concave, last simple ray and first branched ray more or less produced in males; except in very young and certain female specimens, longest rays more or less considerably exceeding length of head. Anal III 5, shorter than head, often reaching root of caudal. Pectoral nearly as long as head, not reaching ventral, the first ray of which falls below 4th or 5th branched ray of dorsal. Caudal deeply emarginate, crescentic when fully spread out. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep. Scales 38-42  $\frac{6\frac{1}{2}-7\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ , 4-5 between lateral line and root of ventral, 16 (rarely 18) round caudal peduncle. Dark olive above and on the sides, white beneath; scales on the sides often pink in the centre; fins dark grey, first ray of pectoral, ventral, and anal often yellowish.

Total length 360 millim.

Lower Nile to upper tributaries of Blue Nile.

|                      |                                                 |                                                       |
|----------------------|-------------------------------------------------|-------------------------------------------------------|
| 1-4. Ad. & hgr.      | Lower Nile.                                     | S. S. Allen, Esq. (P.).                               |
| 5-9. Ad.             | Near Samannud, Damietta Nile.                   | L. Loat, Esq. (C.).                                   |
| 10-12. Yg.           | Rosetta Nile, near Barrage.                     | "                                                     |
| 13-14. Ad.           | Near Cairo.                                     | "                                                     |
| 15. Hgr.             | Wasta, Lower Nile.                              | "                                                     |
| 16-23. Yg.           | Near Luxor.                                     | "                                                     |
| 24. Ad.              | Assuan.                                         | "                                                     |
| 25-27. Ad.           | Korosko, Upper Nile.                            | "                                                     |
| 28-37. Ad. & hgr.    | Wady Halfa.                                     | "                                                     |
| 38. Hgr.             | Kosheh, Upper Nile.                             | "                                                     |
| 39. Ad.              | Near Hannek, Third Cataract.                    | "                                                     |
| 40. Ad.              | Khartum.                                        | J. Petherick, Esq. (C.).                              |
| 41. Skel.            | "                                               | "                                                     |
| 42. Yg.              | Wad Medine, Blue Nile.                          | L. Loat, Esq. (C.).                                   |
| 43, 44-63. Ad. & yg. | Rosaires, "                                     | "                                                     |
| 64-66. Ad. & hgr.    | Didessa R. (Blue Nile), Guma, 1500 ft.          | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 67-68. Ad.           | Juju R., affluent of Didessa R., Guma, 2000 ft. | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |

25. LABEO CYLINDRICUS.

Peters, Mon. Berl. Ac. 1852, p. 684, and Reise Mossamb. iv. p. 47, pl. x. fig. 1 (1868); Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 361, Proc. Zool. Soc. 1903, ii. p. 330, and Tr. Zool. Soc. xvii. 1906, p. 548.

*Tylognathus cantini*, Sauv. Bull. Soc. Philom. (7) vi. 1882, p. 175; Vincig. Ann. Mus. Genova, (2) xv. 1895, p. 50, & xix. 1898, p. 259.

*Tylognathus montanus*, Günth. Proc. Zool. Soc. 1889, p. 71, pl. viii. fig. B.

*Labeo forskalii*, part., Pfeff. Thierw. O.-Afr., Fische, p. 49 (1896); Hilgend. Zool. Jahrb., Syst. xxii. 1905, p. 413.

*Labeo montanus*, Pfeff. t. c. p. 52.

? *Labeo mesops* (non Günth.), Vincig. op. cit. (2) xvii. 1897, p. 361.

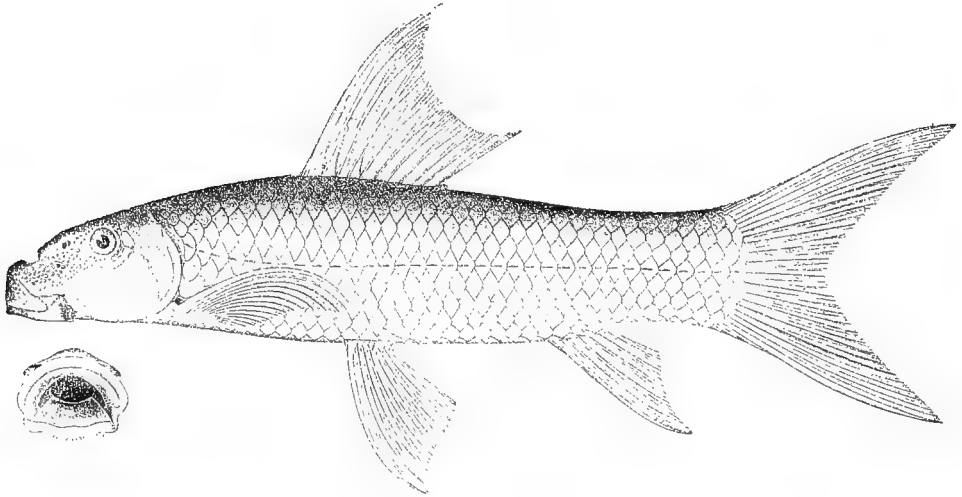
Very closely allied to and barely separable from *L. forskalii*.

Body feebly compressed, 4 to  $4\frac{3}{5}$  times in total length. Head 4 to  $4\frac{3}{4}$  times in total length, its width  $\frac{3}{5}$  to  $\frac{3}{4}$  its length, as in *L. forskalii*, but eye larger, 4 to 7 times in length of head. Dorsal III 8-10, longest ray usually longer, often much longer, than head, sometimes as much as twice as long. Anal III 5. Scales  $35-39$   $\frac{5\frac{1}{2}-6\frac{1}{2}}{(6\frac{1}{2}-7\frac{1}{2})}$ , 3-4 between lateral line and root of ventral, 15-18 round caudal peduncle. Dark olive above and on the sides, white beneath; caudal often with the upper and lower edges dark.

Total length 400 millim.

Abyssinia, East Africa to the Zambesi, Lakes Tanganyika and Nyassa.—Type in Berlin Museum.

Fig. 249.

*Labeo cylindricus.*

Type, after Peters (Reise Mossamb.).  $\frac{1}{2}$ .

|                   |                                           |                                                       |
|-------------------|-------------------------------------------|-------------------------------------------------------|
| 1-3. Hgr.         | Jerrer R. (Webi Shebeli),<br>near Harrar. | Mr. E. Degen (C.).                                    |
| 4. Skel.          | ” ” ”                                     | ”                                                     |
| 5. Hgr.           | Modjo R. (Webi Shebeli).                  | Prof. O. Neumann and<br>Baron C. von Erlanger (C.).   |
| 6-8. Ad. & hgr.   | Zeissi R. (L. Abaia),<br>3000 ft.         | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 9-10. Ad.         | L. Gandjule (Margherita),<br>3000 ft.     | ”                                                     |
| 11-12. Ad.        | Ganda R. (L. Gandjule),<br>3000 ft.       | ”                                                     |
| 13. Ad.           | Sagan R. at Wondo,<br>2800 ft.            | ”                                                     |
| 14-16. Ad.        | Delbena R. (Sagan),<br>3200 ft.           | ”                                                     |
| 17. Ad.           | Gato R. (Sagan), 3700 ft.                 | ”                                                     |
| 18-19. Ad.        | Zuja R. (L. Stephanie),<br>4200 ft.       | ”                                                     |
| 20. Ad.           | Barja R. (L. Stephanie),<br>4250 ft.      | ”                                                     |
| 21-23. Ad. & hgr. | Omo R. at Kullo, 2000 ft.                 | ”                                                     |
| 24-26. Ad.        | Ergino R. (Omo), 3000 ft.                 | ”                                                     |
| 27-29. Ad. & hgr. | Zendo R. (Omo), 4500 ft.                  | ”                                                     |

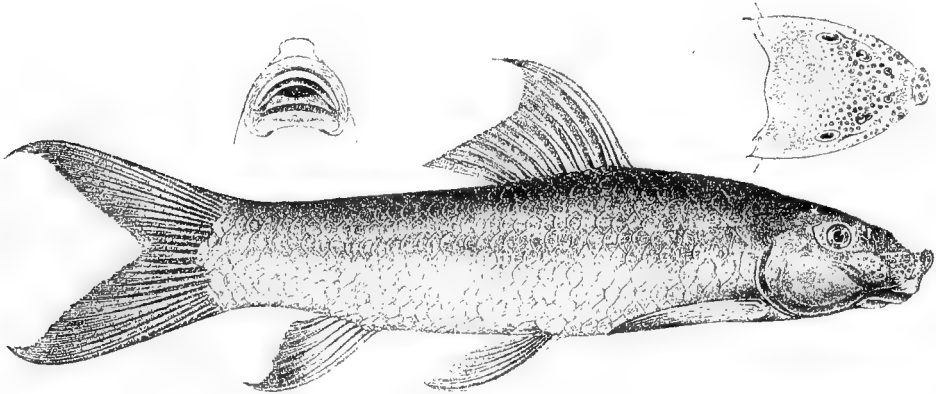
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|-------------------------------------------|-----------------------------------------|----------------------------|
| 30-33. Hgr.                               | L. Baringo.                             | Sir H. H. Johnston (P.).   |
| 34-35. Ad.                                | Niro - Narock System,<br>Lorian Swamp.  | S. L. Hinde, Esq. (P.).    |
| 36-38, 39. Ad. & hgr.                     | Mathoiya R. (Tana),<br>4000 ft.         | „                          |
| 40. Hgr., type of<br><i>T. montanus</i> . | Kilimandjaro.                           | F. J. Jackson, Esq. (P.).  |
| 41-42. Yg.                                | Lumi R., E. of Kili-<br>mandjaro.       | A. B. Percival, Esq. (C.). |
| 43-44. Ad.                                | Utinta, L. Tanganyika.                  | Dr. W. A. Cunningham (C.). |
| 45-46. Ad.                                | L. Nyassa.                              | Capt. E. L. Rhoades (P.).  |
| 47. Ad.                                   | Upper Zambesi, above<br>Victoria Falls. | T. Codrington, Esq. (P.).  |

26. LABEO NASUS.

Bouleng. Ann. Mus. Congo, Zool. i. p. 99, pl. xl. fig. 2 (1899), and Poiss. Bass. Congo, p. 218 (1901).

Body feebly compressed, its depth  $4\frac{1}{2}$  times in total length. Head a little longer than broad,  $4\frac{1}{2}$  times in total length; snout pointed, very

Fig. 250.



*Labeo nasus*.  
Type (A. M. C.).  $\frac{1}{2}$ .

prominent, ending in a small transverse, slightly turned up appendage; eye supero-lateral, in second half of head, 5 (young) to 7 times in length of head,  $3\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $\frac{2}{3}$  length of head; lips with feeble transverse plicæ on inner surface, with feebly denticulate edge; rostral flap entire; a minute barbel, hidden in folds of skin; snout with large tubercles. Dorsal III 10, a little nearer caudal fin than end of snout, deeply emarginate, longest ray as long as

head. Anal II 5, reaching root of caudal. Pectoral hardly as long as head, not reaching ventral, the first ray of which is below 7th of dorsal. Caudal deeply notched, crescentic when fully spread out. Caudal peduncle nearly as long as deep. Scales 38-39  $\frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Purplish above, lighter beneath; scales edged with yellow.

Total length 190 millim.

Congo.—Type in Congo Museum, Tervueren.

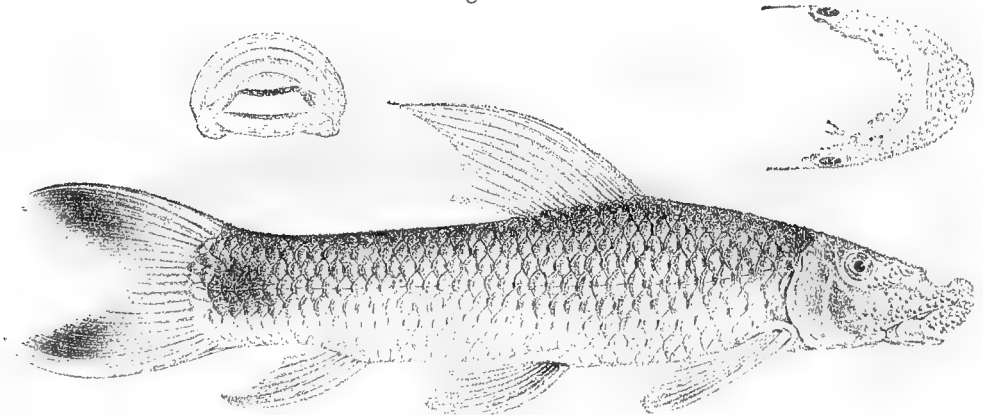
- |                           |                      |                      |
|---------------------------|----------------------|----------------------|
| 1. Yg., one of the types. | Matadi, Lower Congo. | Capt. Wilverth (C.). |
| 2. Yg.                    | Stanley Pool.        | M. De Meuse (C.).    |

### 27. LABEO GREENII.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 29, pl. viii. fig. 4 (1902).

Body feebly compressed, its depth 5 to  $5\frac{1}{4}$  times in total length. Head 4 to  $4\frac{1}{3}$  times in total length, its width  $\frac{2}{3}$  to  $\frac{3}{4}$  its length; snout obtusely pointed, very prominent; eye supero-lateral, in second half of head, 4 (young) to  $5\frac{1}{2}$  times in length of head, 2 to 3 times in inter-

Fig. 251.



*Labeo greenii*

Type (A. M. C.).  $\frac{1}{2}$ .

orbital width; width of mouth, with lips, a little more than half length of head; upper lip entire, lower very feebly fringed, both with transverse plicæ on the inner surface; rostral flap very feebly denticulate; a minute barbel, hidden in folds of skin; snout nearly entirely covered with large spinose tubercles in adult. Dorsal III 10, a little nearer caudal than end of snout, notched, longest ray  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times length of head.

Anal II 5, reaching root of caudal. Pectoral nearly as long as head, not reaching ventral, the first ray of which falls below 5th or 6th ray of dorsal. Caudal with deep angular notch. Caudal peduncle as long as deep. Scales 37-38  $\frac{5\frac{1}{2}-6\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Dark olive, belly white; a large black spot on caudal peduncle; caudal blackish, with the lower edge whitish.

Total length 270 millim.

Upper Congo and Ubanghi.—Type in Congo Museum, Tervueren.

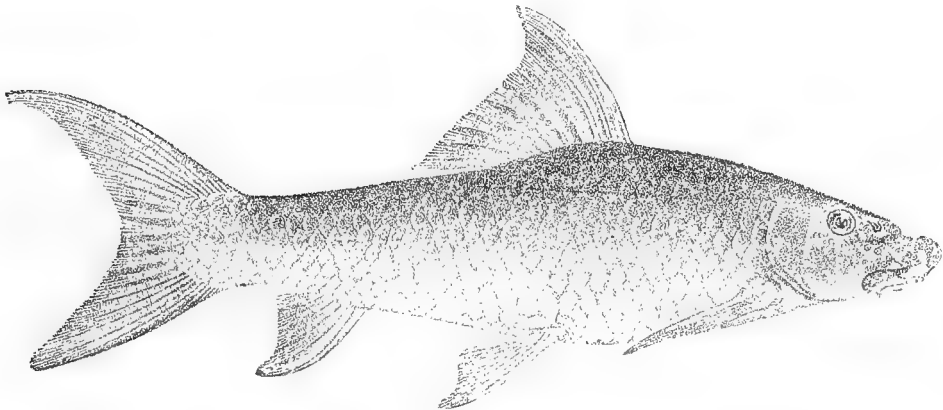
- |                            |                      |                                             |
|----------------------------|----------------------|---------------------------------------------|
| 1. Hgr., one of the types. | Bolobo, Upper Congo. | Rev. G. Grenfell (P.).                      |
| 2-3. Hgr. & yg.            | Lindi River.         | M. M. Storms (C.);<br>Brussels Museum (E.). |

28. LABEO LUKULÆ.

Bouleng. Proc. Zool. Soc. 1902, i. p. 235, pl. xxiii.

Body compressed, its depth nearly 4 times in total length. Head  $4\frac{1}{3}$  times in total length,  $1\frac{1}{2}$  times as long as broad; snout obtusely

Fig. 252.



*Labeo lukulæ.*

Type (P. Z. S. 1902).  $\frac{5}{7}$ .

pointed, strongly projecting; eye supero-lateral, in second half of head, 6 times in length of head,  $2\frac{2}{3}$  in interorbital width; width of mouth, with lips, half length of head; rostral flap and anterior border of lip not denticulated; posterior border of lip denticulated; inner surface of lips with numerous feeble, transverse plicæ; a minute barbel, hidden in folds at sides of mouth; snout covered with large tubercles. Dorsal

III 10, a little nearer root of caudal than end of snout, notched, longest ray as long as head. Anal II 5. Pectoral as long as head, not reaching base of ventral, the first ray of which falls under 4th branched ray of dorsal. Caudal deeply forked. Caudal peduncle  $1\frac{1}{2}$  times as long as deep. Scales  $35\frac{5\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 12 round caudal peduncle. Dark olive, belly whitish.

Total length 250 millim.

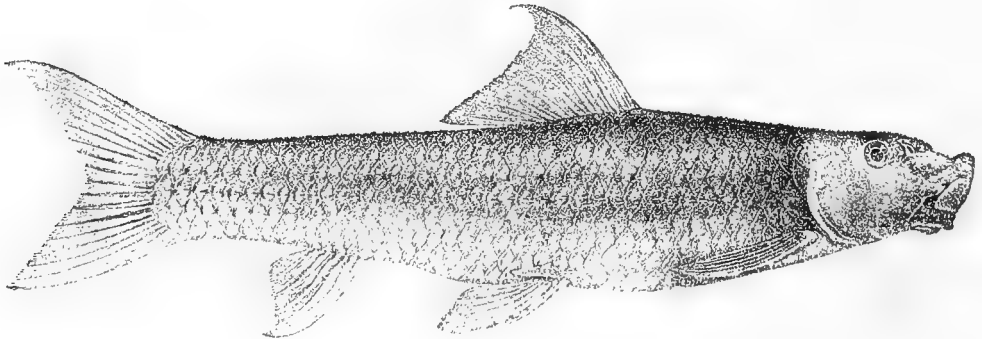
Lukula River, Upper Congo.—Type in Brussels Museum.

### 29. LABEO ANNECTENS.

Bouleng. Proc. Zool. Soc. 1903, i. p. 23, pl. ii. fig. 1.

Body moderately compressed, its depth nearly equal to length of head,  $4\frac{1}{2}$  to 5 times in total length. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as broad; snout rounded or rather pointed, strongly projecting beyond mouth; eye supero-lateral, in second half of head, 5 to 7 times in length of head,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $\frac{1}{2}$  to  $\frac{2}{5}$  length of head; rostral flap and posterior border of lip feebly

Fig. 253.



*Labeo annectens.*

Type (P. Z. S. 1903).  $\frac{5}{7}$ .

denticulated; inner surface of lips with numerous feeble, transverse plicæ; a small barbel hidden in folds of skin; snout with numerous tubercles. Dorsal III 10 (rarely 9 or 11), equally distant from end of snout and from caudal, strongly notched; longest ray equal to length of head or a little longer. Anal II 5; longest ray  $\frac{2}{3}$  length of head. Pectoral as long as or a little shorter than head, not reaching ventral,



the first ray of which falls under 5th or 6th branched ray of dorsal. Caudal deeply forked. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{2}{3}$  times as long as deep. Scales 34-39  $\frac{4\frac{1}{2}-5\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 3 between lateral line and root of ventral, 12 round caudal peduncle. Olive above, whitish beneath, with or without a rather indistinct darker lateral band; fins greyish, tinged with orange or red in life.

Total length 260 millim.

South Cameroon, Gaboon.

- |                  |                                             |                         |
|------------------|---------------------------------------------|-------------------------|
| 1-2. Ad. & hgr., | Kribi R. at Efulen, S. Cameroon.            | G. L. Bates, Esq. (C.). |
|                  | types.                                      |                         |
| 3-6. Ad. & hgr.  | " " "                                       | "                       |
| 7-9. Ad.         | Ja R. (Congo System) at Bitye, S. Cameroon. | "                       |
| 10-12. Ad. & yg. | Libi R. (Congo System), S. Cameroon.        | "                       |
| 13. Ad.          | Komadekke, Ogowe.                           | Dr. W. J. Ansorge (C.). |

### 30. LABEO CHARIENSIS.

Pellegr. Bull. Mus. Paris, 1904, p. 311.

*Labeo parvus* (non Bouleng.), Steind. Ann. Hofmus. Wien, xxi. 1906, p. 154.

Depth of body equal to length of head, 4 times in total length. Head once and  $\frac{1}{3}$  as long as broad; snout very prominent, with numerous tubercles; eye supero-lateral, in second half of head, 6 times in length of head,  $2\frac{3}{4}$  or 3 times in interorbital width; inner surface of lips with numerous transverse plicæ; a minute barbel, hidden in the folds at side of mouth. Dorsal II 10, falciform, deeply notched, anterior rays extremely prolonged,  $1\frac{2}{3}$  or  $1\frac{3}{4}$  times length of head. Anal II 5. Pectoral a little shorter than head, not reaching ventral. Caudal forked, with pointed lobes. Caudal peduncle a little longer than deep. Scales 34  $\frac{4\frac{1}{2}}{6\frac{1}{2}}$ , 3 between lateral line and root of ventral, 12 round caudal peduncle. Olive-brown, lighter beneath.

Total length 300 millim.

Shari River (type in Paris Museum), Cameroon.

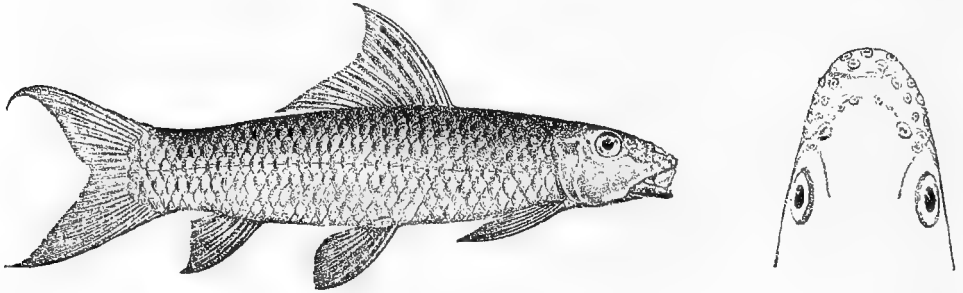
### 31. LABEO PARVUS.

Bouleng. Ann. Mus. Congo, Zool. ii. p. 30, pl. viii. fig. 5 (1902).

Body feebly compressed, its depth equal to or a little greater than length of head, 4 or 5 times in total length. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as broad; snout rounded or obtusely pointed, very prominent, with

large spiny tubercles in the male; eye supero-lateral, nearer gill-opening than end of snout, 4 times in length of head,  $1\frac{2}{3}$  to 2 times in inter-orbital width; width of mouth, with lips, 2 to  $2\frac{1}{2}$  times in length of head; rostral flap not denticulated; lower lip with very feebly denticulated edge, inner surface with numerous transverse plicæ; a small barbel, hidden in the folds at side of mouth. Dorsal III 10, notched,

Fig. 254.

*Labeo parvus.*Type (A. M. C.).  $\frac{4}{5}$ .

longest ray as long as or a little shorter than head. Anal III 5, not reaching root of caudal. Pectoral a little shorter than head, not reaching ventral, which is below middle of dorsal. Caudal deeply forked, with acutely pointed lobes. Caudal peduncle as long as deep, or a little longer. Scales  $33-35\frac{4\frac{1}{2}}{5\frac{1}{2}}$ ,  $2\frac{1}{2}-3$  between lateral line and ventral, 12 round caudal peduncle. Olive above, yellowish beneath, each scale on the upper parts sometimes with a blackish spot; lips and paired fins blackish in the males.

Total length 130 millim.

Congo.—Types in Congo Museum, Tervueren.

|                        |                      |                                                    |
|------------------------|----------------------|----------------------------------------------------|
| 1-2. Two of the types. | Banzyville, Ubanghi. | Capt. Royaux (C.).                                 |
| 3. Ad.                 | Aruwimi R.           | R. B. Woosnam, Esq. (C.);<br>Ruwenzori Expedition. |
| 4. Ad.                 | Lindi R.             | M. M. Storms (C.);<br>Brussels Museum (E.).        |
| 5-8. Yg.               | Bange Ngola, Angola. | Dr. W. J. Ansorge (C.).                            |

### 32. LABEO OBSCURUS.

Pellegr. Bull. Mus. Paris, 1908, p. 204, and Bull. Soc. Philom. (9) x. 1908, p. 126, fig.

Depth of body equal to or a little less than length of head, 4 to  $4\frac{1}{2}$  times in total length. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad; snout

rounded, very prominent, with large spiny tubercles; eye supero-lateral, nearly in middle of length of head, 3 (young) to  $4\frac{1}{3}$  times in length of head,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times in interorbital width; width of mouth, with lips,  $2\frac{1}{3}$  to  $2\frac{1}{2}$  times in length of head; inner surface of lips with numerous transverse plicæ; a small barbel, hidden in the folds at side of mouth. Dorsal III 9-10, strongly notched, longest ray as long as or a little longer than head. Anal II 5, not reaching root of caudal. Pectoral as long as or a little shorter than head, not reaching ventral. Caudal peduncle a little longer than deep. Scales 33-35  $\frac{4\frac{1}{2}}{6\frac{1}{2}}$ , 3 between lateral line and ventral, 12 round caudal peduncle. Blackish brown above and beneath, the caudal fin tinged with reddish.

Total length 160 millim.

Great Falls of Koukouré River, French Guinea.—Types in Paris Museum.

### 33. LABEO UMBRATUS.

*Abrostomus umbratus*, A. Smith, Ill. Zool. S. Afr., Fish. pl. xii. fig. 1 (1841);

Steind. Sitzb. Ak. Wien, ciii. i. 1894, p. 454, pl. iv. fig. 1.

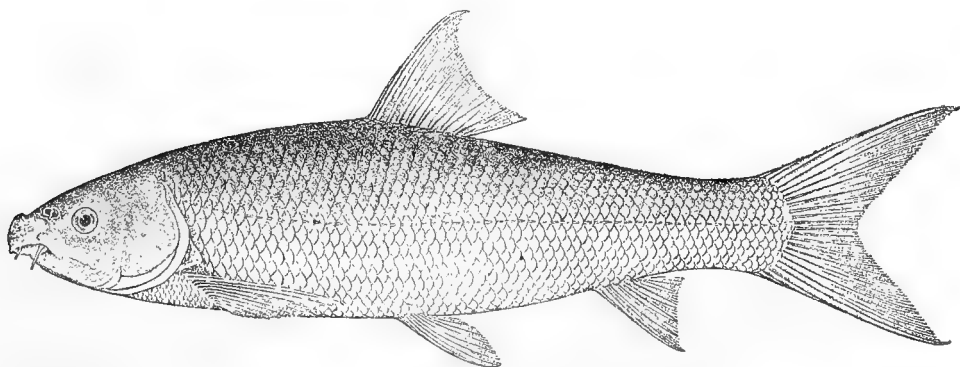
*Labeo cafer*, Casteln. Mém. Poiss. Afr. Austr. p. 60 (1861).

*Labeo sicheli*, Casteln. l. c.

*Labeo umbratus*, Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 362.

Body strongly compressed, its depth equal to length of head and 4 to 5 times in total length. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad;

Fig. 255.



*Labeo umbratus*.  
Great Fish River.  $\frac{1}{2}$ .

snout rounded, feebly prominent, shorter than postocular part of head; eye lateral, 5 to 7 times in length of head; interorbital width  $\frac{1}{2}$  length

of head; width of mouth, with lips, about  $\frac{1}{3}$  length of head; lips rather feebly developed, with rounded or conical papillæ forming a fringe; rostral flap indistinct; two barbels on each side, anterior very short, posterior shorter than or barely as long as eye. Dorsal III 8-10, equally distant from nostrils or eye and from caudal, emarginate, longest ray a little shorter than head. Anal III 5, not reaching root of caudal. Pectoral  $\frac{3}{4}$  to  $\frac{4}{5}$  length of head, not reaching ventral, which is below middle of dorsal. Caudal forked, with long pointed lobes. Caudal peduncle  $1\frac{1}{2}$  to 2 times as long as deep. Scales 58-65  $\frac{13\frac{1}{2}-15\frac{1}{2}}{15\frac{1}{2}-16\frac{1}{2}}$ , 9-10 between lateral line and root of ventral, 30-34 round caudal peduncle. Brown above, yellowish beneath, or yellowish marbled with brown.

Total length 310 millim.

Orange River System and Rivers of Southern Watershed of Cape Colony.

- |                 |                                              |                              |
|-----------------|----------------------------------------------|------------------------------|
| 1. Hgr.         | Grobelaars R., Cape Colony.                  | Dr. J. D. F. Gilchrist (P.). |
| 2. Hgr.         | Gamka R. at Prince Albert, Cape Colony.      | „                            |
| 3-4. Hgr.       | Great Fish R., Cradok Division, Cape Colony. | S. African Museum.           |
| 5-6. Ad. & hgr. | Vredefort Road, Orange River Colony.         | Capt. Barrett Hamilton (P.). |

#### 34. LABEO CAPENSIS.

*Abrostomus capensis*, A. Smith, Ill. Zool. S. Afr., Fish. pl. xii. fig. 2 (1841).

*Labeo tenuirostris*, Steind. Sitzb. Ak. Wien, ciii. i. 1894, p. 459, pl. v. fig. 2.

*Labeo capensis*, Bouleng. Ann. & Mag. N. H. (7) xii. 1903, p. 362.

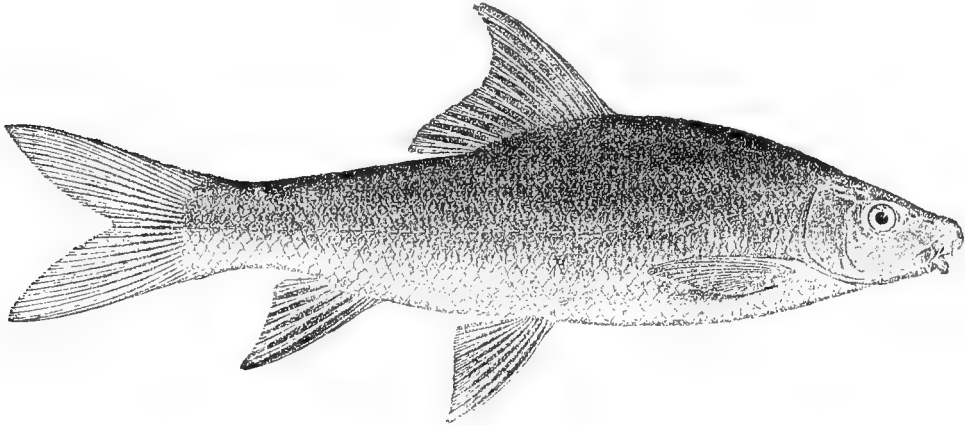
Body strongly compressed, its depth  $3\frac{2}{3}$  to  $4\frac{1}{2}$  times in total length. Head  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as broad,  $4\frac{1}{4}$  to 5 times in total length; snout rounded, very prominent, as long as or a little longer than postocular part of head; eye lateral, 4 to  $6\frac{1}{2}$  times in length of head; interorbital width  $\frac{1}{2}$  length of head; width of mouth, with lips, about  $\frac{1}{3}$  length of head; lips rather feebly developed, with rounded or conical papillæ forming a fringe; rostral flap fringed; two short barbels on each side, equal, or anterior the longer, as long as or shorter than eye. Dorsal IV 10-11, equally distant from eye and from caudal, emarginate, longest ray as long as or a little shorter than head. Anal III 5, reaching, or nearly reaching, root of caudal. Pectoral as long as or a little shorter than head, not reaching ventral, which is below middle or posterior half of dorsal. Caudal forked, with long pointed lobes. Caudal peduncle

$1\frac{1}{2}$  to  $1\frac{2}{3}$  times as long as deep. Scales 44-50  $\frac{8\frac{1}{2}-9\frac{1}{2}}{10\frac{1}{2}-11\frac{1}{2}}$ , 6-7 between lateral line and root of ventral, 20-24 round caudal peduncle. Grey above, silvery white beneath.

Total length 320 millim.

Orange and Limpopo River Systems (Rivers of Cape Colony, according to A. Smith).

Fig. 256.



*Labeo capensis.*

Type of *L. tenuirostris*, after Steindachner (*l. c.*)  $\frac{4}{5}$ .

|                  |                                      |                              |
|------------------|--------------------------------------|------------------------------|
| 1. Hgr.          | Cape Colony.                         | S. African Museum.           |
| 2. Ad.           | Zak R., trib. of Orange R.           | Dr. J. D. F. Gilchrist (P.). |
| 3-4. Ad.         | Town Reservoir, Kimberley.           | "                            |
| 5-12. Ad. & hgr. | Vredefort Road, Orange River Colony. | Capt. Barrett Hamilton (P.). |
| 13. Skel.        | Vredefort Road.                      | "                            |
| 14. Ad.          | Mooi R. at Potchefstroom, Transvaal. | S. African Museum.           |

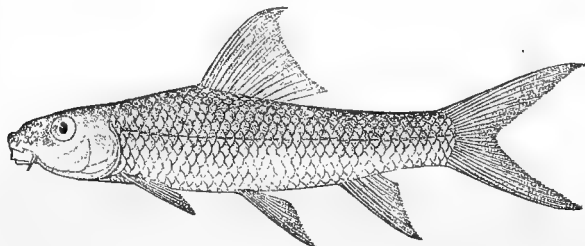
35. LABEO ANSORGII.

Bouleng. Ann. & Mag. N. H. (7) xx. 1907, p. 108.

Body strongly compressed, its depth equal to length of head and 4 times in total length. Head once and  $\frac{2}{3}$  as long as broad; snout broad, truncate, feebly projecting; eye nearly perfectly lateral, 4 times in length of head and once and  $\frac{3}{4}$  in interorbital width; width of mouth, with lips, about half that of head; rostral flap not denticulated; lips bordered with rounded papillæ, their inner surface with numerous

transverse plicæ; two barbels on each side, anterior  $\frac{1}{3}$ , posterior  $\frac{3}{4}$  diameter of eye; snout with conical horny tubercles. Dorsal IV 10, with concave upper border, a little nearer caudal than end of snout, longest ray slightly longer than head. Anal III 5, nearly reaching root

Fig. 257.

*Labeo ansorgii.*

Type.

of caudal. Pectoral nearly as long as head, not reaching ventral, which is below middle of dorsal. Caudal deeply forked, with acutely pointed lobes. Caudal peduncle slightly longer than deep. Scales  $36 \frac{6\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal peduncle. Silvery, back brownish.

Total length 65 millim.

Angola.

- |          |                                  |                         |
|----------|----------------------------------|-------------------------|
| 1. Type. | Swamps at Dongwenna, Mossamedes. | Dr. W. J. Ansorge (C.). |
| 2. Yg.*  | Cabro Negro.                     | Dr. Welwitsch (P.).     |

### 36. LABEO BARBATUS.

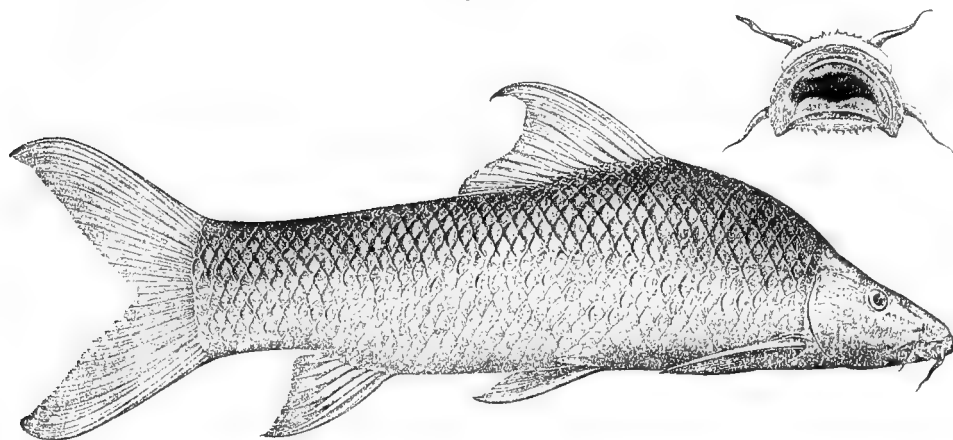
Bouleng. Ann. Mus. Congo, Zool. i. p. 36, pl. xix. fig. 2 (1898), and Poiss. Bass. Congo, p. 218 (1901).

Body strongly compressed, its depth  $3\frac{1}{3}$  to  $3\frac{3}{4}$  times in total length. Head  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as broad, 4 to 5 times in total length; snout rounded, very prominent, slightly longer than postocular part of head; eye supero-lateral,  $3\frac{1}{2}$  (young) to 8 times in length of head,  $1\frac{1}{2}$  to 4 times in interorbital width; width of snout, with lips,  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head; lips with transverse plicæ on inner surface, upper entire, lower fringed with conical papillæ; rostral flap with denticulate edge; two much developed barbels on each side, much longer than eye in adult,

\* This specimen, in bad condition, was referred by Günther to *L. senegalensis*.

about as long as eye in young; small tubercles on end of snout. Dorsal III 10–11, nearly equally distant from end of snout and from caudal, emarginate, longest ray a little longer than head. Anal II 5, not extending beyond root of caudal. Pectoral as long as head, not reaching

Fig. 258.



*Labeo barbatus.*

Type (A. M. C.).  $\frac{1}{3}$ .

ventral, the first ray of which is below 7th or 8th of dorsal. Caudal with deep angular notch. Caudal peduncle as long as deep. Scales 40–41  $\frac{7\frac{1}{2}-8\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 6 between lateral line and root of ventral, 20–22 round caudal peduncle. Purplish above, yellowish white beneath, the dorsal scales edged with darker; dorsal pale yellow; young with a large blackish spot on caudal peduncle.

Total length 500 millim.

Lower Congo.—Types in Congo Museum, Tervueren.

|                            |                  |                      |
|----------------------------|------------------|----------------------|
| 1. Hgr., one of the types. | Boma.            | Capt. Wilverth (C.). |
| 2–3. Ad. & yg.             | „                | M. P. Delhez (C.).   |
| 4. Yg.                     | Bangala Country. | M. De Meuse (C.).    |

## 2. DISCOGNATHUS.

Heckel, Russegger's Reise, i. pt. ii. p. 1027 (1843); Günth. Cat. Fish. vii. p. 68 (1868); Bouleng. Fish. Nile, p. 180 (1907).

Body moderately or feebly compressed, covered with moderately large scales. Lateral line equally distant from the back and from the belly. Mouth inferior, transverse, crescent-shaped, protractile, sharp-edged, with more or less developed lps; a more or less developed suctorial

disk on the chin, usually bordered by the lower labial fold; one or two barbels on each side. Suborbitals not covering the cheek. Gill-openings restricted to the sides. Dorsal fin with 9 to 11 rays, 7 or 8 of which are branched, originating in advance of the ventrals. Anal fin short, with 7 rays. Pectoral fins horizontal. A scaly process at the base of the ventral fins. Pharyngeal teeth in three series (2 or 3, 3 or 4, 4 or 5—5 or 4, 4 or 3, 3 or 2), with hooked, spoon-shaped crowns.

Southern Asia and North-east Africa.

*Synopsis of the Species.*

- I. Pupil of the eye in the second half of the head; barbels not more than  $\frac{1}{2}$  diameter of eye; ventrals below posterior half of dorsal; Lat. l. 37-40.
- Snout projecting strongly beyond mouth, the width of which is less than  $\frac{1}{2}$  length of head; upper lip well developed, with a series of papillæ forming a fringe . . . . . 1. *D. dembeensis*, Rüpp., p. 345.
- Snout projecting feebly beyond mouth, the width of which equals  $\frac{1}{2}$  length of head; upper lip scarcely developed, not fringed . . . . . 2. *D. johnstonii*, Blgr., p. 346.
- II. Pupil of the eye in the middle, or anterior to the middle, of the length of the head.
- A. Mental disk well developed, with free posterior border.
1. Eye lateral, visible from below.
- Barbels  $\frac{3}{5}$  diameter of eye; ventrals below posterior half of dorsal; caudal peduncle as long as deep; Lat. l. 35-38 . . . . . 3. *D. vinciguerræ*, Blgr., p. 347.
- Barbels  $\frac{2}{3}$  to  $\frac{4}{5}$  diameter of eye; ventrals below middle of dorsal; caudal peduncle  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as deep; Lat. l. 38-40 . . . . . 4. *D. makiensis*, Blgr., p. 348.
2. Eye supero-lateral, not visible from below; barbels  $\frac{1}{2}$  to  $\frac{4}{5}$  diameter of eye; caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep.
- Lat. l. 33-38; ventrals below posterior half of dorsal . . . . . 5. *D. blanfordii*, Blgr., p. 349.
- Lat. l. 38-42; ventrals below middle of dorsal . . . . . 6. *D. hindii*, Blgr., p. 350.
- B. Mental disk very indistinct, or reduced to a mere pad, without free posterior border; barbels  $\frac{1}{2}$  to  $\frac{2}{3}$  diameter of eye; Lat. l. 37-42.
7. *D. quadrimaculatus*, Rüpp., p. 351.



## 1. DISCOGNATHUS DEMBEENSIS.

*Chondrostoma dembeensis*, Rüpp. Mus. Senckenb. ii. p. 16, pl. ii. fig. 4 (1837).

*Gymnostomus? dembeensis*, Heckel, Russegger's Reise Egypt. iii. p. 329 (1846).

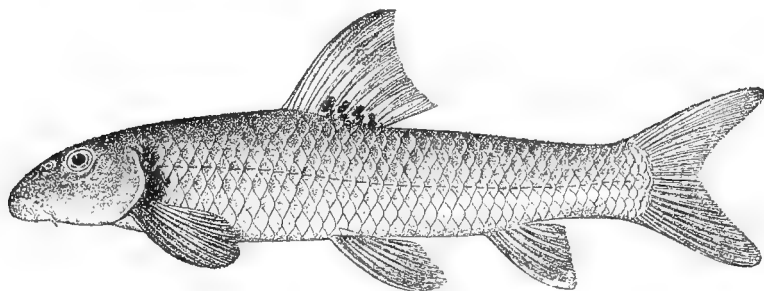
*Discognathus dembeensis*, Bouleng. Ann. & Mag. N. H. (7) xi. 1903, p. 54, and

Fish. Nile, p. 181, pl. xlvi. fig. 1 (1904).

? *Discognathus rothschildi*, Pellegr. Bull. Mus. Paris, 1905, p. 291.

Body feebly compressed, its depth  $4\frac{2}{3}$  to  $6\frac{1}{2}$  times in total length. Head moderately depressed,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as broad, its length  $4\frac{1}{4}$  to 5 times in total length; snout rounded, interorbital region nearly flat; eye supero-lateral, in second half of head, its diameter 4 (young) to 7 times in length of head and about 2 to 3 times in interorbital width; width of mouth  $\frac{2}{5}$  to  $\frac{1}{2}$  length of head; lips covered with granular papillæ, the upper well developed, bordered by large papillæ

Fig. 259.



*Discognathus dembeensis*.

Lake Tsana (F. N.).

forming a fringe; lower lip forming a fold embracing a mental disk, which is broader than long; 2 small barbels on each side, not measuring more than  $\frac{1}{2}$  diameter of eye; snout of breeding males studded with numerous conical horny tubercles. Dorsal III 7, equally distant from nostrils or anterior border of eye and from caudal, emarginate, longest ray as long as or a little shorter than head. Anal II 5. Pectoral as long as or a little shorter than head, widely separated from ventral, which is situated below posterior half of dorsal. Caudal deeply emarginate. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep. Scales 36-40  $\frac{5-6\frac{1}{2}}{5-7}$ , 3-4 between lateral line and root of the ventral, 16-18 round caudal peduncle. Olive-green or brown above, yellowish beneath; a series of round black spots on the dorsal near its base.

Total length 160 millim.

Lake Tsana and upper tributaries of Blue Nile; Omo River; Kilimandjaro.—Types in Senckenberg Museum, Frankfort (M.).

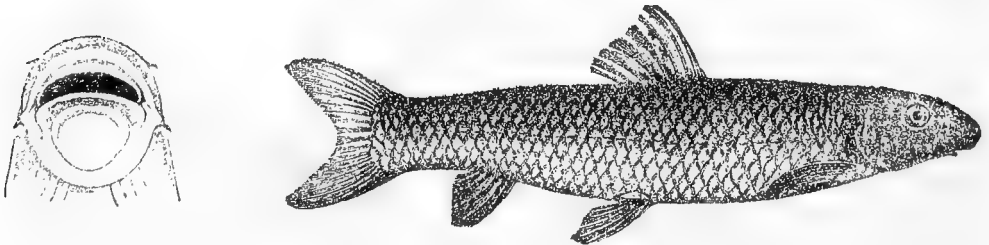
|                   |                                                |                                                 |
|-------------------|------------------------------------------------|-------------------------------------------------|
| 1-3. Ad. & hgr.   | Bahardar, Lake Tsana.                          | Mr. E. Degen (C.).                              |
| 4-7. Ad.          | Matti R., affluent of Gudar R.<br>(Blue Nile). | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan (P.). |
| 8. Skel.          | ” ” ”                                          | ”                                               |
| 9. Ad.            | Didessa R. (Blue Nile), 1500 ft.               | ”                                               |
| 10-11. Ad.        | Juju R., affluent of Didessa R.,<br>2000 ft.   | ”                                               |
| 12-17. Ad.        | Gibe R. (Omo), 2800 ft.                        | ”                                               |
| 18-19. Ad. & hgr. | Nairobi R., Kilimandjaro,<br>6500 ft.          | A. B. Percival, Esq. (C.).                      |

## 2. DISCOGNATHUS JOHNSTONII.

Bouleng. Proc. Zool. Soc. 1901, ii. p. 159, and Fish. Nile, p. 184, pl. xxxii. fig. 2 (1907).

Body feebly compressed, its depth equal to length of head and 5 times in total length. Head moderately depressed,  $1\frac{1}{4}$  to  $1\frac{1}{3}$  times as long as broad, with rounded, feebly projecting snout and nearly flat interorbital region; eye supero-lateral, in second half of head, its diameter  $4\frac{2}{3}$  times in length of head.  $2\frac{1}{4}$  times in interorbital width; width of mouth  $\frac{1}{2}$  length of head; upper lip feebly developed, not fringed; lower lip

Fig. 260.



*Discognathus johnstonii*.

Type (F. N.).  $\frac{4}{5}$ .

embracing a mental disk, which is much broader than long; 2 minute barbels on each side, not measuring  $\frac{1}{2}$  diameter of eye. Dorsal III 7, equally distant from nostrils and from caudal; longest ray  $\frac{2}{3}$  length of head. Anal II 5. Pectoral  $\frac{4}{5}$  length of head, widely separated from ventral, which is situated below posterior half of dorsal. Caudal deeply emarginate. Caudal peduncle  $1\frac{1}{3}$  times as long as deep. Scales 37-38  $\frac{5\frac{1}{2}}{7\frac{1}{2}}$ , 4 between lateral line and root of ventral, 16 round caudal

peduncle. Upper parts and fins blackish olive ; lips, gular and pectoral regions yellowish white, belly brown ; two round deep black spots on the dorsal fin, in the middle of its base.

Total length 110 millim.

Lake Victoria and Nairobi River, Kilimandjaro.

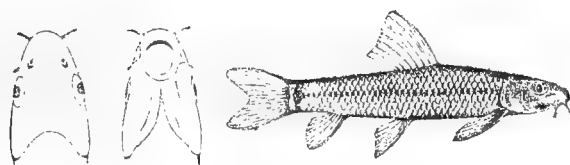
- |          |                                    |                                                      |
|----------|------------------------------------|------------------------------------------------------|
| 1. Type. | Lake Victoria.                     | Mr. W. G. Doggett (C.) ;<br>Sir H. H. Johnston (P.). |
| 2. Ad.   | Nairobi R., Kilimandjaro, 6500 ft. | A. B. Percival, Esq. (C.).                           |

### 3. DISCOGNATHUS VINCIGUERRÆ.

Bouleng. Proc. Zool. Soc. 1901, ii. p. 160, and Fish. Nile, p. 185, pl. xxxi. fig. 4 (1907).

Body feebly compressed, its depth  $4\frac{1}{2}$  to  $5\frac{1}{2}$  times in total length. Head moderately depressed, once and  $\frac{1}{2}$  as long as broad,  $\frac{1}{4}$  total length ; snout rounded, interorbital region nearly flat, its width not quite half length of head ; eye lateral, but better visible from above than from below, in middle of head,  $3\frac{1}{2}$  times in length of head and once and  $\frac{2}{3}$  in interorbital width ; width of mouth about  $\frac{1}{3}$  length of head ; upper lip well developed, bordered by papillæ forming a fringe ; lower lip embracing a mental disk, which is about as long as broad ; two barbels on each side, measuring  $\frac{2}{5}$  diameter of eye. Dorsal III 7, equally distant from centre or posterior border of eye and from caudal ; first

Fig. 261.



*Discognathus vinciguerræ.*

Type (F. N.).

branched ray longest, as long as head. Anal II 5. Pectoral nearly as long as head, widely separated from ventral, which is situated below posterior half of dorsal. Caudal deeply emarginate. Caudal peduncle as long as deep. Scales 35-38  $\frac{5\frac{1}{2}}{6\frac{1}{2}}$ , 3-3 $\frac{1}{2}$  between lateral line and root of ventral, 16 round caudal peduncle. Yellowish, the scales on the back and sides finely speckled with brown, especially towards the border ; a dark brown rhomboidal spot or vertical bar on the caudal peduncle

near the base of the caudal, and a more or less distinct dark bar on the base of the fin; fins whitish, transparent.

Total length 43 millim.

Upper Nile and White Nile.

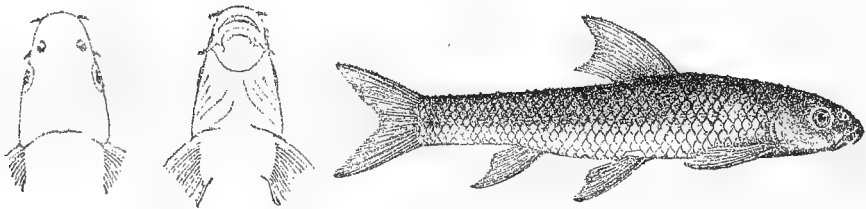
|             |                            |                    |
|-------------|----------------------------|--------------------|
| 1-5. Types. | Near Kermeh, 3rd Cataract. | L. Lat. Esq. (C.). |
| 6. Hgr.     | Kaka, White Nile.          | „                  |

#### 4. DISCOGNATHUS MAKIENSIS.

Bouleng. Proc. Zool. Soc. 1903, ii. p. 330, pl. xxxi. fig. 1.

Body feebly compressed, its depth 5 to 6 times in total length. Head as broad as deep,  $1\frac{1}{2}$  times as long as broad,  $\frac{1}{5}$  to  $\frac{1}{4}$  total length; snout rounded, projecting beyond mouth; interorbital region convex, its width not quite  $\frac{1}{2}$  length of head; eye lateral, but better visible from above than from below, in middle of length of head, its diameter 4 to  $5\frac{1}{2}$  times

Fig. 262.



*Discognathus makiensis.*  
Type (P. Z. S. 1903).  $\frac{4}{5}$ .

in length of head and 2 to  $2\frac{1}{2}$  times in interorbital width; width of mouth not quite  $\frac{1}{3}$  length of head; upper lip well developed, not fringed; lower lip embracing a mental disk which is broader than long; 2 barbels on each side, measuring  $\frac{2}{3}$  to  $\frac{4}{5}$  diameter of eye. Dorsal III 7, equally distant from end of snout or nostrils and from caudal; longest ray a little longer than head. Anal II 5. Pectoral as long as or slightly longer than head, not reaching ventral, which is situated below middle of dorsal. Caudal deeply emarginate. Caudal peduncle  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times as long as deep. Scales 38-40  $\frac{5\frac{1}{2}}{7\frac{1}{2}}$ ,  $3\frac{1}{2}$ -4 between lateral line and ventral, 16 round caudal peduncle. Olive above, white beneath.

Total length 80 millim.

Maki River, running into L. Zwai.

|             |         |                        |
|-------------|---------|------------------------|
| 1-2. Types. | Maki R. | Prof. O. Neumann (C.). |
|-------------|---------|------------------------|

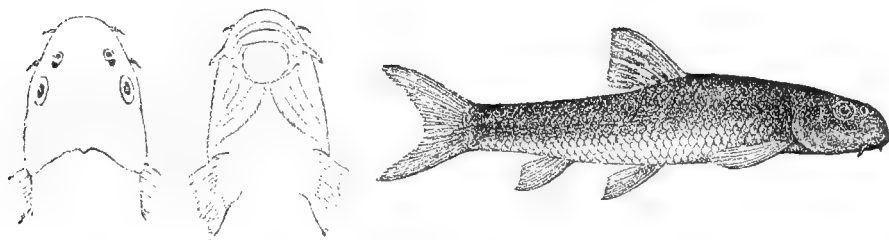
## 5. DISCOGNATHUS BLANFORDII.

*Discognathus lamta* (non Ham. Buch.), Blanf. Geol. Zool. Abyssin. p. 460 (1870); Vincig. Ann. Mus. Genova, xviii. 1883, p. 695.

*Discognathus blanfordii*, Bouleng. Proc. Zool. Soc. 1901, ii. p. 160, and 1903, ii. p. 330, pl. xxxi. fig. 2.

Body very feebly compressed, its depth 4 to  $5\frac{1}{2}$  times in total length. Head scarcely depressed,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as broad, its length  $4\frac{1}{4}$  to  $4\frac{1}{2}$  times in total length; snout rounded, projecting strongly beyond mouth; interorbital region flat, its width  $\frac{1}{2}$ , or a little more than  $\frac{1}{2}$ , length of head; eye supero-lateral or nearly lateral, but not visible from below, in middle, or anterior to middle, of length of head, its diameter 4 (young) to  $5\frac{1}{2}$  times in length of head, 2 to  $2\frac{1}{2}$  times in interorbital width; width of mouth (with lips) about  $\frac{1}{2}$  length of head; upper lip well developed, feebly fringed; lower lip surrounding a mental

Fig. 263.



*Discognathus blanfordii*.  
Gadschimboda R. (P. Z. S. 1903).  $\frac{4}{5}$ .

disk which is broader than long; 2 barbels on each side, measuring  $\frac{1}{2}$  to  $\frac{4}{5}$  diameter of eye; snout of breeding males with conical horny tubercles. Dorsal III 7, equally distant from anterior border of eye or occiput and from caudal; longest ray as long as or slightly shorter than head. Anal II 5. Pectoral as long as head, not reaching ventral, which is situated below second half of dorsal. Caudal deeply emarginate. Caudal peduncle  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times as long as deep. Scales 33-38  $\frac{4\frac{1}{2}-5\frac{1}{2}}{6\frac{1}{2}-7\frac{1}{2}}$ , 3-4 between lateral line and root of ventral, 16 round caudal peduncle. Olive-brown to blackish above, whitish beneath; usually a few black spots at the base of the dorsal fin.

Total length 115 millim.

Eastern watershed of Abyssinia, Erythræa.

1-5. Hgr. & yg., types. Suru, Abyssinia.

Dr. W. T. Blandford (P.).

6. Hgr., types. „ „

W. Jesse, Esq. (P.).

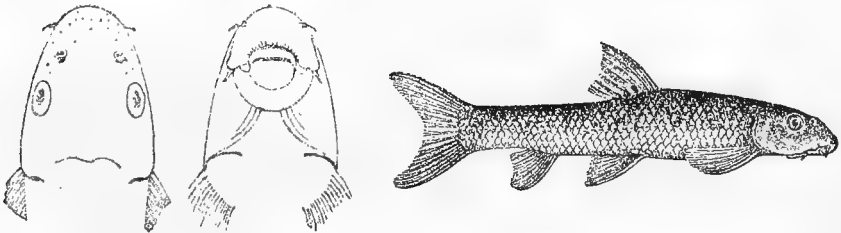
|                           |                                            |                                                  |
|---------------------------|--------------------------------------------|--------------------------------------------------|
| 7-15. Ad. & yg.           | Chaffé - Dousa, high Plateau of Abyssinia. | Mr. E. Degen (C.).                               |
| 16-25. Ad., hgr., & yg.   | Jerrer R. near Harrar.                     | „                                                |
| 26. Skel.                 | „                                          | „                                                |
| 27-29. Ad. & yg.          | Gadschimboda R. (Hawash).                  | Prof. O. Neumann and Baron C. von Erlanger (C.). |
| 30-37. Hgr. & yg., types. | Abyssinia.                                 | Marquis G. Doria (P.).                           |
| 38-42. Hgr. & yg., types. | Amba, near Massowa.                        | W. Jesse, Esq. (C.);<br>Dr. W. T. Blanford (P.). |
| 43-49. Hgr. & yg., types. | Near Massowa.                              | W. Jesse, Esq. (P.).                             |

## 6. DISCOGNATHUS HINDII.

Bouleng. Proc. Zool. Soc. 1905, i. p. 62, pl. vii. fig. 1.

Body feebly compressed, its depth 5 to  $5\frac{1}{2}$  times in total length. Head broader than deep,  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as broad; snout rounded, projecting very strongly beyond mouth; interorbital region flat, its width not quite  $\frac{1}{2}$  length of head; eye supero-lateral, not visible from below, in middle of length of head, its diameter 4 (young) to 5 times in length of head and 2 to  $2\frac{1}{2}$  times in interorbital width; width of mouth about  $\frac{2}{7}$  length of head; upper lip well developed, fringed; lower lip surrounding a mental disk which is broader than long; 2 barbels on

Fig. 264.

*Discognathus hindii*.

Type (P. Z. S. 1905).  $\frac{4}{5}$ .

each side, measuring  $\frac{1}{2}$  to  $\frac{2}{3}$  diameter of eye. Dorsal III 7, equally distant from centre or anterior border of eye and from caudal; longest ray as long as head or a little shorter. Anal II 5. Pectoral nearly as long as head, not reaching ventral, which is situated below middle of dorsal. Caudal deeply emarginate, as long as head. Caudal peduncle  $1\frac{1}{3}$  to  $1\frac{1}{2}$  times as long as deep. Scales 38-42  $\frac{5\frac{1}{2}-6\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ ,  $3\frac{1}{2}$ -4 between lateral line and ventral, 16 round caudal peduncle. Dark olive above, whitish beneath; usually a few black spots on the base of the dorsal fin; young with

a more or less distinct yellowish, dark-edged bar at the root of the caudal fin.

Total length 70 millim.

Nyiro River (Lorian Swamp), Kenya District, East Africa.

1-20. Types.

Nyiro R., 7000 ft.

S. L. Hinde, Esq. (P.).

#### 7. DISCOGNATHUS QUADRIMACULATUS.

*Gobio quadrimaculatus*, Rüpp. Mus. Seckenb. ii. p. 22, pl. iii. fig. 3 (1837).

? *Gobio hirticeps*, Rüpp. t. c. p. 23, pl. iii. fig. 4.

? *Discognathus hirticeps*, Heckel, Russegger's Reise Egypt. iii. p. 329 (1846).

*Discognathus quadrimaculatus*, Heckel, l. c. ; Bouleng. Proc. Zool. Soc. 1903, ii. p. 330, and Fish. Nile, p. 186, pl. xxxi. fig. 5 (1907).

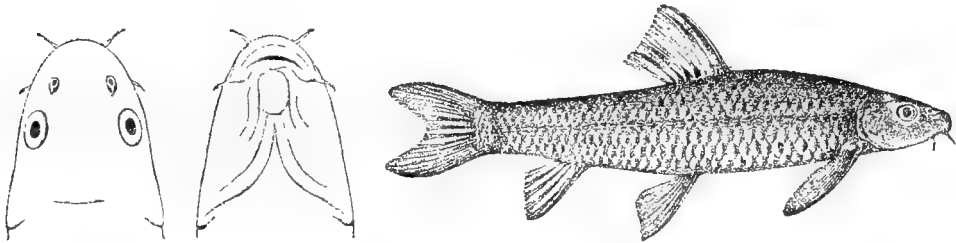
*Barbus quadrimaculatus*, Günth. Cat. Fish. vii. p. 98 (1868).

*Discognathus chiarinii*, Vincig. Ann. Mus. Genova, xviii. 1883, p. 696, fig., and xxix. 1898, p. 259.

*Crossochilus quadrimaculatus*, Bouleng. Ann. & Mag. N. H. (7) x. 1902, p. 422.

Body feebly compressed, its depth equal to or a little less than length of head, which is contained 4 to 5 times in total length. Head slightly depressed,  $1\frac{1}{3}$  to  $1\frac{3}{5}$  times as long as broad, with rounded snout and nearly flat interorbital region ; eye supero-lateral, in middle of length of head, its diameter 4 (young) to 6 times in length of head,  $1\frac{3}{5}$  to  $2\frac{1}{2}$  times

Fig. 265.



*Discognathus quadrimaculatus*.

Lake Tsana (F. N.).  $\frac{5}{7}$ .

in interorbital width ; width of mouth nearly  $\frac{1}{2}$  length of head ; upper lip well developed, bordered by papillæ forming a fringe ; lower lip usually confined to the sides, the mental disk merely indicated by a swelling of the integument ; this disk, which may be very indistinct, not broader than long, without or with a very feeble free border ; 2 barbels on each side, measuring  $\frac{1}{2}$  to  $\frac{4}{5}$  diameter of eye. Dorsal II-III 7, equally distant from centre or posterior border of eye and from caudal ; longest ray a little shorter than head. Anal II 5. Pectoral as long as

or a little shorter than head, widely separated from ventral, which is situated below posterior half of dorsal. Caudal deeply emarginate. Caudal peduncle about  $1\frac{1}{2}$  times as long as deep. Scales 37-42  $\frac{5-6\frac{1}{2}}{5-6\frac{1}{2}}$ , 3-4 between lateral line and root of ventral, 16-18 round caudal peduncle. Brown or olive, somewhat lighter below, lower surface of head yellowish; usually a small black spot behind the gill-opening; a more or less distinct dark spot or blotch on the caudal peduncle, separated from the caudal fin by a yellowish bar; fins dusky, the dorsal lighter at the base, which usually bears two to four black spots.

Total length 118 millim.

Lake Tsana, Lake Arsadé, Lake Zwai, upper tributaries of Hawash River.—Types in Senckenberg Museum, Frankfort (M.).

|                                               |                                 |                                                       |
|-----------------------------------------------|---------------------------------|-------------------------------------------------------|
| 1-13. Ad., hgr., & yg.                        | Bahardar, Lake Tsana.           | Mr. E. Degen (C.).                                    |
| 14-21. Ad., hgr., & yg.                       | Zegi, "                         | "                                                     |
| 22. Skel.                                     | " "                             | "                                                     |
| 23-25. Yg., types of<br><i>D. chiarinii</i> . | Lake Arsadé, Adda<br>Gallaland. | Marquis O. Antinori (C.);<br>Genoa Museum (P.).       |
| 26-35. Ad. & hgr.                             | Lake Zwai.                      | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 36. Hgr.                                      | Akaki R., Hawash.               | "                                                     |
| 37-38. Hgr. & yg.                             | Suksuk R., "                    | Prof. O. Neumann and<br>Baron C. von Erlanger (C.).   |

### 3. VARICORHINUS.

Rüpp. Mus. Senckenb. ii. p. 21 (1837); Bouleng. Fish. Nile, p. 190 (1907).

*Capoëta*, part., Cuv. & Val. Hist. Poiss. xvi. p. 278 (1842); Günth. Cat. Fish. vii p. 77 (1868); Bouleng. Poiss. Bass. Congo, p. 220 (1901).

*Chondrostoma*, part., Cuv. & Val. op. cit. xvii. p. 381 (1844).

*Dillonina*, Heckel, Russegger's Reise Egypt. iii. p. 285 (1846).

*Gymnostomus*, part., Heckel, t. c. p. 287.

*Nychostoma*, Günth. Ann. Mus. Zool. St. Petersb. 1896, p. 211.

*Pterocapoëta*, Günth. Novit. Zool. ix. 1902, p. 446.

Body strongly compressed, covered with small, moderate, or large scales. Lateral line nearer the belly than the back, but running along the middle of the caudal peduncle. Mouth large, inferior, transverse, feebly protractile, without lips, the upper jaw partly covered by a rostral fold, the lower completely exposed and showing a sharp cutting-edge covered with a horny sheath; barbels present or absent. Suborbitals not covering the cheek. Dorsal fin with or without ossified ray, with 11 to 14 rays, 8 to 11 of which are branched. Anal fin short, with 7 or



8 rays. Pharyngeal teeth in three series (2, 3, 4 or 5—5 or 4, 3, 2), with spoon-shaped crowns, which may be close together as in *Labeo* or more wide apart as in *Barbus*.

South-western and Central Asia, Africa.

*Synopsis of the Species.*

I. Less than 40 scales in the lateral line; last simple ray of dorsal strong and ossified.

A. Two pairs of barbels.

D. IV 9; Sc.  $29 \frac{4\frac{1}{2}}{4\frac{1}{2}}$ ; caudal peduncle as long as deep; ventral below anterior soft rays of dorsal . . . . . 1. *V. ansorgii*, Blgr., p. 353.

D. IV 9; Sc.  $31 \frac{4\frac{1}{2}}{4\frac{1}{2}}$ ; caudal peduncle twice as long as deep; ventral below middle of dorsal . . . . . 2. *V. brucei*, Blgr., p. 354.

B. One pair of barbels; dorsal originating in advance of ventrals.

D. IV 11; Sc.  $31 \frac{4\frac{1}{2}}{4\frac{1}{2}}$ ; caudal peduncle  $1\frac{1}{2}$  times as long as deep . . . . . 3. *V. tornieri*, Sldr., p. 355.

D. IV 9; Sc.  $30-35 \frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ ; caudal peduncle  $1\frac{2}{3}-2$  times as long as deep . . . . . 4. *V. beso*, Rüpp., p. 356.

II. More than 40 scales in the lateral line; one pair of barbels.

D. IV 10-11, originating in advance of ventrals, last simple ray slender and flexible; Sc.  $43-46 \frac{8\frac{1}{2}-9\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$  . . . . . 5. *V. maroccanus*, Gthr., p. 357.

D. IV 8-9, originating above ventrals, last simple ray very strong and ossified; Sc.  $64-70 \frac{13\frac{1}{2}-14\frac{1}{2}}{14\frac{1}{2}-15\frac{1}{2}}$  . . . . . 6. *V. tanzanicæ*, Blgr., p. 358.

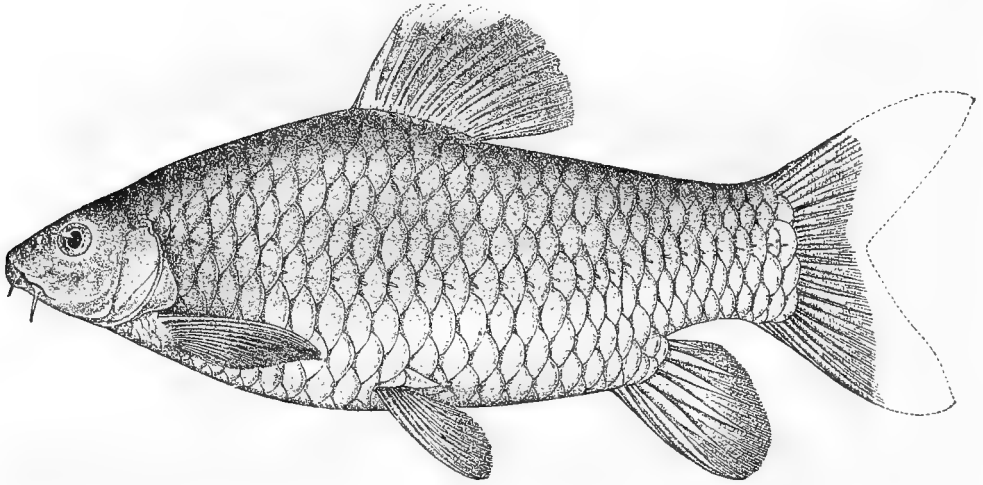
1. VARICORHINUS ANSORGII.

Bouleng. Ann. & Mag. N. H. (7) xvii. 1906, p. 111.

Depth of body twice and  $\frac{3}{5}$  in total length, length of head 5 times. Snout rounded, broader than long,  $\frac{1}{3}$  length of head; eye superolateral, its diameter  $5\frac{1}{2}$  times in length of head, twice in interorbital width; mouth wide, curved, its width  $\frac{2}{5}$  length of head; two barbels on each side, anterior  $\frac{2}{3}$  diameter of eye, posterior as long as eye. Dorsal IV 9, equally distant from eye and from caudal, last simple ray strong, bony, not serrated, shorter than head; border of fin convex; longest

soft rays as long as head. Anal III 5, reaching root of caudal. Pectoral pointed, as long as head, not reaching ventral, which is situated below anterior soft rays of dorsal. Caudal peduncle as long as deep. Scales  $29 \frac{4\frac{1}{2}}{4\frac{1}{2}}$ , 2 between lateral line and root of ventral, 12 round caudal peduncle.

Fig. 266.

*Varicorhinus ansorgii.*Type.  $\frac{1}{2}$ .

Pale mauve above, scales edged with bluish grey, greyish white beneath; fins all pale mauve, with dark mauve striæ.

Total length 300 millim.

Kwango R. (Congo System), Angola.

1. Type. Kwango R. at Fort Don Carlos, Angola. Dr. W. J. Ansorge (C.).

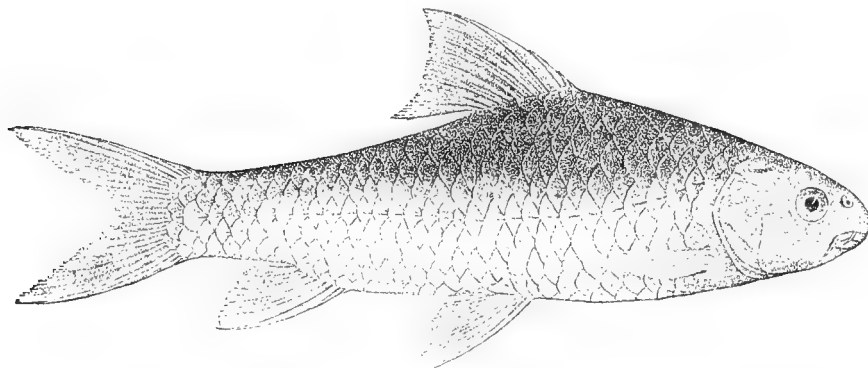
## 2. VARICORHINUS BRUCIL.

Bouleng. Proc. Zool. Soc. 1907, p. 310, pl. xix.

Depth of body  $3\frac{1}{3}$  times in total length, length of head  $4\frac{1}{2}$  times. Snout rounded, broader than long,  $\frac{1}{3}$  length of head; eye lateral,  $4\frac{1}{2}$  times in length of head, twice in interorbital width; no conical tubercles on the head; mouth feebly curved, its width 3 times in length of head; two barbels on each side, anterior  $\frac{1}{2}$  diameter of eye, posterior as long as eye. Dorsal IV 9, last simple ray strong, bony, not serrated, its rigid part  $\frac{2}{3}$  length of head; border of fin concave; longest ray a

little shorter than head. Anal III 5, not reaching root of caudal. Pectoral a little shorter than head, not reaching ventral, which is inserted below middle of dorsal. Caudal deeply forked, with pointed

Fig. 267.

*Varicorhinus brucei*.Type (P. Z. S. 1907).  $\frac{2}{3}$ .

lobes. Caudal peduncle twice as long as deep. Scales  $31\frac{4\frac{1}{2}}{4\frac{1}{2}}$ ,  $2\frac{1}{2}$  between lateral line and ventral, 12 round caudal peduncle. Back muddy brown, belly white, fins grey.

Total length 170 millim.

Klein Olifant River, Transvaal.

1. Type.

Klein Olifant R.

Major G. E. Bruce (P.).

### 3. VARICORHINUS TORNIERI.

Steind. Ann. Hofmus. Wien, xxi. 1907, p. 152\*.

Depth of body 3 times in total length, length of head a little more than 4 times. Snout rounded, a little broader than long, a little less than  $\frac{1}{3}$  length of head; eye supero-lateral,  $4\frac{2}{3}$  times in length of head, slightly less than orbital width; mouth scarcely curved, its width  $2\frac{1}{2}$  times in length of head; a minute barbel. Dorsal IV 11, last simple ray very strong, bony, not serrated, a little longer than head; border of fin strongly concave. Anal III 5, not reaching root of caudal. Pectoral a little shorter than head, not reaching ventral, which is inserted below

\* This paper bears the date 1906, but as allusion is made to *V. brucei*, the description of which did not appear until late in August 1907, its publication must be of a later date.

middle of dorsal. Caudal deeply forked. Caudal peduncle once and  $\frac{1}{2}$  as long as deep. Scales  $31 \frac{4\frac{1}{2}}{4\frac{1}{2}}$ ,  $2\frac{1}{2}$  between lateral line and ventral, 12 round caudal peduncle. Dark brown above, yellow beneath.

Total length 180 millim.

Nyong River District, South Cameroon.—Types in Vienna Museum.

#### 4. VARICORHINUS BESO.

*Varicorhinus beso*, Rüpp. Mus. Senckenb. ii. p. 21, pl. iii. fig. 2 (1837); Bouleng. Ann. & Mag. N. H. (7) x. 1902, p. 422, and Fish. Nile, p. 191, pl. xxxiii. (1907).

*Chondrostoma dillonii*, Cuv. & Val. Hist. Poiss. xvii. p. 404 (1844).

*Labeo varicorhinus*, Cuv. & Val. t. c. p. 491.

*Dillonia dillonii*, Heckel, Russegger's Reis. Egypt. iii. p. 285 (1846); Vincig. Ann. Mus. Genova, xviii. 1883, p. 699.

*Dillonia abyssinica*, Heckel, t. c. p. 329.

*Systomus beso*, Heckel, t. c. p. 328.

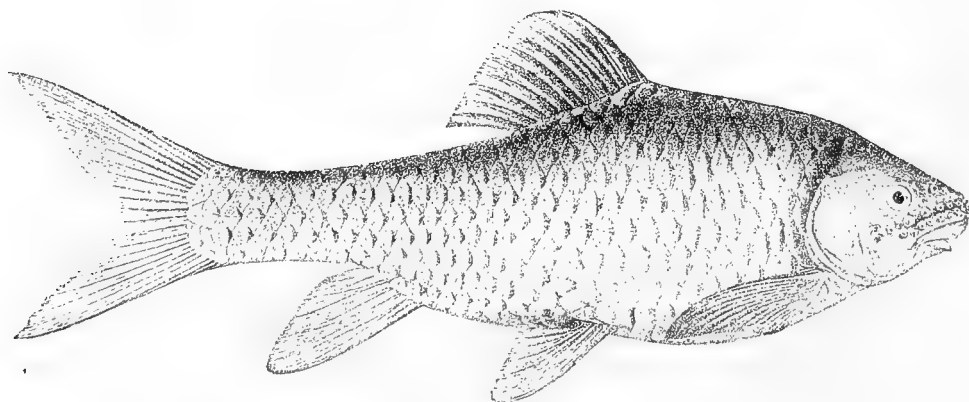
*Capoëta dillonii*, Günth. Cat. Fish. vii. p. 81 (1868); Blanf. Geol. Zool. Abyssin. p. 460 (1870).

*Barbus beso*, Günth. t. c. p. 148.

*Capoëta beso*, Pellegr. Bull. Mus. Paris, 1905, p. 291.

Depth of body 3 to  $3\frac{1}{2}$  times in total length, length of head 4 to 5 times. Snout broad, swollen, its length  $2\frac{3}{4}$  to  $3\frac{1}{2}$  times in length of head; eye supero-lateral, its diameter 4 (young) to 6 times in length of

Fig. 268.



*Varicorhinus beso*.

Lake Tsana (F. N.).  $\frac{1}{3}$ .

head; interorbital region convex, its width 2 to  $2\frac{1}{2}$  times in length of head; mouth wide, its width as great as or a little greater than inter-

orbital width; a minute barbel at angle of mouth; horny conical or subconical tubercles in 2 or 3 series round snout and below eye, the largest on the sides. Dorsal IV 9-10, nearer occiput than root of caudal, originating a little in advance of ventrals, border not or but slightly emarginate, sometimes even slightly convex; last simple ray very strong, bony, smooth, more or less curved, its bony part usually as long as or a little shorter than head in young,  $\frac{2}{3}$  to  $\frac{3}{4}$  length of head in adult. Anal III 5, longest ray a little shorter than head. Pectoral nearly as long as head, not reaching ventral. Caudal deeply forked. Caudal peduncle  $1\frac{2}{3}$  to 2 times as long as deep. Scales 30-35  $\frac{4\frac{1}{2}-5\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$ , 2-3 between lateral line and ventral, 12 round caudal peduncle. Grey or green above, base of scales blue, yellowish below; fins bluish or pinkish grey.

Total length 360 millim.

Lake Tsana and rivers of Abyssinia (Blue Nile and Hawash Systems).—Type in Senckenberg Museum, Frankfort (M.).

|                        |                                                      |                                                       |
|------------------------|------------------------------------------------------|-------------------------------------------------------|
| 1-6. Ad.               | Zegi, Lake Tsana.                                    | Mr. E. Degen (C.).                                    |
| 7. Skel.               | " "                                                  | "                                                     |
| 8-14. Ad., hgr., & yg. | Bahardar, Lake Tsana.                                | "                                                     |
| 15-19. Ad. & hgr.      | Meti R., affluent of Gudar R.,<br>3500 ft.           | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |
| 20. Hgr.               | Didessa R., Guma, 1500 ft.                           | "                                                     |
| 21. Ad.                | Juju R., affluent of Didessa R.,<br>2000 ft.         | "                                                     |
| 22. Hgr.               | Urgessa R., Limmu, 2300 ft.                          | "                                                     |
| 23-27. Ad. & hgr.      | Hurso R., Upper Adal, 2000 ft.                       | Mr. E. Degen (C.).                                    |
| 28. Ad.                | Marmasa, Gota R., affluent of<br>Hawash R., 1500 ft. | "                                                     |
| 29-32. Ad. & hgr.      | Zc Kuala, Hawash R., 4100 ft.                        | Mr. P. C. Zaphiro (C.);<br>W. N. McMillan, Esq. (P.). |

##### 5. VARICORHINUS MAROCCANUS.

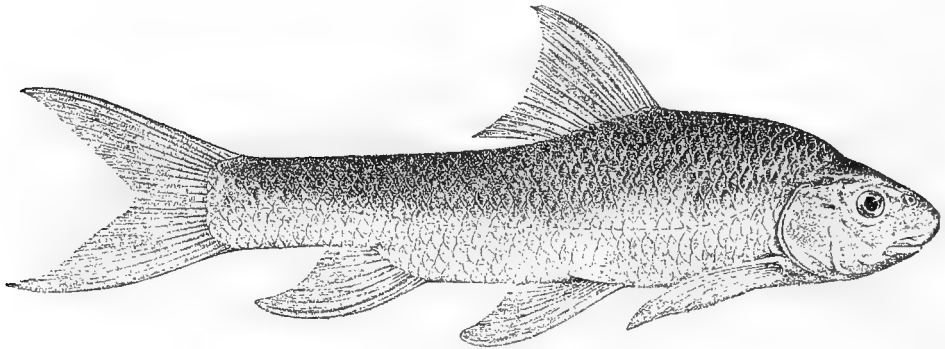
*Pterocapoëta maroccana*, Günth. Nov. Zool. ix. 1902, p. 446, pl. xxii.

*Varicorhinus maroccanus*, Bouleng. Ann. & Mag. N. H. (7) xvi. 1905, p. 43.

Depth of body  $3\frac{2}{3}$  to  $4\frac{1}{4}$  times in total length, length of head 4 to  $4\frac{2}{3}$  times. Snout rounded, much broader than long, its length  $\frac{1}{3}$  to  $\frac{2}{5}$  length of head; eye supero-lateral or nearly lateral, its diameter 4 (young) to 6 times in length of head, 2 to 3 times in interorbital width; mouth wide, curved, its width  $\frac{1}{2}$  to  $\frac{2}{5}$  length of head; a minute barbel, hidden

in the folds at side of mouth; adult with large bony tubercles on side of snout and below eye. Dorsal IV 10–11, about equally distant from end of snout and from caudal, last simple ray slender, flexible, as long as or a little longer than head; border of fin emarginate. Anal III 5, reaching, or nearly reaching, root of caudal. Pectoral longer than

Fig. 269.

*Varicorhinus maroccanus.*Type, after Günther (*l. c.*).  $\frac{5}{7}$ .

head, sometimes reaching ventral, which is inserted below middle of dorsal. Caudal deeply forked. Caudal peduncle  $1\frac{2}{3}$  to 2 times as long as deep. Scales 43–46  $\frac{8\frac{1}{2}-10\frac{1}{2}}{9\frac{1}{2}-10\frac{1}{2}}$ , 4–5 between lateral line and root of ventral, 16 round caudal peduncle. Brown above, whitish beneath.

Total length 390 millim.

Morocco.

- |                  |                           |                            |
|------------------|---------------------------|----------------------------|
| 1–2. Hgr. & yg., | Oum Erbiah, near Mazagan. | Mr. F. W. Riegenbach (C.). |
| types.           |                           |                            |
| 3. Ad.           | ”                         | ”                          |
| 4. Yg., type.    | R. Talmist.               | ”                          |

#### 6. VARICORHINUS TANGANICÆ.

*Capoëta tanganicæ*, Bouleng. Ann. & Mag. N. H. (7) vi. 1900, p. 478, Poiss. Bass.

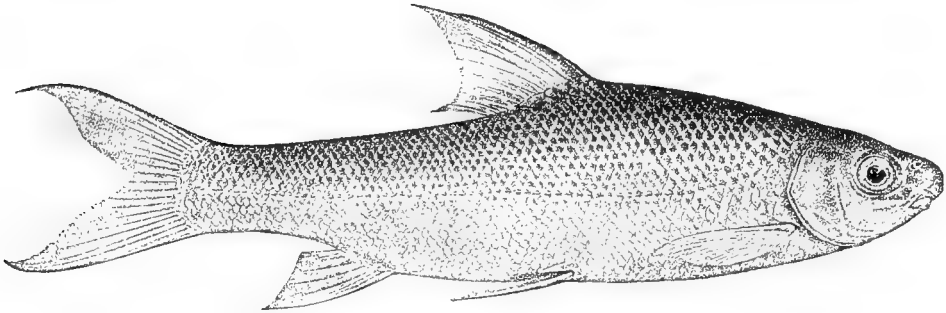
Congo, p. 220 (1901), and Tr. Zool. Soc. xvi. 1901, p. 143, pl. xii. fig. 1.

*Varicorhinus tanganicæ*, Bouleng. Ann. & Mag. N. H. (7) xvi. 1905, p. 43, and Tr. Zool. Soc. xvii. 1906, p. 549.

Depth of body  $3\frac{2}{3}$  to 4 times in total length, length of head  $4\frac{2}{3}$  to 5 times. Snout rounded, broader than long,  $3\frac{1}{2}$  to 4 times in length of head; eye perfectly lateral,  $2\frac{2}{3}$  to  $3\frac{1}{2}$  times in length of head,  $1\frac{1}{4}$  to nearly 2 times in interorbital width; mouth feebly curved, its width  $\frac{2}{3}$  that

of head; a minute barbel, hidden in folds at side of mouth. Dorsal IV 8-9, equally distant from anterior or posterior border of eye and from caudal, last simple ray very strong, bony, smooth, nearly as long as head; border of fin emarginate. Anal III 5, not reaching caudal. Pectoral as long as head, not reaching ventral, which is below anterior rays of dorsal. Caudal deeply forked. Caudal peduncle twice as long

Fig. 270.



*Varicorhinus tanganicæ.*  
Type (Tr. Z. S. 1901).  $\frac{1}{2}$ .

as deep. Scales 64-70  $\frac{13\frac{1}{2}-14\frac{1}{2}}{14\frac{1}{2}-15\frac{1}{2}}$ , 9-10 between lateral line and root of ventral, 32-34 round caudal peduncle. Olive above, each scale darker at the base, silvery white beneath.

Total length 320 millim.

Lake Tanganyika.

|             |                             |                            |
|-------------|-----------------------------|----------------------------|
| 1-2. Types. | North end of L. Tanganyika. | Prof. J. E. S. Moore (C.). |
| 3. Skel.    | ” ”                         | ”                          |
| 4-5. Hgr.   | Niamkolo.                   | Dr. W. A. Cunnington (C.). |





# I N D E X.

- abadii* (*Gnathonemus*), 118.  
*abbreviatus* (*Mormyrops*), 110.  
     "    (*Mormyrus*), 110.  
*Abrostomus*, 300.  
     "    *capensis*, 340.  
     "    *umbratus*, 339.  
*abyssinica* (*Dillonia*), 356.  
*acutidens* (*Alestes*), 224.  
     "    (*Brachyalestes*), 224.  
     "    (*Micralestes*), 224.  
*acutirostris* (*Pellonula*), 159.  
*adansonii* (*Heterotis*), 149.  
     "    (*Sudis*), 149.  
*adpersus* (*Marcusenius*), 70.  
     "    (*Mormyrus*), 70.  
*ægyptiacus* (*Salmo*), 273, 275.  
*æthiopicus* (*Protopterus*), 21.  
*afer* (*Notopterus*), 146.  
*affinis* (*Alestes*), 208.  
     "    (*Brachyalestes*), 208.  
     "    (*Distichodus*), 260.  
     "    (*Mormyrus*), 88.  
     "    (*Petrocephalus*), 88.  
*agnus* (*Mormyrus*), 128.  
*Alausa vulgaris*, 154.  
*Alestes*, 190.  
     "    *acutidens*, 224.  
     "    *affinis*, 208.  
     "    *baremore*, 195.  
     "    *batesii*, 221.  
     "    *bimaculatus*, 213.  
     "    *brevipinnis*, 227.  
     "    *brevis*, 222.  
     "    *chaperi*, 203.  
     "    *dentex*, 193.  
     "    *fuchsii*, 209.  
     "    *grandisquamis*, 220.  
     "    *hasselquistii*, 193, 195.  
     "    *holargyreus*, 227.  
     "    *humilis*, 211.  
     "    *imberi*, 208, 209.  
     "    *intermedius*, 201.  
     "    *kingsleyæ*, 212.  
     "    *kotschyi*, 195.  
     "    *lateralis*, 204.  
     "    *lemairii*, 209.  
     "    *leuciscus*, 206.  
     "    *liebrechtsii*, 198.  
     "    *longipinnis*, 202, 203, 236.  
     "    *macrolepidotus*, 217, 218, 222.  
     "    *macrophthalmus*, 197.  
     "    *natalensis*, 204.  
     "    *nurse*, 205.  
     "    *opisthotænia*, 215.  
     "    *poptæ*, 216.  
     "    *rhodopleura*, 218.  
     "    *ruppellii*, 206.  
     "    *sadleri*, 200.  
     "    *senegalensis*, 206.  
     "    *sethente*, 193.  
     "    *splendens*, 195.  
     "    *stuhlmanni*, 199.  
     "    *tæniurus*, 214.  
     "    *tholloni*, 201.  
     "    *wytsi*, 195.  
*Alosa*, 153.  
     "    *finta*, 154.  
*alosa* (*Clupea*), 154.  
*altivelis* (*Labeo*), 309.  
*altus* (*Distichodus*), 261.  
     "    (*Micralestes*), 230.  
*amblystoma* (*Mormyrus*), 52.  
*amphibia* (*Rhinocryptis*), 20.  
*amphibius* (*Protopterus*), 20.  
*anchietæ* (*Mormyrus*), 129.  
*angolensis* (*Gnathonemus*), 109.  
     "    (*Kneria*), 170.  
*anguilliformis* (*Protopterus*), 20.  
*anguilloides* (*Marcusenius*), 34.  
     "    (*Mormyrops*), 34.

- anguilloides (Mormyrus), 34.  
 anna-carolina (Mugilomorus), 25.  
 annectens (Labeo), 336.  
   " (Lepidosiren), 20, 21.  
   " (Protopterus), 20, 21.  
 ansorgii (Citharidium), 289.  
   " (Labeo), 341.  
   " (Marcusenius), 73.  
   " (Petrocephalus), 51.  
   " (Phractolæmus), 168.  
   " (Varicorhinus), 353.  
 antonii (Distichodus), 266.  
 apalike (Elops), 28.  
 arabicus (Chanos), 164.  
 Argentina carolina, 25.  
   " machnata, 25.  
 arnaudii (Lepidosiren), 21.  
   " (Polypterus), 14.  
 atroventralis (Distichodus), 267.  
 attenuatus (Mormyrops), 45.  
 auriculatus (Xenopomatischthys), 172.
- bachiqua (Mormyrus), 134.  
 ballayi (Petrocephalus), 52.  
 bane (Mormyrus), 48.  
   " (Petrocephalus), 48.  
 barbatus (Labeo), 342.  
 Barbus beso, 356.  
   " quadrimaculatus, 251.  
 baremose (Alestes), 195.  
   " (Myletes), 195.  
 batesii (Alestes), 221.  
   " (Marcusenius), 72.  
 bebe (Hyperopisus), 142.  
   " (Mormyrus), 142.  
 bentleyi (Gnathonemus), 103.  
   " (Mormyrus), 103.  
 beso (Barbus), 356.  
   " (Capoëta), 356.  
   " (Systemus), 356.  
   " (Varicorhinus), 356.  
 besse (Characinus), 251.  
   " (Ichthyoborus), 251.  
 bichir (Polypterus), 6, 10, 14, 16.  
 bimaculatus (Alestes), 213.  
 blanfordii (Discognathus), 349.  
 boulengeri (Bryconæthiops), 188.  
   " (Mormyrops), 40.  
   " (Phago), 248.  
 bovei (Mormyrus), 54.
- bovei (Petrocephalus), 54.  
 bozasi (Mormyrus), 138.  
 brachistius (Marcusenius), 67.  
 Brachyalestes, 190, 223.  
   " acutidens, 224.  
   " affinis, 208.  
   " imberi, 209.  
   " longipinnis, 202.  
   " mocquardianus, 188.  
   " nurse, 206.  
   " ruppellii, 206.  
 brachyistius (Marcusenius), 65, 67.  
   " (Mormyrops), 67.  
 brachypoma (Labeo), 324.  
 breviceps (Mormyrops), 36.  
 brevipinnis (Alestes), 227.  
   " (Distichodus), 272.  
 brevis (Alestes), 222.  
   " (Hydrocyon), 186.  
   " (Nannocharax), 280.  
 brucii (Varicorhinus), 354.  
 brumpti (Petersius), 235.  
 bruyerii (Gnathonemus), 104.  
 Brycinus, 190.  
   " macrolepidotus, 217.  
   " nurse, 206.  
 Bryconæthiops, 187.  
   " boulengeri, 188.  
   " microstoma, 188.  
   " yseuxi, 189.
- buchholzi (Pantodon), 151.  
 budgetti (Marcusenius), 83.  
 büttikoferi (Polypterus), 16.
- caballus (Mormyrus), 132.  
 cabræ (Marcusenius), 65.  
 cafer (Labeo), 339.  
 calabaricus (Calamichthys), 18.  
   " (Erpetoichthys), 18.  
 Calamichthys, 17.  
   " calabaricus, 18.  
 cameronensis (Kneria), 171.  
 Campylomormyrus, 94.  
   " elephas, 120.  
   " tamandua, 118.  
 cantini (Tylognathus), 331.  
 capensis (Abrostomus), 340.  
   " (Elops), 25.  
   " (Labeo), 340.  
 Capoëta, 352.

- Capoëta beso, 356.  
   ,, dillonii, 356.  
   ,, tanganicæ, 358.  
 Carcharias, 2.  
   ,, zambesensis, 2.  
 Carchariidæ, 1.  
 carolina (Argentina), 25.  
 cashive (Mormyrus), 128, 136.  
 castor (Hippopotamyrus), 77.  
   ,, (Marcusenius), 77.  
 catostoma (Mormyrus), 52, 57.  
   ,, (Petrocephalus), 56, 57.  
 caudalis (Petersius), 236.  
 Centriscus niloticus, 137.  
 Chalceus guile, 206.  
 Chaninæ, 153.  
 Chanos, 164.  
   ,, arabicus, 164.  
   ,, chanos, 164.  
   ,, chloropterus, 164.  
   ,, lubina, 164.  
   ,, mento, 164.  
   ,, mossambicus, 164.  
   ,, nuchalis, 164.  
   ,, salmoneus, 164.  
 chanos (Chanos), 164.  
   ,, (Lutodeira), 164.  
   ,, (Mugil), 164.  
 chaperi (Alestes), 203.  
 Characinidæ, 174.  
 Characinus besse, 251.  
   ,, dentex, 180.  
   ,, nefasch, 273, 275.  
   ,, niloticus, 193.  
 chariensis (Labeo), 337.  
 chiarinii (Discognathus), 351.  
 chloropterus (Chanos), 164.  
 Chondrostoma, 352.  
   ,, dembensis, 306, 345.  
   ,, dillonii, 356.  
 Citharidium, 289.  
   ,, ansorgii, 289.  
 Citharininæ, 176.  
 Citharinus, 290.  
   ,, citharus, 291.  
   ,, congicus, 293.  
   ,, geoffroyi, 291.  
   ,, gibbosus, 297.  
   ,, latus, 295.  
   ,, macrolepis, 294.  
 citharus (Citharinus), 291.  
 citharus (Serrasalmus), 291.  
 Cladistia, 4.  
 Clupea, 153.  
   ,, alosa, 154.  
   ,, cyprinoides, 28.  
   ,, finta, 154.  
   ,, nilotica, 154.  
   ,, sprattus, 154.  
 Clupeidæ, 153.  
 Clupeinæ, 153.  
 cobitiformis (Mormyrus), 59.  
 Cobitinæ, 300.  
 congicus (Citharinus), 293.  
   ,, (Elops), 26.  
   ,, (Polypterus), 9.  
 congoro (Labeo), 319.  
 conserialis (Petersius), 233.  
 Coregonus niloticus, 283.  
 corneti (Stomatorhinus), 90.  
 coubie (Labeo), 309, 313, 317.  
 crassus (Xenocharax), 288.  
 Cristivomer, 166.  
 crocodilus (Mesoborus), 245.  
 Cromeria, 173.  
   ,, nilotica, 173.  
 Cromeriidæ, 173.  
 Crossochilus quadrimaculatus, 351.  
 Crossopterygii, 4.  
 cundinga (Cyprinodon), 28.  
   ,, (Elops), 28.  
 curtifilis (Megalops), 28.  
 curtus (Mormyrops), 41.  
 curvifrons (Mormyrus), 132.  
 curvirostris (Gnathonemus), 123.  
 cuvieri (Hydrocyonoides), 177.  
 cyclorhynchus (Labeo), 326.  
 cylindricus (Labeo), 331.  
 Cyprinidæ, 298.  
 Cyprinina, 299.  
 Cyprinodon cundinga, 28.  
 cyprinoides (Clupea), 28.  
   ,, (Elops), 28.  
   ,, (Gnathonemus), 110.  
   ,, (Megalops), 28.  
   ,, (Mormyrops), 110.  
   ,, (Mormyrus), 48, 49, 110.  
 Cyprinus niloticus, 304, 329.  
 darlingi (Labeo), 321.  
 degeni (Petrocephalus), 58.

- dejoannis (*Petrocephalus*), 48.  
 delhezi (*Polypterus*), 13.  
 deliciosus (*Mormyrops*), 32.  
     " (*Mormyrus*), 32.  
     " (*Oxyrhynchus*), 32.  
 dembeensis (*Chondrostoma*), 345.  
     " (*Discognathus*), 345.  
     " (*Gymnostomus*), 345.  
 dembensis (*Chondrostoma*), 306.  
 dendera (*Mormyrus*), 34.  
 dentex (*Alestes*), 193.  
     " (*Characinus*), 180.  
     " (*Hydrocyon*), 180.  
     " (*Myletes*), 193.  
     " (*Salmo*), 180, 193, 195.  
 dequesne (*Mormyrus*), 48.  
     " (*Petrocephalus*), 48.  
 Dillonia, 352.  
     " *abyssinica*, 356.  
     " *dillonii*, 356.  
 dillonii (*Capoëta*), 356.  
     " (*Chondrostoma*), 356.  
     " (*Dillonia*), 356.  
 dimidiatus (*Nannocharax*), 286.  
 Dipneusti, 18.  
 Discognathus, 343.  
     " *blanfordii*, 349.  
     " *chiarinii*, 351.  
     " *dembeensis*, 345.  
     " *hindii*, 350.  
     " *hirticeps*, 351.  
     " *johnstonii*, 346.  
     " *lamta*, 349.  
     " *makiensis*, 348.  
     " *quadrimaculatus*, 351.  
     " *rothschildi*, 345.  
     " *vineguerræ*, 347.  
 discorhynchus (*Marcusenius*), 81.  
     " (*Mormyrus*), 81, 82.  
 Distichodontinæ, 176.  
 Distichodus, 258.  
     " *affinis*, 260.  
     " *altus*, 261.  
     " *antoni*, 266.  
     " *atroventralis*, 267.  
     " *brevipinnis*, 272.  
     " *engycephalus*, 271.  
     " *fasciolatus*, 270.  
     " *hypostomatus*, 264.  
     " *leptorhynchus*, 277.  
     " *lusosso*, 277.  
     " *macrolepis*, 268.  
     " *maculatus*, 264.  
     " *marnoi*, 291.  
     " *martini*, 275.  
     " *mossambicus*, 268.  
     " *nefasch*, 274, 275.  
     " *niloticus*, 273.  
     " *noboli*, 262.  
     " *notospilus*, 262.  
     " *petersii*, 265.  
     " *rodolphi*, 274.  
     " *rostratus*, 275.  
     " *schenga*, 268.  
     " *sexfasciatus*, 276.  
     " *touteei*, 271.  
 ditchoa (*Pellona*), 163.  
 dolloi (*Protopterus*), 22.  
 donnyi (*Genyomyrus*), 125.  
 dorsalis (*Hyperopisus*), 142.  
     " (*Mormyrus*), 142.  
     " (*Phagrus*), 142.  
 eetveldii (*Eugnathichthys*), 241.  
 ehrenbergii (*Heterotis*), 149.  
     " (*Mormyrus*), 48.  
     " (*Petrocephalus*), 48.  
 elephas (*Campylomormyrus*), 120.  
     " (*Gnathonemus*), 120.  
 elongatus (*Mormyrops*), 110.  
     " (*Mormyrus*), 110.  
     " (*Nannocharax*), 284.  
 Elopidae, 24.  
 Elops, 25.  
     " *apalike*, 28.  
     " *capensis*, 25.  
     " *congius*, 26.  
     " *cundinga*, 28.  
     " *cyprinoides*, 28.  
     " *indicus*, 25.  
     " *inermis*, 25.  
     " *lacerta*, 26.  
     " *machnata*, 25.  
     " *purpurascens*, 25.  
     " *saurus*, 25.  
 endlicheri (*Polypterus*), 10.  
 engycephalus (*Distichodus*), 271.  
 engystoma (*Mormyrops*), 36.  
 Erpetoichthys, 17.  
     " *calabarius*, 18.  
 Eugnathichthys, 241.

- Eugnathichthys eetveldii*, 241.  
 „ *macroterolepis*, 243.
- falcifer* (Labeo), 327.  
*falcipiinnis* (Labeo), 327.  
*Fario*, 166.  
*fario* (*Salmo*), 166.  
*fasciatus* (*Nannocharax*), 281.  
*fasciolatus* (*Distichodus*), 270.  
*filamentosus* (*Megalops*), 28.  
*fiuta* (*Alosa*), 154.  
 „ (*Clupea*), 154.  
*forskalii* (*Hydrocyon*), 180, 182, 186.  
 „ (*Labeo*), 328, 329, 331.  
*friteli* (*Gnathonemus*), 103.  
*fuchsii* (*Alestes*), 209.  
*fuelleborni* (*Labeo*), 323.  
*furcicens* (*Mormyrops*), 46.
- Genyomyrus*, 125.  
 „ *donnyi*, 125.  
*geoffroyi* (*Citharinus*), 291.  
 „ (*Mormyrus*), 136, 137.  
*gibbosus* (*Citharinus*), 297.  
*gilli* (*Gnathonemus*), 114.  
*gliroides* (*Mormyrus*), 58.  
 „ (*Petrocephalus*), 58.
- Gnathonemus*, 94.  
 „ *abadii*, 118.  
 „ *angolensis*, 109.  
 „ *bentleyi*, 103.  
 „ *bruyerii*, 105.  
 „ *curvirostris*, 123.  
 „ *cyprinoides*, 110.  
 „ *elephas*, 120.  
 „ *friteli*, 103.  
 „ *gilli*, 114.  
 „ *greshoffi*, 117.  
 „ *ibis*, 122.  
 „ *kutuensis*, 115.  
 „ *lambouri*, 97.  
 „ *leopoldianus*, 102.  
 „ *livingstonii*, 104.  
 „ *longibarbis*, 100.  
 „ *macrolepidotus*, 112.  
 „ *mento*, 106.  
 „ *mirus*, 119.  
 „ *monteiri*, 105.
- Gnathonemus moorii*, 96.  
 „ *niger*, 101.  
 „ *numenius*, 124.  
 „ *petersii*, 99.  
 „ *pietus*, 113.  
 „ *rhyuchophorus*, 121.  
 „ *schilthuisiæ*, 98.  
 „ *senegalensis*, 108.  
 „ *stanleyanus*, 107.  
 „ *tamandua*, 118.  
 „ *ussleri*, 116.
- Gobio birticeps*, 351.  
 „ *quadrinaculatus*, 351.  
*goliath* (*Hydrocyon*), 184.  
*grandisquamis* (*Alestes*), 220.  
 „ (*Mormyrus*), 96.  
*greenii* (*Labeo*), 334.  
*gregorii* (*Labeo*), 321.  
*greshoffi* (*Gnathonemus*), 117.  
 „ (*Mormyrus*), 117.  
*guentheri* (*Mormyrus*), 128.  
*guile* (*Chalceus*), 206.  
 „ (*Myletes*), 205.
- Gymnarchinæ*, 30.  
*Gymnarchus*, 144.  
 „ *niloticus*, 144.
- Gymnostomus*, 352.  
 „ *dembeensis*, 345.
- harringtoni* (*Marcusenius*), 78.  
*hasselquistii* (*Alestes*), 193, 195.  
 „ (*Mormyrus*), 128.  
 „ (*Myletes*), 193.
- Helicobranchus*, 149.  
*Hemistichodus*, 253.  
 „ *vallanti*, 253.
- henryi* (*Isichthys*), 59.  
 „ (*Mormyrops*), 59.  
 „ (*Mormyrus*), 59.
- herse* (*Mormyrus*), 128.
- Heteromormyrus*, 60.
- Heterotis*, 149.  
 „ *adansonii*, 149.  
 „ *ehrenbergii*, 149.  
 „ *niloticus*, 149.
- hildebrandti* (*Mormyrus*), 136.
- hilgendorfi* (*Petersius*), 232.
- hindii* (*Discognathus*), 350.
- Hippopotamyus*, 60.  
 „ *castor*, 77.

- hirticeps* (*Discognathus*), 351.  
 „ (*Gobio*), 351.  
*holargyreus* (*Alestes*), 227.  
 „ (*Micralestes*), 227.  
*horie* (*Labeo*), 306.  
*Hucho*, 166.  
*humilior* (*Stomatorhinus*), 89.  
*humilis* (*Alestes*), 211.  
 „ (*Micralestes*), 226.  
*Hydrocynus*, 179.  
*Hydrocyon*, 179.  
 „ *brevis*, 186.  
 „ *dentex*, 180.  
 „ *forskali*, 180, 182, 186.  
 „ *goliath*, 184.  
 „ *lineatus*, 182.  
 „ *vittatus*, 182, 184.  
 „ *vittiger*, 184.  
*Hydrocyoninae*, 175.  
*Hydrocyonoides*, 177.  
 „ *cuvieri*, 177.  
*Hyperopisus*, 142.  
 „ *bebe*, 142.  
 „ *dorsalis*, 142.  
 „ *occidentalis*, 142.  
 „ *tenuicauda*, 142.  
*hypostomatus* (*Distichodus*), 264.  
*Hypotremi*, 3.  
*Hypsifario*, 166.
- ibis* (*Gnathonemus*), 122.  
*Ichthyoborinae*, 175.  
*Ichthyoborus*, 251.  
 „ *besse*, 251.  
 „ *microlepis*, 251.  
*Ilisha*, 162.  
 „ *indica*, 163.  
*imberi* (*Alestes*), 208, 209.  
 „ (*Brachyalestes*), 209.  
*indica* (*Ilisha*), 163.  
 „ (*Pellona*), 163.  
*indicus* (*Elops*), 25.  
 „ (*Megalops*), 28.  
 „ (*Platygaster*), 163.  
*inermis* (*Elops*), 25.  
*intermedius* (*Alestes*), 201.  
 „ (*Nannocharax*), 282.  
 „ (*Phago*), 247.  
*interruptus* (*Micralestes*), 229.  
*Isichthys*, 59.
- Isichthys henryi*, 59.  
*isidori* (*Marcusenius*), 75.  
 „ (*Mormyrus*), 75.  
 „ (*Petrocephalus*), 75.  
*joannisii* (*Mormyrus*), 48.  
*johnstonii* (*Discognathus*), 346.  
*jubelini* (*Mormyrus*), 140.
- kannume* (*Mormyrus*), 134.  
 „ (*Scrophicephalus*), 134.  
*keatingii* (*Petrocephalus*), 55.  
*kingsleyae* (*Alestes*), 212.  
 „ (*Marcusenius*), 65.  
 „ (*Mormyrus*), 65.  
*kirkii* (*Labeo*), 328.  
*Kneria*, 169.  
 „ *angolensis*, 170.  
 „ *cameronensis*, 171.  
 „ *spekii*, 171.  
*Kneriidae*, 169.  
*kotschy* (*Alestes*), 195.  
*kundinga* (*Megalops*), 28.  
*kutuensis* (*Gnathonemus*), 115.
- Labeo*, 300.  
 „ *altivelis*, 309.  
 „ *annectens*, 336.  
 „ *ansorgii*, 341.  
 „ *barbatus*, 342.  
 „ *brachypoma*, 324.  
 „ *cafer*, 339.  
 „ *capensis*, 340.  
 „ *chariensis*, 337.  
 „ *congoro*, 319.  
 „ *coubie*, 309, 313, 317.  
 „ *cyclorhynchus*, 326.  
 „ *cylindricus*, 331.  
 „ *darlingi*, 321.  
 „ *falcifer*, 327.  
 „ *falcipinnis*, 327.  
 „ *forskali*, 328, 329, 331.  
 „ *fuelleborni*, 323.  
 „ *greenii*, 334.  
 „ *gregorii*, 321.  
 „ *horie*, 306.  
 „ *kirkii*, 328.  
 „ *lineatus*, 311.

- Labeo longipinnis*, 316.  
 „ *lukulæ*, 335.  
 „ *macrostoma*, 325.  
 „ *mesops*, 313, 331.  
 „ *montanus*, 331.  
 „ *nasus*, 333.  
 „ *neumanni*, 320.  
 „ *niloticus*, 304, 306, 317.  
 „ *obscurus*, 333.  
 „ *parvus*, 337.  
 „ *rosæ*, 312.  
 „ *ruddi*, 314.  
 „ *selti*, 317.  
 „ *senegalensis*, 308.  
 „ *sicheli*, 339.  
 „ *steindachneri*, 317.  
 „ *tenuirostris*, 340.  
 „ *umbratus*, 339.  
 „ *varicorhinus*, 356.  
 „ *velifer*, 315.  
 „ *victorianus*, 322, 323.  
 „ *vulgaris*, 304.  
 „ *walkeri*, 324.  
 „ *weeksii*, 310.  
*labiatus* (*Mormyrops*), 110.  
 „ (*Mormyrus*), 110.  
*lacerda* (*Mormyrus*), 128.  
*lacerta* (*Elops*), 26.  
*lambouri* (*Gnathonemus*), 97.  
*lamta* (*Discognathus*), 349.  
*lapradii* (*Polypterus*), 7.  
*lateralis* (*Alestes*), 204.  
 „ (*Nannocharax*), 283.  
*latus* (*Citharinus*), 295.  
*lemairii* (*Alestes*), 209.  
*leopoldianus* (*Gnathonemus*), 102.  
 „ (*Petersius*), 235.  
*lepasseti* (*Salmo*), 166.  
*Lepidosiren annectens*, 20, 21.  
 „ *arnaudii*, 21.  
*Lepidosirenidæ*, 19.  
*leptorhynchus* (*Distichodus*), 277.  
*lepturus* (*Mormyrus*), 96.  
*leuciscus* (*Alestes*), 206.  
*lhuyssii* (*Marcusenius*), 70.  
 „ (*Mormyrus*), 70.  
*libericensis* (*Mormyrus*), 67.  
*liebrechtsii* (*Alestes*), 198.  
*lineatus* (*Hydrocyon*), 182.  
 „ (*Labeo*), 311.  
*lineolatus* (*Mormyrops*), 42.  
*livingstonii* (*Gnathonemus*), 104.  
*longianalis* (*Marcusenius*), 69.  
*longibarbis* (*Gnathonemus*), 100.  
 „ (*Mormyrus*), 100.  
*longipes* (*Mormyrops*), 35.  
 „ (*Mormyrus*), 35.  
*longipinnis* (*Alestes*), 202, 203, 236.  
 „ (*Brachyalestes*), 202.  
 „ (*Labeo*), 316.  
 „ (*Mormyrus*), 136.  
 „ (*Scrophicephalus*), 136.  
*longirostris* (*Mormyrus*), 136, 139, 140.  
*loricatus* (*Phago*), 247.  
*losera* (*Odaxothrissa*), 160.  
*lubina* (*Chanos*), 164.  
*lukulæ* (*Labeo*), 335.  
*lusosso* (*Distichodus*), 277.  
*Lutodeira*, 164.  
 „ *chanos*, 164.  
 „ *salmonea*, 164.  
*machnata* (*Argentina*), 25.  
 „ (*Elops*), 25.  
*macrodon* (*Mormyrus*), 93.  
*macrolepidotus* (*Alestes*), 217, 218, 222.  
 „ (*Brycinus*), 217.  
 „ (*Gnathonemus*), 112.  
 „ (*Mormyrops*), 112.  
 „ (*Mormyrus*), 112.  
*macrolepis* (*Citharinus*), 294.  
 „ (*Distichodus*), 268.  
*macrophthalmus* (*Alestes*), 197.  
 „ (*Megalops*), 28.  
 „ (*Mormyrus*), 130.  
*macrops* (*Marcusenius*), 84.  
*macropterus* (*Megalops*), 28.  
*macrostoma* (*Labeo*), 325.  
*macrostigma* (*Salar*), 166.  
 „ (*Salmo*), 166.  
*macroterolepis* (*Eugnathichthys*), 243.  
*maculatus* (*Distichodus*), 264.  
*major* (*Petersius*), 237.  
*makiensis* (*Discognathus*), 348.  
*Malacopterygii*, 23.  
*marchei* (*Mormyrus*), 64.  
 „ (*Petrocephalus*), 64.  
*marchii* (*Marcusenius*), 64.  
*Marcusenius*, 60.  
 „ *adspersus*, 70.  
 „ *anguilloides*, 34.  
 „ *ansorgii*, 73.

- Marcusenius batesii*, 72.  
 „ *brachyistius*, 65, 67.  
 „ *budgetti*, 83.  
 „ *cabræ*, 65.  
 „ *castor*, 77.  
 „ *discorhynchus*, 81.  
 „ *harringtoni*, 78.  
 „ *isidori*, 75.  
 „ *kingsleyæ*, 65.  
 „ *lhuyssii*, 70.  
 „ *longianalis*, 69.  
 „ *macrops*, 84.  
 „ *marchii*, 64.  
 „ *nigricans*, 75.  
 „ *nigripinnis*, 63.  
 „ *pauciradiatus*, 74.  
 „ *petherici*, 82.  
 „ *plagiostoma*, 80.  
 „ *psittacus*, 85.  
 „ *pulverulentus*, 63.  
 „ *sphcodes*, 66.  
 „ *tanganicanus*, 81.  
 „ *tumifrons*, 79.  
 „ *weeksii*, 71.  
 „ *wilverthi*, 86.  
*mariaë* (*Mormyrops*), 44.  
 „ (*Mormyrus*), 44.  
*marnoi* (*Distichodus*), 291.  
*maroccana* (*Pterocapoëta*), 357.  
*maroccanus* (*Varicorhinus*), 357.  
*martini* (*Distichodus*), 275.  
*masuianus* (*Mormyrops*), 38.  
*Megalops*, 27.  
 „ *curtifilis*, 28.  
 „ *cyprinoides*, 28.  
 „ *filamentosus*, 28.  
 „ *indicus*, 28.  
 „ *kundinga*, 28.  
 „ *macrophthalmus*, 28.  
 „ *macropterus*, 28.  
 „ *oligolepis*, 28.  
 „ *setipinnis*, 28.  
*mento* (*Chanos*), 164.  
 „ (*Gnathonemus*), 106.  
 „ (*Mormyrus*), 106.  
*Mesoborus*, 245.  
 „ *crocodilus*, 245.  
*mesops* (*Labeo*), 313, 331.  
*Micralestes*, 223.  
 „ *aeutidens*, 224.  
 „ *altus*, 230.  
*Micralestes holargyreus*, 227.  
 „ *humilis*, 226.  
 „ *interruptus*, 229.  
 „ *stormsi*, 225.  
 „ *urotænia*, 228.  
*microcephalus* (*Mormyrus*), 67.  
*microlepidotus* (*Ichthyoborus*), 251.  
*microlepis* (*Sarcodaces*), 177.  
*microps* (*Stomatorhinus*), 92.  
*microstoma* (*Bryconæthiops*), 188.  
 „ (*Mormyrops*), 44.  
*Microthrissa*, 161.  
 „ *royauxi*, 161.  
*miodon* (*Pellonula*), 157.  
*mirus* (*Gnathonemus*), 119.  
*mocquardianus* (*Brachyalestes*), 188.  
*modesta* (*Pellonula*), 156.  
*modestus* (*Petersius*), 232.  
*montanus* (*Labeo*), 331.  
 „ (*Tylognathus*), 331.  
*monteiri* (*Gnathonemus*), 105.  
 „ (*Mormyrus*), 105.  
*moorii* (*Gnathonemus*), 96.  
 „ (*Mormyrus*), 96.  
*Mormyridæ*, 29.  
*Mormyrinæ*, 29.  
*Mormyrodes*, 126.  
*Mormyrops*, 30, 59, 94.  
 „ *anguilloides*, 34.  
 „ *attenuatus*, 45.  
 „ *boulengeri*, 40.  
 „ *breviceps*, 36.  
 „ *curtus*, 41.  
 „ *deliciosus*, 32.  
 „ *engystoma*, 36.  
 „ *furcoides*, 46.  
 „ *henryi*, 59.  
 „ *lineolatus*, 42.  
 „ *longiceps*, 35.  
 „ *mariaë*, 44.  
 „ *masuianus*, 38.  
 „ *microstoma*, 44.  
 „ *nigricans*, 43.  
 „ *parvus*, 37.  
 „ *sirenoides*, 39.  
 „ *tuckeyi*, 32.  
 „ *vallanti*, 43.  
 „ *zambanenje*, 32.  
 „ *zancirostris*, 40.  
*Mormyrus*, 30, 47, 60, 94, 126.  
 „ *adpersus*, 70.



- Mormyrus affinis*, 88.  
 „ *agnus*, 128.  
 „ *amblystoma*, 52.  
 „ *anchietæ*, 129.  
 „ *anguilloides*, 34.  
 „ *bachiqua*, 134.  
 „ *bane*, 48.  
 „ *bebe*, 142.  
 „ *bovei*, 54.  
 „ *bozasi*, 138.  
 „ *brachyistius*, 67.  
 „ *caballus*, 132.  
 „ *caschive*, 123, 136.  
 „ *catostoma*, 52, 57.  
 „ *cobitifformis*, 59.  
 „ *curvifrons*, 132.  
 „ *cyprinoides*, 48, 49.  
 „ *deliciosus*, 32.  
 „ *dendera*, 34.  
 „ *dequesne*, 48.  
 „ *discorhynchus*, 81, 82.  
 „ *dorsalis*, 142.  
 „ *ehrenbergii*, 48.  
 „ *geoffroyi*, 136, 137.  
 „ *gliroides*, 58.  
 „ *grandisquamis*, 96.  
 „ *greshoffi*, 117.  
 „ *guentheri*, 128.  
 „ *hasselquistii*, 128.  
 „ *henryi*, 59.  
 „ *herse*, 128.  
 „ *hildebrandti*, 136.  
 „ *isidori*, 75.  
 „ *joannisi*, 48.  
 „ *jubelini*, 140.  
 „ *kannume*, 134.  
 „ *kingsleyæ*, 65.  
 „ *lacerda*, 128.  
 „ *lepturus*, 96.  
 „ *liberiensis*, 67.  
 „ *lhuyssii*, 70.  
 „ *longiceps*, 35.  
 „ *longipinnis*, 136.  
 „ *longirostris*, 136, 139, 140.  
 „ *macrophthalmus*, 130.  
 „ *marchei*, 64.  
 „ *marizæ*, 44.  
 „ *microcephalus*, 67.  
 „ *moorii*, 96.  
 „ *mucupe*, 139.  
 „ *nacra*, 136.  
*Mormyrus niloticus*, 137.  
 „ *ovis*, 131.  
 „ *oxyrhynchus*, 134, 140.  
 „ *pauciradiatus*, 74.  
 „ *proboscirostris*, 141.  
 „ *psittacus*, 85.  
 „ *rume*, 140.  
 „ *sauvagii*, 49.  
 „ *simus*, 53.  
 „ *sphecodes*, 66.  
 „ *swanenburgi*, 32.  
 „ *tamandua*, 118.  
 „ *tapirus*, 133.  
 „ *tenuicauda*, 53.  
 „ *tenuirostris*, 134.  
 „ *tuckeyi*, 32.  
 „ *ussheri*, 116.  
 „ *walkeri*, 88.  
 „ *zambanenje*, 32.  
 „ *zanclirostris*, 40.  
*mossambicus* (*Chanos*), 164.  
 „ (*Distichodus*), 268.  
*mucupe* (*Mormyrus*), 139.  
*Mugil chanos*, 164.  
 „ *salmoneus*, 164.  
*Mugilomorus anna-carolina*, 25.  
*Myletes*, 190.  
 „ *baremore*, 195.  
 „ *dentex*, 193.  
 „ *guile*, 205.  
 „ *hasselquistii*, 193.  
 „ *nurse*, 205.  
*Myomyrus*, 92.  
 „ *macrodon*, 93.  
*nacra* (*Mormyrus*), 136.  
*Nannæthiops*, 254.  
 „ *unitæniatus*, 254.  
*Nannocharax*, 279.  
 „ *brevis*, 280.  
 „ *dimidiatus*, 286.  
 „ *elongatus*, 284.  
 „ *fasciatus*, 281.  
 „ *intermedius*, 282.  
 „ *niloticus*, 283.  
 „ *ocellicauda*, 285.  
 „ *parvus*, 281.  
 „ *tænia*, 286.  
*nasus* (*Labeo*), 333.  
*nataleensis* (*Alestes*), 204.

- nefasch (Characinus), 273, 275.  
 „ (Distichodus), 274, 275.  
 Neoborus, 249.  
 „ ornatus, 250.  
 „ quadrilineatus, 251.  
 Neolebias, 256.  
 „ trilineatus, 257.  
 „ unifasciatus, 256.  
 neumanni (Labeo), 320.  
 niger (Gnathonemus), 101.  
 „ (Mormyrus), 101.  
 nigri (Notopterus), 147.  
 „ (Xenomystus), 147.  
 nigricans (Marcusenius), 75.  
 „ (Mormyrops), 43.  
 nigripinnis (Marcusenius), 63.  
 nili (Notopterus), 147.  
 „ (Xenomystus), 147.  
 nilotica (Clupea), 154.  
 „ (Cromeria), 173.  
 niloticus (Centriscus), 137.  
 „ (Characinus), 192.  
 „ (Coregonus), 283.  
 „ (Cyprinus), 304, 329.  
 „ (Distichodus), 273.  
 „ (Gymnarchus), 144.  
 „ (Heterotis), 149.  
 „ (Labeo), 304, 306, 317.  
 „ (Mormyrus), 137.  
 „ (Nannocharax), 283.  
 „ (Salmo), 273, 275.  
 „ (Sudis), 149.  
 noboli (Distichodus), 262.  
 Notopteridæ, 145.  
 Notopterus, 146.  
 „ afer, 146.  
 notospilus (Distichodus), 262.  
 nuchalis (Chanos), 164.  
 numenius (Gnathonemus), 124.  
 nurse (Alestes), 205.  
 „ (Brachyalestes), 206.  
 „ (Brycinus), 206.  
 „ (Myletes), 205.  
 obscurus (Labeo), 333.  
 obtusirostris (Pellonula), 158.  
 occidentalis (Hyperopisus), 142.  
 „ (Petersius), 240.  
 ocellicauda (Nannocharax), 285.  
 Odaxothrissa, 160.  
 „ losera, 160.  
 odoë (Salmo), 177.  
 „ (Sarcodaces), 177.  
 „ (Xiphorhamphus), 177.  
 „ (Xiphorhynchus), 177.  
 oligolepis (Megalops), 23.  
 Oncorhynchus, 166.  
 Onychostoma, 352.  
 opisthotænia (Alestes), 215.  
 ornatipinnis (Polypterus), 12.  
 ornatus (Neoborus), 250.  
 Ostariophysis, 174.  
 Osteoglossidæ, 148.  
 ovis (Mormyrus), 131.  
 Oxymormyrus, 30.  
 Oxyrhynchus deliciosus, 32.  
 oxyrhynchus (Mormyrus), 134, 140.  
 palmis (Polypterus), 16.  
 Pantodon, 151.  
 „ buchholzi, 151.  
 Pantodontidæ, 151.  
 Paraphago, 244.  
 „ rostratus, 244.  
 parvus (Labeo), 337.  
 „ (Mormyrops), 37.  
 „ (Nannocharax), 281.  
 pauciradiatus (Marcusenius), 74.  
 „ (Mormyrus), 74.  
 Pellona, 162.  
 „ ditchoa, 163.  
 „ indica, 163.  
 Pellonula, 155.  
 „ acutirostris, 159.  
 „ miodon, 157.  
 „ modesta, 156.  
 „ obtusirostris, 158.  
 „ vorax, 156.  
 perroteti (Pristis), 3.  
 petersii (Distichodus), 265.  
 „ (Gnathonemus), 99.  
 „ (Mormyrus), 99, 100.  
 Petersius, 231.  
 „ brumpti, 235.  
 „ caudalis, 236.  
 „ conserialis, 233.  
 „ hilgendorfi, 232.  
 „ leopoldianus, 235.  
 „ major, 237.  
 „ modestus, 232.  
 „ occidentalis, 240.

- Petersius pulcher*, 237.  
 „ *spilopterus*, 239.  
 „ *tangensis*, 234.  
 „ *woosnami*, 239.  
*petherici* (Marcusenius), 82.  
*Petrocephalus*, 47, 60.  
 „ *affinis*, 88.  
 „ *ansorgii*, 51.  
 „ *ballayi*, 52.  
 „ *bane*, 48.  
 „ *bovei*, 54.  
 „ *catostoma*, 56, 57.  
 „ *degeni*, 58.  
 „ *dejoannisi*, 48.  
 „ *dequesne*, 48.  
 „ *ehrenbergii*, 48.  
 „ *gliroides*, 58.  
 „ *isidori*, 75.  
 „ *keatingii*, 55.  
 „ *marchei*, 64.  
 „ *pictus*, 113.  
 „ *sauvagii*, 49.  
 „ *simus*, 53.  
 „ *stuhmanni*, 56.  
*Phago*, 246.  
 „ *boulengeri*, 248.  
 „ *intermedius*, 247.  
 „ *loricatus*, 247.  
*Phagrus*, 142.  
 „ *dorsalis*, 142.  
*Phenacogrammus*, 223.  
*Phractolæmidæ*, 167.  
*Phractolæmus*, 168.  
 „ *ansorgii*, 168.  
*pictus* (*Gnathonemus*), 113.  
 „ (*Petrocephalus*), 113.  
*plagiostoma* (Marcusenius), 80.  
*Plagiostomi*, 1.  
*Platygaster*, 162.  
 „ *indicus*, 163.  
*Pleurotremi*, 1.  
*polylepis* (*Stomatorhinus*), 91.  
*Polypteridæ*, 4.  
*Polypterus*, 5.  
 „ *arnaudii*, 14.  
 „ *bichir*, 6, 10, 14, 16.  
 „ *büttikoferi*, 16.  
 „ *congius*, 9.  
 „ *delhezi*, 13.  
 „ *endlicheri*, 10.  
 „ *lapradii*, 7.  
*Polypterus ornatipinnis*, 12.  
 „ *palmas*, 16.  
 „ *retropinnis*, 17.  
 „ *senegalensis*, 10, 14.  
 „ *senegalus*, 14.  
 „ *weeksii*, 11.  
*poptæ* (*Alestes*), 216.  
*Pristidæ*, 3.  
*Pristis*, 3.  
 „ *perroteti*, 3.  
*proboscirostris* (*Mormyrus*), 141.  
*Protomelus*, 19.  
*Protopterus*, 19.  
 „ *æthiopicus*, 21.  
 „ *amphibius*, 20.  
 „ *anguilliformis*, 20.  
 „ *annectens*, 20, 21.  
 „ *dolloi*, 22.  
 „ *rhinocryptis*, 20.  
*psittacus* (Marcusenius), 85.  
 „ (*Mormyrus*), 85.  
*Pterocapoëta*, 352.  
 „ *maroccana*, 357.  
*pulcher* (Petersius), 237.  
*pulverulentus* (Marcusenius), 63.  
*puncticulatus* (*Stomatorhinus*), 88.  
*purpurascens* (*Elops*), 25.  
  
*quadrifasciatus* (*Barbus*), 351.  
 „ (*Crossochilus*), 351.  
 „ (*Discognathus*), 351.  
 „ (*Gobio*), 351.  
*quadrilineatus* (*Neoborus*), 251.  
  
*retropinnis* (*Polypterus*), 17.  
*Rhinocryptis*, 19.  
 „ *amphibia*, 20.  
*rhinocryptis* (*Protopterus*), 20.  
*rhodopleura* (*Alestes*), 218.  
*rhynchophorus* (*Gnathonemus*), 121.  
*rodolphi* (*Distichodus*), 274.  
*Rohitichthys*, 300.  
*rosæ* (*Labeo*), 312.  
*rostratus* (*Distichodus*), 275.  
 „ (*Paraphago*), 244.  
*rothschildi* (*Discognathus*), 345.  
*royauxi* (*Microthrissa*), 161.  
*ruddi* (*Labeo*), 314.  
*rume* (*Mormyrus*), 140.

- ruppellii (Alestes), 206.  
   " (Brachyalestes), 206.
- sadleri (Alestes), 200.  
 salahie (Mormyrus), 110.  
 Salar, 166.  
   " macrostigma, 166.  
 Salmo, 166.  
   " ægyptiacus, 273, 275.  
   " dentex, 180, 193, 195.  
   " fario, 166.  
   " lepasseti, 166.  
   " macrostigma, 166.  
   " niloticus, 273, 275.  
   " odoë, 177.  
   " trutta, 166.  
 salmonea (Lutodeira), 164.  
 salmoneus (Chanos), 164.  
   " (Mugil), 164.  
 Salmonidæ, 165.  
 Salvelinus, 166.  
 Sarcodaces, 177.  
   " microlepis, 177.  
   " odoë, 177.  
 saurus (Elops), 25.  
 sauvagii (Mormyrus), 49.  
   " (Petrocephalus), 49.  
 schenga (Distichodus), 268.  
 schilthuisiæ (Gnathonemus), 98.  
 Scoliostomus, 164.  
 Scrophicephalus, 126.  
   " kannume, 134.  
   " longipinnis, 136.  
 Selachii, 1.  
 selti (Labeo), 317.  
 senegalensis (Alestes), 206.  
   " (Gnathonemus), 107, 108.  
   " (Labeo), 308.  
   " (Mormyrus), 108.  
   " (Polypterus), 10, 14.  
 senegalus (Polypterus), 14.  
 Serrasalmus citharus, 291.  
 sethente (Alestes), 193.  
 setipinnis (Megalops), 28.  
 sexfasciatus (Distichodus), 276.  
 sicheli (Labeo), 339.  
 simus (Mormyrus), 53.  
   " (Petrocephalus), 53.  
 sirenoides (Mormyrops), 39.  
 Solenomormyrus, 126.  
 spekii (Kneria), 171.  
 sphecodes (Marcusenius), 66.  
   " (Mormyrus), 66.  
 sphekodes (Mormyrops), 66.  
 spilopterus (Petersius), 239.  
 spilurus (Xenocharax), 287.  
 splendens (Alestes), 195.  
 sprattus (Clupea), 154.  
 stanleyanus (Gnathonemus), 107.  
   " (Mormyrus), 107.  
 steindachneri (Labeo), 317.  
 Stomatorhinus, 87.  
   " corneti, 90.  
   " humilior, 89.  
   " microps, 92.  
   " polylepis, 91.  
   " puncticulatus, 88.  
   " walkeri, 88.  
 stormsi (Micralestes), 225.  
 stuhlmanni (Alestes), 199.  
   " (Petrocephalus), 56.  
 Sudis, 149.  
   " adansonii, 149.  
   " niloticus, 149.  
 swanenburgi (Mormyrus), 32.  
 Systemus beso, 356.
- tamandua (Campylomormyrus), 118.  
   " (Gnathonemus), 118.  
   " (Mormyrus), 118.  
 tanganicæ (Capoëta), 358.  
   " (Varicorhinus), 358.  
 tanganicanus (Marcusenius), 81.  
 tangensis (Petersius), 235.  
 tænia (Nannocharax), 286.  
 tæniata (Alestes), 209.  
 tæniurus (Alestes), 214.  
 tapirus (Mormyrus), 133.  
 Tarpon, 27.  
 Teleostei, 23.  
 Teleostomi, 4.  
 tenuicauda (Hyperopisus), 142.  
   " (Mormyrus), 53.  
 tenuirostris (Labeo), 340.  
   " (Mormyrus), 134.  
 tholloni (Alestes), 201.  
 tornieri (Varicorhinus), 355.  
 touteei (Distichodus), 271.  
 trilineatus (Neolebias), 257.

- Trutta*, 166.  
*trutta* (*Salmo*), 166.  
*tuckeyi* (*Mormyrops*), 32.  
     " (*Mormyrus*), 32.  
*tumifrons* (*Marcusenius*), 79.  
*Tylognathus*, 300.  
     " *cantini*, 331.  
     " *montanus*, 331.
- Umbla*, 166.  
*umbratus* (*Abrostomus*), 339.  
     " (*Labeo*), 339.  
*unifasciatus* (*Neolebias*), 256.  
*unitæniatus* (*Nannæthiops*), 254.  
*urotania* (*Micralestes*), 228.  
*ussleri* (*Gnathonemus*), 116.  
     " (*Mormyrus*), 116.
- vallanti* (*Hemistichodus*), 253.  
     " (*Mormyrops*), 43.  
*Varicorhinus*, 352.  
     " *ansorgii*, 353.  
     " *beso*, 356.  
     " *brucii*, 354.  
     " *maroccanus*, 357.  
     " *tanganicæ*, 358.  
     " *tornieri*, 355.  
*varicorhinus* (*Labeo*), 356.  
*variegata* (*Labeo*), 326.  
*velifer* (*Labeo*), 315.  
*victorianus* (*Labeo*), 322, 323.  
*vinciguerræ* (*Discognathus*), 347.  
*vittatus* (*Hydrocyon*), 182, 184.  
*vittiger* (*Hydrocyon*), 184.  
*vorax* (*Pellonula*), 156.
- vulgaris* (*Alausa*), 154.  
     " (*Labeo*), 304.
- walkeri* (*Labeo*), 324.  
     " (*Mormyrus*), 88.  
     " (*Stomatorhinus*), 88.  
*weeksii* (*Labeo*), 310.  
     " (*Marcusenius*), 71.  
     " (*Polypterus*), 11.  
*wilverthi* (*Marcusenius*), 86.  
*woosnami* (*Petersius*), 239.  
*wytsi* (*Alestes*), 195.
- Xenocharax*, 287.  
     " *crassus*, 288.  
     " *spilurus*, 287.  
*Xenomystus*, 147.  
     " *nigri*, 147.  
     " *nili*, 147.  
*Xenopomatiichthys*, 172.  
     " *auriculatus*, 172.  
*Xenopomichthys*, 172.  
*Xiphorhamphus*, 177.  
     " *odoë*, 177.  
*Xiphorhynchus*, 177.  
     " *odoë*, 177.
- yseuxi* (*Bryconæthiops*), 189.
- zambanenje* (*Mormyrops*), 32.  
     " (*Mormyrus*), 32.  
*zambesensis* (*Carcharias*), 2.  
*zanelirostris* (*Mormyrops*), 40.  
     " (*Mormyrus*), 40.















