



SHORT ACCOUNT OF THE FRESH WATER FISHES OF KENYA.

BY HUGH COPLEY.

The lack of a list of the fresh water fishes of Kenya has been felt for years by the person who takes an interest in the fauna and also by those who wish to see some economic use made of the fishery resources of the Colony.

Before discussing the various sheets of water and the fishes which inhabit them a little may be said of their prehistory.

The waters of Kenya can be divided into three parts: Lake Victoria as one part; Lakes Rudolf, Hannington, Baringo, Nakuru, Elmenteita, Naivasha, and Magadi in the Rift Valley as the second part and the river systems of the Athi and the Tana as the third. All the other rivers group into their respective lake systems. Not enough is known of the prehistory of the third group to make any definite statements, but enough is known of the first two to get a general idea of their early history. The prehistory of Lake Rudolf is simple and differs entirely from that of Lake Victoria and so do the fish which inhabit its waters. To begin the story we will go back a brief period of 15,000 years.

Fifteen thousand years ago the waters of Lake Rudolf stood 475 feet higher than they do to-day with the consequence that a greater part of West Suk and parts of Turkana were submerged. Being at the end of one of the pluvial periods there were heavy rains; snow on the summits of the Aberdares; and snow on Mount Kenya 1,000 feet below its present level. The amount of water flowing into the lake was far greater than the evaporation and this surplus overflowed northwards down the present dried-up bed of the Sobat River and so into the Nile. In other words the Great Lake Rudolf fed the Nile and consequently Nilotic fish inhabited this great sheet of water.

The Pluvial period finished and a period of desiccation set in. The waters shrank and gradually stopped supplying the Nile until Lake Rudolf became isolated; its waters lost their freshness until they became hardly fit for drinking. The Nilotic fish have survived, even multiplied, and although only 15,000 years have passed away, yet there are definite small differences between the Lake Rudolf fish and those of the Nile showing the effects of isolation and environment.

The prehistory of Lake Victoria is much more complicated. We will not consider the history of the formation of the lake,

but we may mention that its waters were connected with the great rivers of the Congo and then to the Nile. Then owing to the complete drying up of the lake the whole stock of fish died off with the exception of the lung-fish, a catfish or two and a tilapia; these surviving owing to accessory breathing appliances or sheer cussedness. The lake filled up again during the last pluvial period (15,000 years ago) and no Nilotic fish (predatory or otherwise) were able to get into the lake owing to the formation of the Murchison Falls.

The lung-fish being very ancient in its lineage, only multiplied itself, but the very modern *Tilapia*, being most unstable and, owing to a lack of predators, was able to break up into dozens and dozens of species and all this has occurred in the short space of 15,000 years.

There is no doubt that the ancient lakes Baringo, Hannington, Elmenteita, Nakuru, Naivasha, and Magadi had a Nilotic fauna. Naivasha, Nakuru, and Elmenteita have dried out several times and their fish have died out. Baringo and Hannington have also dried out at various times, but seem to have received two or three species of fish from the Athi-Tana River systems in very recent times.

In Lake Magadi, there is a little *Tilapia* which is a relic from some ancestral form, maybe Nilotic, and this fish has survived and adapted itself to a progressive increase in the soda content of the lake. It shows how hardy their constitution is and how a few could have survived distressing conditions experienced during the drying-up of Lake Victoria.

The freshwater fishes are interesting as they contain one Sub-Order *Dipneusti*, Family *Lepidosirenidae*, Genus *Protopterus* (Lung fish) with a very ancient history going back to Devonian times. This fish is also interesting as it has many primitive features developmentally in common with the Amphibia.

The other fish are all, what one might call, straight forward bony fishes with a more recent line of ancestry only going back to the Cretaceous times.

The fossil remains of fish so far found are few and only of fish which are still found in our lakes and rivers.

The fish fauna of Lake Rudolf is characterised by a large number of genera each representing a very few species. On the other hand Lake Victoria, and the rivers flowing in to it, have comparatively a small number of genera representing a great number of individual species. This is due to the latter body of water having no predatory fish to control the breaking up of the genera into numerous related species. This question of the influence of large predators has been discussed by

Dr. Worthington and the interested can refer to his writings. The following are brief notes on the lakes and rivers of Kenya and their fishes.

Lake Victoria.—This lake has an area of about 26,000 square miles, nearly the size of Scotland. Its greatest length is 250 miles with a breadth of 200 miles and a coastline of 2,100 statute miles. There are 60 islands with an individual coastline of 4 miles and others, smaller, which makes the total coastline of about 3,000 statute miles.

The greatest depth is about 250 feet whilst the bottom is composed of fine greenish-black ooze composed entirely of diatoms, (*Melosira*, *Cyclotella*, and *Surirella*). There are two areas of sand on the Uganda side. The water of the lake is fresh and potable whilst the pH ranges from 7.4 to 8.5 and the temperature is, on an average, 76° F.

The lake supports a large fishing industry. The figures for 1938, which are only for Kenya, are interesting and show the size of the industry. The number of *Tilapia* caught was 3,578,428 of a value of £38,648. The value of other fish used for the dried fish industry and fresh native consumption is roughly worth another £60,000. This is for Kenya alone and the total value for the lake fisheries would be about £300,000.

Lake Rudolf.—This lake lies in the trough of the Rift Valley; its northern shores being on the Kenya-Sudan-Abyssinia border. It is 180 miles long with a width of from 15 to 35 miles. The eastern shoreline is steep and rocky whilst the western shore is bordered by a strip of desert country. There are three small volcanic islands. The lake has an altitude of 1,250 ft. above sea level. The greatest depth is about 300 ft. whilst the average water temperature is about 86° F. with a high soda content (sodium carbonate).

There are no commercial fisheries but a small communal fishery exists at a few scattered places. pH 9.4—9.6.

Lake Baringo.—This lake also lies in a trough of the Rift Valley. The lake is situated at an altitude of 3,150 ft. above sea level. It is 12 miles long by 5 miles wide and has a fairly uniform depth of 22 feet. The water is comparatively fresh with an average temperature of about 84° F. There is no economic fishery in the lake but a few primitive Njemps catch fish for their own consumption. pH 8.4—8.8.

Lake Hannington.—Another lake in the Rift Valley about 4 miles long with an average width of half a mile. What is the average depth, temperature or pH, I do not know, but the water is excessively alkaline.

Lake Naivasha.—Another lake in the Rift Valley at an altitude of 6,200 ft. It has one island which is at the present, owing to a series of low water seasons, joined to the mainland. This island is the remnant of the partially submerged rim of a volcanic crater. The greatest depth of water inside the crater is about 60 feet whilst the average depth over the main lake is not more than 12 feet. The temperature of the water, which is fresh and potable, is, on an average, 72° F. and the pH 8.5.

There is no economic fishery. *Tilapia nigra* was introduced from the Athi River system and the Large Mouth Black bass from England to supply sporting amenities. Rainbow trout have migrated into the lake from the Morandati River.

Kerio River.—This river rises in the highlands round Molo and then continues its course down the Rift Valley until it reaches the southern extremity of Lake Rudolf. The waters only reach this lake for a short period during the heaviest of rains and in the dry periods no water gets beyond a point quite 40 miles south of the lake. The water is palatable with a temperature of 84° F. and an air temperature of 94° F. at noon. The fish fauna is typically Lake Rudolf. pH 8.0.

Namanga River.—A short stream rising on Ol Joro Orok which loses itself in the swamp Amboseli. Its total length is not more than 10 miles.

Lumi River.—The headwaters of this river are on the eastern slope of Mount Kilimanjaro. The total length of the river is not more than 20 miles when it loses itself in Lake Jipe. In its lower course the volume of water is considerably augmented by strong springs of cold water. The fish fauna is the same as Lake Jipe. Temperature, 72° F. pH 8.0.

Athi River.—This river drains the south-eastern slope of the Aberdare range and the country bordering the Ngong Hills whilst the Tsavo, a tributary, draws its water from the south-eastern slopes of Mount Kilimanjaro. Some of the tributaries are stocked with trout above the 6,000 feet contour. The total course of the river is about 320 miles before it debouches into the Indian Ocean near Malindi. The water is potable, but contains large quantities of mica particles in suspension. The average temperature of the water after the upper tributaries have joined is 76° F.; pH 7.8—8.1. A considerable native fishing industry is carried on along the banks, the fish being dried and sold to native employees on the many large sisal shambas in the vicinity.

Uaso Nyiro River.—This river drains a considerable portion of the eastern slopes of the Aberdares whilst other tributaries,

the Naro Maro, Burguret, the Liki, Nanyuki, and the Sirimon, drain a part of the slopes of Mount Kenya. A number of these streams contain trout in their upper reaches. The evaporation in the low country coupled with the extraction of water in regions bordered by European settlement have considerably reduced the water flowing through the Northern Frontier. In seasons of high rainfall water reaches the Lorian Swamp; but at other times the river is dry 40 miles below the bridge at Archer's Post. There is no commercial fishing done on the river. The water temperature in the low country is high, 84° F., whilst the pH is 8.0 to 8.4.

The Tana River.—This is the largest and the longest river in the Colony. It drains a section of the eastern slopes of the Aberdares and a considerable portion of Mount Kenya. Nearly all its tributaries rise on the Aberdare Range and Mount Kenya and have been stocked with trout. During its lowland course to the sea the river is subjected to large seasonal fluctuations in the amount of water carried to the Indian Ocean. No temperature or pH readings have been taken. Less is known of the fish fauna than any other river in the Colony. There are a number of resident tribes who trap and sun-dry fish, but the trade is not large.

The following are a few descriptive notes on the different fishes their characters, food, and habits which should help the layman to identify them should any come to hand.

PROTOPTERUS.—The English name for this fish is "Lung-fish" whilst the common native name all over Lake Victoria is "MAMBA," but the DHOLUO have another name "KAMONGO." The young pass through a larval stage. At the beginning of the dry weather the fish disappears into a cylindrical cavity fitted with a lid perforated with small air holes. The fish, when in this cavity, is surrounded by a secretion of mucus. When the rains begin the fish comes forth. At the beginning of the rains a nest is made in the grass at the water edge. Thousands of eggs are laid on the mud at the bottom of the nest and these hatch out in from 7 to 9 days depending on the weather conditions. Whilst the young are in the nest the male keeps guard.

The food of the adult fish consists largely of snails and bivalves, but they will attack fish caught in the seine nets or hooked on a long line. The fish is rather eel-like in its movements and progression forward is made by ripple movements along its body. Another character of the fish is that the air bladder is a functional lung at all times acting in connection with the gills. The fish, at intervals, comes to the surface of

the water, puts its snout out, empties the lungs, and takes in a fresh supply. Whilst doing this it makes a decided noise which can be heard for some distance. The fish as will be seen from Fig. 1, Plate 1, cannot be mistaken for any other. The average length caught is from 24 to 32 inches, but there is in the Coryndon Museum one of nearly 72 inches which is a monster. The flesh is red, like beef, and very good eating when fresh.

POLYPTERUS.—A typical fish of the Nile and found in Lake Rudolf. Its rounded tail and the row of finlets in place of the dorsal fin will enable one to recognise this fish from all others. Shallow warm water plentifully supplied with weeds is the home of this fish. By day it is sluggish and hardly moves from one favoured spot. At night it is far more active, feeding on small fish, worms, frogs, snails, etc. From the egg stage it undergoes a larval stage. In this stage its most striking feature is the cutaneous gills.

The general colour of the matured fish is a dark green, blotched with black whilst the belly is yellow.

The flesh is oily and mushy; often with an odour which is not pleasant. Fig. 2, Plate 1.

MORMYRIDAE.—The "Elephant Snout Fish" generally known on Lake Victoria as "SUMA."

All the species in this family can be immediately recognised by the snout. In some species it is small, hardly more than a bump, whilst in others it is long with a small flexible, feeling tip. These fish have a brain far larger than any other fish and also feeble electric organs. Again they are always covered with slime which gives a pale olive-green colour to the fish. Rub this off and the fish becomes drab. Fossil Mormyridae are unknown, but there are some beautiful pictures of this fish in the mural paintings and bronze medals of the ancient Egyptians. The eyes are minute and it is presumed that the long snout, with the soft fleshy feeling tip, pokes about in the mud at the bottom of the water, for its food consisting principally of the underwater larvae of flies, blood worms, etc. The flesh of the fish is a sickly yellow in colour and full of oil, which goes bad very quickly. The Kavirondo will not eat it as they say it gives them diarrhoea. This fish goes up to 5 lbs. in weight and will take a small worm at bait. Figs. 3 and 4, Plate 1.

GYMNARCHUS.—This is another fish of the lower Nile and is found in Lake Rudolf. It is eel-like, very powerful and generally covered in a layer of slime. It is principally active

at night when it feeds on small fish, frogs, snails and other trifles. In the hours of daylight it generally tucks itself away in deep holes or in banks of weeds. Its general colour is a dark brownish olive shading to white on the belly. In size it goes big, even to a weight of 12 pounds. Fig. 5, Plate 2.

HETEROTIS.—Another unusual looking fish of the lower Nile and Lake Rudolf is *Heterotis niloticus*. It has a funny little tail. The scales are very large and rugose. It is a dirty blackish green in colour fading to greenish yellow on the belly. The fish builds an enormous nest in the papyrus or suitable reeds in which it lays its eggs. The young pass through a larval stage when they have long blood-red gill filaments. It goes to 7 pounds in weight and the flesh is wholesome eating. Fig. 6, Plate 2.

CHARACINIDAE.—One member of this family is well-known as the "Tiger Fish." The two members found in the Colony are *Hydrocyon forskalii* (the small Tiger Fish) and *Hydrocyon lineatus* (the large Tiger Fish). The native name for the small tiger fish in Lake Rudolf is "LOKEL." Here again is a fish which cannot be mistaken for anything else because of its terrible teeth. Its colour is a gleaming silver with steel-blue on the back. Along the sides are a number of black dots in stripes whilst the fins are an orange-flame colour. Both are predatory and live on nothing but live fish. The little one goes to a pound and a half whilst the large one to 35 pounds and both give grand sport on suitable tackle. They are rotten eating owing to the numerous, small, needle-sharp bones embedded in the flesh. Fig. 7, Plate 2.

The cousins of the tiger fish are the **ALESTES** which are small, silvery, roach-like fish with a beautiful blue or a golden sheen. An *Alestes* in an aquarium is a very beautiful sight. *Alestes nurse* has a black blotch on the sides of the body just near the gills. *Alestes dentex* is long and slim with no black spot and so is *Alestes baremose*, but *Alestes sadleri* has a black blotch on the base of the tail. All have an adipose fin like the tiger fish. All these fish are plankton eaters and the writer has seen none over 9 inches in length. The native name on Lake Rudolf is "DOROBELA." Fig. 8, Plate 3.

DISTICHODUS again can never be mistaken, see Fig. 9, Plate 3. It goes large, up to 10 lbs. will not take a bait, is rotten eating and the native name is "GWOLO." It feeds on weeds, snails, chironomid larvae, gastropods, and all sorts of funny things from the bottom of the lake.

CITHARINUS.—Might be called the Lake Rudolf Bream as it has the shape of a dinner plate and is incredibly thin across the back. It is, however, a very handsome fish with a beautiful silver colour, green-black back and pinkish fins. It goes up to 7 or 8 pounds in weight and feeds off weeds, plankton and things off the bottom. It is better eating than the previous fish, but only just. The Lake Rudolf name is "AGURT." Fig. 10, Plate 3.

CYPRINIDAE.—This is a large family having about 1,300 species of which just over a 100 are found in Africa. A great number cannot be distinguished from each other except by an expert, so a typical small barbus Fig. 12 and a large type Fig. 11 will be described and illustrated.

This fish is of a silvery colour with an olive or blue-black shading on the back; fins dusky or tinged with yellow or pink. The scales are large and the lateral line well-defined. There is no adipose fin. The Rhino Fish of the Athi, Fig. 11, Plate 4, gives great sport to anglers as it grows to a weight of 45 lbs. It can be recognised by the horn on the snout which rises when the mouth is protracted. The main food of the barbus is weed, plankton, underwater insects, mollusca, etc., but the rhino fish when large feeds on small fish. They have all good eating flesh, but suffer from numerous small bones.

The *LABEO* are carp-like, but narrower in the body whilst the mouth is underneath the face. The flesh is firm and rich, but suffers from small bones. Mollusca, weed and insect larvae are their principal food. Fig. 13, Plate 4.

Labeo victorianus is called "NINGU" on Lake Victoria and is caught in large quantities and sun-dried for native consumption.

The *BARILIUS* are small dace-like fish, some having a number of dark finger marks along their sides. They are a brilliant silver with olive-green backs. Fig. 14, Plate 5.

ENGRAULICYPRIS are other little sardine-like fish which generally go in shoals at the surface of the water and feed upon plankton. They are fed upon by the tiger fish, tern and gulls. The scales come off very easily when handled and the fish is very delicate, dying as soon as it is out of the water. Fig. 15, Plate 5.

SILURIDAE, the catfishes.—These are well known as they have flat hard heads, adipose fins and seem scaleless whilst they are generally covered in slime. Some croak when out of the water. There are also, round the mouth, feelers which often have attached taste buds. These fish eat anything good, bad

or indifferent; but are very good eating themselves. Two typical species are shown Fig. 16 and Fig. 17, Plate 5.

CYPRINODONTIDAE, the top minnows.—Tiny fish found in Lake Rudolf and Lake Naivasha. Never more than 2½ inches in length feeding on plankton and algae. Like *Engraulicypris* they are very delicate. See Fig. 18, Plate 6.

CICHLIDAE, the tilapias.—These are the most important economic fish in Lake Victoria and the Colony. There are four important ones; the two tilapias of Lake Victoria (*Tilapia variabilis*, *Tilapia esculenta*); the Lake Rudolf Tilapia (*Tilapia nilotica*) and *Tilapia nigra* of the Athi River.

Tilapia variabilis, Fig. 19, native name "MBIRU" differs from *Tilapia esculenta*, Fig. 20, the "NGEGE" by having less scales on the body and on the cheeks; the shape of the head is a little different; whilst the "ngege" is olive-brownish in colour. The "mbiru" has scarlet tips to the rays of the dorsal fin and to the edge of the tail whilst its general colour is bluish. The males of both species put on an added colouration of reds, golds and green during the breeding season whilst the males of the "mbiru," during the breeding season, have a highly decorated tassellated genital papila. The food of these two tilapia is diatoms, green algae, floating vegetable life (phytoplankton). The "mbiru" will not keep so is sun-dried or smoked for local native consumption. The "ngege" is shipped all over the Colony in a fresh state as it will keep. The average size of the "ngege" in the trade, cleaned and gutted, would be 14 ounces.

The Lake Rudolf Tilapia (*Tilapia nilotica*) is similar to an overgrown "ngege" as it grows to a weight of 12 pounds. Owing to the great distance of the lake from selling centres no economic use has been made of this fish. The food of this fish is phytoplankton, weeds and algae.

The Athi River Tilapia (*Tilapia nigra*). This fish has been used extensively for stocking artificial dams. It is on a par with the "ngege" as a good fish and being much more omnivorous in its habits gives sport to the angler. In appearance it resembles the "ngege." Very much more could be done with this fish from the economic point of view, for it is an ideal subject with which to carry out continental methods of fish culture.

All these species of tilapia have similar nesting habits. The male hollows out a nest in sand in shallow warm water, sometimes utilising the foot-print of a hippo as a foundation. In this depression the female lays about 250 eggs and these are fertilised by the male. After this process these eggs are carried

in the mouth of the female until their development is complete. Even after that the female will take the young fry into her mouth in time of danger. The fry frequent hot, shallow water where they swim about in shoals.

HAPLOCHROMIS.—The stronghold of these fish is Lake Victoria and it seems that when the lake filled up after one of its dry periods a few tilapia survived. As there was no predatory fish the tilapia bred and split up into a great number of species of *Haplochromis*. All are small and can be recognised by the comparatively large head which is far more drawn out to the lips than in the tilapia. Some have beautiful colouration, but it requires one who has specialised on the cichlids to tell one from the other. Their food and general habits are the same as those of the tilapia. They are caught by the natives, dried and then sold all over the Colony. Fig. 21, Plate 7.

CENTROPOMIDAE, the Nile perch.—The only body of water in which this large fish is found in Kenya is Lake Rudolf. In this lake there is a small type and a large type. The small type lives in the deep open water whilst the large type lives in the bays and inshore water. The food of the Nile perch is fish and yet more fish. The male hardly ever goes over 30 pounds in weight whilst the females go up to 300 pounds. The flesh is wholesome and good eating; but no economic use has been made of this fish up to the present. Fig. 22, Plate 7.

ANABANTIDAE.—A very pretty little fish which can be immediately recognised from the tilapia's and the *Haplochromis* by its rounded tail and spinuous anal fin. The colouration is olive with numerous black spots and there is a dark blotch edged with yellow at the base of the tail. Fig. 23, Plate 7.

MASTACEMBELIDAE.—A long eel-like creature, olive-green with black bands and wavy black lines on the body and a pointed head. This fish can be recognised from any of the eels by passing the hand along the back from the tail to the head when a number of needle-like spines will be encountered. The largest specimen seen was about 14 inches in length. Fig. 24, Plate 8.

MALOPTERURIDAE, the electric fish.—A filthy, flabby, nasty fish of a dirty bluish grey colour, blotched with black. All the fins are edged with orange-red. It is sluggish in habit and gives a good electric shock when handled. It has a long fleshy adipose fin. In every respect a revolting fish. Fig. 25, Plate 8.

TETRODONTIDAE, the puffer fish.—Another funny little fish with an olive-grey back and a yellow-coloured belly. There are numerous black stripes along the body. The head and body are covered with minute spines making the skin feel like sand-paper. The teeth are coalescent forming a beak like the marine parrot fish. This fish can blow itself out into a miniature balloon; but in this position the fish is helpless. It exhales the air with a long sigh. Very pathetic. Fig. 26, Plate 8.

Having given a very brief description of the fishes and their habitat I will conclude with a provisional list in the hopes that it will be useful to the layman as well as form a basis for future work by those who will have to work on our fresh water fishes in the future.

A PROVISIONAL LIST OF THE FRESH WATER FISHES OF KENYA.

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
LAKE VICTORIA.		
LEPIDOSIRENIDAE.	<i>Protopterus aethiopicus</i> .	Lungfish; Mamba Kamongo.
MORMYRIDAE.	<i>Marcusenius nigricans</i> .	
	<i>Mormyrus kannume</i> .	Elephant snout- fish; Suma.
	<i>Petrocephalus degeni</i> .	
	<i>Gnathonemus longibarbis</i> .	Bobo.
CHARACINIDAE.	<i>Gnathonemus victoriarum</i> .	
	<i>Marcusenius grahami</i> .	Kuumpi.
	<i>Alestes sadleri</i> .	
CYPRINIDAE.	<i>Alestes nurse</i> .	Osoga.
	<i>Barbus nummifer</i> .	General name bar
	<i>Barbus paludinosus</i> .	bel, scaley, yellow
	<i>Barbus thikensis</i> .	belly, Kasinga.
	<i>Barbus radcliffi</i> .	
	<i>Barbus bayoni</i> .	
	<i>Barbus minchini</i> .	
	<i>Barbus tetraspilus</i> .	
	<i>Barbus sexradiatus</i> .	
	<i>Barbus apleurogramma</i> .	
	<i>Barbus doggetti</i> .	
	<i>Barbus magdalenae</i> .	
	<i>Labeo victorianus</i> .	Ningu.
	<i>Engraulicypris argenteus</i> .	Omena.
	<i>Discognathus johnstonii</i> .	
SILURIDAE.	<i>Clarias alluaudi</i> .	The catfishes.
	<i>Clarias eupogon</i> .	
	<i>Clarias anguillaris</i> .	
	<i>Clarias mossambicus</i> .	Mumi.
	<i>Clarias carsonii</i> .	
	<i>Clarias werneri</i> .	

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
	<i>Bagrus degeni.</i>	Seu.
	<i>Bagrus docmac.</i>	
	<i>Schilbe mystus.</i>	Butterfish; Sire.
	<i>Synadontis victoriae.</i>	
CYPRINODONTIDAE.	<i>Synadontis afro-fischerei.</i>	
	<i>Fundulus taeniopygus.</i>	
	<i>Haplochilus pumilus.</i>	
	<i>Cynopanchax bukobanus.</i>	
CICHLIDAE.	<i>Tilapia variabilis.</i>	Mbiru.
	<i>Tilapia esculenta.</i>	Ngege.
	<i>Haplochromis multicolor.</i>	General name for
	<i>Haplochromis nigricans.</i>	all these fish Fulu.
	<i>Haplochromis</i> <i>nuchisquamulatus.</i>	
	<i>Haplochromis gestri.</i>	
	<i>Haplochromis nubilus.</i>	
	<i>Haplochromis melanopus.</i>	
	<i>Haplochromis macrops.</i>	
	<i>Haplochromis cinereus.</i>	Bihuru.
	<i>Haplochromis sauvagai.</i>	
	<i>Haplochromis crassilabris.</i>	
	<i>Haplochromis annectens.</i>	
	<i>Haplochromis humilior.</i>	
	<i>Haplochromis ishmaeli.</i>	
	<i>Haplochromis obesus.</i>	
	<i>Haplochromis chilotes.</i>	
	<i>Haplochromis flavipinnis.</i>	
	<i>Haplochromis taeniatus.</i>	
	<i>Haplochromis martini.</i>	
	<i>Haplochromis nigrescens.</i>	
	<i>Haplochromis microdon.</i>	
	<i>Haplochromis guarti.</i>	
	<i>Haplochromis serranus.</i>	
	<i>Haplochromis altigenis.</i>	
	<i>Haplochromis squamulatus.</i>	
	<i>Haplochromis bayoni.</i>	
	<i>Haplochromis macrodon.</i>	
	<i>Haplochromis prognathus.</i>	
	<i>Haplochromis maculipinna.</i>	
	<i>Haplochromis dichrourus.</i>	
	<i>Haplochromis spekii.</i>	
	<i>Haplochromis serranoides.</i>	Somo.
	<i>Haplochromis acutirostris.</i>	
	<i>Haplochromis plagiostoma.</i>	
	<i>Haplochromis macrognathus.</i>	
	<i>Haplochromis dentex.</i>	
	<i>Haplochromis mento.</i>	
	<i>Haplochromis cavifrons.</i>	
	<i>Haplochromis orthostoma.</i>	
	<i>Haplochromis xenostoma.</i>	
	<i>Haplochromis pellegrini.</i>	
	<i>Haplochromis argenteus.</i>	
	<i>Haplochromis longirostris.</i>	

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
	<i>Haplochromis gracilicauda.</i>	
	<i>Haplochromis xenodon.</i>	
	<i>Haplochromis obliquidens.</i>	
	<i>Haplochromis michaeli.</i>	
	<i>Haplochromis maxillaris.</i>	
	<i>Haplochromis gowersii.</i>	
	<i>Haplochromis melanopterus.</i>	
	<i>Haplochromis obtusidens.</i>	
	<i>Haplochromis plagiodon.</i>	
	<i>Haplochromis diplotaenia.</i>	
	<i>Haplochromis eutaenia.</i>	
	<i>Haplochromis tridens.</i>	
	<i>Haplochromis latifasciatus.</i>	
	<i>Haplochromis pharyngomylus.</i>	
	<i>Haplochromis worthingtoni.</i>	
	<i>Haplochromis estor.</i>	
	<i>Astatoreochromis alluaudi.</i>	
	<i>Macropleurodus bicolor.</i>	
	<i>Hoplotilapia retrodens.</i>	
	<i>Platytaeniodus degeni.</i>	
ANABANTIDAE.	<i>Anabas muriei.</i>	
MASTACEMBELIDAE.	<i>Mastacembelus victoriae.</i>	Okunga.
LAKE RUDOLF.		
POLYPTERIDAE.	<i>Polypterus bichir.</i>	
	<i>Polypterus senegalus.</i>	
MORMYRIDAE.	<i>Gymnarchus niloticus.</i>	
OSTEOGLOSSIDAE.	<i>Heterotis niloticus.</i>	
CHARACINIDAE.	<i>Hydrocyon forskalii.</i>	Lokel.
	<i>Hydrocyon lineatus.</i>	
	<i>Alestes dentex.</i>	
	<i>Alestes baremose.</i>	Dorobela.
	<i>Alestes nurse.</i>	
	<i>Distichodus niloticus.</i>	Gwolo.
	<i>Citharinus citharus</i>	
	<i>intermedius.</i>	Agurt.
CYPRINIDAE.	<i>Barbus bynni rudolfianus.</i>	Toto Chibule.
	<i>Barbus meneliki.</i>	
	<i>Barbus plagiostomus.</i>	
	<i>Barbus werneri.</i>	
	<i>Labeo horie.</i>	Chibule.
	<i>Barilius niloticus.</i>	
	<i>Engraulicypris stellae.</i>	
	<i>Engraulicypris bottegi.</i>	
SILURIDAE.	<i>Clarias lazera.</i>	Cat-fishes; Obito.
	<i>Schilbe uranoscopus.</i>	Naili.
	<i>Bagrus bayad.</i>	Lorogo; Lorok.
	<i>Auchenoglanis occidentalis.</i>	
	<i>Synodontis schall.</i>	Tirr.
	<i>Synodontis frontosus.</i>	

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
CYPRINODONTIDAE.	<i>Mochochus niloticus.</i> <i>Andersonia leptura.</i> <i>Haplochilichthys rudolfianus.</i>	
CENTROPOMODAE.	<i>Haplochilichthys jeanneli.</i> <i>Lates niloticus rudolfianus.</i>	Large Nile Perch; Idgi.
CICHLIDAE.	<i>Lates niloticus longispinis.</i> <i>Tilapia nilotica.</i> <i>Tilapia vulcani.</i> <i>Tilapia galilaea.</i> <i>Tilapia zillii.</i>	Small Nile Perch. Rogene.
MALOPTERURIDAE.	<i>Haplochromis rudolfianus.</i> <i>Pelmatochromis exsul.</i>	
TETRODONTIDAE.	<i>Malopterurus electricus.</i> <i>Tetrodon fahaka.</i>	Electric Cat-fish. The Puffer-fish.

LAKE BARINGO.

CYPRINIDAE.	<i>Barbus gregorii.</i>	Libile.
SILURIDAE.	<i>Labeo cylindricus.</i>	Livuli.
CICHLIDAE.	<i>Clarias mossambicus.</i> <i>Tilapia nilotica.</i>	Singre; Mumi. Sibore.

LAKE HANNINGTON.

CYPRINIDAE.	<i>Labeo cylindricus.</i>	
SILURIDAE.	<i>Clarias mossambicus.</i>	Cat-fish.

LAKE NAIVASHA.

CYPRINODONTIDAE.	<i>Haplochilichthys antinorii.</i> (Indigenous to the Lake.)	
CICHLIDAE.	<i>Tilapia nigra.</i> (Introduced 1926.)	Ngege.
CENTRARCHIDAE.	<i>Micropterus salmoides.</i> (Introduced 1928.)	Large mouth black bass.
SALMONIDAE.	<i>Salmo irideus.</i> (Downstream migration from the Morandat River.)	Rainbow trout.

KERIO RIVER.

CYPRINIDAE.	<i>Barbus bynni rudolfianus.</i>	
SILURIDAE.	<i>Clarias lazera.</i>	Cat-fish.
CICHLIDAE.	<i>Tilapia nilotica.</i>	
MALOPTERURIDAE.	<i>Malopterurus electricus.</i>	Electric Cat-fish.

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
SEYA RIVER.		
CYPRINIDAE.	<i>Barbus erlangeri.</i> <i>Barbus percivali.</i> <i>Labeo cylindricus.</i>	
NAMANGER RIVER		
CYPRINIDAE.	<i>Barbus paludinosus.</i>	
SILURIDAE.	<i>Clarias mossambicus.</i>	Cat-fish.
CICHLIDAE.	<i>Tilapia nigra.</i> (Introduced.)	Ngege.
LUMI RIVER, TAVETA.		
CYPRINIDAE.	<i>Barbus lineomaculatus.</i> <i>Barbus lumiensis.</i> <i>Labeo cylindricus.</i>	
SILURIDAE.	<i>Clarias mossambicus.</i>	Cat-fish.
ATHI RIVER.		
CHARACINIDAE.	<i>Alestes nurse.</i>	
CYPRINIDAE.	<i>Barbus mariae.</i>	Domo.
	<i>Barbus tanensis.</i>	} Large barbus Mtonzi, Kambale, Kuyu.
	<i>Barbus athi.</i>	
	<i>Barbus copleyae.</i>	
	<i>Barbus matris.</i>	
	<i>Barbus amphigramma.</i>	} Small barbus.
	<i>Barbus percivali.</i>	
	<i>Barbus alkeleyi.</i>	
	<i>Labeo cylindricus.</i>	
SILURIDAE.	<i>Schilbe mystus.</i>	Butter fish.
	<i>Clarotes laticeps.</i>	Pongwe.
	<i>Bagrus docmac.</i>	Shula.
	<i>Clarias mossambicus.</i>	Kambali.
	<i>Amphilius grandis.</i>	
	<i>Chiloglanis athiensis.</i>	
	<i>Chiloglanis brevibarbus.</i>	
CYPRINIDAE.	<i>Discognathus hindii.</i>	
	<i>Discognathus dembeensis.</i>	
MORMYRIDAE.	<i>Mormyrus kannume.</i>	Tangu; Elephant
	<i>Mormyrus tenuirostris.</i>	snout-fish.
CICHLIDAE.	<i>Tilapia nigra.</i>	Kina.
GOBIIDAE.	<i>Gobius (Awaous) aenofuscus.</i>	
ANGUILLIDAE.	<i>Anguilla mosambica.</i>	Eels; Mkunga.
	<i>Anguilla labiata.</i>	
	<i>Anguilla unicolor.</i>	
MASTACEMBELIDAE.	<i>Mastacembelus victoriae.</i>	

The tributaries are as follows:—

The Stoney Athi, Embakasi, Nairobi, Thita, Thiririki (trout) Ndarugu (trout), Ruraka, Kibwesi, Tsavo, and Kiboko Rivers.

FAMILY.	SCIENTIFIC NAME.	COMMON AND NATIVE NAME.
UASO NYIRO RIVER.		
MORMYRIDAE.	<i>Mormyrops deliciosus.</i>	Elephant snout-fish.
	<i>Mormyrus kannume.</i>	Elephant snout-fish.
CYPRINIDAE.	<i>Barbus erlangeri.</i>	
	<i>Barbus percivali.</i>	
	<i>Barbus argyrotaenia.</i>	
	<i>Barbus minus.</i>	
	<i>Barbus mariae.</i>	
	<i>Barbus perplexicans.</i>	
	<i>Labeo percivali.</i>	
	<i>Labeo cylindricus.</i>	
	<i>Discognathus hindi.</i>	
SILURIDAE.	<i>Eutropsis depressirostris.</i>	Cat-fishes.
	<i>Bagrus urostigma.</i>	
	<i>Clarias lazera.</i>	
	<i>Synodontis schall.</i>	
	<i>Synodontis geledensis.</i>	
	<i>Synodontis zambesensis.</i>	
	<i>Amphilius grandis.</i>	
	<i>Amphilius oxyrhinus.</i>	
CICHLIDAE.	<i>Clarotes laticeps.</i>	
	<i>Tilapia nilotica.</i>	
	<i>Tilapia percivali.</i>	
	(Hot springs at Chandler's Falls.)	

The tributaries are as follows:—

Uaso Narok (trout), Sugaroi, Mutara, Naro Maro (trout), Burguret (trout), Liki (trout), and Nanyuki (trout).

TANA RIVER.		
MORMYRIDAE.	<i>Mormyrus kannume.</i>	Elephant snout-fish.
CHARACINIDAE.	<i>Alestes nurse.</i>	
CYPRINIDAE.	<i>Barbus gregori.</i>	
	<i>Barbus tanensis.</i>	
	<i>Barbus mariae.</i>	
	<i>Barbus aphigramma.</i>	
	<i>Labeo cylindricus.</i>	
	<i>Labeo gregori.</i>	
SILURIDAE.	<i>Clarias mossambicus.</i>	Cat-fishes.
	<i>Schilbe mystus.</i>	
	<i>Eutropius depressirostris.</i>	
	<i>Synadontis victoriae.</i>	
	<i>Chiloglanis brevibarbus.</i>	
	<i>Amphilius grandis.</i>	
ANGUILLIDAE.	<i>Anguilla mosambica.</i>	Eels.
	<i>Anguilla labiata.</i>	
	<i>Anguilla unicolor.</i>	

The tributaries are as follows:—

Thika (trout), Thika Chania (trout), Maragua (trout), Gura (trout), Mathioya (trout), Nyeri Chania (trout), Ragati (trout), Amboni (trout), Thiba (trout), Mara, Thuchi, Ena, Nithi, Mutonga, Itaru (trout), Thingishu (trout), Karita (trout), and Mariani (trout).

PLATE 1.

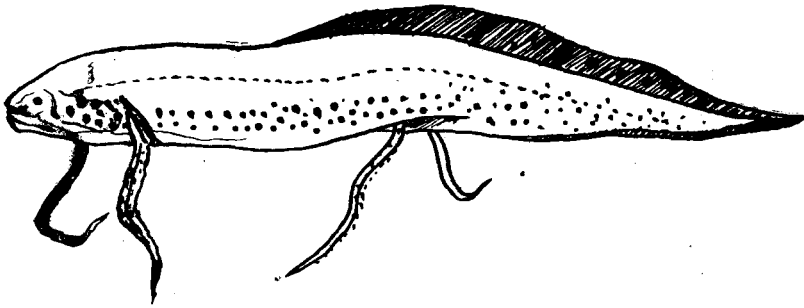


FIG. 1. *Protopterus aethiopicus*. 1/3

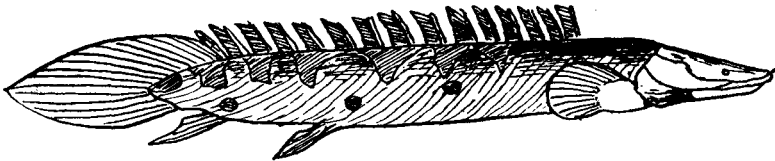


FIG. 2. *Polypterus bichir*. 1/4

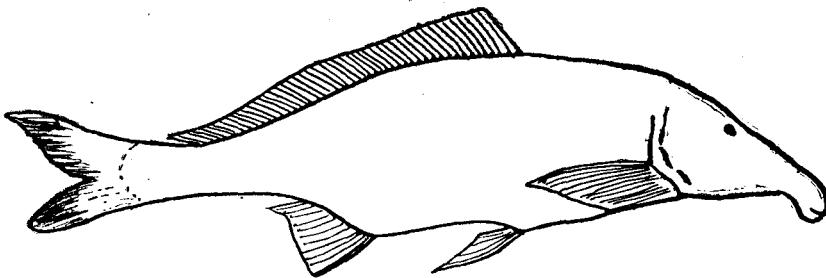


FIG. 3. *Mormyrus kannume*. 1/3

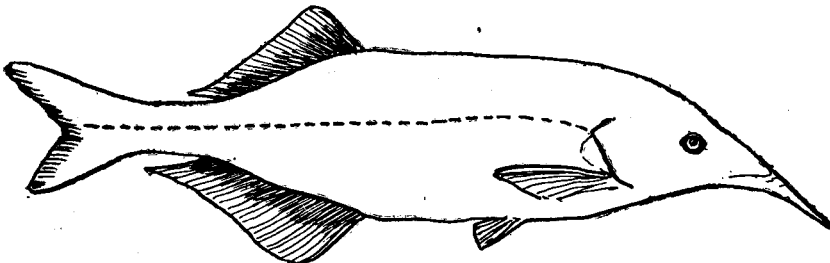


FIG. 4. *Gnathonemus longibarbis*. 1/3

PLATE 2.

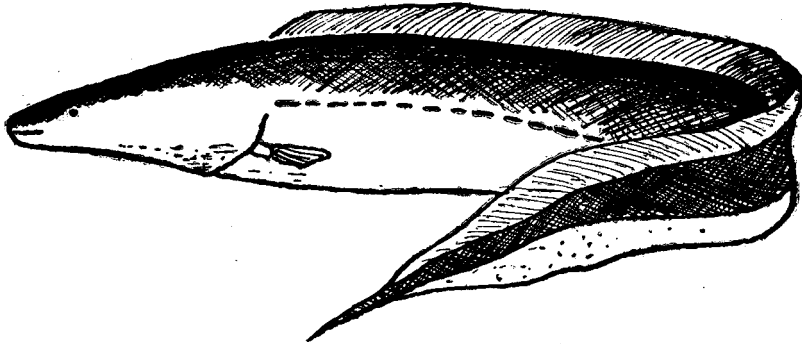


FIG. 5. *Gymnarchus niloticus*. 1/5

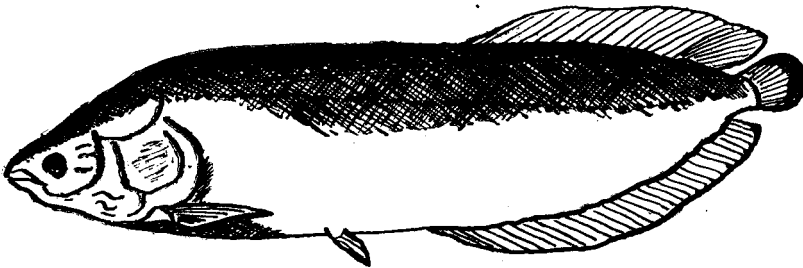


FIG. 6. *Heterotis niloticus*. 1/4

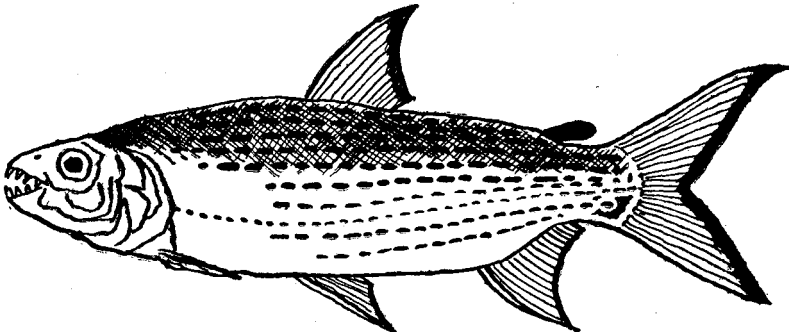


FIG. 7. *Hydrocyon lineatus*. 1/4

PLATE 3.

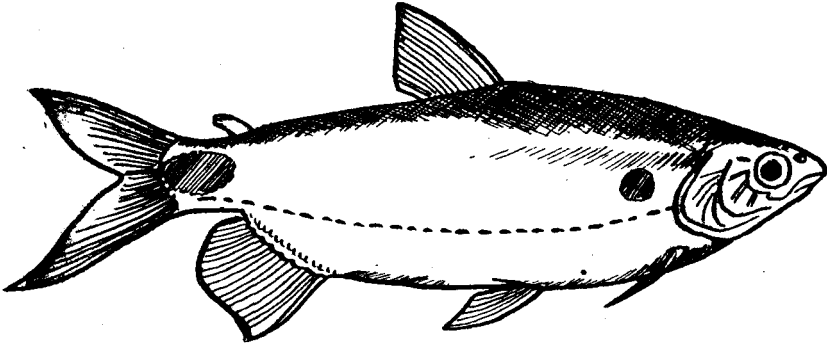


FIG. 8. *Alestes nurse*. 1/2

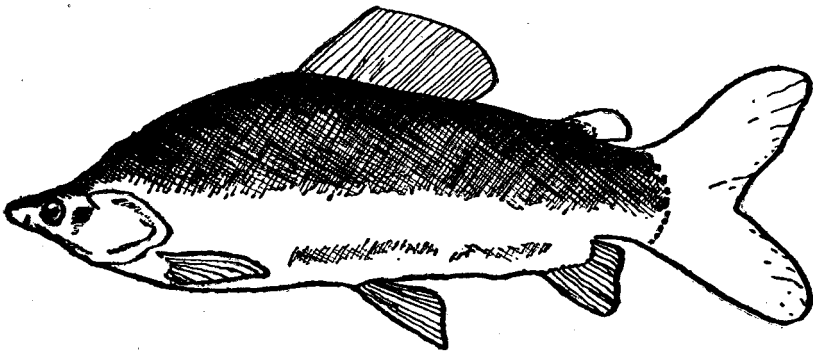


FIG. 9. *Distichodus niloticus*. 1/4

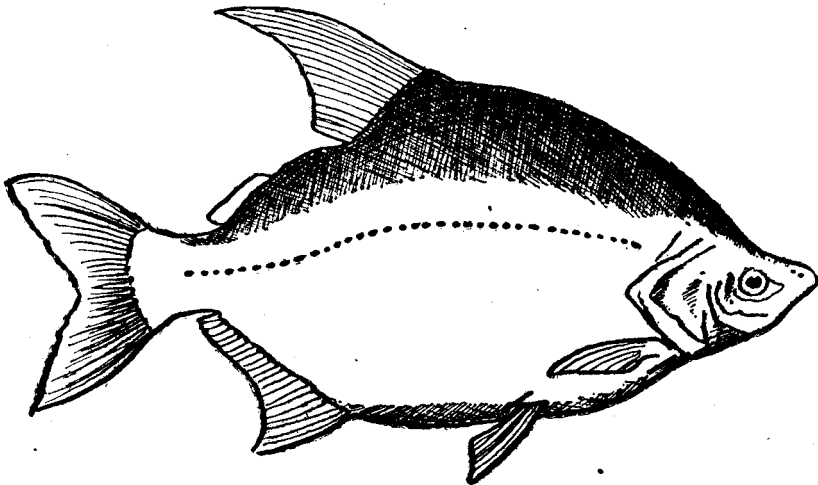


FIG. 10. *Citharinus citharus*. 1/4

PLATE 4.

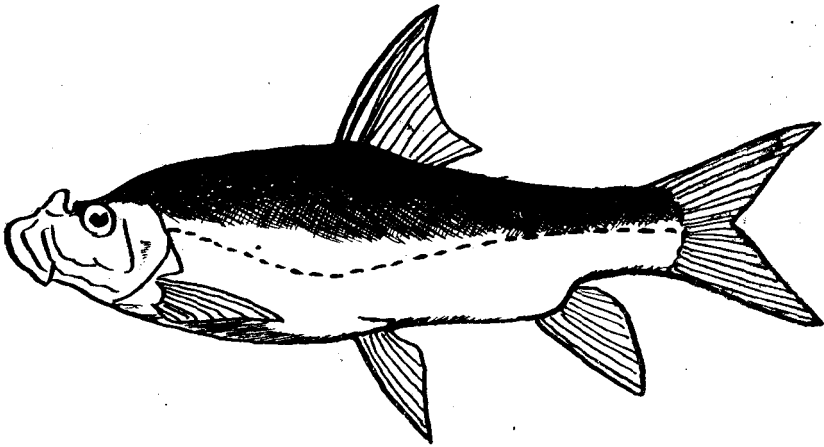


FIG. 11. *Barbus mariae*. 1/4

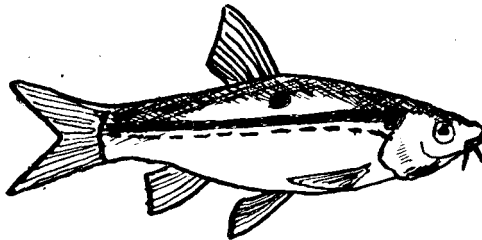


FIG. 12. *Barbus percivali*. Nat. size.

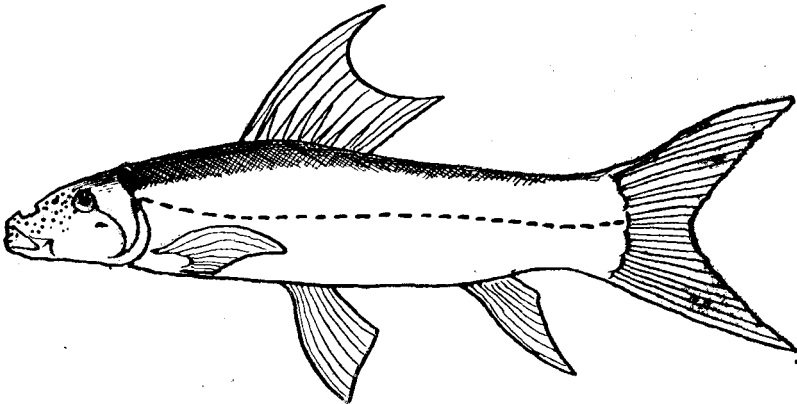


FIG. 13. *Labeo cylindricus*. 1/3

PLATE 5.

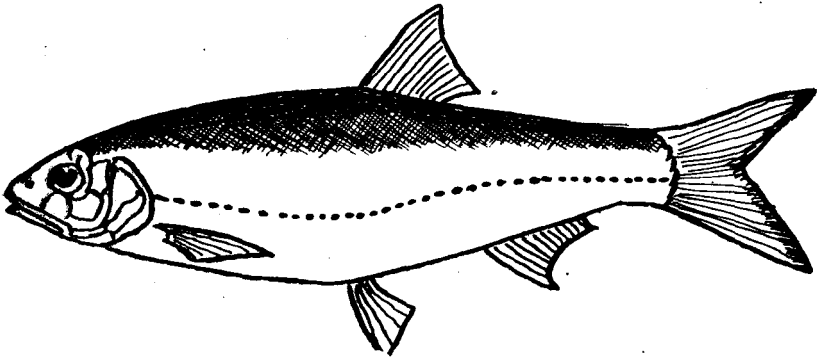


FIG. 14. *Barilius niloticus*. 1/2

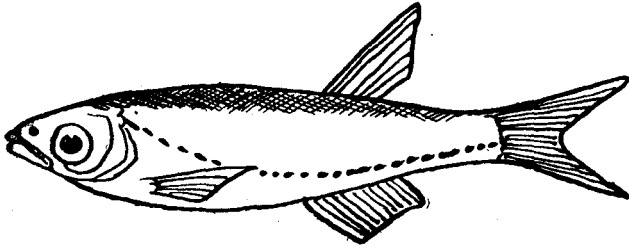


FIG. 15. *Engraulicypris stellae*. Nat. size.

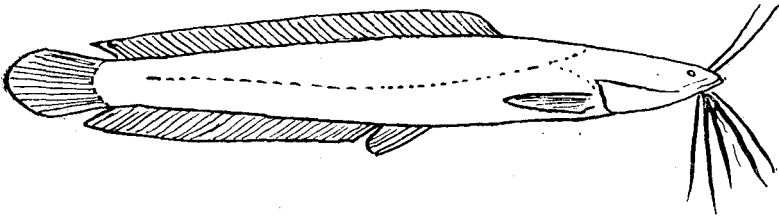


FIG. 16. *Clarias lazera*. 1/3

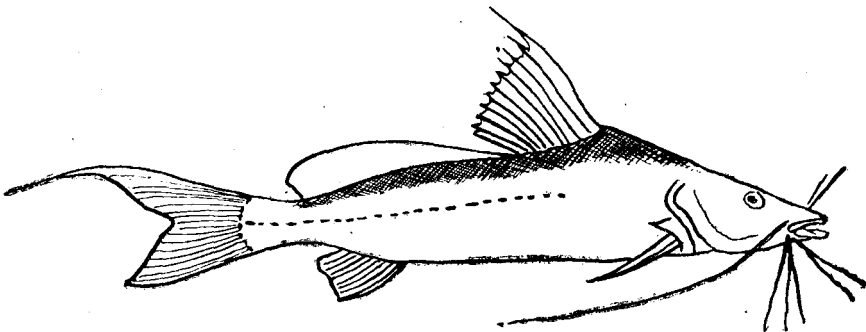


FIG. 17. *Bagrus docmac*. 1/4

PLATE 6.

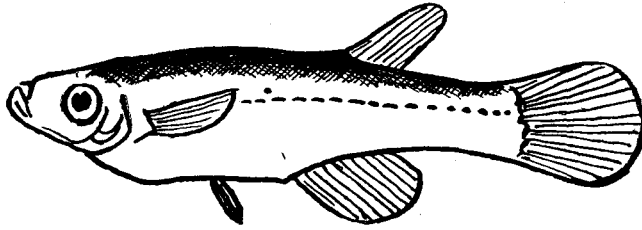


FIG. 18. *Haplochilichthys rudolfianus*. Nat. size.

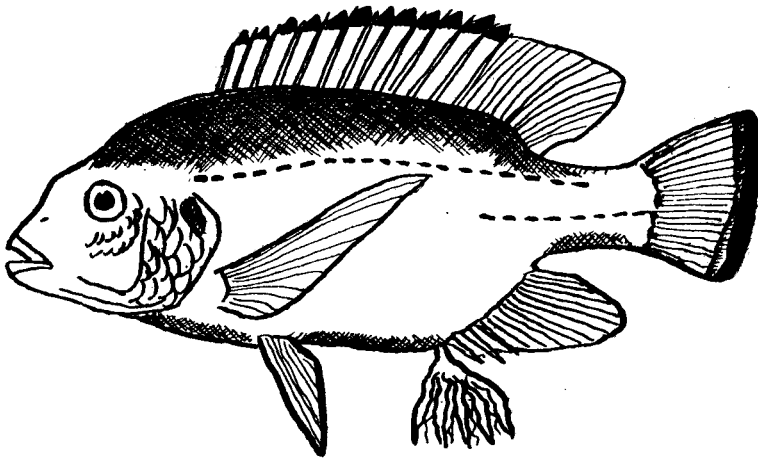


FIG. 19. *Tilapia variabilis*. 1/2

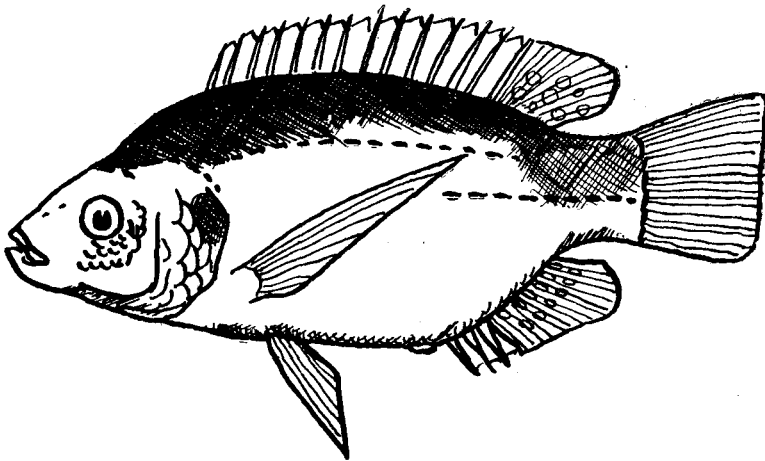


FIG. 20. *Tilapia esculenta*. 1/2

PLATE 7.

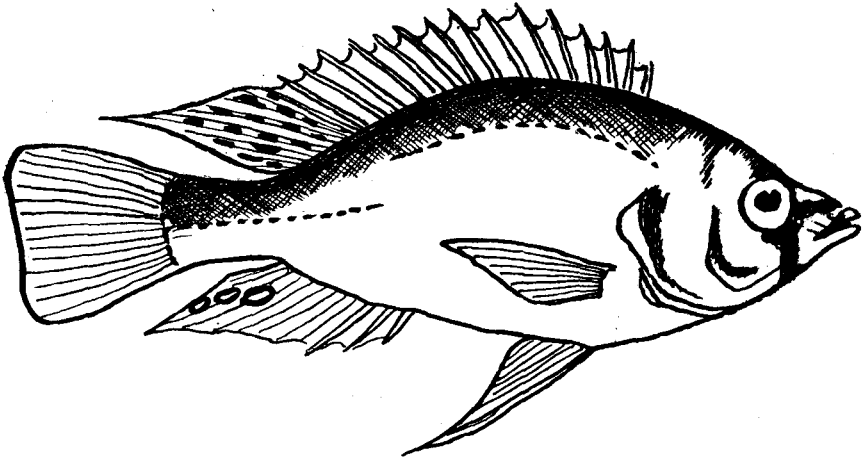


FIG. 21. *Haplochromis nuchisquamulatus*, 1/1.25

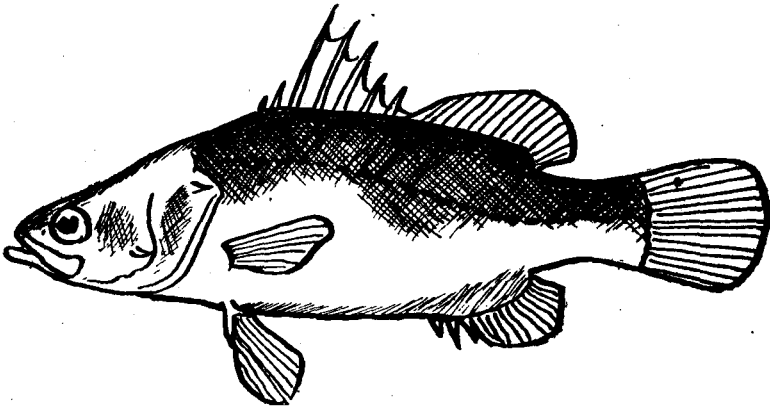


FIG. 22. *Lates niloticus rudolfianus*. 1/10.

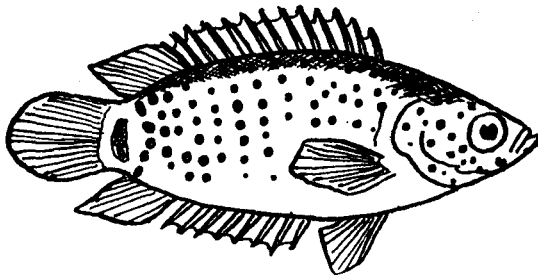


FIG. 23. *Anabas muriei*. Nat. size.

PLATE 8.

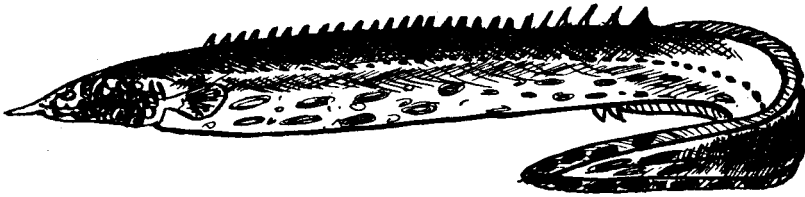


FIG. 24. *Mastacembelus victoriae*. 1/3

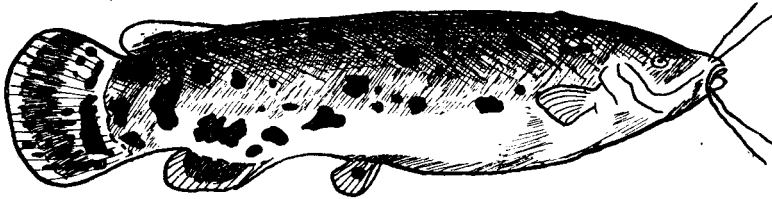


FIG. 25. *Malopterurus electricus*. 1/2

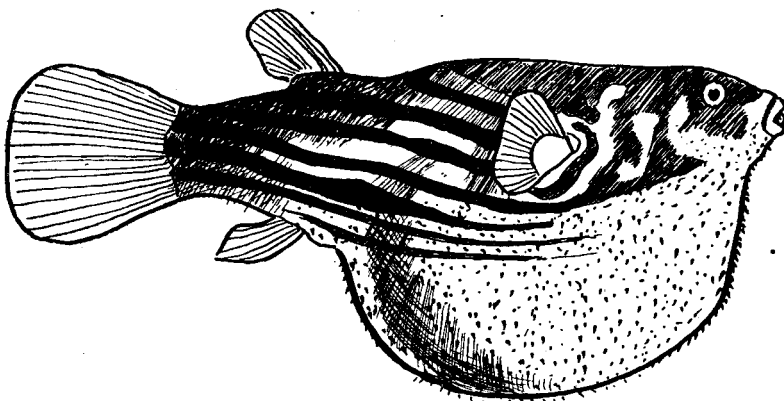


FIG. 26. *Tetradon fahaka*. Nat. size.