# THE HYDROMETRIDAE OF THE HUNGARIAN NATIONAL MUSEUM AND OTHER STUDIES IN THE FAMILY. (HEMIPTERA).

(With plates I—XII).

By

H. B. HUNGERFORD and N. E. EVANS

University of Kansas, Lawrence, Kansas

Through the kindness of Dr. GÉZA HORVÁTH the senior author was permitted to spend some time at the Hungarian National Museum in Budapest in the year 1928. Here he found an interesting collection of *Hydrometra* containing several undescribed species. Although Dr. HORVÁTH had recognized some of the species as new and had assigned manuscript names to them he most generously surrendered them for further study and they were brought to Kansas where they have served as the basis of this study.

Other unidentified specimens, assembled by the senior author, from various museums have been examined and are reported as a part of this paper. Occasion is also taken to report notes concerning types that have been viewed by the senior author. Besides examining the collections in a number of European Museums and some of the more extensive ones in America, we have had for study 1669 specimens from the University of Kansas Entomological Museum. The old world collections should be more extensive than they appear to be at present and should be examined intensively by one who has accumulated long series. It seems quite probable that more species occur there. There are, without doubt, many undescribed species of this curious genus yet to be collected. It is hoped that the plates of drawings and the synoptic keys to the *Hydrometra* of both Hemispheres may prove useful to future students of this family.

We have accepted the synonomy of OSHANIN in his „Katalog der paläarktischen Hemipteren" 1912 for *Hydrometra stagnorum.* L. and recognize as *Hydrometra stagnorum* L. European specimens determined as such by Dr. HORVÁTH since the type is unknown to us. We cannot, however, recognise the synonomy

under *Hydrometra vittata* STÅL as proposed by DISTANT (4) and accepted by OSHANIN. A few types cannot be located. In case of *Hydrometra papuana* KIRKALDY for instance, the type has been destroyed. The pin and label were in the KIRKALDY collection but the insect was gone when his collection was examined at Washington, D. C. some years ago. Professor R. GESTRO has been kind enough to look for it in the Museo Civico di Storia Naturale, Genova, and reports that no specimens of this species are present in his Museum. A few other species are represented by partially mutilated types or by female types that make the fixation of these species difficult.

A more worthy monographic revision of this genus must await the assemblage of more extensive collections from many countries. In arranging the keys and the notes and descriptions of species, we have attempted to place closely related species together. In some sections of the keys it will be necessary to possess male specimens. We have figured both sexes whenever possible. The majority of the drawings were made by the junior author. The others were made for us by Dr. KATHLEEN DOERING, Assistant Professor of Entomology in the University of Kansas. The species illustrated by Miss DOERING are marked by an asterisk.

## Acknowledgments.

We wish to acknowledge our indebtedness and to extend our thanks to the many friends who have made this paper possible either by the loan or gift of specimens, or by extending to the senior author the opportunity of studying types and other specimens while visiting the Museums in their charge.

For the undetermined borrowed material we are indebted to the following: To Dr. G. HORVÁTH in charge of the Hemiptera at the National Museum of Hungary whose connection with and interest in this paper is mentioned in our opening paragraph. The senior author desires especially to express his gratitude to Dr. HORVÁTH for his generosity in loaning the material he had studied, and to his assistant, Mr. J. UJHELYI, who sacrificed his own personal work to make the writer's brief two weeks in Budapest most profitable; To Dr. F. MAIDL of the Vienna Museum; To Dr. BOUVIER and Dr. SÉGUY of the Paris Museum; To Mr. W. E. CHINA in charge of the Hemiptera at the British Museum; To Mr. W. L. MCATEE at that time in charge of the Hemiptera of the U. S. N. M.; To Dr. Y. SJÖSTEDT and Dr. A. ROMAN of the Stockholm Museum. Dr. A. ROMAN most kindly re-examined types for us in regard to characters unfortunately over-

looked by the senior author in his study at the Swedish Museum. In America Mr. J. R. DE LA TORRE-BUENO, with his characteristic hospitality permitted the senior writer to examine such Hydrometra as he possessed in his own collections.

The material in the University of Kansas collections has been increased greatly in recent years by the Entomological Expeditions sent out under the leadership of Dr. R. H. BEAMER. Exotic materials have been added both by collectors employed by the University of Kansas and by friends of the senior author, among whom may be mentioned: Dr. F. X. WILLIAMS, J. G. MYERS, Professor T. ESAKI, Professor R. TAKAHASHI, E. SWENSON, Dr. O. LUNDBLAD, CARL C. ADDISON, W. A. HOFFMAN, and A. CULBERTSON.

## Natural History and Geographical Distribution.

The Hydrometridae are exceedingly slender bugs that dwell upon the shores and floating vegetation of the water. We have collected the *Hydrometra* on the *Sphagnum* at the edge of bog ponds, midst the emergent vegetation of shallow waters, on rafts of dead cattail in a marsh and on floating mats of duckweed *(Lemna)* and of filamentous algae. They prefer the footing such things afford but can walk upon the water when occasion demands. They are predaceous in habit and the life history of *Hydrometra Martini* KIRKALDY, common in North America, will illustrate the essential features of what is known concerning these marsh treaders. The curiously sculptured spindle shaped eggs (see Plate I) are attached by the basal end to some support at or above the surface of the water. HUNGERFORD (7) observed one female that deposited 175 eggs, 11 in one day. The eggs hatch in about a week and the nymphs undergo 5 instars.* The complete cycle from egg to egg, under the most favorable conditions can occur in 15 days. There are several generations in the season and winter is passed in the adult stage.

Mr. TORRE-BUENO (17) on the basis of facts known to him in 1926 gave the distribution of the family as: „Predominantly neogeic — in fact neotropical — one might almost say that the center of dispersal lies in the Caribbean Islands and littoral . . ." The presence of all three genera in this region certainly supports him. He recorded

* BOLLWEG (2) records 4 nymphal instars for *H. stagnorum* but O. LUNDBLAD (12) and V. TEYROVSKY (15) give 5.

24 species of the genus *Hydrometra* for the Western Hemisphere and 12 for the Eastern Hemisphere. In this paper we record 30 species for the Western Hemisphere and 37 species and two varieties for the Eastern Hemisphere. There are some parallels of development in the two hemispheres, in both we find groups with a broad quadrate more of less truncate clypeus and groups with slender and conate clypeus. In the Western Hemisphere the first group ranges from Southern North America to the Amazon in South America, in the Eastern Hemisphere it is found in Africa south of the Sahara, in Madagascar, Australia and New Guinea. *H. stagnorum* (LINN.) and *H. eremobia* (KIRITSHENKO), somewhat related perhaps, being the only ones in the palaearctic region. In the Western Hemisphere the second group is found from Canada in North America to the Argentine in South America and the Eastern Hemisphere also has representatives from Sweden to Madagascar eastward including Australia and New Caledonia, and northward to China and Japan. The *H. Greeni* KIRK. group of closely related species are scattered as follows: *H. Greeni* KIRKALDY in Ceylon and South India. *H. Maindroni* sp. n. Mascate in the southeast of the Arabian peninsula. *H. aegyptia* sp. n. in Egypt and its variety *Chabanaudi* var. new in French Guinea (West Africa), and *H. Isaka* sp. n. in Madagascar, The *H. lineata* ESCHSCH. series has representatives in China, Japan, Philippines, Java, Sumatra and Australia.

On the other hand there are certain well defined groups with characteristic facies that appear to have developed in restricted geographical ranges. There is, for example *H. ambulator* STÅL and its three close relatives *H. albolineolata* REUTER, *H. transvaalensis* sp. n. and *H. africana* sp. n. which are found in Africa south of the Sahara and are unlike any other known species. Another group of characteristic species comprises *H. Horváthi* sp. n., *H. Halei* sp. n. and *H. Illingworthi.* These species live in New Queensland of Northeastern Australia and in New Guinea which is quite near.

In contrast to the above we have, here and there, species that are unique and are not represented in our collections by any close relatives. For example, there is *H. Mulfordi* HUNGERFORD from Bolivia, South America. It possesses a number of the characters set forth by Professor ESAKI for his *Bacillometra.* It has large eyes, a short thorax, the scutellar portion is visible and the sulcations of the sternum suggest *Bacillometra.* On the other hand the head is considerably more than twice as long as the prothorax (less than twice as long in *Bacillometra).* The second tarsal segment is not the shortest

although it is longer than in typical *Hydrometra* (see plate XI). The body is only a little more than half as broad relatively as in *Bacillometra ventralis* ESAKI. *Bacillometra ventralis* ESAKI was described from a winged male. The femora are incrassate at base and the type measures 6.6 mm long by 1 mm in breadth. *Hydrometra Mulfordi* HUNGERFORD was described from six apterous females. They are 12.5 mm long and 1.1 mm in breadth across the abdomen which ist the widest place in these females. The femora are not incrassate.

Until both sexes are available either in one or the other of the above species it is impossible to say they are congeneric. *Hydrometra Mulfordi* HUNGERFORD is at least intermediate between *Hydrometra* and *Bacillometra.*

There is *H. madagascarensis* sp. n. The nearest relative of this second species appears to be *H. longicapitis* BUENO from Sumatra. Another interesting illustration is that of the strangely formed *H. Sztolcmani* JACZEWSKI described from Parana, Brazil, and possessing remarkable lateral outgrowths of the first genital segment in the male. No other species known from the Western Hemisphere has even a suggestion of such modification of the first genital of the male. Over in South Africa there is *H. Turneri* sp. n. with much smaller process similarly placed. This species, however, is not a close relative being much near akin to *H. stagnorum* (LINN.).

## Divisions of the Family *Hydrometridae.*

In 1927 Professor TEISO ESAKI (5) proposed the division of the family into two subfamilies which he characterized as follows:

### *1. Hydrometrinae.*

„Antennae four-jointed, third segment longest, first shortest, body slender, more than six times as long as broad; head setae in three pairs set in pits, two pairs on the anterior swollen part, one pair near the base; rostrum not passing the anterior margin of prothorax, omphalium absent, tarsal claws apical."

In this subfamily he placed two genera, *Hydrometra* LAMARCK 1801 and *Bacillometra* ESAKI 1927. *Hydrometra* which is universally distributed now includes 67 species and 2 varieties and *Bacillometra* with a single known species from South America. (Unless *H. Mulfordi* HUNGERFORD should go here in which case the generic diagnosis must be modified).

### 2. *Limnobatodinae.*

„Antennae five-jointed, fifth segment longest, second and fourth shortest, body less slender, not more than six times as long as broad; head setae set in non-pigmented areas, in two pairs, one pair on the anterior swollen part and one pair near the anterior margin of pronotum; rostrum reaching mesosternum, omphalium present, tarsal claws subapical, inserted dorsally".

„A single genus and species, *Limnobatodes paradoxus* HUSSEY, is known from Honduras, Central America".

## Key to Genera of Hydrometridae.

(See Plate IX).

A. Antennae four-segmented.

B. Pronotum longer than twice the breadth; mesosteruum not sulcated along the median longitudinal line *Hydrometra* LAMARCK

BB. Pronotum only a little longer than broad; mesosternum sulcated along the median longitudinal line; metasternum with two distinct longitudinal sutures which extend and vanish into the ventral abdominal segments *Bacillometra* ESAKI

AA. Antennae five-segmented; pronotum scarcely longer than wide *Limnobatodes* HUSSEY

## The Genus ***Hydrometra*** LAMARCK 1801.

### Specific Characters.

In LINNÉ's (11) brief latin description of his *Cimex stagnorum* 1758 there are mentioned no characteristics of specific or even generic value. One by one students have discovered and used various structural characteristics in the differentiation of the species of this genus *Hydrometra*. Mr. J. R. DE LA TORRE-BUENO in his excellent paper on „The Family Hydrometridae in the Western Hemisphere 1926" has summarized these as follows:

1. Proportion of the anteocular part of the head to the postocular.

2. Length of the rostrum as compared to the head, which is expressed in terms of its extension to or beyond the eyes.

3. Proportions of the antennal segments, particularly between I and II and between II and IV.

4. Thoracic and acetabular pitting, their absence or presence and their character.

5. Form of clypeus.

6. Proportional distances of the coxae *inter se.*

7. Extension of the anterior and posterior femora as compared to the apex of the head and the tip of the abdomen respectively.

8. Comparative length of the head and antennal segment II.

9. Male ventral processes of the sixth or seventh segments of the abdomen.

10. Terminal segment of the male abdomen.

11. Length.

To the above Dr. T. JACZEWSKI (10) 1928 has added the information that the male claspers of *H. Husseyi* BUENO and *H. Sztolcmani* JACZEWSKI are different.

The anteocular part of the head is considered as extending from the very tip of the clypeus to the anterior margin of the eyes, while the postocular part is measured from the posterior margin of the eyes to the anterior margin of the pronotum. The head of the specimen must be in its natural position if the measurements are to be accurate. The rostrum appears to be quite flexible and sometimes is quite difficult to measure accurately due to its curvature. Antennal segments I and II are stiff and straight and are easily measured. The third segment, however, is very frequently curved or sinuate and is often missing. The presence or absence of pits on the pronotum and acetabula and their arrangement seem to be characteristic, although some variation in number may occur on the two sides of the same insect in some groups. In other groups the number and arrangement of the pits are most constant. The distance between the coxae is more properly the distance from the anterior margin of each acetabulum to the anterior margin of the acetabulum immediately behind. The presence or absence, the position and structure, of the male abdominal processes are very good characters.

Considering that the proportions of the antennal segments *inter se* are being used in taxonomic work, it was considered worthwhile to measure as accurately as possible the lengths of the antennal segments of a series of specimens in order to see how much variation there was present. Accordingly, the antennal segments of fifty males and fifty females of *Hydrometra Martini* KIRKALDY were measured. These had been collected in October from hibernating quarters near a very small pool. The measurements were made with the aid of an eyepiece micrometer with fifty divisions to the millimeter.

It was found that the ratio of segment II to segment I varied from 2.05 to 2.33 in the males with a mean ratio of 2.20; in the females the variation of the ratio of segment II to segment I was from 1.94 to 2.23, the mean ratio being 2.06. The ratio of segment II to segment IV varied from 0.65 to 0.81 in the males, the mean being 0.725; for the females the variation was from 0.64 to 0.81, the mean being 0.743.

The lengths of the antennal segments of six males and six females of *Hydrometra Myrae* BUENO from Calcasieu Parish, Louisiana, were also measured. In the males of this species the ratio of segment II to segment I varied from 2.50 to 2.80, the mean being 2.65; in the females the variation was from 2.34 to 2.61, the mean being 2.42. The mean ratio of segment II to segment IV was 0.91 for the males and 0.94 for the females.

In the following descriptions of new species a unit of measurement is aqual in length to 0.0325 mm except for those marked with an asterisk in which the unit = 0.0333 mm. A change in eyepiece micrometer was responsible for the variation in the unit. The difference is trifling and far within the variation of a species.

Since we have found no species of *Hydrometra* common to both Hemispheres we have chosen to treat the genus under the two great geographical divisions, Eastern and Western Hemispheres. This will suit the convenience also of those who wish to utilize the keys presented in this paper.

## Key to Hydrometra of Eastern Hemisphere.

1. Clypeus deeply excavate and thus bifurcate. (See plate I). *H. bifurcata* sp. n.
   Clypeus not deeply excavate ..... (2).
2. Clypeus with two elevated callosities, anterior margin excavate. Female with hair tufts on last segment and venter of last abdominal segment greatly produced *H. Chinai* sp. n.
   Not as above ..... (3).
3. Clypeus truncate to slightly excavate on anterior margin (4).
   Clypeus truncate to slightly rounded or conate ..... (16).
4. Hair tufts present on sixth ventral abdominal segment of male ..... (5).
   No hair tufts on sixth ventral abdominal of male ..... (12).
5. Hair tufts on first genital of male ..... (6).
   No hair tufts on first genital of male ..... (9).

6. Two pairs of conspicuous tufts on the first genital segment of male (viewed from above) ..... *H. transvaalensis* sp. n.
One pair of conspicuous tufts on the first genital segment of male ..... (7).

7. First genital of male, as seen from above, broadest near the middle and with dorso-lateral depressions on caudal half ..... *H. africana* sp. n.
First genital of male, as seen from above, broadest near the front, without depressions ..... (8).

8. Caudal process of male upturned and a marked ventral longitudinal keel on first genital ..... *H. ambulator* STÅL.
Caudal process only slightly upturned and without a well marked ventral longitudinal keel on first genital
*H. albolineolata* REUTER.

9. Hair tufts or elevations of sixth ventral of male arrising on anterior half ..... (10).
Hair tufts of sixth ventral of male on posterior half ... (11).

10. Large elevations on sixth ventral capped with brush of stiff black hairs ..... *H. hoplogastra* HALE.
and *H. papuana* KIRK.
No elevations on sixth ventral, linear hair tufts placed laterally ..... *H. Hutchinsoni* sp. n.

11. First genital of male with latero-ventral depressions
*H. Fanjahira* sp. n.
First genital of male without depressions *H. Julieni* sp. n.

12. Linear hair tuft guarding a depression on the side of the first genital of male ..... *H. rhodesiana* sp. n.
Not as above ..... (13).

13. First genital of male of normal length with hairy elevations near posterio-lateral margin of first genital *H. Smithi* sp. n.
First genital of male long, cylindrical with a small black peg-like spine on the side ..... (14).

14. Posterior margin of fifth ventral abdominal segment of male with two elevations ..... *H. Illingworthi* sp. n.
Posterior margin of fifth abdominal segment of male without elevations ..... (15).

15. The peg-like spine on the anterio-ventral portion of first genital. Terminal process long ..... *H. Halei* sp. n.
The peg-like spine on the side and near the middle of the first genital. Terminal process short ..... *H. Horváthi* sp. n.

16. Clypeus truncate to slightly rounded on anterior margin (17).
Clypeus conate ..... (18).

17. Color dark. Two protuberances on the sixth ventral and also on the first genital of male ..... *H. stagnorum* (LINN).
Color light (flavo-ferrugineus) ..... *H. eremobia** KIRITSH.

18. Eyes and head normal in diameter ..... (19).
Eyes small and head very slender and much longer than the thorax. The postocular length plaintly greater than the distance between the anterior and middle acetabula measured on their lower margin from cleft to cleft ..... (36).

19. First genital segment of male with lateral protuberances slightly overlapping the rear margin of the sixth segment *H. Turneri* sp. n.
First genital not as above ..... (20).

20. Two spine-like processes on venter of sixth abdominal segment of male ..... (21).
No spine-like processes on venter of sixth abdominal segment of male ..... (24).

21. Two spine-like processes near anterior margin of sixth ventral of male ..... (22).
Two spine-like processes slightly anterior to the middle of sixth ventral of male or absent ..... (23).

22. Hind femora not attaining tip of abdomen. Head not conspicuously longer than thorax. Male processes small *H. gracilenta* HORVÁTH.
Hind femora surpassing tip of abdomen and head conspicuously longer than thorax. Male processes stout and curved ..... *H. aculeata* MONTR.

23. Two spine-like processes present ..... *H. procera* HORVÁTH
No spine-like processes on venter of sixth abdominal segment of male ..... (24).

24. Two brush tipped elevations near the middle of the sixth ventral of male ..... *H. annamana* sp. n.
No stout mammilose elevations on sixth ventral of male (25).

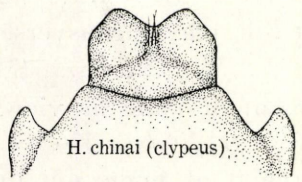
25. Venter of sixth abdominal segment of male swollen *H. Butleri* sp. n.
Venter of sixth abdominal segment of male not swollen (26).

---

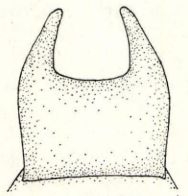
* We have not seen males of this species but the females look like a pale variety of *H. stagnorum* (LINN.).

26. Venter of sixth abdominal segment of male straight, at least not definitely transversely concave ..... (27)
Venter of sixth abdominal segment of male transversely concave ..... (31).
27. Caudolateral angles of genital segment of male as viewed from above prominent ..... *H. lineata* ESCHSCH.
Caudolateral angles of genital segment of male not prominent ..... (28).
28. Venter of sixth abdominal segment of male with two well defined hair patches ..... *H. Maidli* sp. n.
Venter of sixth abdominal segment of male more or less hairy but not as above ..... (29).
29. First antennal segment surpassing jugae by more than half its length ..... *H. albolineata* SCOTT.
First antennal segment not surpassing the jugae by more than half its length ..... (30).
30. Clypeus bluntly rounded. Caudal process of female near one-third length of its segment ..... *H. strigosa* SKUSE.
Clypeus pointed. Caudal process of female near one-half the length of the segment ..... *H. insularis* sp. n.
31. Caudal process more than one-fourth the length of its segment in the male ..... (32).
Caudal process less than one-fourth the length of its segment in the male ..... (33).
32. Transverse depression of sixth ventral of male deep ... (33).
Transverse depression of sixth ventral of male shallow (34).
33. Clypeus pointed ..... *H. Greeni* sp. n.
Clypeus blunt ..... *H. Isaka* sp. n.
34. Transverse depression of sixth ventral of male shallow *H. aegyptia* sp. n.
35. Caudal process less than one-fourth the length of last segment of male *H. Maindroni* sp. n.
36. Two „chitinized" tubercles on the anterior margin of sixth ventral segment of male. The sixth abdominal and first genital segments curved as seen from the side *H. longicapitis* BUENO.
Four „chitinized" tubercles on the anterior margin of sixth ventral segment of male ..... *H. madagascarensis* sp. n.

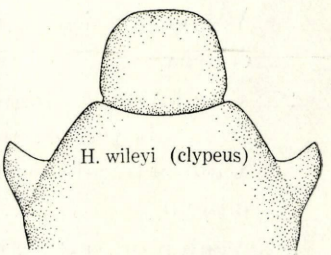
# PLATE I.



H. chinai (clypeus)

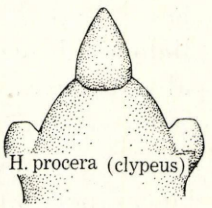


H. bifurcata (clypeus)

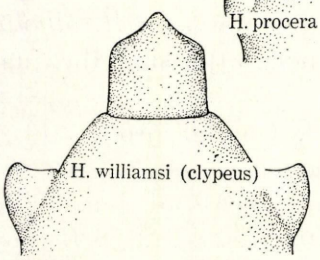


H. wileyi (clypeus)

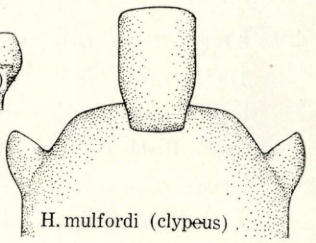
H. martini
(egg)



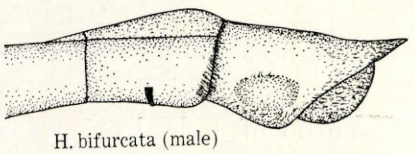
H. procera (clypeus)



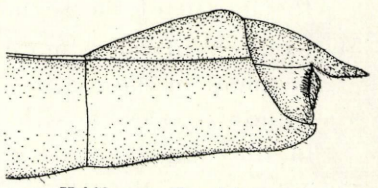
H. williamsi (clypeus)



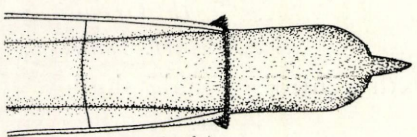
H. mulfordi (clypeus)



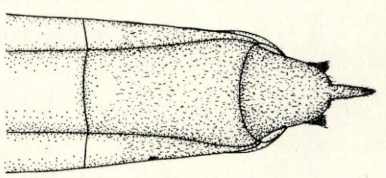
H. bifurcata (male)



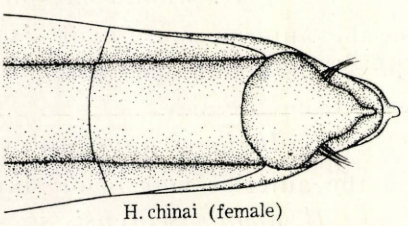
H. bifurcata (female)



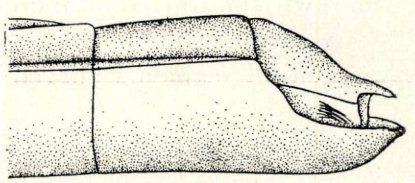
H. bifurcata (male)



H. bifurcata (female)



H. chinai (female)



H. chinai (female)

***Hydrometra bifurcata*** sp. n. (Plate I).

Size and Color:

Length, 11.8 mm (male holotype), 13.9 mm (female allotype); the general color of the body is a very dark brown; the pronotum of the male holotype with a narrrow, median, longitudinal, light-colored stripe, which is more distinctly defined on the posterior lobe; the median stripe is bordered successively on each side by a purplish-brown band, a broader band of brownish yellow, and on the extreme lateral margins by a band of purplish brown; a frosted stripe extends along the lateral margins of the thorax; the frosted stripe along the lateral margins of the abdomen is very faintly defined except near the margin of each segment where there is a large patch of frosting; ventral parts of the entire body with frosted appearance; the female allotype is similarly colored with the exception that the median stripes on the pronotum are narrow and much lighter in color and that the stripe along the lateral margin of the abdomen is clearly defined.

Structural Characteristics.

Head: Length, 112 units (holotype), 126 units (allotype); the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :72:30 (holotype), 82:33 (allotype); on both the male and female the dorsal interocular groove is short, about as long as the diameter of an eye, shallow and narrow; the ventral interocular groove on both the male and female is the same lenght as the dorsal groove but is somewhat deeper and broader; the clypeus is deeply and broadly incised, thus appearing bifurcated; the rostrum of the male and female surpasses the eyes by about one-half the postocular distance; beginning with the basal one the lengths of the segments of the antennae are in the following ratio: 20:44: :129:62 (male), 23:49: :133:57 (female).

Pronotum: Length, 52 units (holotype), 67 units (allotype); an encircling row of pits parallel to the anterior margin and about three units from it; the posterior lobe has a median longitudinal row of pits and other pits arrangend in rows; a row of three or four faint pits near the margin of each of the propleura of the male; on the female the pits on the propleura are more numerous.

Metanotum:* Length, 45 units (holotype); the hemelytra of

* Metanotum used throughout descriptions — of course the hemelytra arise from preceding segment.

the male holotype are narrow and straplike, extending slightly beyond the middle of the second abdominal segment; on the female allotype the hemelytra are large and long, extending to the middle of the fifth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 30:38 (holotype), 40:70 (allotype); on the right side of the body of the male holotype the anterior acetabulum has two pits anterior to the cleft and two pits posterior to it; the middle acetabulum has four faint pits similarly arranged; the posterior acetabulum is unpitted.

Femora: The anterior femora of the male holotype do not extend quite to the apex of the head while on the female allotype the anterior femora reach slightly beyond the apex; the posterior femora slightly surpass the tip of the abdomen on both the holotype and allotype.

Abdomen: Length, 154 units (holotype); the two male processes, located on the ventral side of the sixth segment, are placed so that each one is about midway between both the anterior and posterior ends of the segment and the median longitudinal line and the lateral margin; the processes are small tufts of very stiff hairs; posterior to each of the processes and located on the margin of the segment, is a brush of long stiff hairs; the posterior margin of the sixth segment has a fringe of short stiff hairs on the dorsal side; the seventh segment of the holotype is somewhat compressed ventrolaterally to form a broad, median, ventral, longitudinal keel which is broadly expanded distally; on each side of the keel is a large depression; the terminal dorsal process of the holotype is long and stout, about one-third the length of the segment; the terminal dorsal process of the allotype is long and sharp, about one-half the length of the segment.

Described from three males and four females collected in Madagascar by CH. ALLUAUD. The male holotype and two paratypes (one male and one female) were collected in the „Région du Sud-est" in 1901; the female allotype and two paratypes (one male and one female) were collected in Diego-Suarez in 1893; the other female paratype was taken in the „Région du Sud" in 1901. Types in the Paris Museum.

Notes.

The bifurcated condition of the clypeus and the nature and position of the male processes distinguish this species from all other known species.

*Hydrometra Chinai** sp. n. (Plate I).

Size and Color.

Length 13.5 mm (female holotype); the general color of the body is a light brown, only a middle stripe down the abdominal tergites, the clypeus, basal antennal segment and tips of femora and a thin median longitudinal line on the six ventral abdominal segments dark brown. Indications of median longitudinal light stripe on pronotum and frosted lines over the acetabula and along sides of the abdomen.

Structural Characteristics.

Head: Length 125 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO:PO: :80:35; the dorsal interocular groove absent, the ventral interocular groove broad, shallow and about as long as the diameter of an eye; the clypeus is slightly concave on anterior margin, longer than half its width and with two roughened calosities on anterior two-thirds; the rostrum surpasses the eyes by three-fourths the postocular distance; the antennal formula is as follows: 1st:2nd:3rd:4th: :26:42:128:62.

Pronotum: Length 65 units; the encircling row of pits parallel to the anterior margin not conspicuous; the median longitudinal groove not conspicuous; scattered pits on the posterior lobe, not conspicuous.

Metanotum: The wings not developed, reaching only to posterior margin of first abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third as 38:67; the anterior acetabulum with two pits; the middle acetabulum with three pits in front and two behind the cleft; posterior acetabulum with one pit on top.

Femora: The anterior femora conspicuously shorter than the head and the posterior femora not attaining tip of abdomen.

Abdomen: The terminal abdominal segments distinctive for this species. The last ventral greatly prolonged and the sides of the dorsal with conspicuous hair tufts (see figures on Plate I). Described from one female specimen labeled „Verulam 3, 7, 97. 283" South Africa, British Museum 1911—493". The holotype is in the British Museum and is named in honor of Mr. W. E. China of the British Museum who so kindly sent me for study the Hydrometra of their Museum.

*Hydrometra transvaalensis* sp. n. (Plate II).

Size and Color.

Length 10.5 mm (male holotype); the general color of the body is a dark brown; the dorsal part of the head and the ventral part of the thorax are lightly frosted; the ventral part of the abdomen is heavily frosted; the pronotum with a narrow, longitudinal, median, frosted line bordered successively on each side by a narrow, dark purplish-brown band, a broader light yellowish-brown band, and a broad dark purplish-brown band, the last band lying on the margin of the pronotum; a narrow frosted stripe extends along the lateral margins of the thorax; a median longitudinal white stripe on the hemelytra which is slender and broken only by the veins which cross it.

Structural Characteristics.

Head: Length, 93 units; the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :58:27 (male holotype); the dorsal interocular groove is about equal in length to the diameter of an eye and is shallow; the ventral interocular groove is about the same length as the dorsal groove but is somewhat deeper; the clypeus is truncate, about one and one-half times as broad as long; the rostrum surpasses the eyes by about four-fifths of the postocular distance; beginning with the basal one the ratio of the lengths of the antennal segments is expressed by the formula 18:33:83? (approximately): 48.

Pronotum: Length, 53 units; an encircling row of small pits parallel to the anterior margin and about three units from it; a shallow median groove extends practically the entire length of the pronotum and is pitted on the posterior lobe; the posterior lobe with scattered pits, those near the lateral margins being deeper and arranged more or less in rows.

Metanotum: The hemelytra are large and long, extending to the posterior margin of the fifth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 32:56; on the right side of the body the anterior acetabulum has one pit anterior to the cleft and two pits posterior to it; the middle acetabulum has two pits on each side of the cleft; the posterior acetabulum is unpitted or has a faint pit or two.

Femora: The anterior femora attain the apex of the head while the posterior femora slightly surpass the tip of the abdomen.

Abdomen: The posterior half of the sixth abdominal segment is swollen; on the ventral side of the sixth segment, about midway between the median longitudinal line and the lateral margin, is a small brush of stiff hairs close to the posterior margin; the seventh segment is provided with a hairy, broad, ventral keel extending the length of the segment; a large depression on each side of the keel; a heavy ledge above each depression with a tuft of long spinelike hairs near the anterior margin and a similar tuft of much longer hairs near the posterior margin; on the dorsal posterior margin of the sixth segment there is a fringe of short stiff hairs; the terminal dorsal process is stout and sharp, about one-third the length of the segment. In the female the dorsal process is one-third the length of the segment.

Described from two males bearing the following label: „Transvaal, Makapan, E. Simon, Coll. Noualhier, 1898", (One of these is the holotype in the Paris Museum), and specimens from Cape Province, Transvaal, N. Rhodesia, and S. Rhodesia collected by G. E. HUTCHINSON. These belong to the British Museum. An allotype is chosen from the paratypes of this series.

Notes: This species is related to *H. ambulator* STÅL and *H. albolineolata* REUTER from which it may be distinguished as indicated in the key.

***Hydrometra africana**** sp. n. (Plate II).

Size and Color.

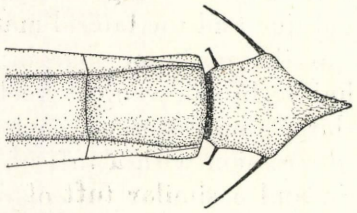
Length, 11.4 mm (male holotype) 12.3 mm (allotype); the general color of the body is a dark brown; indeed the color and pattern essentially as in *H. transvaalensis* except that the white line on the hemelytra is broader and broken into four disconnected segments, in which regard it resembles *H. albolineolata* REUTER.

Structural Characteristics.

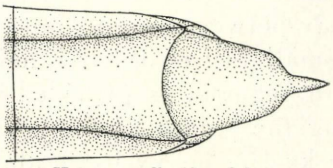
Head: Length, 90 units (holotype); the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :53:27; dorsal interocular groove shallow; the ventral interocular groove marked and longer than the diameter of an eye; the clypeus is truncate. The rostrum surpasses the middle of the postocular distance; beginning with the basal one the ratio of the lengths of the antennal segments is expressed by the formula: 17:33: :83:48.

Pronotum: Length, 52 units; the usual encircling row of pits parallel to the anterior margin; the median groove pitted on the posterior lobe; the posterior lobe with scattered pits.

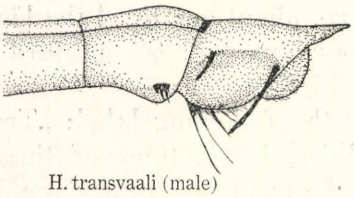
# PLATE II.



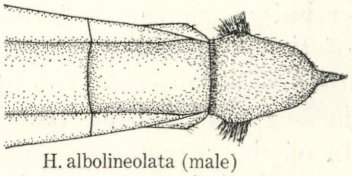
H. transvaali (male)



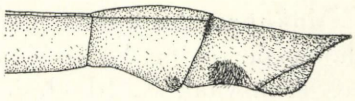
H. transvaali (female)



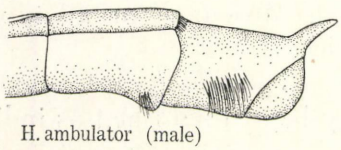
H. transvaali (male)



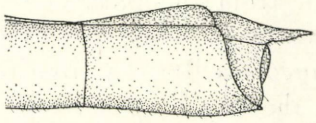
H. albolineolata (male)



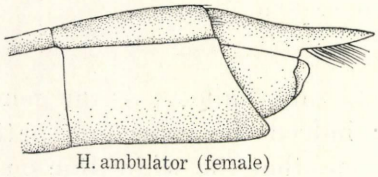
H. albolineolata (male)



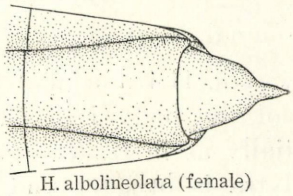
H. ambulator (male)



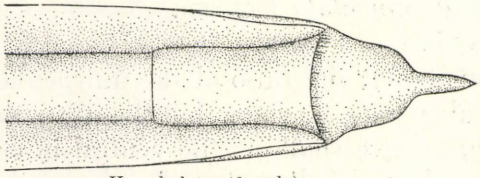
H. albolineolata (female)



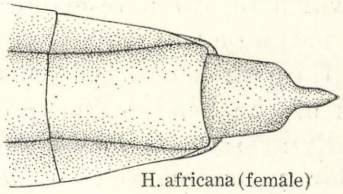
H. ambulator (female)



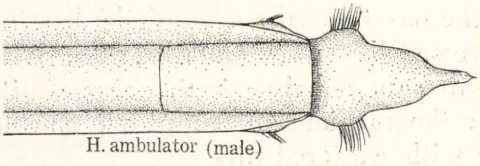
H. albolineolata (female)



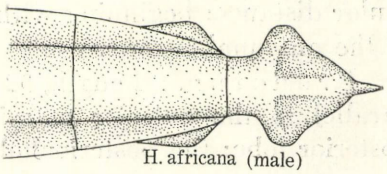
H. ambulator (female)



H. africana (female)



H. ambulator (male)



H. africana (male)

Metanotum: The hemelytra are fully developed extending nearly to anterior margin of sixth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 32:38; acetabular pitting as in *H. transvaalensis* sp. n.

Femora: The anterior femora attain the apex of the head and the posterior femora attain the tip of the abdomen.

Abdomen: The posterior half of the sixth abdominal segment is swollen and provided with a pair of small brushes of stiff hairs as in *H. transvaalensis;* the seventh segment (first genital) is provided with a ventral keel throughout its length; there is a pair of conspicuous tufts of hair on the first genital much as in *H. albolineolata* REUTER (now gone from the type); the first genital as seen from above is broadest near the middle with dorso-lateral depressions on the caudal half; the terminal process is stout and sharp, about one-fourth the length of the segment; in the female the genital segment is declevent and the process less than a third the length of the segment and pointed.

Described from holotype and allotype labeled „Afrique or. Allemande, Tanga, Alluaud and Jeannel Avril 1912". There are also two females labeled „Tanganyika Territory 15. 1. 1918. Loveridge" which were labeled *H. ambulator* STÅL in the British Museum. The holotype and allotype belong to the Paris Museum.

***Hydrometra ambulator*** STÅL, 1855. (Plate II).

*Hydrometra ambulator* STÅL, Öfvers. Vetenskaps-Akad. Förhandl. XII. 1845—55, nr. 1. p. 46.

Doctor STÅL described this species most inadequately. His type which we have seen in Stockholm is labeled „Cafraria. J. Wahlb." At the close of his very brief latin description he wrote „In terra Natalensi". We have found four closely related species from Africa and in our studies have appealed to Mr A. ROMAN of the Stockholm Museum who has been kind enough to make two examinations of the type concerning points overlooked in our own examination of the type.

The specimens from which our drawings were made are from Cape Province, South Africa. The distinguishing features of this species are given in the key. The acetabula pits were difficult to see on the type and on the dark specimens before us. The Cape Province specimens show some lack of symmetry in this regard. One male has 2 pits in front and 3 pits behind the cleft on both anterior and

middle acetabula of the left side and only 2 pits on either side of cleft on the right side. There is one obscure pit on top of each posterior acetabulum.

***Hydrometra albolineolata*** REUTER, 1882, (Plate II).

*Hydrometra albolineolata* REUTER, Öfvers., Finska Vet. Soc. Förhandl. XXV. p. 38.
*Hydrometra Reuteri* LETHIERRY and SEVERIN, Catalogue Général des Hémiptères, III, p. 54. (See KIRKALDY in Ann. Soc. Ent. Belg. 1900, p. 434).

In describing this species from Addah, Africa, DR. REUTER says this species is related to *H. ambulator* STÅL but differs by its larger eyes, more slender and longer second antennal segment and in the color of the hemelytra.

Various syntypes have been examined. There are two in the Museum at Perth, Scotland, where, through the kindness of Mr. RITCHIE the senior author was permitted to examine them. There is one also in the KIRKALDY collection at the U. S. National Museum. The National Museum of Hungary has specimens under this label from „Africa or., Katona", „Pangani 1905 V." and „Guinea, Addah".

The British Museum has specimens labeled: „Abyssinia, Small stream between Hawash and L. Zwai Circa 6000 ft. 30. X. 1926. J. Omer Cooper", „Abyssinia Stream west of Zaquala 27, XI, 1926. J. Omer Cooper", „Abyssinia, River Hawash at Bridge 28, XI, 1926. J. Omer Cooper", „Abyssinia Katere River XI, 1926. J. Omer Cooper", „Abyssinia, Adda shores of Hora Harsadi 3, XII, 1926. J. Omer Cooper".

There are also some female specimens in the Paris Museum which we believe belong to this species. They come from „Nord de Sokoto, Birni n'Konni (Mission Tilho) Dr. R. Goillard. 1910" and „Dahomey, env. de Porto-Novo. Waterlot, 1908".

This species therefore has a distribution entirely across the middle of Africa.

In the syntypes there are four longitudinal lines in a row on the hemelytra and two longitudinal orange bands on the thorax separated by a purple line which is margined with black. The middle acetabula have four pits.

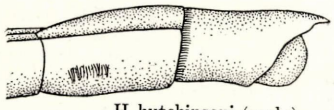
***Hydrometra hoplogastra*** HALE, 1925. (Plate IV).

*Hydrometra hoplogastra* HALE, Arkiv f. Zool., No. 20, pp. 2—3, Fig. 1. C and D.

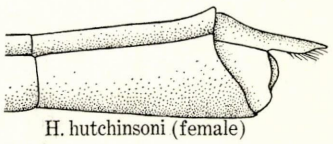
The male type in the Stockholm Museum has no acetabular pits and was described from Laura, Queensland, Australia. HALE gives also Cape York, Queensland; Northern Territory and Northwest Australia.

Specimens before us, which were collected in New Guinea

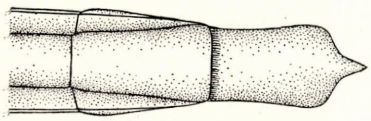
# PLATE III.



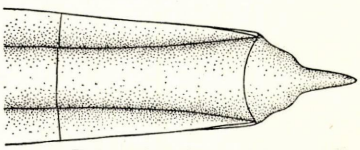
H. hutchinsoni (male)



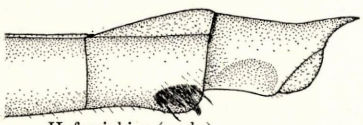
H. hutchinsoni (female)



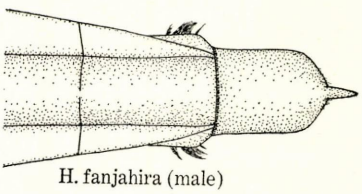
H. hutchinsoni (male)



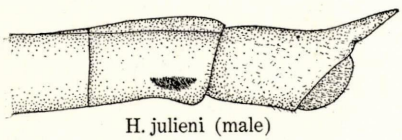
H. hutchinsoni (female)



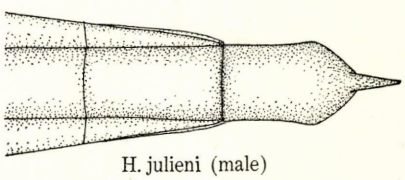
H. fanjahira (male)



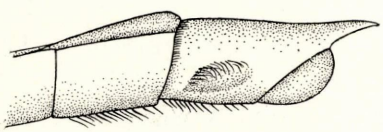
H. fanjahira (male)



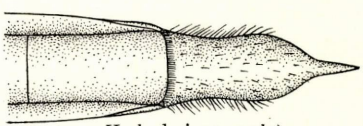
H. julieni (male)



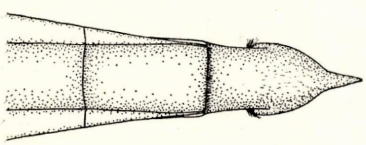
H. julieni (male)



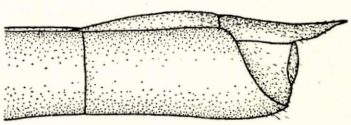
H. rhodesiana (male)



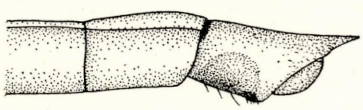
H. rhodesiana (male)



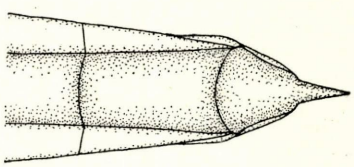
H. smithi (male)



H. smithi (female)



H. smithi (male)



H. smithi (female)

(Lemien, Berlinhafen), differ in some respects from HALE's specimens.

The size varied from 15.1 mm (male) to 18 mm (female); the ratio of the anteocular part of the head to the postocular part is expressed in the following formulas: AO:PO: :103:32 (male), 113:34 (female); the lengths of the antennal segments are in the following ratio: 26:62:X:64 (male), 28:69:X:65 (female), 31:70:195:64 (female); on two of the specimens the third antennal segments could not be measured due to their curvature. The distance between the first and second coxae is to that between the second and third coxae as 40:75 (male) and 46:78 (female); the acetabula are not pitted. The regions of the body bear the following relation to each other: Head:pronotum: metanotum:abdomen: :144:61:64:197 (male) and 157:73:69:255 (female). The white median longitudinal line on pronotum is absent although the lateral ones are very conspicuous. Dr. HALE says his species „evidently has some affinity with *H. papuana* KIRK. but the male of that species is of larger size with the under side blackish". KIRKALDY's species came from Fly River in New Guinea which is in that portion of the Island nearest to Cape York, Australia. The type of *H. papuana* KIRK. has been destroyed and the description is inadequate. The slight difference in size and color of the ventral side of the abdomen is surely not sufficient to distinguish *H. papuana* KIRK. from *H. hoplogastra* HALE. Since the specimens before us labeled „N. Guinea BIRÓ 96, Lemien, Berlinhafen" from the Hungarian Museum are certainly HALE's species, even though they show some variation, there is grave doubt concerning the specific differences of the two species. Dr. KIRKALDY had a male specimen, yet he failed to mention the large conspicuous processes on the venter of the sixth abdominal segment. His type specimen was carded which fact, with the dark abdomen as a background, may account for this oversight. This question cannot be settled without the examination of more material. We also have before us specimens of this species from the U. S. National Musem labeled „Gordenvale N. Q."

***Hydrometra Hutchinsoni*** sp. n. (Plate III).

Size and Color.

Length, 13 mm (holotype); the general color is brown, connexiva and sides of abdomen nearly black, the abdominal tergites dark brown and polished except the last one; a pale lemon streak on the venter of the thorax and head beneath and behind the eyes.

Structural Characteristics.

Head: Length, 116 units; the ratio of the anteocular part of

the head to the postocular part is given by the formula AO : PO : : 87 : 32; the dorsal interocular groove fairly broad, of median depth and shorter than the diameter of an eye; the ventral interocular groove appears to be longer than the diameter of an eye; clypeus very bluntly conate, the rostrum attaining rear margin of the eyes; antennal formula is: 1st:2nd:3rd:4th:25;54;114;38.

Pronotum: Length, 63 units; the encircling row of pits not conspicuous and three unit spaces behind the anterior margin. The posterior lobe undeveloped with a few pits; the usual median longitudinal line present; no pits laterally.

Metanotum: Hemelytra minute.

Coxae: The distance between the first and second coxae is to that between the second and third as 43 : 67; anterior and middle acetabula with two pits each; posterior acetabulum with a pit on top.

Femora: Anterior femora surpassing the apex of the head by one-thirteenth their length and the posterior femora surpassing the tip of the abdomen by 7.5 percent of their length.

Abdomen: The sixth segment of the male slightly swollen on the anterior ventral half and provided with two oval hair tufts at the extreme sides of the segment which occupy the anterior half of the margin. (See drawings on Plate III).

Described from one male labelled „Caprivi Strips" „S. Africa" G. E. Hutchinson collect. B. M. 1928—393. Holotype in the British Museum. A female bearing a similar label is referred with some doubt to this species.

***Hydrometra Fanjahira*** sp. n. (Plate III).

Size and Color.

Length, 12.8 mm (male holotype); general color of the body is a reddish brown; a longitudinal, median, narrow, white stripe extending from the anterior margin of the eyes to the base of the pronotum; the anterior third of the pronotum and the lateral margins dark reddish brown in color; the remaining part of the pronotum brownish yellow; a narrow white band extends along the lateral margins of the thorax; ventral parts of entire body with frosted appearance; white patches of frosting on the sides of the abdomen near the anterior margin of each segment; a broad, white, longitudinal stripe on the hemelytra.

Structural Characteristics.

Head: Length, 113 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO : PO : : 72 : 31; the dorsal interocular groove is slightly shorter than the dia-

meter of an eye, fine, and shallow; the ventral interocular groove is equal in length to the diameter of an eye, broader and much deeper than the dorsal groove; clypeus about half again as broad as long, slightly concave on the anterior margin; the rostrum surpasses the eyes by about one-half the postocular distance; only the first two antennal segments are present on the specimen and they are in the ratio of 18 : 40.

Pronotum: Length, 63 units; an encircling row of pits parallel to the anterior margin and about three units from it; the posterior two-thirds of the pronotum with a shallow, median, longitunidal groove, faintly pitted except near the posterior end where the pits are more distinct; an irregular row of about twenty pits parallel to the median row on each side of it; an irregular row of about twenty pits near each lateral margin; five or six pits in an irregular row near each of the margins of the propleura.

Metanotum: The hemelytra are large and long, extending nearly to the posterior margin of the fifth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 37 : 68; all the acetabula are pitted; on the left side of the body the anterior acetabulum has one pit anterior to the cleft and two pits posterior to it; the middle acetabulum has two pits on each side of the cleft; the posterior acetabulum has two small pits; the pits on the right side of the body are similarly arranged except that the anterior acetabulum has two pits anterior to the cleft instead of one.

Femora: The anterior femora extend to the base of the antennae; the posterior femora slightly surpass the tip of the abdomen.

Abdomen: Two large elevations on the ventral side of the posterior half of the sixth abdominal segment; each elevation is about midway between the median, longitudinal line and the lateral margin; these elevations are about one-half as long as the segment and are capped with a longitudinal brush of long stiff hairs, inclined outward and backward; the seventh segment is slightly compressed ventro-laterally to form a ventral keel, on each side of which is a large shallow depression; in dorsal view the sides of the seventh segment are nearly parallel; the tergites of the posterior two-thirds of the sixth segment and of the entire seventh segment present a fine, transversely-wrinkled appearance; the other tergites are polished; the tergite of the seventh segment is frosted; the terminal dorsal process of the male is prominent, about one-fourth as long as the segment, and curved slightly downwards.

Described from one male bearing the following label: „Madagascar, Région du Sud-est, Vallée du Fanjahira, Isaka, Ch. Alluaud, 1901". Type in the Paris Museum.

Notes.

This species seems to be more closely allied to *H. Julieni,* which is described as new in this paper, than to any other known species. They can easily be separated by the fact that *H. Fanjahira* has the large elevations on the sixth abdominal segment, relatively shorter femora, and the shorter terminal process.

***Hydrometra Julieni*** sp. n. (Plate III).

Size and Color.

Length 13.0 mm (male holotype); the general color of the body is a brownish yellow.

Structural Characteristics.

Head: Length, 120 units; the ratio of the anteocular part of the head to the postocular part is expressed by the formula AO: PO: :75:35; both the dorsal and ventral interocular grooves are about as long as the diameter of an eye and are broad and shallow; clypeus truncate, about half again as broad as long; rostrum extends back one-third of the postocular distance; beginning with the basal one the ratio of the lengths of the antennal segments is expressed by the following; 25: 50: 129 (approx.): X; the third segment, due to its curvature, could not be measured accurately; the last segment of the antennae is missing from the specimen.

Pronotum: Length, 59 units; an encircling row of pits parallel to the anterior margin and about three units from it; the posterior lobe with a median longitudinal row of pits on the posterior two-thirds of the lobe; on each side of the median row and also near each lateral margin is an irregular row of punctures; a row of six or seven pits near the margin of each of the propleura.

Metanotum: Length, 53 units; the hemelytra are large, extending slightly beyond the middle of the fifth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 35:67; all the acetabula are pitted; the anterior acetabulum on the left side of the body has four pits, two anterior to the cleft and two posterior to it; the middle acetabulum has two pits anterior to the cleft and one posterior to it; the posterior acetabulum has one or two very faintly defined pits;

on the right side of the body the pits are similarly arranged except on the middle acetabulum which has one pit anterior to the cleft and two pits posterior to it.

F e m o r a : The anterior femora surpass the apex of the head by about one-seventh of their own length; the posterior femora extend beyond the tip of the abdomen by about one-sixth of their own length.

A b d o m e n: Length, 168 units; the two male processes are on the posterior half of the ventral side of the sixth segment; each process, which is about one-third the length of the segment, is about midway between the median, longitudinal, ventral line and the lateral margin and consists of a longitudinal brush of stiff hairs; the terminal dorsal process is long and sharp, about one-half the length of the segment.

Described from one male bearing the label: „Muséum Paris, Cochinchine, Julien, 1873." Type in the Paris Museum.

N o t e s.

The position and nature of the male processes distinguish this species from all other known species with the exception of *H. Fanjahira,* which is described as new in this paper. *H. Julieni* may be separated from *H. Fanjahira* by the fact that the latter species has two large elevations on the ventral side of the posterior half of the sixth abdominal segment, the femora are relatively shorter, and the terminal dorsal process is shorter.

***Hydrometra rhodesiana*** sp. n. (Plate III).

S i z e a n d C o l o r.

Length, 10.8 mm (male holotype); the general color of the body brown; the basal two-thirds of head and abdomen nearly black. the pronotum with a median longitudinal frosted line bordered on each side by a dark band; hemelytra with a median longitudinal slender white line and the basal one-fourth of the posterior margin white; the latter white streak surpassing anterior end of the other one for a short distance.

S t r u c t u r a l C h a r a c t e r i s t i c s.

H e a d : Length, 110 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO:PO: :67:31; the dorsal interocular groove, broad and shallow, about equal in length to the diameter of an eye; the ventral interocular groove is broader and deeper than the dorsal groove; the clypeus is

truncate about twice as broad as long; the rostrum surpasses the eyes by about three-fourths of the postocular distance. The antennal formula is as follows: 1st; 2nd; 3rd: 4th::17: 33: 91: 55.

Pronotum: Length, 55 units; the encircling row of pits parallel to the anterior margin and scattered pits on posterior lobe present but not conspicuous.

Metanotum: The hemelytra are long, surpassing anterior margin of the sixth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third as 33:62; the anterior and middle acetabula with four pits each, the posterior acetabula with one pit on top.

Femora: The anterior femora attaining base of antennal elevations only and the posterior femora just attaining tip of the abdomen.

Abdomen: The male without ventral processes on the sixth or seventh abdominal segment. The seventh (first genital) is slender and compressed laterally by oblique grooves which give the venter of this segment a very broad keel that is fringed with a few golden hairs; sparse bands of similar hairs occur on the venter of the sixth segment as continuations of those of the seventh. (See Plate III).

Described from one male specimen labeled „S. Rhodesia, S. Africa, G. E. Hutchinson, coll. B. M. 1928-395".

Notes.

This species is very near *Hydrometra Smithi* but can be distinguished from it by comparing the male genital segments as shown in the drawings on Plate III.

***Hydrometra Smithi*** sp. n. (Plate III).

Size and Color.

Length, 9.9 mm (male holotype), 11.8 mm (female allotype): general color of the body of the male yellowish brown; a narrow, median, frosted stripe extends from the anterior margin of the eyes to the posterior margin of the pronotum; ventral part of the head darker brown; ventral parts of thorax and abdomen with frosted appearance; a median frosted stripe on pronotum, bordered successively on each side by a narrow purplish-brown band, a broad yellowish-brown band, and on each margin of the pronotum by a reddish-brown band; the general color of the female is darker than that of the male; a narrow white stripe extends from the apex of the head to the end of the pronotum on the allotype; a white band

along the margins of the prothorax and abdomen of the female allotype; underside of body with frosted appearance; hemelytra with longitudinal white stripe.

Structural Characteristics.

Head: Length, 90 units (holotype), 108 units (allotype); the ratio of the anteocular part of the head to the postocular part is given by the formulas AO: PO:: 55: 26 (holotype), 66: 32 (allotype), on the male holotype the dorsal interocular groove is obsolete; the ventral interocular groove is about as long as the diameter of an eye, broad and deep; the clypeus is large and truncate, about one-half again as broad as long; the rostrum surpasses the eyes by about three-fourths of the postocular distance on both the male and female; the first three segments of the antennae of the holotype and paratype are present and the lengths of the segments are in the following ratio; 15:26:78:X (holotype); the antennae are missing from the allotype.

Pronotum: Length, 48 units (holotype), 55 units (allotype); an encircling row of faint pits parallel to the anterior margin and close to it, the pits very faintly defined on the dorsal side but somewhat more prominent on the ventral side; posterior lobe with median longitudinal row of very faint pits bordered by an irregular row of pits on each side; each of the propleura with a marginal row of five or six small pits.

Metanotum: The hemelytra are large and long, extending nearly to the posterior margin of the fifth abdominal segment on the holotype and to the end of the fourth abdominal segment on the allotype.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 28 : 50 (holotype); 33 : 56 (allotype); the acetabula are pitted approximately the same on both the male and female; on the left side of the body of the male holotype the anterior and middle acetabula have two pits on each side of the cleft; the posterior acetabulum has one or two faint pits; the pitting is the same on the right side of the body.

Femora: The anterior femora of the holotype extend to the middle of the expanded part of the head while the posterior femora extend almost to the tip of the abdomen; the anterior femora of the allotype extend to the base of the antennae and the posterior femora extend nearly to the tip of the abdomen.

Abdomen: No processes on the sixth segment; in dorsal view the general appearance of the seventh segment of the male is quite pointed, the sides of the segment being somewhat concave; on the ventral side of the seventh abdominal segment of the male, on each side of the median longitudinal line, is a hairy elevation near the posterior margin; the terminal dorsal spine of the male is long, stout, and sharp, about one-fourth as long as the segment; the terminal spine of the female is very sharp and prominent, about one-half as long as the segment.

The holotype bears the following label: „Kortwright, Sierra Leone, W. Africa, 1100 ft., 20, II, 1904, Major F. Smith, R. A. M. C." The allotype bears the label „Côte d'Afrique or. angl., Tiwi, Alluaud et Jeannel, Nov. 1911." There are also two other paratypes labeled „Sierra Leone, Njali, X, 26, E. Hargreaves." One in British Museum and one in the Kansas University Collection.

Holotype in the British Museum; allotype in the Paris Museum.

***Hydrometra Illingworthi*** sp. n. (Plate IV).

Size and Color.

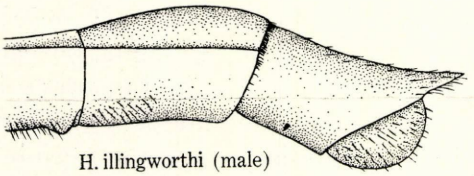
Length, 15 mm (male holotype); the general color light brown, darker on head between and in front of the eyes; the pronotum with a narrow, median longitudinal, frosted line bordered on each side by a dark band; a frosted stripe extending on the lateral margins of the body from near the anterior margin of the thorax to the posterior margin of the sixth abdominal segment, plainer on the abdomen than in *H. Horváthi* which shows only faint band connecting marked spots near anterior margins of the segments; abdominal tergites are dark brown polished except last abdominal which is dull; connexiva and ventral parts of body light brown, slightly frosted.

Structural Characteristics.

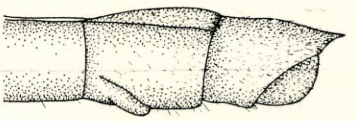
Head: Length, 135 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO : PO : : 87 :38; the dorsal interocular groove is short but nearly as long as the diameter of an eye; the ventral interocular groove is about like dorsal one but broader; the clypeus is truncate, about twice as broad as long; the rostrum surpasses the eyes by about one-third the postocular distance; the antennae are missing.

Pronotum: Length, 80 units; the pits very indistinct, even the encircling row parallel to the anterior margin difficult to discern above.

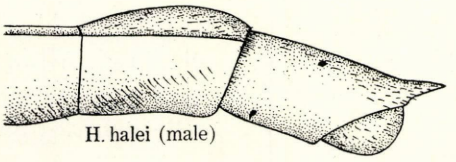
# PLATE IV.



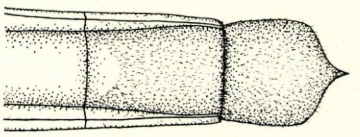
H. illingworthi (male)



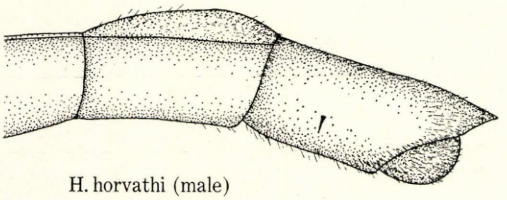
H. hoplogastra (male)



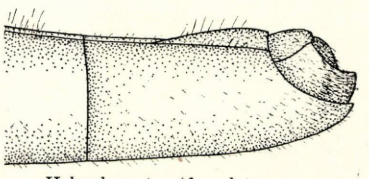
H. halei (male)



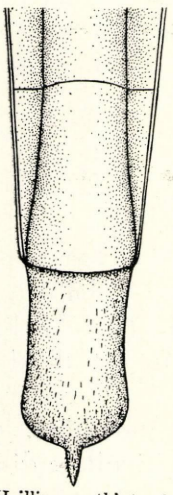
H. hoplogastra (male)



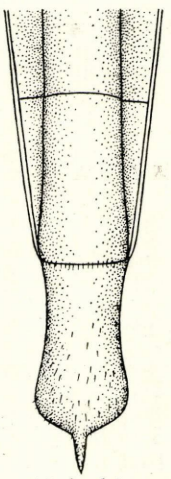
H. horvathi (male)



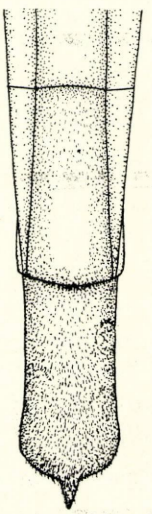
H. hoplogastra (female)



H. illingworthi (male)



H. halei (male)



H. horvathi (male)

Metanotum: The hemelytra extend slightly beyond the posterior margin of fourth abdominal segment; four white stripes in a broken median longitudinal line on the hemelytra.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 50*:78; four pits on front and middle acetabula.

Femora: The anterior femora just attaining apex of head, and posterior femora very slightly surpassing tip of abdomen.

Abdomen: The two male processes are minute spine-like and located on the ventral side of the seventh segment slightly behind the median point between the front and rear margin of the segment as shown on Plate IV; a pair of elevations on posterior ventral margin of sixth abdominal segment.

Described from one male specimen, the holotype labeled „Cairns, N. Q."

Holotype in U. S. National Museum.

Notes.

While this is from the same place as *H. Halei* sp. n. it is distinctly a different species as indicated by the elevations on the sixth ventral and the different position of the spine-like processes on the seventh; both of these species are related to *H. Horváthi* which differs in having the minute spine-like processes located higher on the sides of the seventh segment and in having a shorter terminal process.

***Hydrometra Halei**** sp. n. (Plate IV).

Size and Color.

Length, 13 mm (male holotype); the general color of the body brown, head nearly black; pronotum with a depressed median longitudinal line bordered with black; the abdominal tergites are dark brown and polished except the last one which is dull and covered with fine golden pubescence; the connexiva and the ventral parts of abdomen are light brown in color; a lateral submarginal whitish band extends from the acetabula of the hind leg to distal end of the last abdominal segment.

Structural Characteristics.

Head: Length, 134 units; the ratio of the anteocular part of the head to the posterior part is given in the formula AO:PO: :87:38; the dorsal interocular groove is short, shorter than the diameter of

* Probably too long, the body is broken at this point.

an eye but deep and well marked; the ventral interocular groove cannot be seen on this carded, somewhat dermestid eaten specimen; the clypeus is truncate, about twice as broad as long; rostrum is not entire in the specimen; terminal segments of antennae are missing, the other segments have following formula: 1st:2nd:3rd: :29:51:162.

Pronotum: Length, 73 units; a few pits parallel to anterior margin, a median longitudinal groove extends nearly the full length of the pronotum, a row of pits implanted in this groove; a few scattered pits on the posterior lobe.

Metanotum: The hemelytra have been destroyed by dermestids.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 37:72; the anterior acetabulum has two pits; the middle acetabulum has four pits, two in front and two behind the cleft; the posterior acetabulum with one faint pit on top.

Femora: The anterior femora attaining apex of head and posterior femora surpassing the tip of abdomen by two-elevenths of their length.

Abdomen: The two male processes are minute, spine-like and located on the ventral side of the seventh segment, about one-third the length of the segment from the anterior margin as shown on Plate IV.

Described from one male specimen labeled „Cairns, N. Q".

Holotype in U. S. National Museum.

Notes.

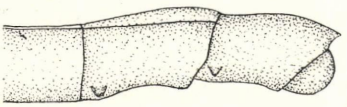
Closely related to *Hydrometra Horváthi* and to *Hydrometra Illingworthi* but distinguished from them as shown by the figures on Plate IV.

***Hydrometra Horváthi*** sp. n. (Plate IV).

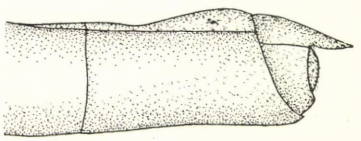
Size and Color.

Length, 14.5 mm (male holotype); the general color of the body is a light brown; the head is darker in color especially the expanded area, the region about the eyes, and the ventral part; the pronotum with a narrow, median, longitudinal, frosted line bordered on each side by a dark purplish-brown band; this latter band bordered with a broad, yellowish-brown band which in turn is bordered with a broad, light-brown band near the lateral margin; a frosted stripe extending on the lateral margins of the body from near the anterior

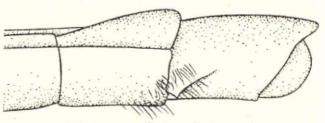
# PLATE V.



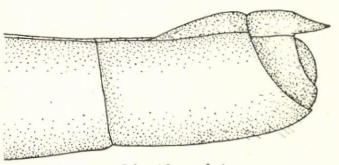
H. stagnorum (male)



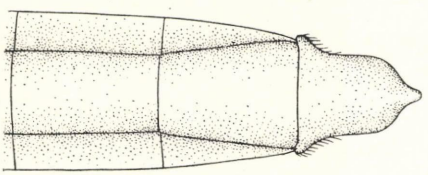
H. stagnorum (female)



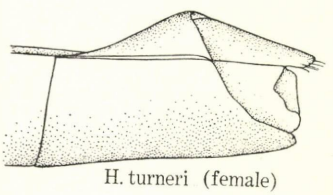
H. turneri (male)



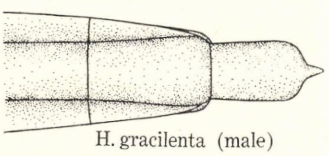
H. eremobia (female)



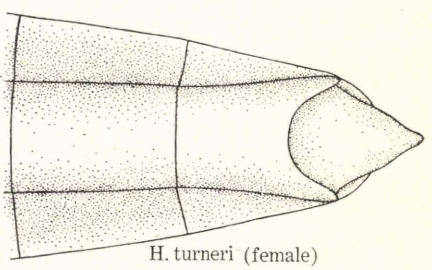
H. turneri (male)



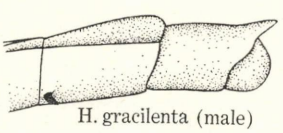
H. turneri (female)



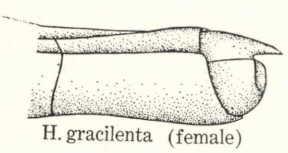
H. gracilenta (male)



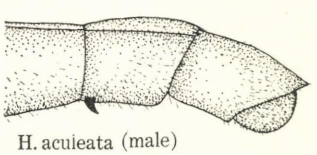
H. turneri (female)



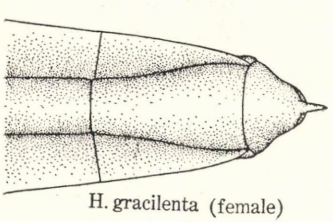
H. gracilenta (male)



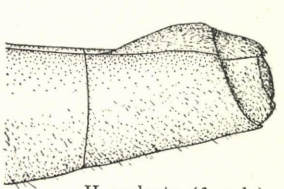
H. gracilenta (female)



H. aculeata (male)



H. gracilenta (female)



H. aculeata (female)

margin of the thorax to the posterior margin of the sixth abdominal segment; the abdominal tergites are dark brown, polished except last one, but the connexiva and the ventral parts of the abdomen are light brown in color; the ventral parts of the postocular region of the head, the thorax, and the abdomen are lightly frosted.

Structural Characteristics.

Head: Length, 130 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO:PO: :85:35; the dorsal interocular groove is short, about equal in length to the diameter of an eye, shallow, and narrow; the ventral interocular groove is about the same length as the dorsal groove but is much broader; the clypeus is truncate, about twice as broad as long; the rostrum surpasses the eyes by about one-third the postocular distance; the antennae are missing from the specimen.

Pronotum: Length, 73 units; an encircling row of pits parallel to the anterior margin and about three units from it; a median longitudinal groove extends nearly the full length of the pronotum; scattered pits on the posterior lobe, the pits more numerous and deeper near the lateral margins; the prothorax and mesothorax have a swollen appearance in comparison with the other parts of the body.

Metanotum: The hemelytra are long, extending to the posterior margin of the fourth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 35:65; the anterior and middle acetabula are pitted; on the right side of the body the anterior acetabulum has three pits, one anterior to the cleft and two posterior to it; the middle acetabulum has two pits anterior to the cleft and three pits posterior to it; on the left side of the body the anterior acetabulum has one pit on each side of the cleft; the middle acetabulum has two pits on each side of the cleft; the posterior acetabulum on each side of the body is unpitted.

Femora: The anterior femora surpass the apex of the head by about one-eighth of their own length and the posterior femora extend beyond the tip of the abdomen by about the same distance.

Abdomen: The two male processes are located on the ventral side of the seventh segment slightly anterior to the middle and somewhat nearer to the median longitudinal line than to the lateral margin; each process appears to be a small sharp spine;* the sixth

* Each spine is probably a tuft of very stiff hairs but the high power of the binocular microscope does not reveal the exact nature of the processes.

and seventh segments are approximately the same length; the terminal dorsal process is short and conical.

Described from one male specimen labeled „N. Guinea Bíró 97, Stephansort Astrolabe B." Type in the Hungarian National Museum, Budapest.

Notes.

Allied to *H. Halei* and *H. Illingworthi* described in this paper. *H. feta* HALE was described from a female and differs from *H. Horváthi* sp. n., *H. Halei* sp. n., and *H. Illingworthi* sp. n. at least in color and in having a beak that reaches only slightly beyond the posterior margin of the eyes. HALE's species has but two pits on the anterior and middle acetabula and is a strikingly handsome species.

***Hydrometra feta*** HALE 1925.

*Hydrometra feta* HALE, Arkiv. f. Zool. XVII. A, No. 20, p. 4, Fig. 1, A and B, and Fig. 2.

We have seen the female type in the Stockholm Museum. It is a very handsome Hydrometrid taken by MJOBERG at Bellenden Ker. Queensland, Australia. The beak just surpasses the hind margin of the eye. There are two acetabular pits on the anterior and middle acetabula, none on the posterior ones.

It is regrettable that Dr. HALE did not give some notes of comparison between this species and *Hydrometra strigosa* (SKUSE). Apparently *H. strigosa* (SKUSE) described from Sydney and Botany Swamps, N. S. W. is a smaller species, being only 11 mm long.

***Hydrometra stagnorum*** (LINNAEUS) 1758. (Plate V).

LINNAEUS, C. Systema Naturae, 10th Ed. p. 450.

This well known species appears to be widely distributed in Europe. The Hungarian Museum has, among others, specimens labeled: „P. Marót Szépligeti", „Szt. Endre Ujhelyi", „Munkács Ujhelyi", „Tata 1915 Horváth" and „I. Canar. Becker, Teneriffe, Icod".

The Paris Museum also has specimens from the Canary Islands labeled: „Isles Canaries G. Buchet 1897". It also has a series from „Tanger (env.) Favier 113—59", another „Moroc., Andjera, G. Buchet 1903", and two other series — one labeled „Californie Avril 1889" and the other „Canal de Californie 1884".*

* These two places probably refer to La Californie, a small sea-side village on the Riviera between Nice and Cannes.

The Museum at Copenhagen has a couple of specimens from „Sicilia, coll. Western". And the one at Vienna a series from Africa. No attempt has been made to record the many places from which this species is well known.

***Hydrometra eremobia*** KIRITSHENKO 1923. (Plate V).

*Hydrometra eremobia* KIRITSHENKO, A. A., Revue Russe d'Entomologie, Vol. XIX, p. 5.

Thanks to the kindness of Doctor KIRITSHENKO we have in the University of Kansas Collection two specimens of this species, unfortunately they are both females, so we cannot figure the male. The females, aside from color, are indistinguishable from *H. stagnorum* L.

***Hydrometra Turneri**** sp. n. (Plate V).

Size and Color.

Length, 10 mm to 10.8 mm; the females a little longer than the males; the general color of the body is dark nearly black; pronotum, legs, spots on connexivum above and beneath, and median ventral line on abdomen may be brown; the pronotum, beak, antennae and legs brown in all the specimens, other parts mentioned above black in most of the specimens; a median longitudinal frosted stripe on posterior half of pronotum and a similar curved stripe above each of the acetabula; the pits often made conspicuous by frosty spots; abdominal tergites dull black (in two specimens dull brown).

Structural Characteristics.

Head: Length, 112 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO:PO: :71:32; the dorsal interocular groove narrow nearly as long as the diameter of an eye; the ventral interocular groove is about as long as the dorsal one but deep due to the elevated ridges on either side; the clypeus is conate; the rostrum surpasses the eyes a little more than half the postocular distance; the antennae have following formula: 1st:2nd:3rd:4th: :16:30:125:60 (♀).

Pronotum: Length, 42 units (brachypterous male); a very distinct encircling row of pits parallel to the anterior margin; median longitudinal groove pitted and distinct on posterior half only, the anterior lobe with a median shallow depression instead; the transverse constriction and posterior lobe covered with pits.

Metanotum: The hemelytra are short, undeveloped and not surpassing posterior end of this segment.

Coxae: The distance between the first and second coxae is to that between the second and third as 26:48; the anterior and middle acetabula with numerous pits, about four in front and seven behind each cleft, five or six pits on posterior acetabula.

Femora: Anterior femora not quite attaining apex of the head; hind femora surpassing the abdomen by a little more than an eighth their length in the female and by at least a fourth their length in the male.

Abdomen: The terminal process short and blunt in both sexes; the males have lateral processes near the anterior margin of the seventh abdominal (first genital) segment that embrace the rear margin of the sixth segment; the sixth segment provided with an oblique band of hairs on either side, beginning at a point just in front of the terminal point of the processes of the seventh and converging but not meeting on the ventral anterior margin of the sixth segment (see Plate V).

Described from five males and three females labeled „Natal: Kloof. 1500 ft. Aug. 1926" S. Africa, R. E. Turner, British Museum 1926—350. There is also another specimen bearing a written label that is illegible, also from S. Africa.

Holotype, allotype and paratypes in the British Museum. One pair of paratypes retained for the University of Kansas Collection.

***Hydrometra gracilenta*** HORVÁTH 1899. (Plate V).

*Hydrometra gracilenta* HORVÁTH, Természetrajzi Füzetek, Vol. XXII, pp. 450—51.

The National Museum of Hungary has nine specimens of this species from Hungary and Rumania. Through the kindness of Dr. O. LUNDBLAD we have three specimens from Sweden. It is from these that our illustrations have been drawn.

Dr. O. M. REUTER (14) 1900 made some valuable comparisons between *Hydrometra stagnorum* L. and *Hydrometra gracilenta* HORVÁTH and figured the abdominal tips of both sexes and the heads of these species.

***Hydrometra aculeata*** MONTROUZIER 1864. (Plate V).

*Hydrometra aculeata* MONTROUZIER, Mélanges Entomologiques par M. B. P. PERROUD 4th Part, pp. 195—196.

In the original description of this species MONTROUZIER states that there are two recurved hooks towards the extremity of the fifth segment of the abdomen. On specimens before us, which were collected in New Caledonia by Professor LAMBERTON, there are two

prominent recurved hooks near the ventral anterior margin of the sixth abdominal segment.

***Hydrometra procera*** HORVÁTH 1905. (Plate VI).

*Hydrometra procera* HORVÁTH, G. Annales Musei Nationalis Hungarici, 1905, p. 416.

Described from Sapporo, Japan. There is a series in the Hungarian National Museum labeled „Japonia Okayama, H. Sauter", and a pair in the Kansas University Entomological Museum labeled „Kyûshûl Fukuoka (Chikuzen) 8. VI. 1929 Esaki and Hori". These last were sent to the senior author by the kindness of Professor TEISO ESAKI. A female specimen of this species from China is before us. It is labeled: „Spirit Valley, Kanking, Kiangau Province, China, H. F. Loomis, Oct. 2, 1919."

This is a stout little species without acetabular pits and a beak almost as long as the head. The male has two stout widely separated pig-like projections on the sixth ventral abdominal segment.

***Hydrometra annamana*** sp. n. (Plate VI).

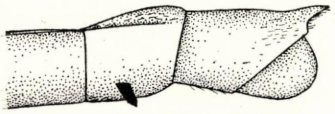
Size and Color.

Length, 12.7 mm (male holotype), 13.9 mm (female allotype), 11.9—12.6 mm (two male paratypes), 13.4—14.1 mm (five female paratypes); the general color of the body of the holotype is a yellowish brown; a median longitudinal line on the pronotum and lateral margins of pronotum reddish brown; ventral parts of head somewhat darker and frosted in appearence; frosted stripe along the sides of the body from the anterior margin of the pronotum to the end of the abdomen; the female allotype is similar in color except that the body is more yellowish; median longitudinal white stripe on pronotum bordered on each side by a reddish-brown band on the posterior lobe; white longitudinal stripe on the hemelytra.

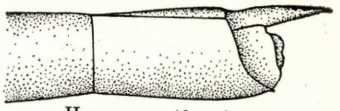
Structural Characteristics.

Head: Length, 110 units (holotype), 115 units (allotype); the ratio of the anteocular part of the head to the postocular part is given by the formulas AO:PO: :74:28 (holotype), 77:29 (allotype); on the holotype the dorsal interocular groove is short and deep; the ventral interocular groove is about the same length as the dorsal groove but is broader; on a male paratype the lower groove is long, extending from about the middle of the anteocular part of the head nearly to the pronotum, the postocular portion of the groove being deeper and broader than the anteocular portion; the dorsal inter-

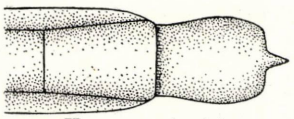
# PLATE VI.



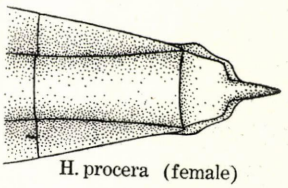
H. procera (male)



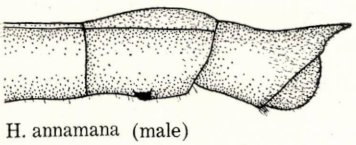
H. procera (female)



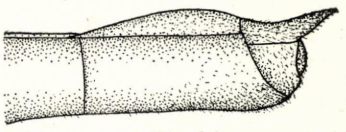
H. procera (male)



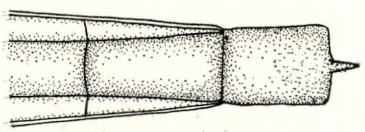
H. procera (female)



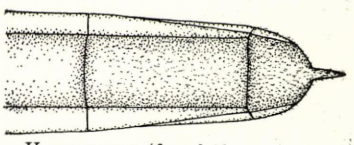
H. annamana (male)



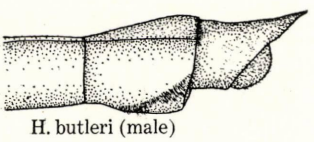
H. annamana (female)



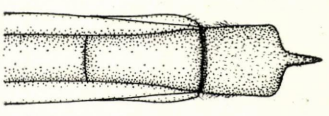
H. annamana (male)



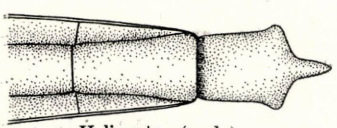
H. annamana (female)



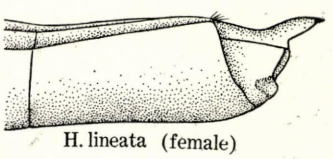
H. butleri (male)



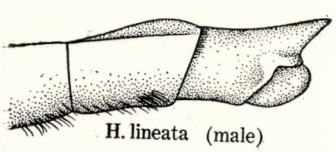
H. butleri (male)



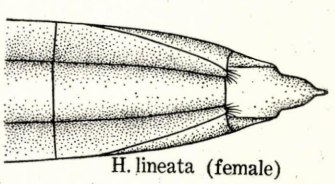
H. lineata (male)



H. lineata (female)



H. lineata (male)



H. lineata (female)

ocular groove of the allotype is the same as the holotype and paratype and the ventral groove is similar to that of the paratype except that the anteocular portion is relatively longer, beginning near the base of the expanded part of the head; clypeus large, bluntly conical and polished; the rostrum surpasses the eyes by about one-half the postocular distance on the holotype but does not extend quite so far on the allotype; the first two antennal segments of the male holotype are present and their lengths are in the ratio of 19:45; the ratio of the lengths of the antennal segments of the allotype is 18:43:X:40; the third segment could not be measured accurately due to its curvature.

Pronotum: Length, 58 units (holotype), 64 units (allotype); an encircling row of pits parallel to the anterior margin and close to it; the posterior lobe with median longitudinal row of pits which has a row of pits on each side and also on each lateral margin, each of the propleura with an irregular row of four or five pits; the pits on the allotype are more irregularly placed and more numerous than on the holotype.

Metanotum: The hemelytra are large and long, extending nearly to the posterior margin of the fourth abdominal segment on the holotype and nearly to the middle of the fourth abdominal segment on the allotype.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 36:60 (holotype), 40:64 (allotype); all the acetabula are pitted; on the holotype the anterior acetabulum on the left side of the body has two pits anterior to the cleft and three pits posterior to it; the middle acetabulum has two pits anterior to the cleft and four pits posterior to it; the third acetabulum has one large pit at the top; the pits are similarly arranged on the right side of the body; on the left side of the body of the allotype the anterior acetabulum has two pits on each side of the cleft; the middle acetabulum has three pits on each of the cleft; the third acetabulum has two pits; the pits on the right side of the body are similarly arranged except that the middle acetabulum has four pits posterior to the cleft instead of three.

Femora: On the holotype the anterior femora slightly surpass the apex of the head and the posterior femora do not extend quite to the tip of the abdomen; the anterior femora of the allotype do not extend quite to the apex of the head and the posterior femora extend slightly beyond the posterior margin of the fifth abdominal segment.

Abdomen: The two male processes are located on the ventral side of the sixth abdominal segment, one on each side of the median longitudinal line; each process is about midway between the anterior and posterior margins of the segment and consists of a small elevation capped with short stiff hairs; the posterior dorsal margin of the sixth segment of the holotype has a fringe of short stiff hairs; in dorsal view the sides of the seventh segment are nearly parallel and the segment presents a very blunt appearance; the terminal dorsal process of the male is sharp and about one-fourth the length of the segment; the terminal dorsal process of the female is sharp and prominent, about two-fifths of the segment in length.

Described from three males and six females; the holotype, allotype, and three female paratypes were collected in Annam Laos; two paratypes, one male and one female, bear the following label: „Formosa Sauter, Takao, 1907". All of these specimens are from the Hungarian National Museum, Budapest. Two paratypes, a male and a female, from the Paris Museum were collected in Nhatrang by A. KREMPF in 1913.

Notes.

We have in the University of Kansas Collection two specimens from Tokio, Japan sent us some years ago by R. TAKAHASHI.

***Hydrometra Butleri*** sp. n. (Plate VI).

Size and Color.

Length, 11.25 mm (male holotype), 11.0 mm (male paratype); the general color of the body is a brownish-yellow; the hemelytra has a longitudinal white stripe.

Structural Characteristics.

Head: Length, 103 units (holotype), 97 units (paratype); the ratio of the anteocular part of the head to the postocular part is given by the formulas AO:PO: :67:28 (holotype), 63:27 (paratype); the dorsal interocular groove of the holotype is equal in length to the diameter of an eye, fine and shallow; the ventral interocular groove is longer, extending to about onehalf the postocular distance; clypeus bluntly conical and polished; the rostrum surpasses the eyes by about two-fifths of the postocular distance; the antennal segments of the holotype, beginning with the basal one, are in the ratio 17:39:X:40; the third segment could not be measured accurately due to its curvature.

Pronotum: Length, 54 units (holotype and paratype); an encircling row of pits parallel to the anterior margin and close to it;

the posterior lobe with a median longitudinal row of pits and other pits arranged more or less in rows; each of the propleura with a marginal row of five or six pits.

Metanotum: On both the holotype and paratype the hemelytra are large and long, extending to the middle of the fifth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 33:58 (holotype); all the acetabula are pitted; on the left side of the body of the holotype the anterior acetabulum has one pit anterior to the cleft and two pits posterior to it; the middle acetabulum has two pits anterior to the cleft and three pits posterior to it; the third acetabulum has a large pit near the top.

Femora: The anterior femora of the holotype extend to the apex of the head and the posterior femora slightly surpass the tip of the abdomen.

Abdomen: The sixth segment of the male holotype is considerably swollen; on the ventral side of the sixth abdominal segment, on each side of the median longitudinal line, is a small brush of stiff hairs; on the paratype the brush is much more pronounced and extends to the posterior margin of the segment, the posterior end being much nearer the dorsal margin of the segment than the anterior end; near the base of the terminal dorsal spine, on each side of the median longitudinal line, is a small protuberance; the dorsal posterior margin of the sixth segment is fringed with stiff hairs; the terminal dorsal process is sharp and long, about one-half as long as the segment.

Described from two males; the holotype was collected in Kodai Kanal, S. India, by CAMPBELL; the paratype bears the label „Inde Mérid, Trichinopoly, Tos. Dubreuil". Holotype in the Snow Entomological Collection, University of Kansas, Lawrence; paratype in the Hungarian National Museum, Budapest.

***Hydrometra lineata*** ESCHSCHOLTZ 1822. (Plate VI).

*Hydrometra lineata* ESCHSCHOLTZ, JOHANN FRIEDRICH, Entomographien, Erste Lieferung. Dorpat Nat. Abt. I, pp. 166—167? 1822? In: The above separately paginated, Berlin 1822 pp. 110—111. Also in: „Oeuvres entomologiques de Eschscholtz, Tome I" translated by DOUMERC, 1833, pp. 116—118.

*Hydrometra vittata* STÅL, G., Öfversigt Kongl. Vetenskaps-Akademiens Forhandlingar 1870, No. 7, p. 703, Stockholm.

This species was overlooked by LETHIERRY and SEVERIN in their Catalogue Général des Hémiptères, Tome III, and evidently by

Dr. STÅL when he described *H. vittata* from the Philippines for he compared it with *H. stagnorum* L. Mr. KIRKALDY in describing *H. Greeni* from Ceylon in 1898 also failed to mention *H. lineata* ESCHSCHOLTZ. Dr. E. BERGROTH (1) 1915 presented excellent comparisons between *H. lineata* ESCHSCHOLTZ and *H. Greeni* KIRKALDY. We show the differences in our drawings on Plate.

We have seen specimens labeled „Manila, P. I. Dec. 1924, R. C. McGregor coll."; „Limay Bataan Prov. Luzon, P. I., R. C. McGregor coll."; N. and W. Shores of L. Bay, P. I., A. M. Reese coll." The above are in the U. S. National Museum.

BERGROTH lists this species from Samarang, Java and the Vienna Museum has a female specimen or two from Henaratgoda, Ceylon, which must be this species.

***Hydrometra Maidli*** sp. n. (Plate VIII).

Size and Color.

Length, 10.2 mm to 12.3 mm; the general color of the body light brown with the abdominal tergites somewhat darker and shining except last one; a median longitudinal frosted line on postocular part of head and extending the length of the pronotum; a curved frosted stripe above the anterior acetabulum and a faint streak on side of the abdomen.

Structural Characteristics.

Head: Length, 107 units; the ratio of the anteocular part of the head to the postocular part is such that the formula expressing the relationship is AO:PO: :69:29 (male); the dorsal interocular groove not longer than the diameter of an eye; the ventral interocular groove long extending from anterior margin of the eye throughout most of the length of the postocular; clypeus conate bluntly pointed; the rostrum surpassing the eyes by about half the postocular distance; the antennal formula is: 1st:2nd:3rd:4th: :16:40:80:40 (female).

Pronotum: Length, 54 units, an encircling row of pits parallel to the anterior margin; median longitudinal line of pits on posterior portion of pronotum, a row either side of median line and a few other pits laterad.

Metanotum: The hemelytra undeveloped, in most of the specimens about as long as the metanotum.

Coxae: The distance between the first and second coxae is to that between the second and third as 30:50; all the acetabula are

pitted; anterior acetabula have four pits, two either side of the cleft; the middle acetabula have six pits three either side of the cleft; the middle acetabula have six pits three either side and parallel with the cleft; the hind acetabula may have three pits in transverse row on top, these may be confluent into one deep transverse pit.

F e m o r a: The anterior femora do not quite attain the apex of the head; the posterior femora just attain the tip of the abdomen in the male and to the posterior margin of the fifth abdominal in the female.

A b d o m e n: Length, 130 units (male), 177 units (female); the male has two hairy patches on the sixth ventral and some scattered longer hairs on the two segments preceding this; the first five tergites are smooth and polished and broader than the connexiva; the dorsal terminal process is curved as shown in figures on Plate VIII.

Described from eight specimens from W. Sumatra and one from Java.

Holotype, allotype, and some paratypes in Vienna Museum. Others in University of Kansas Entomological Museum and the one from Java in the U. S. National Museum.

N o t e s.

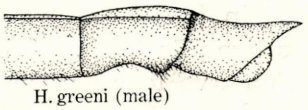
This species is related to *H. lineata* ESCHSCH. from the Philippines and to the following species. It is distinguished from the former by the shape of the terminal segments and from the latter by having very definitely marked patches of hairs on the sixth ventral abdominal of the male as well as by the direction of the caudal process.

***Hydrometra albolineata*** (SCOTT) 1874. (Plate VIII).

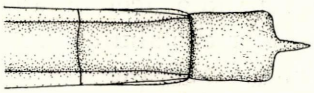
*Limnobates albolineata* SCOTT, Annals and Mag. Nat. Hist., Vol. XIV, Fourth Series, 1874, p. 447.

Mr. SCOTT described this species from Japan. The type is in the British Museum. DISTANT (4) confused this species with *H. vittata* STÅL from the Philippines (= *H. lineata* ESCHSCH) and *H. Greeni* KIRKALDY from Ceylon. We have compared a paratype of *H. albolineata* SCOTT with the type of *H. Greeni* KIRKALDY. The clypeus is blunt in *H. albolineata* SCOTT and sharp in *H. Greeni* KIRK. The pronotum of *H. albolineata* SCOTT is less pitted. The dorsum of the last abdominal segment of the female is broader in front than behind whereas in *H. Greeni* KIRK. this segment is as wide or wider behind than in front. (See Plate VIII). The connexiva are broader

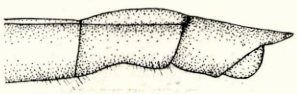
# PLATE VII.



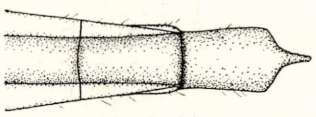
H. greeni (male)



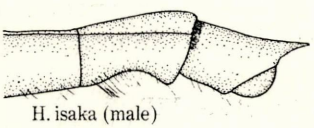
H. greeni (male)



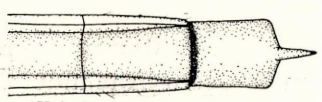
H. aegyptia (male)



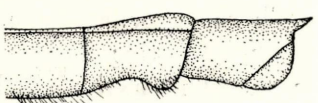
H. aegyptia (male)



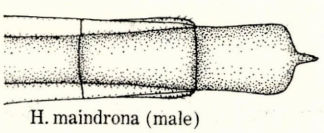
H. isaka (male)



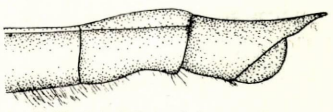
H. isaka (male)



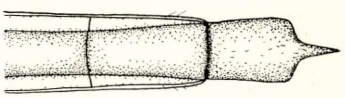
H. maindrona (male)



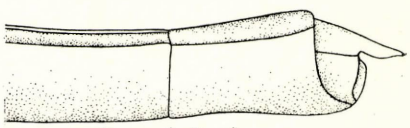
H. maindrona (male)



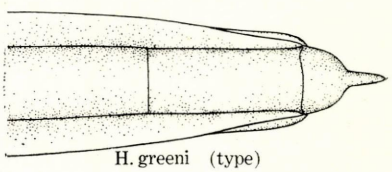
H. chabanaudi (male)



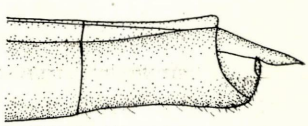
H. chabanaudi (male)



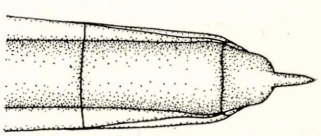
H. greeni (type)



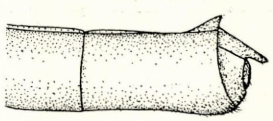
H. greeni (type)



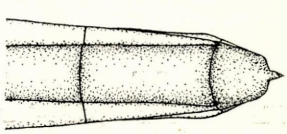
H. isaka (female)



H. isaka (female)



H. maindrona (female



H. maindrona (female

at their caudal ends in *H. albolineata* SCOTT. The acetabular pitting on the female paratype examined is variable. On the right side the anterior acetabulum has two or three? in front and two pits behind the cleft. The middle acetabulum has two pits on each side of the cleft end the posterior acetabulum one (or two together) on the top. On the left side the anterior acetabulum has two or three? pits in front and three behind the cleft. The middle acetabulum has two in front and four behind and the posterior acetabulum has one on top. The beak slightly surpasses the middle of the postocular. The dorsal interocular groove is short, the ventral interocular groove is long reaching almost to the thorax in the rear and forward beyond the eyes. Pits on thorax are frosted, a transverse row behind anterior margin of prothorax; the median line pitted on posterior half and a row of pits either side; sides of pronotum with pits arranged more or less in two rows; clypeus is blunt tipped but not of truncate type; the dorsal terminal process of this female extending beyond the abdomen by a distance equal to one-half the median length of the tergite; hind femur attains the anterior margin of the last abdominal segment.

We have specimens of this species sent to us by Professor TEISO ESAKI from Japan. We also have a long series of a species from China which appear to be only a variety of this species.

***Hydrometra strigosa*** (SKUSE) 1893? (Plate VIII).

*Limnobates strigosa* SKUSE, FREDERICK A. A. Records of Australian Museum II, p. 43, Pl. XI, Figs. 1 & 2.

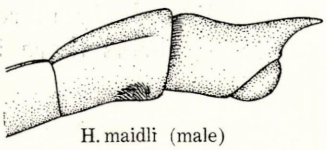
This species was described from Sydney and Botany Swamps, N. S. W., Australia. We have seen a female from Adelaide River determined as this species by DISTANT. It was sent to us for examination by the kindness of Mr. W. E. CHINA of the British Museum. This specimen measures 10.8 mm long. There appear to be four pits ( two on each side of the cleft) on the anterior and middle acetabula and one on top of the posterior one. The sixth dorsal abdominal segment (exclusive of connexivum) is longer than in *H. feta* HALE. The clypeus is conate.

***Hydrometra insularis**** sp. n. (Plate VIII).

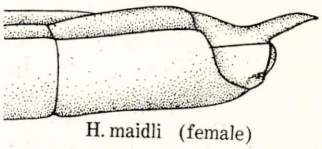
Size and color.

Length, 10.2 mm to 12 mm; the general color of the body is light brown; a white median longitudinal stripe on dorsum of postocular portion of the head and on pronotum; a curved white line

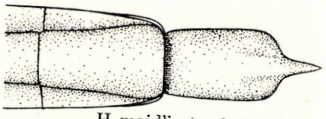
# PLATE VIII.



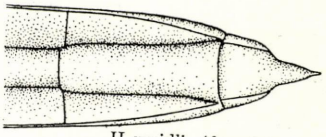
H. maidli (male)



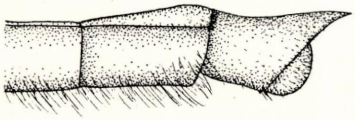
H. maidli (female)



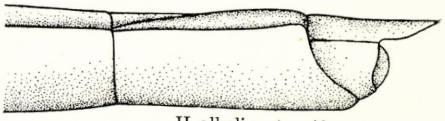
H. maidli (male)



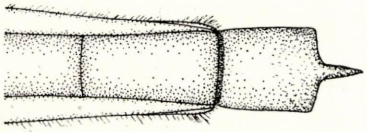
H. maidli (female)



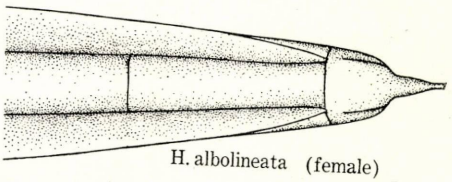
H. greeni var suensoni (male)



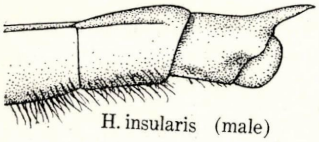
H. albolineata (female)



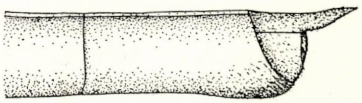
H. greeni var suensoni (male)



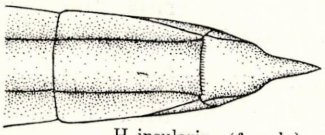
H. albolineata (female)



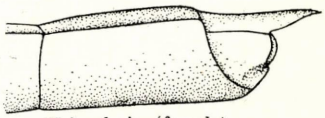
H. insularis (male)



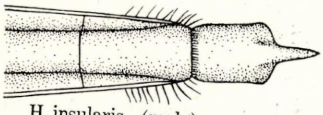
H. greeni var suensoni (female)



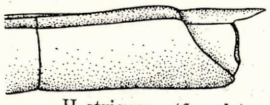
H. insularis (female)



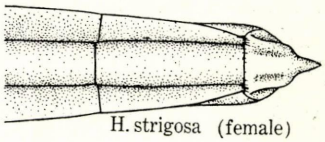
H. insularis (female)



H. insularis (male)



H. strigosa (female)



H. strigosa (female)

above the anterior acetabulum and a frosted stripe on the sides of the abdomen bordered beneath by a darker line; body more or less frosted, especially the venter; in the winged forms there is a white median line on the hemelytra.

Structural Characteristics.

Head: Length, 90 units; the ratio of the anteocular part of the head to the postocular part is such that the formula expressing the relationship is AO:PO: :58:26; the dorsal interocular groove shorter than the diameter of an eye; ventral interocular groove very long traversing the posterior two-fifths of the anteocular and all of the postocular and broader and deeper between the eyes than elsewhere; clypeus conate; rostrum surpassing the eyes by about half of the postocular distance; the lengths of the antennal segments have the following ratio, beginning with the basal one: 14:29:52:35 (male).

Pronotum: Length, 43 units in brachypterous male and 55 units in winged female, an encircling row of small pits parallel to the anterior margin; two irregular rows of pits parallel to lateral margin of posterior lobe, the posterior half of the median line pitted and a few pits in a row on either side.

Metanotum: Length, 48 units (male); hemelytra of holotype short, extending but slightly beyond the metanotum, those of allotype attaining anterior margin of penultimate abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third as 27:50 (holotype); two or three pits on each side of the cleft on the anterior and middle acetabula and one pit on top of posterior acetabulum.

Femora: Anterior femora not surpassing antennal tubercles; posterior femora not surpassing abdomen in males and the anterior margin of the ultimate abdominal segment in the female.

Abdomen: Length, 134 units (male), 162 units (female); the male without processes on underside of sixth segment; the ventral surface of last two abdominal segments somewhat hairy; the long golden hairs more numerous caudally but not in definite patches as in *H. Maidli* sp. n.; the caudal process horizontal in female; shape of terminal abdominal segments shown on Plate VIII.

Described from ten specimens from „W. Sumatra, Fruhstorfer" and five specimens from „Buitenzorg, Java 4—0—09 Bryant & Palmer collection."

The holotype and allotype chosen from the W. Sumatra series and are in the Museum at Vienna, Austria. Paratypes are in the U. S. National Museum and in the Kansas University Museum.

Notes.

This species is closely related to *H. Maidli* sp. n. from which it differs in the shape of the terminal segments in both sexes and in having the femora relatively shorter. From *H. lineata* ESCHSCH. both of these species are easily separated by the shape of the male genital segment as viewed from above (see figures), from *H. Greeni* KIRK. by having the ventral surface of the last abdominal segment in the male concave, and from *H. albolineata* SCOTT which has the ventral surface of the last abdominal segment of the male smooth and shiny.

***Hydrometra Greeni*** KIRKALDY. (Plate VII).

*Hydrometra greeni* KIRKALDY, G. W., The Entomologist, Vol. XXI, p. 2, 1898.

Dr. KIRKALDY described this species from a female collected by E. ERNEST GREEN in May 1897 at Punduloya, Ceylon. The remnants of this type are in the U. S. National Museum. The head and five of the legs are gone. We have compared specimens from Peradeniya and Henaratgoda, Ceylon, with the female type (which may be designated the holotype) and find them to be the same species. A male taken at Pasumalai, South India by J. LAWSON is also this species. One male of the above series is described and figured as the allotype of *H. Greeni* and the other males are labeled parallotypes. There are three specimens in the Hungarian National Museum labeled „Chikkaballapura, S. India, T. V. C."

Dr. E. BERGROTH (1) 1915, who examined specimens from four different places in Ceylon, including Punduloya (the original locality) gave some helpful notes of comparison between this species and *H. lineata* ESCHSCH. He notes that the white longitudinal line of the hemelytra in *H. lineata* ESCHSCH. is only twice very narrowly interrupted by the black transverse veinlets behind the middle whereas in *H. Greeni* KIRK. the white line is four to six times, often broadly interrupted. He also noted that *H. lineata* ESCHSCH. males could be distinguished by the „tricuspidate" apex of the male genital segment as seen from above and the *H. Greeni* KIRK. males by the sinuate ventral margin of the last abdominal segment as seen in profile. We may add that the females of *H. Greeni* KIRK. have the last dorsal abdominal segment broader behind than in front which is not the

case in *H. lineata* ESCHSCH. In KIRKALDY's type the white longitudinal line of the hemelytra is effaced.

Size and Color.

Length, 11.7 mm (male allotype), 10.8 mm (male parallotype); the general color of the body is a brownish-yellow, the underside of the abdomen darker in color and with frosted appearance; a narrow white stripe extends along the median line of the body from the posterior margin of the eyes to the posterior margin of the pronotum; a frosted band along the sides of the body from the anterior margin of the pronotum to the posterior margin of the sixth abdominal segment.

Structural Characteristics.

Head: Length, 87 units; the ratio of the anteocular part of the head to the postocular part is given in the formula AO:PO: :56:24; the dorsal interocular groove is about equal in length to the diameter of an eye; the ventral interocular groove is long, extending from about the middle of the anteocular part of the head nearly to the pronotum, the postocular part being broader and deeper; clypeus bluntly conical and polished; the rostrum surpasses the eyes by about one-half the postocular distance; the antennal formula is: 13:29:60:34.

Pronotum: Length, 45 units; an encircling row of pits parallel to the anterior margin and close to it; the posterior lobe with a median longitudinal row of pits with numerous other pits arranged more or less in rows, each of the propleura with a marginal row of four or five pits.

Metanotum: The hemelytra are large and long, extending to the posterior margin of the fourth abdominal segment on the allotype and slightly farther on the parallotype.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 27:48 (allotype); all the acetabula are pitted; the anterior and middle acetabula having two or three pits each side of the cleft; the posterior acetabula with two pits.

Femora: The anterior femora do not surpass the apex of the head and the posteior femora do not surpass the tip of the abdomen.

Abdomen: In dorsal view the sides of the seventh segment of the abdomen of the male are almost parallel; the ventral side of the sixth abdominal segment of the male is transversely depressed, the width of the depression being about equal to one-half the length of the segment and rather hairy as is the posterior half of the fifth

segment; the posterior dorsal margin of the sixth segment is fringed with short stiff hairs; the terminal dorsal process of the male is sharp and about one-third the length of the segment.

Very closely related to *H. Greeni* KIRKALDY are the following five forms. They are approximately the same size and the males have the transverse depression on the sixth ventral abdominal segment. There is difficulty in separating them unless they are placed side by side. The pitting on the acetabula is not constant, the two sides of the same insect often have differences in number and arrangement so this character in this group is unsatisfactory. Taken as an entire group the differences are greater than has been found in any one species thus far studied. The limited number of specimens and the wide range of territory covered by the isolated spots from which the specimens have been taken add to our perplexity regarding them. With what information we have we assume them to be incipient species nearly related to *H. Greeni* KIRKALDY. An examination of the drawings on Plate VII will aid in separating these allied forms.

***Hydrometra Isaka*** sp. n. (Plate VII).

Size and Color.

Length, 11.4 mm. (male holotype), 11.9 mm. (female allotype); the general color of the body is a dark reddish-brown; pronotum with narrow, longitudinal median, white stripe; faint white stripe extending along the sides of the body from the anterior margin of the thorax to the posterior margin of the sixth abdominal segment; ventral side of entire body with slightly-frosted appearance.

Structural Characteristics.

Head: Length, 103 units (male); 99 units (female); the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :67:28 (male), 64:28 (female); on both the male and female the dorsal interocular groove is slightly shorter than the diameter of an eye, narrow, and moderately deep; the ventral interocular groove of the male is long, extending from about the base of the expanded part of the head almost to the pronotum, the postocular part of the groove being much broader and deeper than the anteocular part; on the female the postocular part of the ventral groove is similar to that of the male but the anteocular part of the groove is very faintly defined; clypeus large, bluntly pointed, and polished; the rostrum of the male surpasses the eyes by about one-third the postocular distance and the rostrum of the female surpasses the eyes

by about three-fifths of the postocular distance; the antennae of the male, with the exception of the basal segments, are missing; the first two segments of the antennae of the female are present and in the ratio of 17:35.

Pronotum: Length, 50 units (male), 51 units (female); an encircling row of pits parallel to the anterior margin and about three units from it; posterior lobe with median longitudinal row of pits; other pits present and arranged more or less in rows; each of the propleura with a marginal row of three or four pits.

Metanotum: Length, 45 units (male), 42 units (female); hemelytra short, narrow, and strap-like, extending to the middle of the first abdominal segment on the male and slightly shorter on the female.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 32:56 (male), 33:52 (female); all the acetabula are pitted; on the male the anterior acetabulum on the right side of the body has two pits anterior to the cleft and one pit posterior to it; the middle acetabulum has one pit anterior to the cleft and two pits posterior to it; the third acetabulum has one pit; on the female the anterior acetabulum on the right side of the body has one pit on each side of the cleft; the middle acetabulum has two pits on each side of the cleft; the third acetabulum has two pits.

Femora: The anterior femora of the male extend to the apex of the head and the posterior femora attain the tip of the abdomen; the anterior femora of the female do not extend quite to the apex of the head while the posterior femora extend slightly beyond the posterior margin of the fifth abdominal segment.

Abdomen: Length, 154 units (male), 176 units (female); the ventral side of the sixth abdominal segment of the male is transversely depressed, the depression being about as wide as two-thirds the length of the segment and rather hairy; the dorsal posterior margin of the sixth segment of the male is fringed with short stiff hairs; in dorsal view the sides of the seventh segment of the male are nearly parallel and the segment presents a very blunt appearance; the terminal dorsal process of the male is prominent, about one-third as long as the segment; the terminal dorsal process of the female is almost one-half as long as the segment; the tergites of the first six abdominal segments present a finely-wrinkled appearance transversely.

Described from one male and two females; the male holotype and the female allotype bear the following label: „Madagascar, Région du Sud-est, Vallée du Fanjahira, Isaka, Ch. Alluaud, 1901." The female paratype bears the label „Madagascar, Tamatave, Mathiaux, 1898." Types in the Paris Museum.

***Hydrometra aegyptia*** sp. n. (Plate VII).

Size and Color.

Length, 10.6 mm. (male holotype); the general color of the body is a yellowish-brown; the anterior part of the pronotum reddish-brown; pronotum with narrow median longitudinal frosted line, bordered successively by bands of reddish-brown, yellowish-brown, and on the lateral margins by reddish-brown; ventral parts of abdomen frosted; a faint frosted stripe extends along the sides of the body from the anterior margin of the pronotum to the posterior margin of the sixth abdominal segment; longitudinal white stripe on the hemelytra.

Structural Characteristics.

Head: Length, 89 units; the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :36:26; the dorsal interocular groove is narrow and about equal in length to the diameter of an eye; the ventral interocular groove is broad and long, extending from a point slightly anterior to the eyes nearly to the pronotum; clypeus bluntly conical and polished; the rostrum surpasses the eyes by slightly more than one-half the postocular distance; the antennae are missing from the specimen.

Pronotum: Length, 52 units; an encircling row of small pits parallel to the anterior margin and close to it; the posterior lobe with median longitudinal row of faint pits and other larger scattered pits; each of the propleura with a marginal row of four or five faint pits.

Metanotum: The hemelytra are large and long, extending slightly beyond the posterior margin of the fourth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 33:52; all the acetabula are faintly pitted; the anterior acetabulum on the left side of the body has one pit anterior to the cleft and one pit posterior to it; the middle acetabulum has two pits on each side of the cleft; the third acetabulum has one or two very faint pits.

Femora: The anterior femora do not extend quite to the antennal tubercles; the posterior femora extend to the posterior margin of the sixth abdominal segment.

Abdomen: In dorsal view the sides of the seventh segment are nearly parallel; the underside of the fifth and sixth segments is hairy; the ventral side of the sixth segment with a shallow transverse depression whose width is about one-half the length of the segment; the terminal dorsal process is blunt and prominent, about one-third as long as the segment.

Described from one male bearing the following label: „Aegypten, Pyramiden X, H. Rolle." Type in the Hungarian National Museum, Budapest.

Notes.

This species belongs to the *H. Greeni* KIRKALDY series from which it is separated as shown in the key. We also have a specimen labeled „Guinée Française, Dixine Foulah, Pres. Konakry, P. Chabanaud 1919" that measures 11. 9 mm long. It is a male and perhaps should be a variety of *H. aegyptia.*

***Hydrometra aegyptia*** var. ***Chabanaudi*** var. n. (Plate VII).

Size and Color.

Length, 11.9 mm. (male holotype); the general color of the body is a dark brown with the ventral parts heavily frosted; a narrow median frosted line extends from the posterior margin of the eyes to the posterior margin of the pronotum; a white band along the sides of the body from the anterior margin of the pronotum to the posterior margin of the sixth abdominal segment; hemelytra with a longitudinal white stripe.

Structural Characteristics.

Head: Length, 104 units; the ratio of the anteocular part of the head to the postocular part is given by the formula AO:PO: :68: 28; the dorsal interocular groove is narrow and equal in length to the diameter of an eye; the ventral interocular groove is very broad and deep, extending from the anterior margin of the eyes nearly to the pronotum; clypeus bluntly conical and polished; the rostrum extends beyond the eyes by about one-fourth the postocular distance: the first two segments of the antennae are present and their lengths are in the ratio of 18:43.

Pronotum: Length, 56 units; an encircling row of pits parallel to the anterior margin and close to it; a median longitudinal

row of small pits on posterior lobe and numerous larger scattered pits; each of the propleura with a marginal row of four or five small pits.

Metanotum: The hemelytra are large and long, extending slightly beyond the posterior margin of the fourth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 35:61; all the acetabula are faintly pitted; on the left side of the body the anterior acetabulum has one pit anterior to the cleft and two small pits posterior to it; the middle acetabulum has one pit on each side of the cleft; the third acetabulum has two or three small pits.

Femora: The anterior femora extend to the apex of the head and the posterior femora attain the tip of the abdomen.

Abdomen: In dorsal view the sides of the seventh segment are nearly parallel; the ventral side of the sixth segment with a shallow, transverse depression equal in width to about one-half the length of the segment; the ventral side of the fifth and sixth segments hairy; the dorsal posterior margin of the sixth segment with a fringe of short stiff hairs; the terminal dorsal process is sharp and prominent, about one-half as long as the segment.

Described from one male bearing the following label: „Guinée Française, Dixine Foulah, Pres. Konakry, P. Chabanaud, 1919." Type in the Paris Museum.

***Hydrometra Maindroni*** sp. n. (Plate VII).

Size and Color.

Length, 11.1 mm. (male holotype), 11.7 mm. (female allotype); the general color of the body is a dark brown; on the male there is a narrow median longitudinal white stripe on the pronotum; a faint white stripe extends along the sides of the body from the anterior margin of the pronotum to the posterior margin of the sixth abdominal segment; the ventral parts of the body with frosted appearance; the female is similarly colored except that the ventral part of the body is lighter brown in color and is not frosted.

Structural Characteristics.

Head: Length, 99 units (male), 104 units (female; the ratio of the anteocular part of the head to the postocular part is given by the formulas AO:PO: :64:28 (male), 68:29 (female); on both the

male and female the dorsal interocular groove is short, about equal in length to the diameter of an eye; the ventral interocular groove of both the male and female is broad and long, extending from the anterior margin of the eyes to about two-thirds of the postocular distance; clypeus small and conical; rostrum extends to the posterior margin of the eyes on the male and slightly farther on the female; the lengths of the first two segments of the antennae of the male are in the ratio of 15:36; the last two segments are missing from the male and all segments except the basal ones are missing from the female.

Pronotum: Length, 49 units (male), 52 units (female); an encircling row of pits parallel to the anterior margin and close to it; the posterior lobe with median longitudinal row of pits which is bordered on each side by a row of six or seven pits; each of the propleura with a marginal row of five or six pits.

Metanotum: Length, 38 units (male), 40 units (female); the hemelytra are narrow and straplike, 52 units in length on the male and 55 units in length on the female.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 32:54 (male), 35:55 (female); all the acetabula are pitted; on the left side of the body of the male the anterior acetabulum has two pits on each side of the cleft; the middle acetabulum also has two pits on each side of the cleft; the third acetabulum has two or three small pits; the pits on the female are similarly arranged.

Femora: The anterior femora of both the male and female extend to the base of the antennae; the posterior femora of the male are missing; the posterior femora of the female extend to the posterior margin of the fifth abdominal segment.

Abdomen: Length, 154 units (male), 166 units (female); the ventral side of the sixth segment of the male with a transverse hairy depression whose width is about equal to one-half the length of the segment; the tergites of the abdominal segments are finely-wrinkled transversely; the seventh segment of the female is very short compared to the other abdominal segments; the terminal dorsal process of both the male and female is short and blunt.

Described from two specimens, a male and a female, bearing the following label: „Mascate, (Sept. Oct.), Maindron 133—96." Types in the Paris Museum.

***Hydrometra longicapitis*** BUENO.

*Hydrometra longicapitis* TORRE-BUENO, J. R. DE LA, Bulletin Brooklyn Entom. Soc., Vol. XXII, p. 31.

The type which is in the U. S. National Museum at Washington, D. C. was examined by the senior author. It is a male, rust red in color and nearly 14 mm long. The anteocular part of the head is strikingly long. There are two chitinized tubercles on the anterior ventral margin of the sixth abdominal segment. The sixth and seventh segments are curved as seen in side view. Mr. TORRE-BUENO gave the head formula as follows: AO:PO: :6:23. Professor H. G. BARBER, now in charge of the Hemiptera at the U. S. N. M., has most obligingly re-examined the specimen for us and reports as follows: „The anteocular part of the head is to the postocular part as 19:7. The head is much longer than the thorax. The head is very slender but I would not call the eyes very small because they are a little wider than the interocular space. The postocular part of the head is longer than the distance between the lower ends of the acetabula clefts of the anterior and middle coxae elevations. There are only two chitinized tubercles on the anterior ventral margin of the sixth abdominal segment, There is no spine on the ventral lateral part of the first genital segment."

We inquired concerning the above points to determine how near the species might be to *H. madagascarensis* sp. n.

***Hydrometra madagascarensis*** sp. n. (Plate IX).

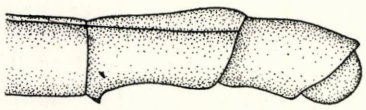
Size and Color.

Length, 14.6 mm. (male holotype), 16.6 mm. (female allotype); the general color of the body of both the male and female is a light yellowish-brown except the connexiva which are a very dark brown.

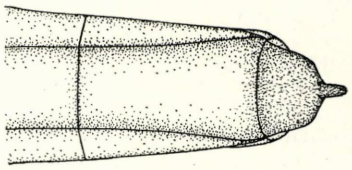
Structural Characteristics.

Head: Length, 154 units (male), 178 units (female); the ratio of the anteocular part of the head to the postocular part is given by the formulas AO:PO: :106:42 (male), 127:45 (female); the dorsal interocular groove of both the male and female is shallow, not longer than the diameter of an eye; the ventral interocular groove of both the male and female is much broader than the dorsal groove, shallow, and about equal in length to the diameter of an eye; the width of the interocular space is about equal to the width of an eye; the clypeus is small and bluntly conical; the rostrum surpasses the eyes by about one-eighth the postocular distance on the male

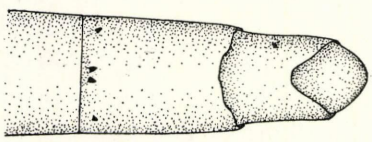
# PLATE IX.



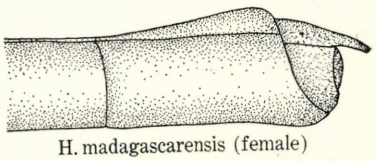
H. madagascarensis (male)



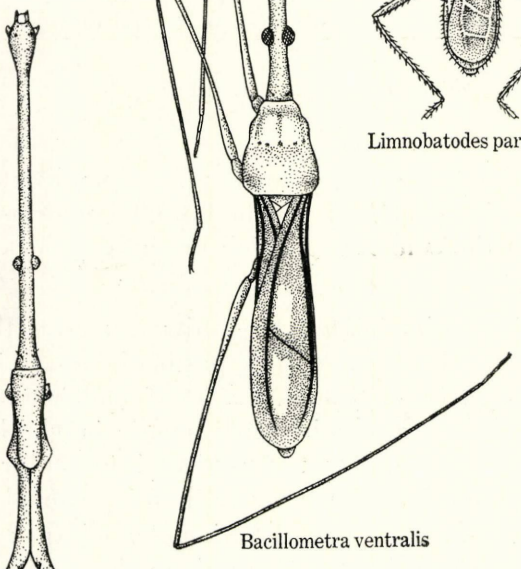
H. madagascarensis (female)



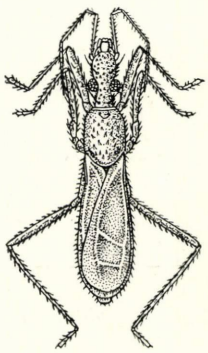
H. madagascarensis (male)



H. madagascarensis (female)



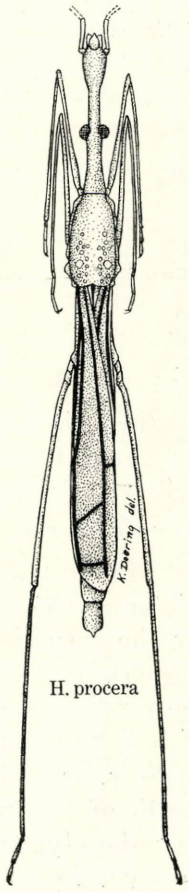
Bacillometra ventralis



Limnobatodes paradoxus



H. madagascarensis



H. procera

and extends to the anterior margin of the eyes on the female; the antennae are missing from both specimens.

Pronotum: Length, 43 units (male), 47 units (female); an encircling row of pits parallel to the anterior margin and about three units from it; entire pronotum pitted; the pits on the posterior lobe are much larger and deeper than those on the anterior part.

Metanotum: Length, 45 units (male), 50 units (female); the hemelytra are absent on both the male and female.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 26:48 (male) and 30:55 (female); all the acetabula are pitted, the anterior and middle acetabula with two or three small pits on each side of the cleft and the posterior acetabulum with several small shallow depressions.

Femora: The anterior femora extend to the antennal tubercles on the male but do not extend quite as far on the female; the posterior femora of the male slightly exceed the tip of the abdomen.

Abdomen: Length, 208 units (male), 236 units (female); the male processes, located on the ventral side of the sixth abdominal segment near its anterior margin, are four pointed chitinized tubercles; the two larger ones are located close together near the median longitudinal line of the segment; each of the smaller ones is located a trifle more posteriorly than the median ones and midway between the median line and lateral margin of the segment; the terminal dorsal process of the male is very short and blunt; the terminal dorsal process of the female is considerably longer, being about one-third as long as the seventh segment.

Described from one male and one female collected in Forêt Tanala, Reg. de Ranomafana, Andranomafana, Madagascar, March, 1901, by CH. ALLUAUD. Types in the Paris Museum.

Notes.

This species appears to be more closely allied to *H. longicapitis* BUENO than to any other known species. The most important difference lies in the nature of the male processes. In BUENO's species there are two mammilose processes close to the anterior ventral margin of the sixth abdominal segment while on the species just described there are the four chitinized tubercles.

## The Western Hemisphere.

Mr. TORRE-BUENO's paper (17) on „The Family Hydrometridae of the Western Hemisphere" appeared in December 1926. In this

splendid contribution the number of species for the New World was increased from twelve to twenty-four. Old and largely inaccessible descriptions were reproduced and translated and a key to the species provided. Unfortunately the writer could not examine the types and therefore did his best with the descriptions which in some cases have been found by the present writers to be inaccurate. Thanks to the above work this section of our paper need not be long. Several species have been described since December 1926, and this paper adds three more. We have figured all the species described since Mr. TORRE-BUENO's paper and as many of the others as possible and give additional notes wherever profitable. In examining species we have found that the description of the clypeus in some cases has been misleading. Where we have not seen a species we have been forced to accept the statement given in the original description. The classification key we have provided differs from that of Mr. TORRE-BUENO in arrangement and incorporates the species described since 1926.

## Key to Hydrometra of Western Hemisphere.*

1. Mesosternum with median longitudinal groove. Scutellum exposed. Caudal margin of last ventral abdominal segment of female with two angulate processes
*H. Mulfordi*** HUNGERFORD
Mesosternum without the median longitudinal groove. Scutellum not exposed. Caudal margin of last ventral abdominal segment of female not as above ..... (2).
2. Clypeus broad, excavate anteriorly. Thoracic pits absent
*H. comata* BUENO.
Clypeus not excavate anteriorly. Thoracic pits present except in *H. Kirkaldyana* BUENO ..... (3).
3. Clypeus broad, quadrate with anterior margin truncate, slightly rounded or medianally angulate. Pleural surface of thorax dull and pitted ..... (4).
Clypeus narrow and elongate or conate ..... (17).
4. Female 22 mm long ..... *H. caraiba* GUÉR.
Female less than 20 mm long ..... (5).

* Omitting *H. chilensis* REED, *H. argentina* BERG, and *H. naiades* KIRK. which are unknown to us.

** Runs also to *Bacillometra* ESAKI.

5. Anterior and middle acetabula not pitted, posterior acetabula with several pits. Male brushes as in *H. Championiana* BUENO
*H. metator* WHITE
Anterior and middle acetabula pitted ..... (6).
6. Male abdominal processes or brushes linear and curved, in one case forming a nearly completed oval ..... (7).
Male abdominal processes not as above or absent ..... (9).
7. Male sixth ventral abdominal segment with crescentic brushes thicker at the anterior end *H. Championiana* BUENO
Male sixth ventral abdominal segment not as above ... (8).
8. Male genital segment with marked lateral protuberances as seen from above. Abdominal processes of sixth ventral segment, brushcovered U-shaped ridges opening posteriorly and located on the posterior half of the segment
*H. guianana* sp. n.
Male genital segment without the lateral protuberances. Two large oval depressions on sixth ventral surrounded by inwardly directed hairs ..... *H. Williamsi* sp. n.
9. Male processes mammilose or reduced to hirsute lateral swellings ..... (10).
Male processes spinose or absent ..... (14).
10. Mammilose processes present ..... (11).
Mammilose processes reduced to hirsute lateral swellings (13).
11. Male processes joined by a wide transverse ridge
*H. Fruhstorferi* sp. n.
Male processes not joined by a wide transverse ridge (12).
12. Male processes not near the connexivum. (Size 13.5—15 mm).
*H. Wileyi* HUNGERFORD.
Male processes near the connexivum. (Size 9—11.8 mm)
*H. Lillianis* BUENO
13. Mammilose processes reducted to hirsute lateral swellings.
*H. Priscillae* BUENO.
14. Male processes absent ..... (15).
Male processes spinose ..... (16).
15. Venter of last abdominal segment of female transversely depressed ..... *H. cordubense* BUENO.
Venter of last abdominal segment of female not transversely depressed ..... *H. Agenor** KIRK.

* Male unknown but species closely related to *H. cordubense.*

16. Anteocular part of head more than twice the postocular
*H. exilis* BUENO.
Anteocular part of head less than twice the postocular
*H. cyprina* BUENO.
17. Thoracic pits present ..... (18).
Thoracic pits absent ..... (28).
18. Male processes on sixth ventral abdominal segment absent
*H. lentipes* CHAMP.
Male processes on sixth ventral abdominal segment present ..... (19).
19. The first genital of male with large lateral protuberances overlapping the rear margin of the sixth segment
*H. Sztolcmani* JACZ.
The first genital of male without protuberances ..... (20).
20. Four or more pits on anterior and middle acetabula ... (21).
Two pits on anterior and middle acetabula ..... (24).
21. A few scattered pits on each side of the cleft on anterior and middle acetabula ..... (22).
Two pits on each side of the cleft on the anterior and middle acetabula ..... (23).
22. The pits on the acetabula deep and large *H. australis* SAY.
The pits on the acetabula evanescent *H. gibara* BUENO.
23. Male ventral abdominal processes not linear
*H. Hungerfordi* BUENO.
Male ventral abdominal processes linear *H. consimilis* BARBER.
24. Females 11.5 mm long or longer ..... (25).
Females less than 11.5 mm ..... (26).
25. Caudal process of female surpasses abdomen by one-third. Acetabular pits far apart, males unknown *H. mensor* WHITE.
Caudal process of female surpasses abdomen by one-half acetabular pits nearer cleft. Male ventral abdominal processes spinose ..... *H. Husseyi* BUENO.
26. Male processes oblique, near the anterior margin of the sixth ventral segment, the distance between the processes more than twice the length of either process. *H. Barei* HUNGERFORD.
Male processes transverse, near the anterior margin of the sixth ventral segment, the distance between them not more than twice the length of either process ..... (27).
27. Antennal segment II two and one-half times as long as segment I and subequal to IV. ..... *H. Myrae* BUENO.

Antennal segment II twice as long as segment I and not more than four-fifths as long as IV ..... *H. Martini* KIRK.

28. Thoracic pits absent ..... *H. Kirkaldyana* BUENO.

***Hydrometra Mulfordi*** HUNGERFORD 1927. (Plate I, XI).

*Hydrometra mulfordi* HUNGERFORD, H. B., Proc. Ent. Soc. Washington, Vol. XXIX, No. 8, p. 187.

Although this species from Bolivia, S. A. is known only from females it is, in color and structure, the most striking species in the genus. The head is a little more than twice as long as the thorax, the latter measured to the rear of posterior acetabula. The postocular part of the head bears near its rear margin two seta bearing elevations. The clypeus is parallel sided and rounded in front, nearly truncate. The distance between the first and second coxae is to that between the second and third coxae as 20:30. (Using the points of measurement employed in this paper instead of the interspace between the acetabula as in the original description).

***Hydrometra metator*** B. WHITE 1879.

*Hydrometra metator* WHITE, F. B., Journ. Linn. Soc. London (Zool.), XIV, p. 486.

The type belongs to the Perthshire Museum Perth, Scotland. This Museum was visited by the senior author who was permitted by the kindness of Mr. J. RITCHIE to examine the types located there. The type is a male from Urucaca, Rio Juruá taken on Nov. 1, 1874 by J. W. TRAIL. Mr. WHITE described the antennae „as long as the body" as a matter of fact they are slender and as long as the body excepting the head. The anteocular part of head is nearly three times the postocular. The antennal segments had the follwing ratio: 1st:2nd: 3rd: 4th: :4: 10.5: 37: 18. No pits are discernible on the anterior and middle acetabula. The posterior acetabula have several pits. The ventral penultimate male segment has crescentic brushes, thicker at their anterior ends and behind which are depressions. The dorsal terminal spine is short. Mr. TORRE-BUENO (17 p. 114) quotes the original description which is brief and in latin and deducts the following: „Head, AO twice PO. Antennae, segment IV twice I". Unfortunately in the quotation cited above there are two discrepancies in spelling and the following phrase is omitted: „Capitis parte anteoculari quam pars postocularis duplo longiore". It was, of course, upon this statement that Mr. BUENO made his statement about the proportions of the head. It will be seen by examining the

type that Mr. WHITE'S statements about the head and antennae are misleading. The specimens in the University of Kansas collection labeled „Manacapuru, S. A., Amazonas, Brazil, Solimoes River, S. M. Klages" are not this species.

***Hydrometra Championiana*** BUENO 1926. (Plate X).

*Hydrometra championiana* TORRE-BUENO, J. R. DE LA. Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 119—121.

Mr. BUENO at the close of his lengthy discussion of this species says „It seemed at first as though we might here have BUCHANAN WHITE'S *H. metator* but it can not be this species, since the antennae are not as long as the body (223 units as against 335). If, however, by b o d y BUCHANAN WHITE means the length of the insect less the head, then this condition (referring to relative length of antennae) is fulfilled, and *H. Championiana* BUENO would be known as *H. metator* B. W".

Our notes on the type of *H. metator* WHITE show that WHITE did mean that the antennae are as long as the body without the head, yet it is not the same species as BUENO's *H. Championiana* which has all acetabula deeply pitted.

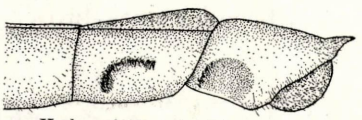
We have before us a long series belonging to the University of Kansas collection labeled: „Manacapuru S. A. Amazonas, Solimoes River 4,26. S. M. Klages". Specimens of this series we have compared with the type *H. metator* WHITE and they are not that species. We also have a series kindly collected for us by J. G. MYERS at Soledad, Cuba in 1925; by W. A. HOFFMANN in Haiti; by CARL ADDISON from Dept. Atlantico Bocas de Ganiza, S. A. in 1926. There is a specimen in the Hungarian National Museum labeled „Columbia, Aracataca 1912. II Ujhelyi". Specimens from Amazonas will be found in the Hungarian National Museum. Unless the description of *H. caraiba* GUÉRIN is grossly inaccurate this is not GUÉRIN's species.

***Hydrometra guianana*** sp. n. (Plate X).

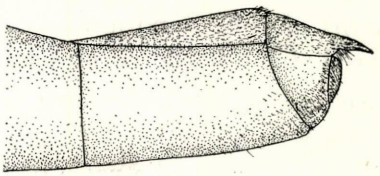
Size and Color.

Length, 15.9 mm. (male holotype), 17.2 mm (female allotype), 16.0 mm (male paratype). The general color of the body is a dark brown, the head and abdomen being somewhat darker than the other parts; a broad, light-colored, frosted stripe extends along the sides of the body from the anterior margin of the pronotum to the anterior margin of the sixth abdominal segment where it fades away into the darker color; on the female the stripe along the sides of the

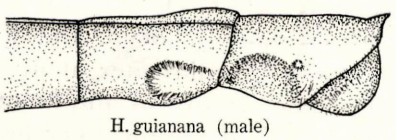
# PLATE X.



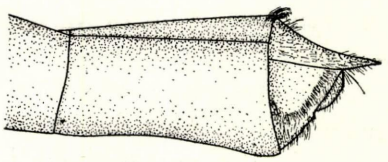
H. championiana (male)



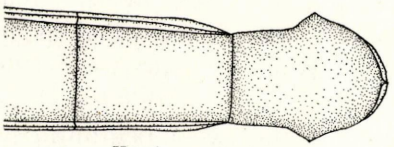
H. championiana (female)



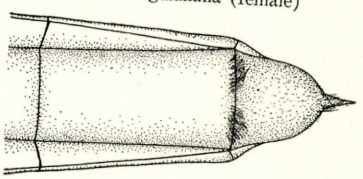
H. guianana (male)



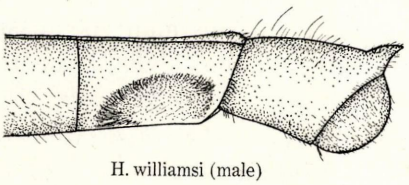
H. guianana (female)



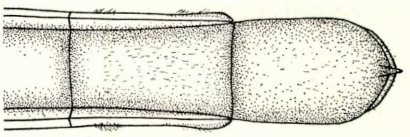
H. guianana (male)



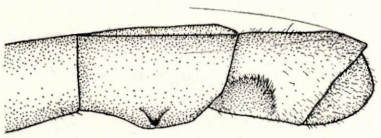
H. guianana (female)



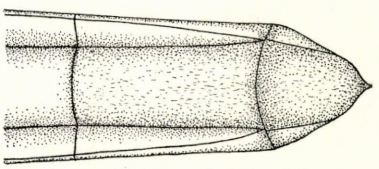
H. williamsi (male)



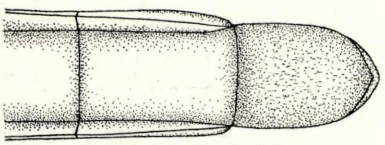
H. williamsi (male)



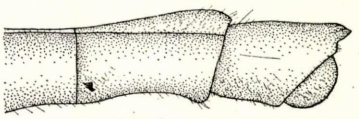
H. fruhstorferi (male)



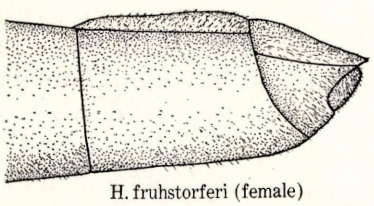
H. fruhstorferi (female)



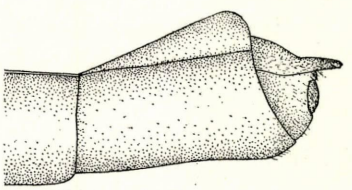
H. fruhstorferi (male)



H. wileyi (male)



H. fruhstorferi (female)



H. wileyi (female)

abdomen is broad, yellow, and very distinct; the posterior three-fourths of the pronotum has a narrow, longitudinal, median, light-colored stripe bordered on each side by a broader dark-brown stripe.

Structural Characteristics.

Head: Length, 163 units (holotype), 164 units (allotype), 160 units (paratype); the ratio of the anteocular part of the head to the postocular part is given in the formulas AO: PO::111: 41 (holotype), 112:40 (allotype), 108:40 (paratype); on the male holotype the dorsal interocular groove is short, not longer than the diameter of an eye, shallow, and narrow; the ventral interocular groove of the holotype is the same length as the dorsal groove, but is deep and very broad; the dorsal interocular groove is somewhat broader on the female allotype than on the male; the clypeus is nearly as broad as long, pointed, and polished; on the male holotype the rostrum extends nearly to the anterior margin of the eyes, while on the female allotype the rostrum reaches to the middle of the eyes; beginning with the basal one, the lengths of the antennal segments are in the following ratio: 24:54:188:X (male holotype); the last segment is missing from the antennae of the holotype and all segments except the first are missing from the antennae of the allotype.

Pronotum: Length, 73 units (holotype), 85 units (allotype), 76 units (paratype); an encircling row of pits parallel to the anterior margin and about four units from it on the male holotype; posterior lobe with median longitudinal row of pits and other pits more or less in rows; seven or eight pits in two rows near the margin of each of the propleura.

Metanotum: Length, 64 units (holotype), 66 units (allotype); the hemelytra of the holotype are small, narrow, and straplike, only 78 units in length; on the allotype and paratype the wings are large and long, extending slightly beyond the posterior margin of the fourth abdominal segment.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 44:82 (holotype), 55:85 (allotype); all the acetabula are pitted; on the male holotype the anterior acetabulum on the left side of the body has eight pits anterior to the cleft and nine pits posterior to it; the middle acetabulum has six pits anterior and twelve pits posterior to the cleft; the third acetabulum has nine scattered pits; on the right side of the body the anterior acetabulum has six pits anterior to the cleft and nine pits posterior to it; the middle acetabulum has seven pits anterior and ten

pits posterior to the cleft; the posterior acetabulum has ten scattered pits.

Femora: The anterior femore attain the apex of the head on both the male and female; the posterior femora extend beyond the tip of the abdomen by about one-fourth of their own length on both the male and female.

Abdomen: Length, 190 units (holotype), 216 units (allotype), 195 units (paratype); the male processes, located on the ventral side of the posterior half of the sixth abdominal segment, are hairy U-shaped ridges opening posteriorly; the seventh segment of the male is somewhat compressed ventro-laterally to form a broad, median, ventral, longitudinal keel, on each side of which is a large depression; the seventh segment of the male also has a small lateral protuberance on each side, located about the center of the segment as seen in the lateral view: the male has a short, sharp, terminal, dorsal process; the process on the female is somewhat longer than that of the male; the tergites of the first five abdominal segments of the male are smooth but those of the sixth and seventh segments are roughened by very numerous, small, black, spicule-like processes.

Described from two males and one female collected near New Amsterdam, British Guiana, South America, on July 30, 1923, by Dr. F. X. WILLIAMS. Types deposited in the Snow Entomological Collection, University of Kansas, Lawrence.

Notes.

This species appears to be more closely allied to *H. Championiana* BUENO than to any other known species. The most important differential characters lie in the shape and position of the abdominal processes. In BUENO's species these processes are chrescentic thickenings converging anteriorly, the ends equidistant from the respective anterior and posterior margins of the segments. In the species described above the processes, which are U-shaped ridges opening posteriorly, are located on the posterior half of the segment.

***Hydrometra Williamsi*** sp. n. (Plate X).

Size and Color.

Length, 15.6 mm (male holotype); the general color of the body is light brown in the dorsal view; in the ventral view the color is brownish black to black with the ventral side of the head and thorax darker than the abdomen; the pronotum has a very narrow, median, longitudinal, white stripe; a much broader stripe extends along the

sides of the body from the anterior margin of the thorax to about the middle of the seventh abdominal segment where it fades away.

Structural Characteristics.

Head; Length, 155 units; the ratio of the anteocular part of the head to the postocular part is such that the formula expressing the relationship is AO:PO::105:39; the dorsal interocular groove is short, not longer than the diameter of an eye, and very shallow; the ventral interocular groove is somewhat shorter than the diameter of an eye and is much broader and deeper than the dorsal groove; clypeus nearly as broad as long, sharply pointed, and polished; the rostrum does not extend quite to the anterior margin of the eyes; the antennae are missing from the specimen.

Pronotum: Length, 72 units; an encircling row of pits parallel to the anterior margin and close to it; near the margin of each of the propleura is a row of five or six small pits; the pits on the posterior lobe are numerous but they are inconspicuous, small, shallow, and scattered.

Metanotum: Length, 60 units; the hemelytra on the male are very small, narrow, and straplike, only 27 units in length.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 47:76; all the acetabula are pitted; the anterior acetabulum on the right side of the body has four pits anterior to the cleft and one pit posterior to the cleft; the middle acetabulum has two pits anterior to the cleft and four posterior to it; the posterior acetabulum has ten small scattered pits. On the left side the anterior acetabulum has three pits anterior to the cleft and two posterior to it; the middle acetabulum has three pits anterior and four pits posterior to the cleft; the posterior acetabulum has thirteen small scattered pits.

Femora: The anterior femora extend slightly beyond the apex of the head; the posterior femora surpass the tip of the abdomen by about one-fifth of their own length.

Abdomen: Length, 194 units; on the ventral side of the sixth abdominal segment of the male, on each side of the median longitudinal line, is a very large oval depression fringed with hairs which are longer and stiffer on the anterior margin; in dorsal view the sides of the seventh segment are parallel; the tergites of the first five abdominal segments are glabrous but on the posterior three-fourths of the sixth and on the seventh segment there are fine hairs; interspersed among the hairs are many, minute, black, spicule-like structures; the terminal dorsal process is short, stout, and sharp.

Described from one male specimen collected at Napo, Ecuador, Feb. 14, 1923, by Dr. F. X. WILLIAMS. Type deposited in the Snow Entomological Collection, University of Kansas, Lawrence.

Notes.

This species differs from all other known species of Hydrometridae in the possession of the large oval depressions on the ventral side of the sixth abdominal segment.

***Hydrometra Fruhstorferi*** sp. n. (Plate X).

Size and Color.

Length, 12.6 mm (male holotype), 13.5 mm (female allotype). The general color of the body is a very dark brown; a frosted band extends along the sides of the thorax; on the abdomen the band is much less distinct than on the thorax; the female is somewhat lighter brown in color, the connexiva being a brownish yellow; on both the male and the female the frosted band along the sides of the body is very indistinct in the lateral view.

Structural Characteristics.

Head: Length, 115 units (male), 122 units (female); the ratio of the anteocular part of the head of the postocular part is expressed by the formula AO : PO : : 72:34 (male), 76 : 36 (female); the interocular grooves are absent on the male; on the female the dorsal interocular groove is equal in length to the diameter of an eye and is very shallow; the ventral interocular groove is absent; the clypeus is nearly as broad as long, obtusely pointed (nearly rounded), and polished; the rostrum surpasses the eyes by about one-half the postocular distance on both the male and female; the antennae, with the exceptions of the basal segments, are missing from the male; on the female the lengths of the antennal segments have the following ratio beginning with the basal one: 22 : 36 : 109 : 60.

Pronotum: Length, 62 units (male), 66 units (female); an encircling row of large pits parallel to the anterior margin and about four units from it; near the margin of each of the propleura are seven or eight pits arranged in two rows; a median row of pits on the posterior lobe and numerous other large pits present more or less in rows.

Metanotum: Length, 45 units (male), 47 units (female); the hemelytra are very small, narrow, and striplike, only 19 units in length on the male and 21 units on the female.

Coxae: The distance between the first and second coxae is to that between the second and third coxae as 38 : 60 (male), 42 : 63 (female); all the acetabula are pitted; on the male the anterior acetabulum on the right side of the body has five pits anterior to the cleft and six posterior to it; the middle acetabulum has four pits anterior and two pits posterior to the cleft; the third acetabulum has seven scattered pits. On the left side of the body the anterior acetabulum has the pits arranged two anterior to the cleft and eight posterior to it; the middle acetabulum has three pits anterior and eight pits posterior to the cleft; the third acetabulum has ten scattered pits.

Femora: On both the male and the female the anterior femora slightly surpass the apex of the head while the posterior femora slightly exceed the tip of the abdomen.

Abdomen: Length, 166 units (male), 180 units (female): the male processes on the ventral side of the sixth segment are mammilose, widely separated, placed slightly posterior to the middle of the segment, and joined by a broad transverse ridge; on the ventral anterior half of the seventh segment, on each side of the median longitudinal line, is a large depression fringed with hairs on the lateral and posterior margins. The first five abdominal tergites are smooth and polished; the sixth one presents a fine, transversely-wrinkled appearance; the male has a small dorsal terminal tubercle; the female has a very short terminal dorsal process.

Described from two specimens, a male and a female, collected in Espirito-Santo, Brazil, in 1898, by FRUHSTORFER. Types in the Paris Museum.

Notes.

In general appearance this species might be confused with *H. Wileyi* HUNGERFORD. However, in HUNGERFORD's species the male processes are mammilose, widely separated and placed near the anterior margin of the segment; in the species just described the processes are mammilose but are placed slightly posterior to the middle of the segment and are joined by a broad transverse ridge.

***Hydrometra Wileyi*** HUNGERFORD 1923. (Plate X).

*Hydrometra wileyi* HUNGERFORD, H. B., Canadian Entomologist, Vol. LV, p. 57, Pl. I, Figs. 1, 6, 9, 10, 11.

This species which was first described from Colorado County, Texas has been collected in Florida since that time by the Entomo-

logical collecting party of the University of Kansas. Specimens of this species will be found in the Hungarian National Museum.

***Hydrometra cordubense*** BUENO 1926. (Plate XI).

*Hydrometra cordubense* TORRE—BUENO, J. R. DE LA, Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 121—123.

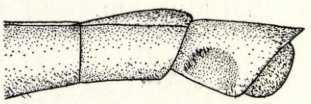
We have before us some specimens from the U. S. National Museum collected in Lower California by W. M. MANN. From these our drawings have been made. They differ from the original description of the species by BUENO especially in the ratio of the intercoxal distances. In his specimens the ratio of the distance between the first and second coxae to that between the second and third coxae was given as 15 : 18 for all specimens. The males from Lower California have the intercoxal distances in the ratio of 25 : 42 while the females average 31 : 45. We have used a different unit of measure but the ratios are comparable. The National Museum of Hungary has specimens labeled „Costa Rica Env. d. S. Jose 1100 m IV. 1906, P. Biolley."

***Hydrometra Agenor**** KIRKALDY 1902. (Plate XI).

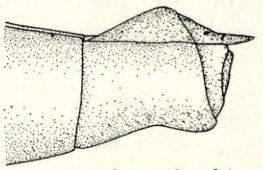
*Hydrometra agenor* KIRKALDY, G. W., Entomologist, Vol. XXV, p. 281, 1902.

A specimen, badly moth eaten, labeled *„Hydrometra agenor* KIRK. Type" in KIRKALDY's handwriting is in the KIRKALDY collection at the U. S. National Museum. The specimen is from Guayaquil, Ecuador. Mr. TORRE-BUENO (17) who quotes the original description on p. 125 of his „The Family Hydrometridae in the Western Hemisphere" does not mention the type. The above named specimen has lost its head and all but fragments of the thorax. The hemelytra and two of the legs are gone. It is a female. Mr. KIRKALDY said his specimen was from MONTANDON's collection and a male. Unless a male type is found in MONTANDON's collection we must conclude that the type is the above mentioned female. There are numerous pits on all acetabula. This is a smaller species than *H. Wileyi* HUNGERFORD and has broader and shorter dorsal abdominal segments. The pronotum is 65 units long and the posterior lobe generously pitted. The distance between the first and second coxae is to that between the second and third as 42 : 75. (The parts badly damaged by dermestids). The abdomen 150 units long and 25 units broad. Hind femur extending beyond tip of abdomen by at least one-tenth its length. While this species is close to *H. cordubense*

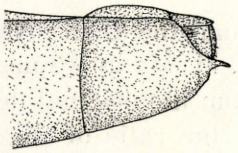
# PLATE XI.



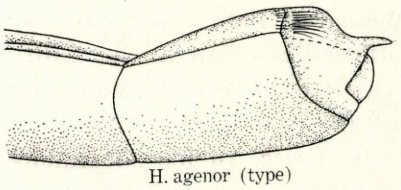
H. cordubense (male)



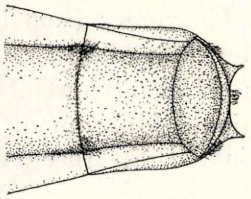
H. cordubense (female)



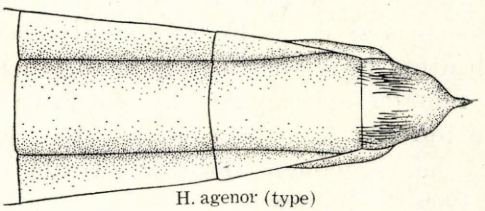
H. mulfordi (female)



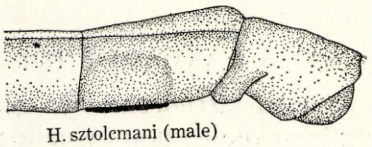
H. agenor (type)



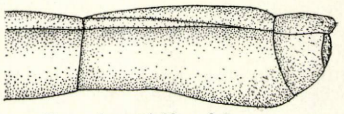
H. mulfordi (female)



H. agenor (type)



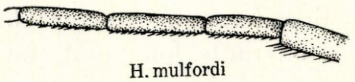
H. sztolcmani (male)



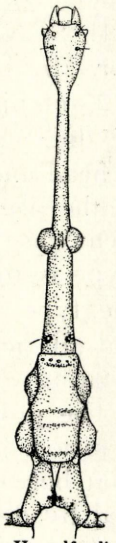
H. sztolcmani (female)

H. myrae

H. myrae



H. mulfordi



H. mulfordi

BUENO a comparison of the drawings will show them to be distinct. The last abdominal segment is longer, the venter straight and the dorsal genital more transversely depressed in KIRKALDY's species.

***Hydrometra Sztolcmani*** JACZEWSKI. (Plate XI).

*Hydrometra sztolcmani* JACZEWSKI, T. Annales Musei Zoologici Polonici. T. VIII. pp. 82—84, Tab. V, Figs. 5, 6, 7, 1928.

Three specimens of this most curious marshtreader belong to the Hungarian Museum. They are labeled „Brasilia, S. Paulo" and were studied by DR. HORVÁTH who recognized them as new and hadgiven them a manuscript name. The University of Kansas has a good series of this species from Sao Paulo. A few were taken by ROBERTO SPITZ but most of them by E. D. TOWNSEND.

***Hydrometra Hungerfordi*** BUENO 1926. (Plate XII).

*Hydrometra hungerfordi* TORRE-BUENO, J. R. DE LA, Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 107—108.

*Hydrometra australis* HUNGERFORD, H. B., Canadian Entomologist, Vol. LV, p. 54 and figures.

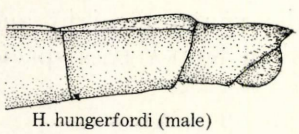
Mr. J. R. DE LA TORRE-BUENO (16) gave some figures to separate *H. Martini* KIRK. and *H. australis* (SAY). By this paper HUNGERFORD identified a species as *H. australis* (SAY) which Mr. BUENO, after comparing them with his specimens, says are not his *H. australis* (SAY). The type of SAY's species does not exist and we have not been able to recognize it in any of our collections. Mr. BUENO has designated a male from Thomasville, Georgia as the autotype of SAY's species. *H. Hungerfordi* BUENO was described from Cherokee County, the southeastern county of Kansas. We now have it from Riley, Chautauqua, Montgomery, Douglas, Atchison and Leavenworth Counties in Kansas and from Hilliard, Florida taken in August 1930 by R. H. BEAMER and PAUL OMAN, and from Hamilton, Mississippi in July by R. H. BEAMER. Specimens of this species will be found in the Hungarian National Museum.

***Hydrometra mensor*** WHITE 1879.

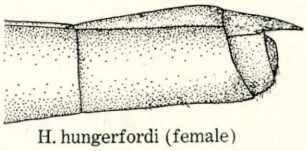
*Hydrometra mensor* WHITE, F., BUCHANAN, Trans. Ent. Soc. London 1879. Pt. IV, P. 267.

The type of this species was examined at the British Museum. It is a female specimen labeled „Manaos on board at light VIII, 1875." (It is the property of the Perthshire Museum). The hemelytra

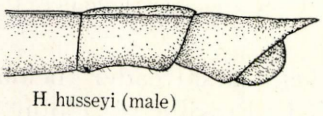
# PLATE XII.



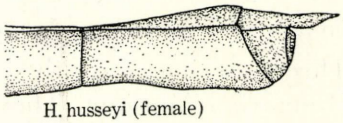
H. hungerfordi (male)



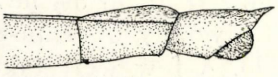
H. hungerfordi (female)



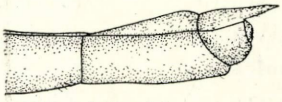
H. husseyi (male)



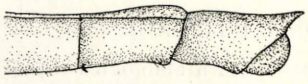
H. husseyi (female)



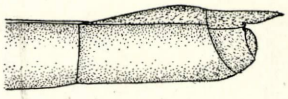
H. barei (male)



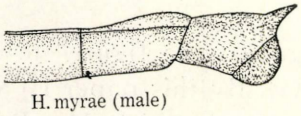
H. barei (female)



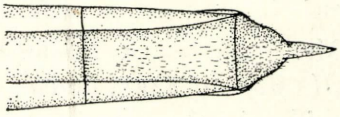
H. martini (male)



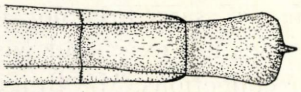
H. martini (female)



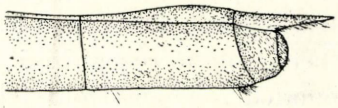
H. myrae (male)



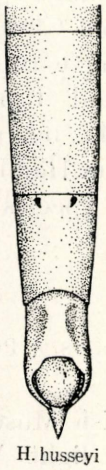
H. myrae (female)



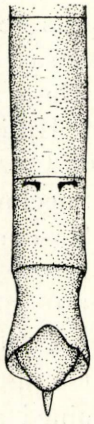
H. myrae (male)



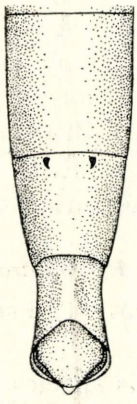
H. myrae (female)



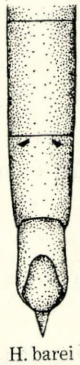
H. husseyi



H. myrae (male)



H. hungerfordi



H. barei

extend to the middle of the antepenult abdominal segment. The two last segments of the antennae are missing. The proportional lengths of those remaining are: 1st : 2nd : : 5 : 11. The anterior and middle acetabula have two pit-like spots, the posterior acetabula have none. The head proportions are: AO : PO : : 20 : 9. The caudal process surpasses the abdomen by a third.

The two specimens cited in WHITE's paper are both females. In his paper he says „ ♂ Long. 11½—12½ mm." This must be a typographical error. Mr. WHITE's statement „Capite parte anteoculari parte postoculari fere 1½ longiore" is also untrue.

***Hydrometra Husseyi*** BUENO 1926. (Plate XII).

*Hydrometra husseyi* TORRE-BUENO, J. DE LA, Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 111—112.

This species described from Villa Rica, Paraguay appears to be an abundant species. There are in the University of Kansas Collections long series of this species from Paraguay. Dr. JACZEWSKI (10) 1928 has reported it from the State of Paranà and figured the terminal abdominal segments and one of the claspers of the male. The type of *H. argentina* BERG. should be examined and compared with this species. The Paris Museum has specimens from the Argentine Republic. Probably *H. Husseyi* BUENO = *H. argentina* BERG.

***Hydrometra Barei*** HUNGERFORD 1927. (Plate XII).

*Hydrometra barei* HUNGERFORD, H. B., Annals Ent. Soc. of America. Vol. XX, No. 2, p. 262.

This species described from Plant City, Florida, was taken at Archer, Naples, Sanford and Homestead, Florida, in July and August 1930 by the University of Kansas Entomological Expedition.

***Hydrometra Myrae*** BUENO 1926. (Plate XII).

*Hydrometra Myrae* TORRE-BUENO, J. R. DE LA, Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 110—111.

The type locality is Billy's Island, Okeefeenokee Swamp, Georgia. There are specimens in the University of Kansas collection labeled: „Calcasieu Co., La. Aug. 1928, R. H. Beamer", „Plant City, Florida, Sept. 20, 1927. Clarence O. Bare"; „Paragua, Cuba, Prov. Camagua, May 2, 1927". The U. S. National Museum has this species from Haiti taken by W. A. HOFFMANN in 1925. Specimens of this species will be found in the Hungarian National Museum.

***Hydrometra Martini*** KIRKALDY 1900. (Plate I, XII).

*Hydrometra martini* KIRKALDY, G. W., Entomologist, Vol. XXXIII, p. 175.

This is the most common species in the United States. It is represented in the University of Kansas Entomological collections by abundant material from the following states: Kansas, Arkansas, Texas, Florida, Louisiana, Mississippi, and Michigan. It is a well known insect from Kansas eastward extending from the Gulf of Mexico to Canada. Specimens of this species will be found in the Hungarian National Museum.

## Check list of Hydrometra of the Eastern Hemisphere.

(Arranged for the cabinet).

1. *H. bifurcata* HUNGERFORD and EVANS. (Madagascar).
2. *H. Chinai* HUNGERFORD and EVANS. (Africa).
3. *H. transvaalensis* HUNGERFORD and EVANS. (South Africa).
4. *H. africana* HUNGERFORD and EVANS. (Tanga, Africa).
5. *H. ambulator* STÅL. (South Africa).
6. *H. albolineolata* REUTER. (Africa South of Sahara).
7. *H. hoplogastra* HALE. (Australia and New Guinea).
8. *H. papuana* KIRKALDY. (New Guinea.)
9. *H. Hutchinsoni* HUNGERFORD and EVANS. (Africa).
10. *H. Fanjahira* HUNGERFORD and EVANS. (Madagascar).
11. *H. Julieni* HUNGERFORD and EVANS. (Cochin China).
12. *H. rhodesiana* HUNGERFORD and EVANS. (Africa).
13. *H. Smithi* HUNGERFORD and EVANS. (West Africa).
14. *H. Illingworthi* HUNGERFORD and EVANS. (New Queensland, Australia).
15. *H. Halei* HUNGERFORD and EVANS. (New Queensland, Australia).
16. *H. feta* HALE. (New Queensland, Australia).
17. *H. Horváthi* HUNGERFORD and EVANS. (New Guinea).
18. *H. stagnorum* (LINN.). (Europe, North Africa, Canary Islands).
19. *H. eremobia* KIRITSHENKO. (Transcaspia).
20. *H. Turneri* HUNGERFORD and EVANS. (Africa).
21. *H. gracilenta* HORVÁTH. (Europe).
22. *H. aculeata* MONTROUZIER. (New Caledonia).
23. *H. procera* HORVÁTH. (Japan and China).
24. *H. annamana* HUNGERFORD and EVANS. (Annam — Formosa, Tokio, Japan).
25. *H. Butleri* HUNGERFORD and EVANS. (India).
26. *H. lineata* ESCHSCHOLTZ. (Philippines).
27. *H. Maidli* HUNGERFORD and EVANS. (Sumatra and Java).
28. *H. albolineata* SCOTT. (Japan, China).
29. *H. strigosa* SKUSE. (South Australia).

30. *H. insularis* HUNGERFORD and EVANS. (Sumatra and Java).
31. *H. Greeni* KIRKALDY. (Ceylon and South India).
32. *H. Isaka* HUNGERFORD and EVANS. (Madagascar).
33. *H. aegyptia* HUNGERFORD and EVANS. (Africa).
    var. *Chabanaudi* HUNGERFORD and EVANS. (West Africa).
34. *H. Maindroni* HUNGERFORD and EVANS. (Oman).
35. *H. longicapitis* BUENO. (Sumatra).
36. *H. madagascarensis* HUNGERFORD and EVANS. (Madagascar).

## Check list of Hydrometra of the Western Hemisphere.

### (Arranged for the cabinet).

1. *H. Mulfordi* HUNGERFORD, (Bolivia, S. A.).
2. *H. comata* BUENO. (Trinidad).
3. *H. caraiba* GUÉRIN. (Cuba).
4. *H. metator* WHITE. (Amazon region, S. A.).
5. *H. Championiana* BUENO. (Guatemala, Costa Rica, Cuba, Columbia & Amazon region, S. A.).
6. *H. guianana* HUNGERFORD and EVANS. (British Guiana, S. A.).
7. *H. Williamsi* HUNGERFORD and EVANS. (Ecuador, S. A.).
8. *H. Fruhstorferi* HUNGERFORD and EVANS. (Brazil, S. A.).
9. *H. Wileyi* HUNGERFORD. (Southern U. S. A.).
10. *H. Lillianis* BUENO. (California, U, S. A.).
11. *H. Priscillae* BUENO. (Guatemala, C. A.).
12. *H. cordubense* BUENO, (Mexico, Lower California and Costa Rica).
13. *H. Agenor* KIRKALDY. (Ecuador, S. A.).
14. *H. exilis* BUENO. (Honduras, C. A.).
15. *H. cyprina* BUENO. (Mexico-Gulf Coast).
16. *H. lentipes* CHAMPION. (Guatemala and Costa Rica).
17. *H. Sztolcmani* JACZEWSKI. (Parana, Brazil, S. A.).
18. *H. australis* SAY. (Southern U. S. A.).
19. *H. gibara* BUENO. (Cuba).
20. *H. Hungerfordi* BUENO. (Southern U. S. A.).
21. *H. consimilis* BARBER, (Cuba and Porto Rico).
22. *H. mensor* WHITE. (Amazon Region, S. A.).
23. *H. Husseyi* BUENO. (Paraguay and Brazil).
24. *H. argentina** BERG. (Argentina, S. A.).
25. *H. chilensis** REED. (Chile, S. A.).
26. *H. Barei* HUNGERFORD. (Florida, U. S. A.).
27. *H. Myrae* BUENO. (Southern U. S. A., Cuba and Haiti).
28. *H. Martini* KIRKALDY. (U. S. A.).
29. *H. naiades** KIRKALDY. (Guatemala).
30. *H. Kirkaldyana* BUENO. (Brazil and Argentine, S. A.).

* Arbitrarily assigned, unknown to us.

## References cited in discussions.

1. BERGROTH, E., 1915. Some Javanese Hemiptera collected by E. Jacobson and Th. H. MacGillavry. Zoologische Mededeelingen uitgegeven vanwege 's Rijks Museum van Natuurlijke Historie te Leiden. Deel I Aflevering 2, pp. 109—123. 2. BOLLWEG, WILHELM 1914. Beitrag zur Faunistik und Ökologie der in der Umgebung Bonns varkommenden aquatilen Rhynchoten, mit besonderer Berücksichtung ihrer Larvenverhältnisse, Verhandlungen des Naturhistorischen Vereins der preussischen Rheinlande und Westfalens pp. 137—187. — 3. DISTANT, W. L. 1902. in: Ann. Nat. Hist. X, 173. — 4. DISTANT, W. L. 1903. in: Ann. Nat. Hist. XI, p. 256. — 5. ESAKI, TEISO, 1927. An Interesting New Genus and Species of Hydrometridae (Hem.) from South America. The Entomologist, Vol. LX, Aug. 1927. — 6. HALE, HERBERT M. 1925. Results of Dr. E. Mjoberg's Swedish Scientific Expedition to Australia 1910—1913. The Aquatic and Semiaquatic Hemiptera. Arkiv för Zoologi. Band 17A, No. 20. — 7. HUNGERFORD, H. B. 1919. The Biology and Ecology of Aquatic and Semi-Aquatic Hemipetra. The Kansas University Science Bulletin, Vol. XI. —8. HUNGERFORD, H. B. 1923. Some studies on the Genus Hydrometra in America. Canadian Entomologist, Vol. LV, pp. 54—58. — 9. HUSSEY, R. F. 1925. A New Hydrometrid Genus from Honduras. (Hemiptera). Bulletin Brooklyn Entomological Society, Vol. XX, No. 3, pp. 115—118. — 10. JACZEWSKI, TADEUSZ 1928. Hydrometriade from the state of Parana. Annales Musei Zoologici Polonici, T. VII, pp. 81—84. — 11. LINNAEUS, C., 1758. Systema Naturae. Regnum Animale, p. 450. — 12. LUNDBLAD, O. 1921. Zur Kenntnis der jungen Larven einiger im Wasser lebenden Rhynchoten, Entomologisk Tidskrift, Arg. 42, pp. 92—106. — 13. REUTER, O. M. 1882. Ad cognitionem Heteropterorum Africae occidentalis. Öfversigt af Finska Vetenskaps Societetens XXV. p. 38. 14. REUTER O. M. 1900. Anteckninger om Finska Heteroptera, Meddelanden af Societas pro Fauna et Flora Fennica h. 26. — 15. TEYROVSKY, VLANDIMIR 1920. České Vodoměrky (Gerroideae), Entomologické priručky, Vol. IX, Prag. 1920. — 16. TORRE-BUENO, J. R. DE LA 1905. Canadian Entomologist, Vol. XXXVII, pp. 12—14. — 17. TORRE-BUENO, J. R. DE LA 1926. The Family Hydrometridae in the Western Hemisphere. Entomologica Americana, Vol. VII (N. Ser.), No. 2, pp. 83—128.

## Explanation of the plates.

### PLATE I.

*Hydrometra Chinai* HUNGERFORD and EVANS. Front part of head showing the broad emarginate clypeus. At the bottom of the plate dorsal view of last abdominal segments of female on the left and side view on the right. Note the very much produced last ventral segment.

*Hydrometra bifurcata* HUNGERFORD and EVANS. Clypeus at top of the plate and drawings of side and dorsal views of last abdominal segments of both sexes.

*Hydrometra Wileyi* HUNGERFORD. Front part of head showing the broad clypeus, slightly rounded in front.

*Hydrometra procera* HORVÁTH. Front part of head, showing the narrow pointed clypeus.

*Hydrometra Martini* egg.

*Hydrometra Williamsi* HUNGERFORD and EVANS. Front part of head showing the broad clypeus with its angulate front margin.

*Hydrometra Mulfordi* HUNGERFORD. Front part of head showing the long truncate clypeus.

## PLATE II.

*Hydrometra transvaalensis* HUNGERFORD and EVANS. Dorsal and side view of last abdominal segments of the male and dorsal view of last abdominal segments of female. (Misspelled on the plate).

*Hydrometra ambulator* STÅL. Side and dorsal views of the last abdominal segments of both sexes.

*Hydrometra albolineolata* REUTER. Dorsal and side views of the last abdominal segments of both sexes.

*Hydrometra africana* HUNGERFORD and EVANS. Dorsal view of last abdominal segments of male. (The lateral hairs in this type have been lost). Dorsal view of last abdominal segments of female.

## PLATE III.

*Hydrometra Hutchinsoni* HUNGERFORD and EVANS. Side and dorsal views of last abdominal segments of both sexes.

*Hydrometra Fanjahira* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of male.

*Hydrometra Julieni* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of male.

*Hydrometra rhodesiana* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of male.

*Hydrometra Smithi* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of both sexes.

## PLATE IV.

*Hydrometra Illingworthi* HUNGERFORD and EVANS. Side view of last abdominal segments of male above and dorsal view of the same on the lower left corner of the plate.

*Hydrometra Halei* HUNGERFORD and EVANS. Side view of last abdominal segments of male. Dorsal view of same at bottom of plate.

*Hydrometra Horváthi* HUNGERFORD and EVANS. Side view of last abdominal segments of male. Dorsal view of same in lower right hand corner of plate.

*Hydrometra hoplogastra* HALE. Side and dorsal view of last abdominal segments of male and side view of last abdominal segments of female.

## PLATE V.

*Hydrometra stagnorum* LINNAEUS. Side view of last abdominal segments of male and female.

*Hydrometra eremobia* KIRITSHENKO. Side view of last abdominal segments of female determined by DR. KIRITSHENKO.

*Hydrometra Turneri* HUNGERFORD and EVANS. Side and dorsal views of last abdominal segments of both sexes.

*Hydrometra gracilenta* HORVÁTH. Side and dorsal views of last abdominal segments of both sexes.

*Hydrometra aculeata.* MONTROUZIER. Side view of last abdominal segments of male and female.

## PLATE VI.

*Hydrometra procera* HORVÁTH. Side and dorsal view of last abdominal segments of both sexes.

*Hydrometra annamana* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of both sexes.

*Hydrometra Butleri* HUNGERFORD and EVANS. Side and dorsal views of last abdominal segments of male.

*Hydrometra lineata* ESCHSCHOLTZ. Side and dorsal views of last abdominal segments of both sexes.

## PLATE VII.

*Hydrometra Greeni* KIRKALDY. Side and dorsal views of last abdominal segments of male and female.

*Hydrometra aegyptia* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of male.

*Hydrometra aegyptia Chabanaudi* HUNGERFORD and EVANS. Side and dorsal view of male.

*Hydrometra Isaka* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of both sexes.

*Hydrometra Maindroni* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of both sexes. (Misspelled on the plate).

## PLATE VIII.

*Hydrometra Maidli* HUNGERFORD and EVANS. Side and dorsal views of last abdominal segments of both sexes.

*Hydrometra albolineata* SCOTT from China. Side and dorsal views of last abdominal segments of male and side view of female. („H. greeni var. suensoni" on the plate).

*Hydrometra albolineata* SCOTT. Side and dorsal view of last abdominal segments of a female specimen in British Museum.

*Hydrometra insularis* HUNGERFORD and EVANS. Dorsal and side views of last abdominal segments of both sexes.

*Hydrometra strigosa* SKUSE. Side and dorsal view of last abdominal segments of a female specimen in British Museum determined by Mr. DISTANT.

## PLATE IX.

*Hydrometra madagascarensis* HUNGERFORD and EVANS. Side view and ventral view of last abdominal segments of male. Dorsal view and side view of last abdominal segments of female. In the lower left corner of the plate is the head and thorax of this curious species. The drawing is to the same scale as those to the right of it. Note the small eyes and the exceedingly long slender head.

*Limnobates paradoxus* HUSSEY. Drawn by Miss DOERING from Mr. HUSSEY's paper.

*Bacillometra ventralis* Esaki. Drawn by Miss DOERING from Mr. ESAKI's paper.

*Hydrometra procera* HORVÁTH. Drawn to same scale as the two above.

## PLATE X.

*Hydrometra Championiana* BUENO. Side view of last abdominal segments of male and female.

*Hydrometra guianana* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of male and female.

*Hydrometra Williamsi* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of the male.

*Hydrometra Fruhstorferi* HUNGERFORD and EVANS. Side and dorsal view of last abdominal segments of both sexes.

*Hydrometra Wileyi* HUNGERFORD. Side view of last abdominal segments of male and female.

## PLATE XI.

*Hydrometra cordubense* BUENO. Side view of last abdominal segments of male and female.

*Hydrometra Mulfordi* HUNGERFORD. Side and dorsal view of last abdominal segments of female paratype. Below is shown head and thorax and tarsus to compare *H. Myrae* BUENO. Note the relatively large eyes and the exposed scutellum of the short metathorax. Note that the middle tarsal segment is not the shortest although the first segment is relatively longer than in typical *Hydrometra*.

*Hydrometra Agenor* KIRKALDY. Side and dorsal view of last abdominal segments of female type.

*Hydrometra Sztolcmani* JACZEWSKI. Side view of last abdominal segments of male and female.

*Hydrometra Myrae* BUENO. Head and thorax and tarsus drawn for a comparison with *Hydrometra Mulfordi* HUNGERFORD.

## PLATE XII.

*Hydrometra Hungerfordi* BUENO. Side view of last abdominal segments of male and female, below is a ventral view of the last abdominal segments of a male.

*Hydrometra Husseyi* BUENO. Figured as above.

*Hydrometra Barei* HUNGERFORD. Figured as above.

*Hydrometra Martini* KIRKALDY. Side view of last abdominal segments of male and of female.

*Hydrometra Myrae* BUENO. Side and dorsal views of last abdominal segments of both sexes and below is a ventral view of the last abdominal segments of a male.