

Mearns

USNM 381331

~~Moxostoma macrolepidotum (Lesueur) Jordan~~

~~Las Moras Creek, Kinney Co., Texas. March 22, 1893~~

Xyrauchen texanus [Catostomus cypho]

381 331

Fins of Leatostomus cyphus Lockington
Verde River at Fort Verde Arizona
April, 1884.

E. A. Mearns.

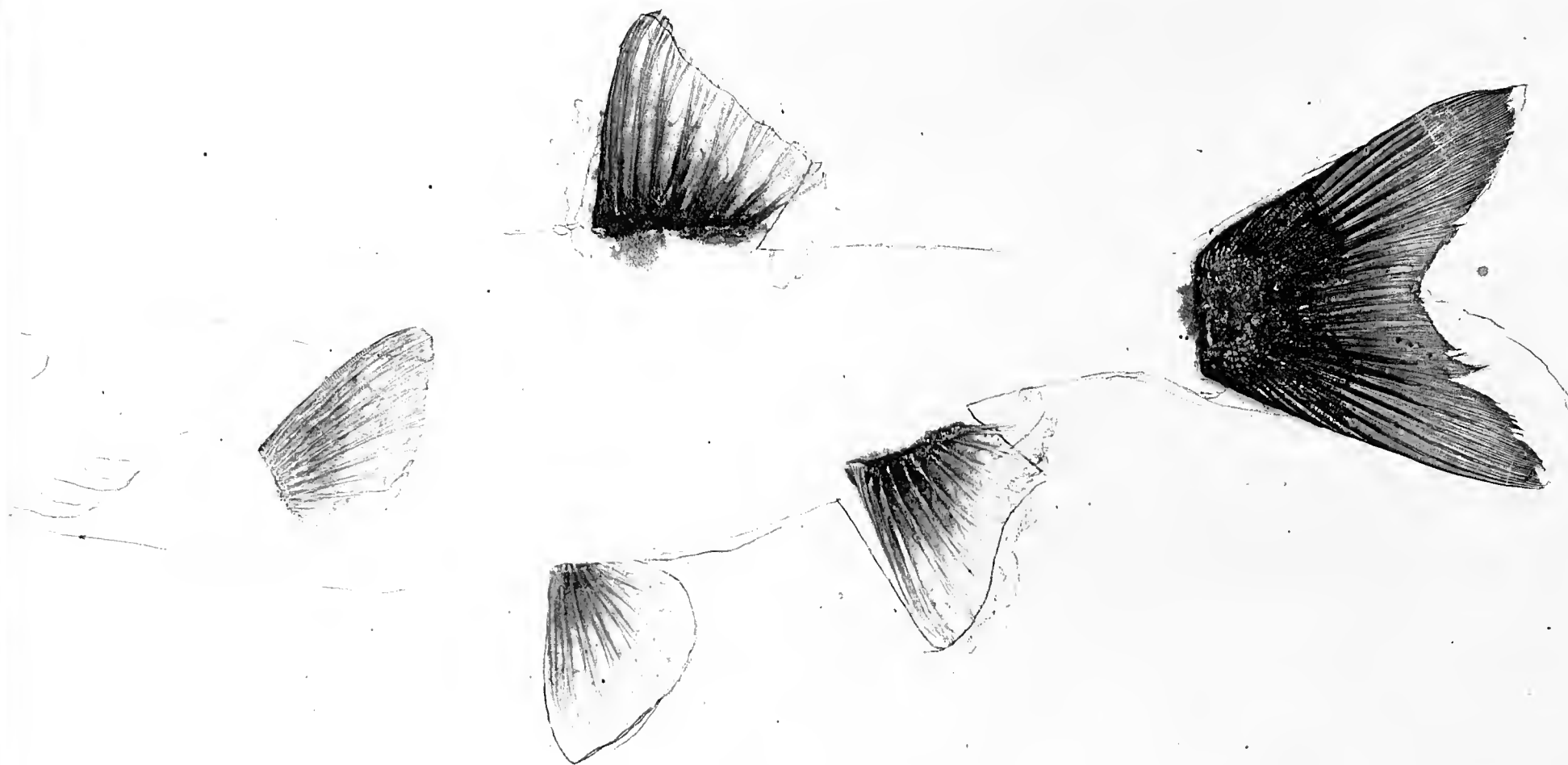
Mearns USNM 391335

"verde of Gila Salmon"

Near the mouth of Beaver creek

August 31st, 1884

C. H. Mearns



"Tide or Gila Salmon"

— Near the mouth of Beaver Creek.
— August 31st, 1884.

USNM 381335

from Mearns: US/Mex. Border Survey notebook - 1893

NO. 3 Gila intermedia [Richardsonius gibbosus]

USNM 381340

Clear Creek, 20 miles above its confluence

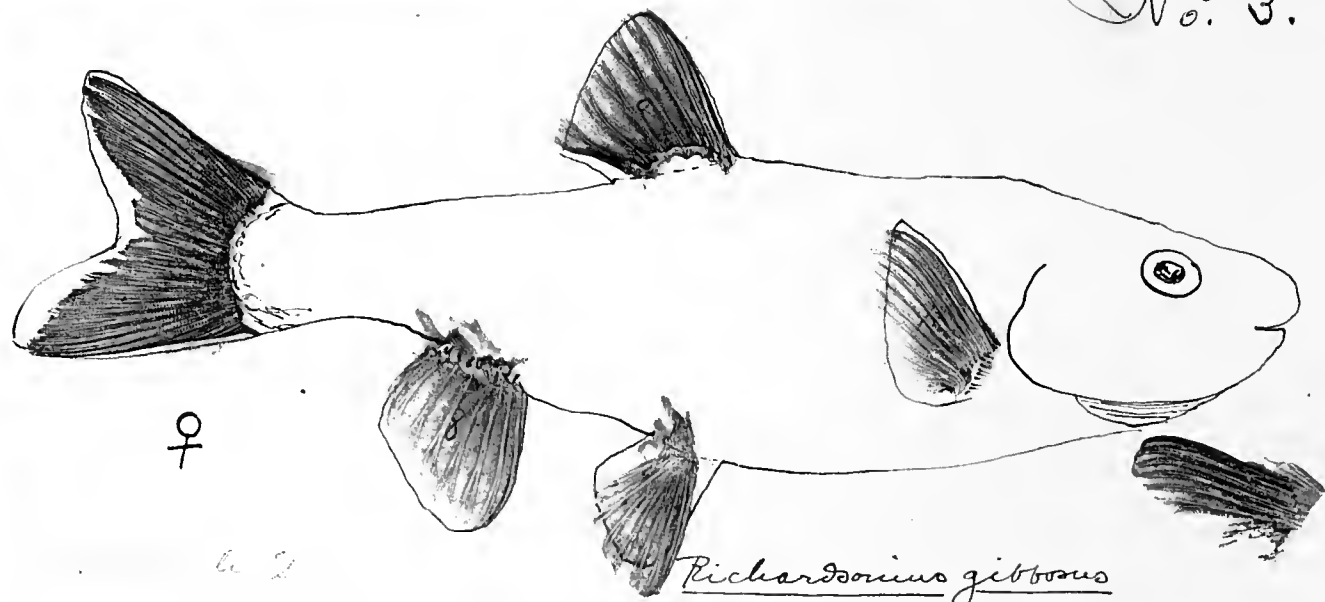
with the Rio Verde ♀

"about July 2"

No. 3.

USNM 381340

Gila intermedia



♀

62

Richardsonius gibbosus

Area around base of fins vermilion; fins themselves orange.
Sides golden yellow. Back dark olive-green. Sides of head
brassy yellow, granulated with black. Iris yellow.
Ventral region yellow.

Clear Creek, 20 miles above its confluence with the Rio Verde,
Arizona. Fins preserved. Edgar A. Mearns.

Mearns

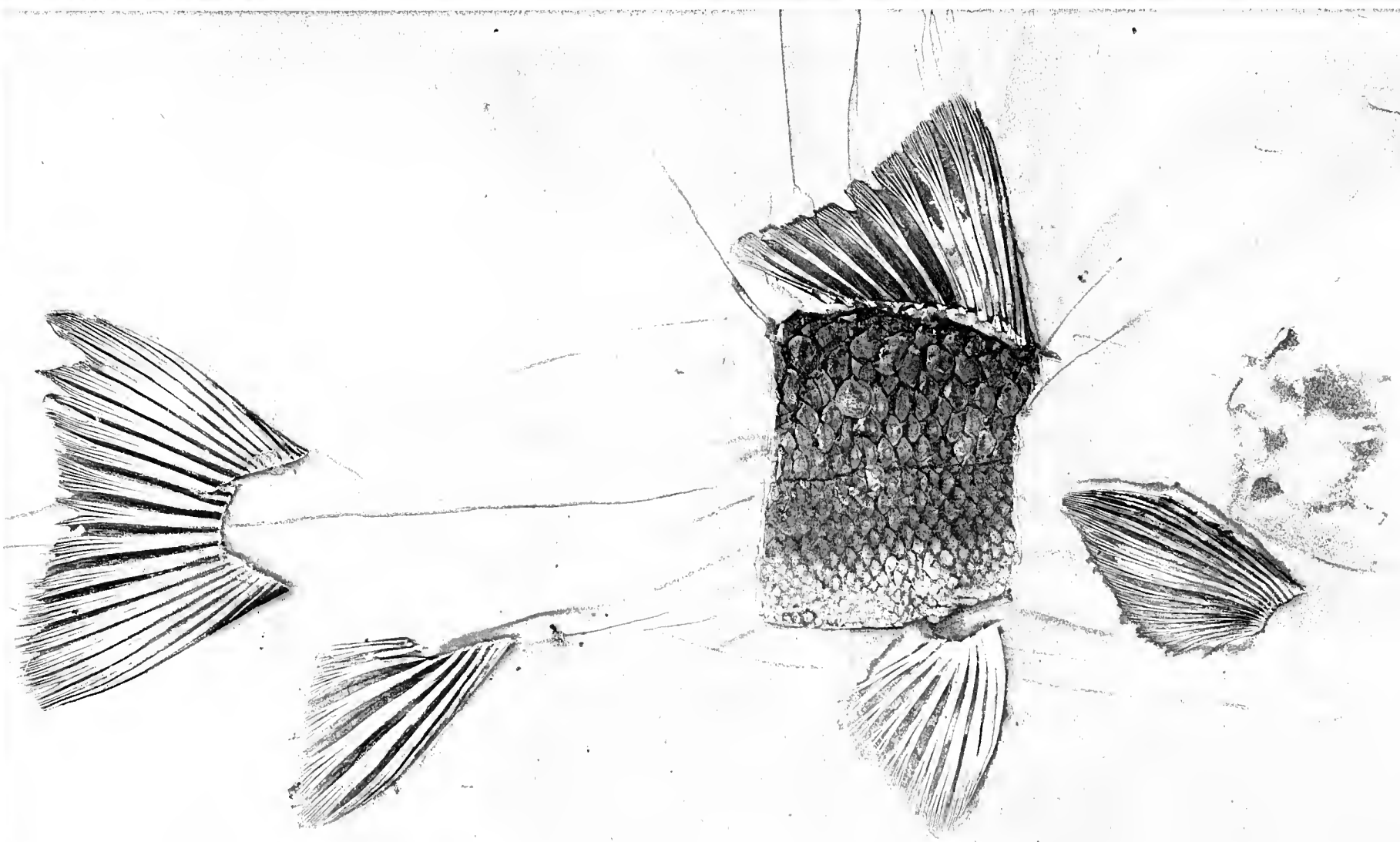
Blunt-nosed Sucker

July 28, 1886

Verde River

Mearns

Blunt-nosed Sucker
Ju
ve



Blunt-nosed Sucker. July 28th, 1886 Verde A.

Mearns

Sharp-nosed Sucker

July 28, 1886. Verde River, Arizona

Copy

USNM



Sharp-nosed Sucker. July 28, 1886. Verde
River, Arizona

Mearns

U.S. + Mexican Bd.

1. Fins of Catostomus cypho Lockington

Verde River at Fort Verde Arizona

April, 1884

381321

2. Tracing of Ictalurus

"see description Journal page 253

(no specimen)

copy

Mearns. U.S.
F.
Mexican Bd.

1893-4

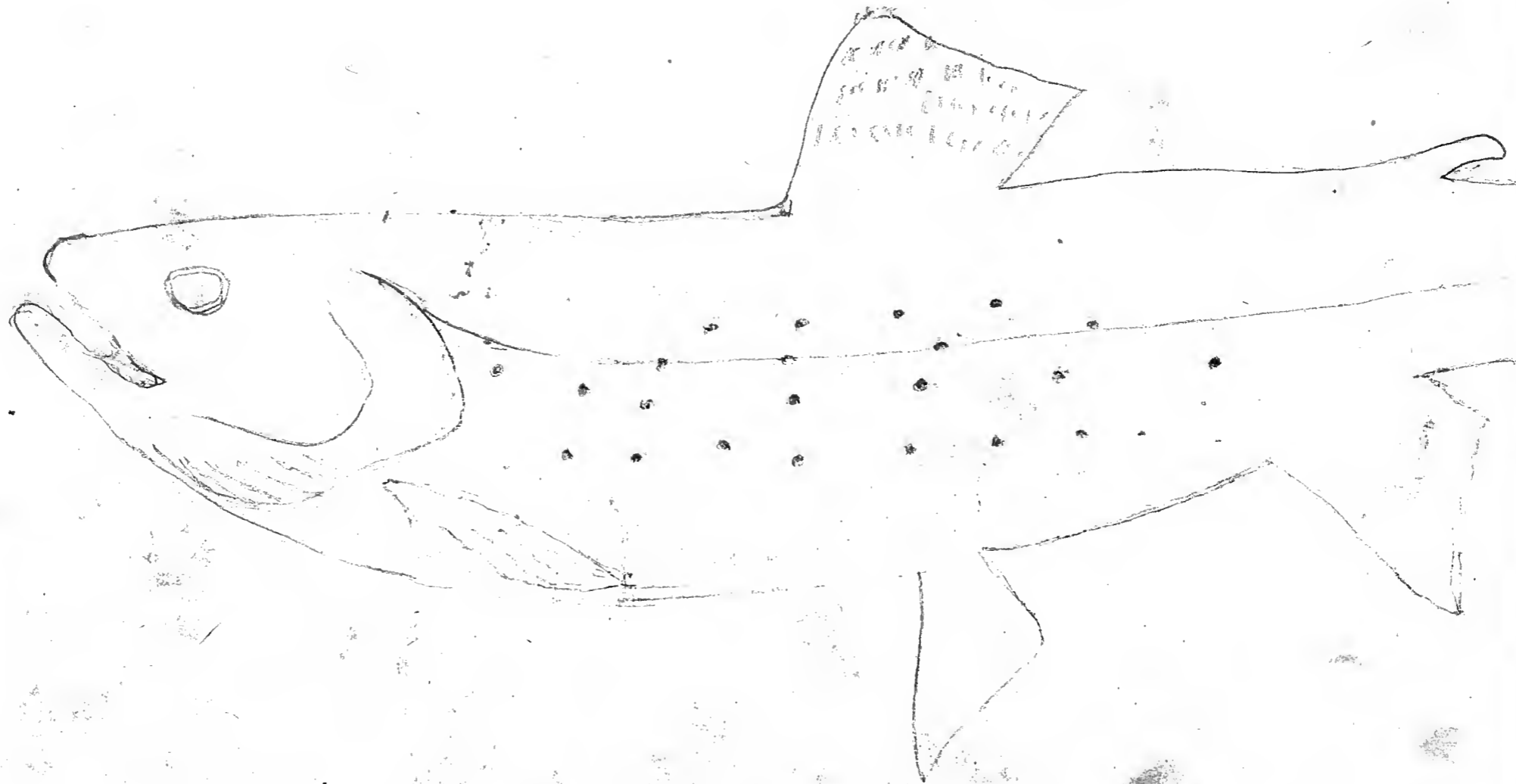
Clusia anthracina



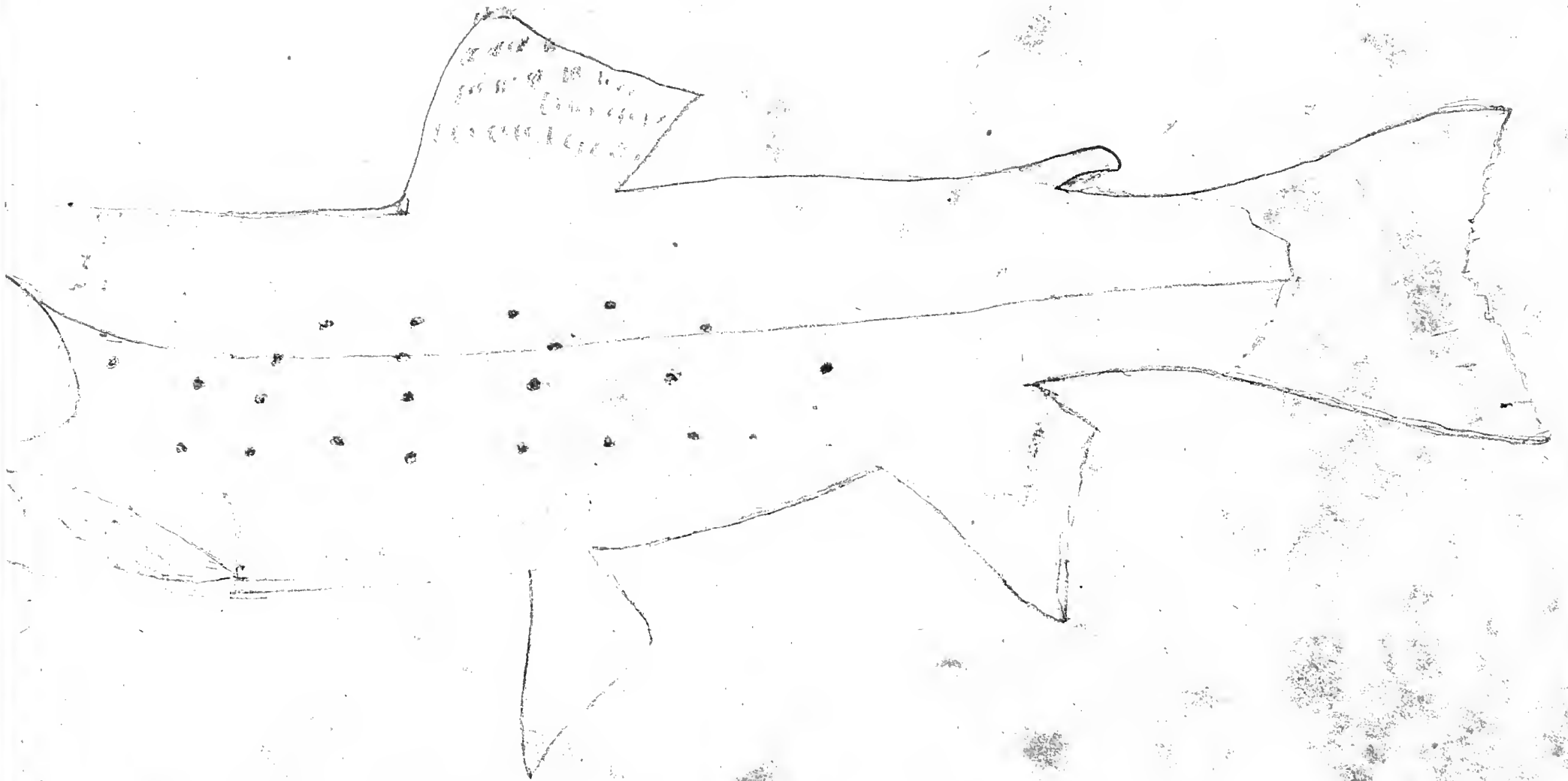
Tracing of Octalurus.
See description Journal page 253

Mearns

Tracings of fishes



Brook Trout from Camp Douglas, Jun
August 20, 1890. E. A.



Brook Front from Camp Douglas, Juneau Co., Wisconsin
+ 11.1890. E. A. M.

"Mud Cat." Leptotes olivaris
Las Moras Creek, Kinney Co., Texas.
April 12, 1898. Head and eight fins for
Weight 23 pounds.
Edgar A. Mearns.

Ictopes olivaris

creek, Kinney Co., Texas.

1898. Head and eight fins preserved in alcohol.

23 pounds.

Edgar A. Mearns.

Journal pp. 395, 396. and
Gilbert's "Synopsis" p. 129.

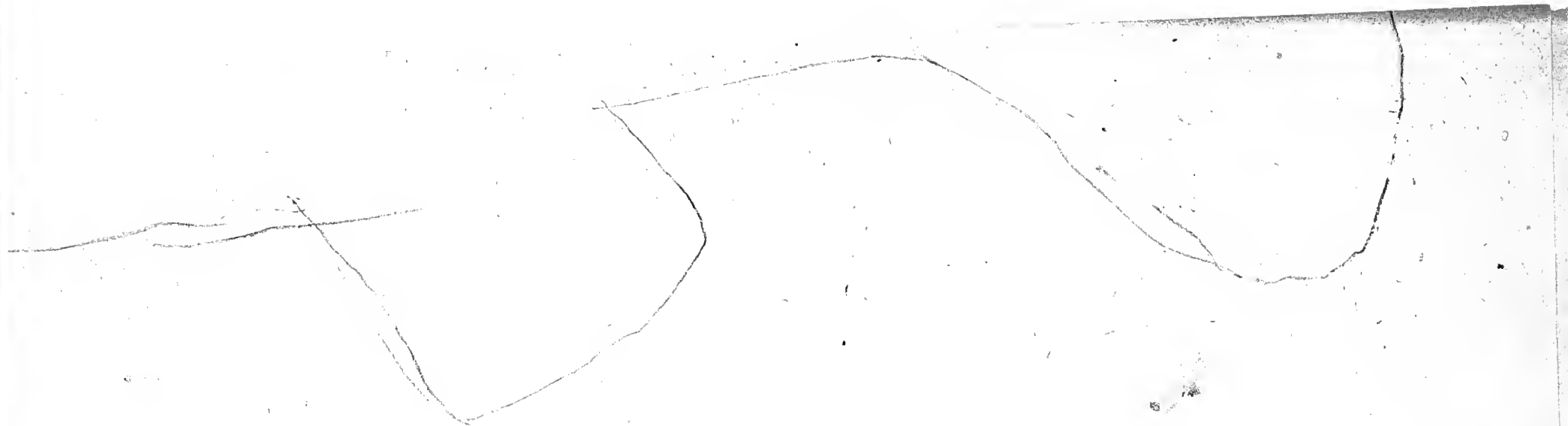
Catostomus cypho Lockington ♂ ad.

"Hump-backed Sucker"

Verde River at Fort Verde, Arizona, July 24, 1885.
E. A. Mearns.

See my Journal pp. 395, 396. and
Jordan & Gilbert's "Synopsis" p. 129.

Catostomus cypho Lockington
"Hump-backed Sucker"
Verde River at Fort Verde, Arizona



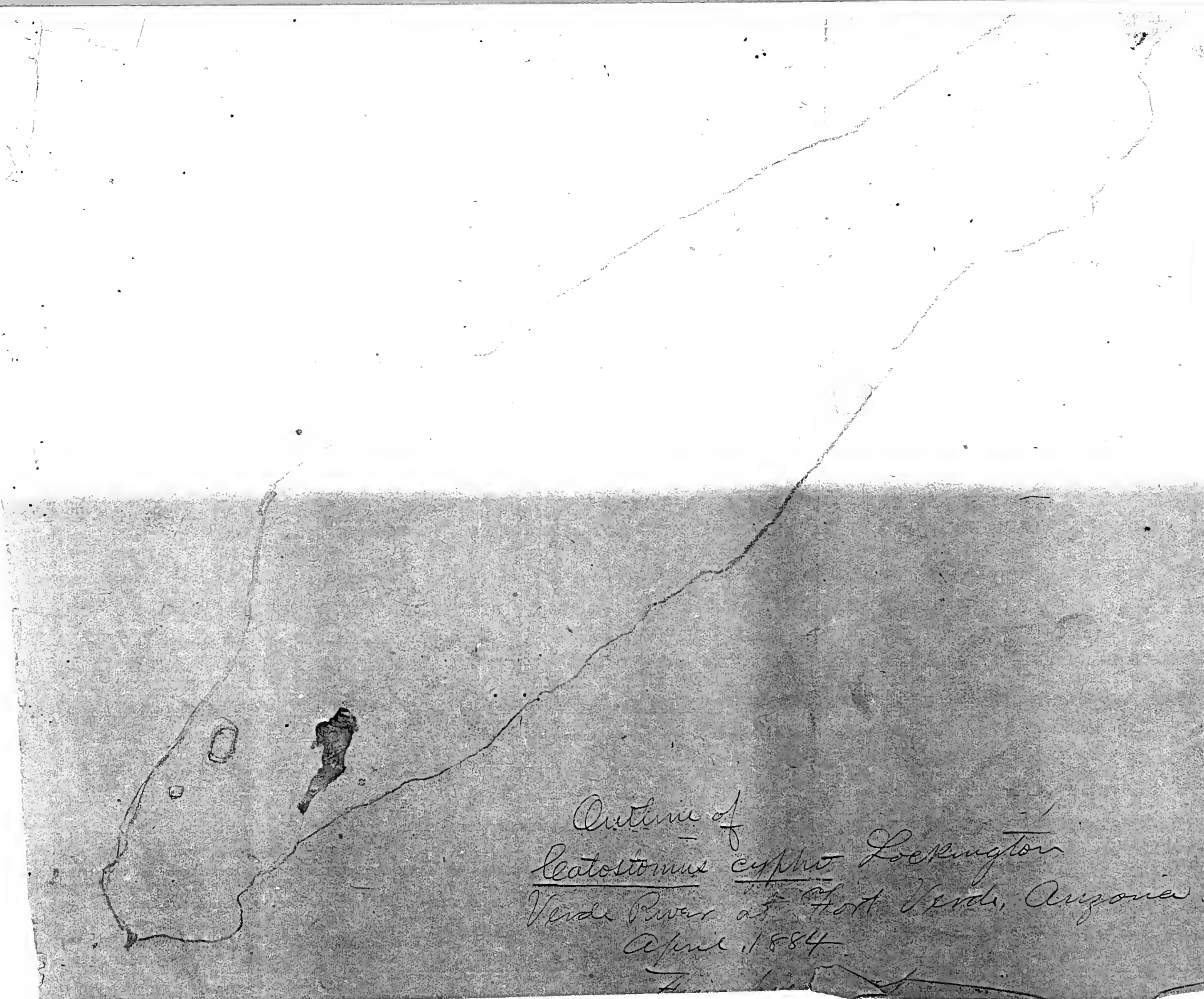
Weight 3 lbs.
This species attains a weight of 7 or 8 lbs.
Micropterus Lillian Heard
newcensis Las Moras Creek, Ft. Clark Texas Louis Heard 4/7/12

1214 H. 1/2

May 19, 1898

H. Clark, Texas (Las Moras Creek).

Edgar A. Mearns.



Outline of
Scatostomus cyphus Lockington
Verde River at Fort Verde, Arizona
April 1884.

Catostomus commersoni Cope & Yarwood
Utah Lake, Sucker adult.
Verde River at Fort Verde, Arizona July 24th 1885.
Edgar A. Mearns.

Mearns

Notes and Correspondence
about fishes

1894 Copied. cat. #fishes

Dr. E. A. Mearns,

U. S. National Museum.

Fish Myers,

ACCESSION CARD.

Was.

Date:

Nov. 13/94

Acc. No.

28661

Cat. No.

Alc. specimens of Fishes

Mexican & U.S. Bd. Surv., Ft. Yuma, Cal., & Pacific O.

Apr. 6 to Sept. 3, 1894.

P. A. Bean

44/111

90/451

R 575

25.00
23.00
2.00

4

2.00
575

1.3

5 / 2 1/2 3,
1.0
3.5

Aplocheilichthys lucius

601	45406,	25 1/2 inches,	Scales 95
34411	45407	20 1/2 "	Scales 98
3240		14 1/2 "	
3232	45410	7 3/4 - 4 3/4	
3202	45410	7 1/2	

Gila robusta elegans

3210	45401	15 1/2 inches
3231	45400	17 "
3216	45403	15 3/4 "
3229	45402	8 "
		10 1/2 "
	45404	16 "
3350		13 "

E. C. Miller
Mex. Isl.

Head ... distance from base of last anal ray to base of caudal ... 1 1/2 in. this distance

45405 - 1 3/4 to 5/8 inches. 30 specimens
Head is slightly longer or equal to distance from base of last anal ray to base of caudal. The caudal peduncle is longer in the larger specimens as shown by this collection

with the above on a lake are 21 specimens 1 1/2 to 3 1/2 inches, like the above

Means - Mex. Bol.

(mexicanus?)
Mugil cephalus, (3378) 45418
18 inches,

Cyprinus carpio (3293),

dorsal with a hump much
like that of a. m. chern, (Scales 44)
Length 19, inches,

(3287)	16 inches,	slight hump
(3440)	45-415,	11 3/4 inches "
3255	} 45-414	8 1/2 inch Hump none
3257		7 1/2 "
(3239)	45411	11 " Peatic. Carp. slender
(3439)	45413	11 1/2 " minor carp. slight hump
3207	} 45410	9 " Slight hump
3200		9 1/2 "
3208		5 2 "
3250	14 "	Slight hump
3217	4 1/2 "	

Tyrancheu cypho

45397	15 inches,
45398 (3438)	18 inches,
45395 (3427)	17 "
45396 (64)	18 "
45399 (3353)	5 1/4 "

Mearns West Isl.

Cyprinodon macularius

45426 (25)

many specimens, nearly all
females (about 150)

28 to 50 mm,

In bottle was 2 ♂, intermedius 25 to 60 mm,
(L.)

Cyprinodon macularius

22 ♂, 45 to 62 ~~mm~~ mm.

38 ♀ 38 to 38 mm,

"Arizona 1892"

C. macularius

45435 (22)

many specimens, 25 to 55 mm.

most are males, some a few males

Small ♂ intermedius
(L.)

C. macularius

45439, (45)

many, 35 to 50 mm.

C. macularius

45427

20 to 45 mm,

many specimens.

Cyprinus carpio

45-412	3252	4 1/4,	Leather Minor
	3220	4 1/4	"
	3214	4	"
	3212	4 1/4	"
	3242	2 1/2	Leather

3 Leather cork 4 1/2 to 3 3/4 inches
 6 minor cork 3 1/4 to 4 inches
 9 Scale cork 3 to 7 1/2 inches
 All of the above under the
 Catalog No. of 45-412

Leuciscus intermedius

45-4.7
 small, slender, inferior, caudal
 peduncle 2 1/3 in head to 2 1/3 in head,
 origin of dorsal ^{about} midway between eye and
 base of caudal,
 Hw 3 1/2 - 3 3/4, Scales about 90 DTL
~~52 mm to 9 mm 9 to 75 mm~~
 In this lot was one small *Cyprinodon macularis*
 21 mm

Cyprinodon macularis,
 45-20 (29) *Cyprinodon*
bonroyti *ignavia*, Bris -
 Scales 26
 57 44 to 58 mm,
 274 25 to 30 mm,
 In this lot was a small *L. intermedius* 15 mm

measur met. Bel.

C. maculatus

✓ 45434, 24
21 to 50, mm,
many,

C. maculatus

45441
✓ 2 males with bars,
48 + 50 mm.

45431



Fishes

acc.
28661.

List of Fishes contained in
Alcohol shipped from San Diego, Cal.
1894, by Edgar A. Mearns.

Region. - Ft. Yuma, Calif. to the Pac
Time. - April 6 to Sept. 3, 1894,

War Department.

Post of _____

OFFICIAL BUSINESS.

Any person using this envelope to avoid the payment of postage on private matter of any kind, will be subject to a fine of three hundred dollars.

the 16-gal. tank of
slip., about Sept. 10,

ific, on Mex. Bd. Line.

No. 3334.

Ten (10) small Fishes from
a "laguna" of Dalton River, at
Seven Wells, Colorado Desert,
Lower California, about four
(4) miles south of the U. S. border,
April 8, 1894. Color blue, with
gold spots on sides of tail, and yel-
-lowish caudal fin.

Edgar A. Mearns.

No. 3348.

Four (4) species (many specimens
of each) of Fishes from a
laguna" of Dalton River, at Seven
Wells, Colorado Desert, Lower
California, about 4 miles south
of the U. S. border. April 8, 1894.

Edgar A. Mearns.

No. 3243.

Very large Carp from a laguna
of the Dalton River, at Seven Wells
in the Colorado Desert, Lower
California. April 15, 1894.

This species is abundant now
in all of the waters of the Colo.
R., including the Gila.

Edgar A. Mearns.

No. 3428.

Fish (Catostomus cyphus) from
a laguna of Dalton River, on the
Colorado Desert, at Seven Wells,
Lower California, about four
miles south of the U. S. border.
April 14, 1894.

Edgar A. Mearns.

No. 3352.

One fish from the Dalton
River, on the Colorado Desert,
Lower Calif. April 13, 1894.

Edgar A. Mearns.

No. 3250.

A large Carp from the
Dalton River, on the Colorado
Desert, about 4 miles south of
the U. S. border, in Lower Calif.
April 13, 1894.

Edgar A. Mearns.

No. 3449.

Two Fishes from a laguna
of Dalton River, on the Colorado
Desert, Lower California, about
4 miles south of the U. S. border,
April 12, 1894.

Edgar A. Mearns.

No. 3320.

Fishes (genus Gila) from a
"laguna" of Dalton River, on the
Colorado Desert, about four (4)
miles south of the U. S. border,
in Lower California, Mexico -
April 11, 1894.

Note: - One of these was probably
thrown into the tank loose (without tag).

Edgar A. Mearns.

No. 3228.

About fifteen (15) small fishes from a lagoon of Salton River, at Seven Wells, Colorado Desert, Lower California. April 9, 1894.

Salton River is a long slough of the Colorado River, which latter overflows its banks periodically so that the water backs up occasionally as far as the so-called "Salton Sea", north of the boundary. New River is similar; further west. E.A.M.

Edgar A. Mearns

No. 3287.

Carp from Gardner's Laguna, Salton River, on the Colorado River, Lower California, April 22, 1894.

Edgar A. Mearns

3272.

A Fish from "Unlucky Lake", a lagoon of the New River San Diego Co., Calif. April 30, 1894.

Edgar A. Mearns

No. 3474.

Marine Fish from the Pacific Ocean at the last monument (No. 258) of the Mexican boundary line. July 10, 1894.

Edgar A. Mearns

No. 3463.

A small fish from the Pacific Ocean at the mouth of the Tia Juana River, San Diego Co., California. July 10, 1894.

Edgar A. Mearns

No. ?

One (1) Small Sea Fish from the Pacific Ocean at the mouth of the Tia Juana River, San Diego Co., California. July 11, 1894.

Edgar A. Mearns

No. 3459.

One (1) Fish from the Pacific, at the mouth (an estuary) of the Tia Juana River, San Diego Co., California. July 12, 1894.

Edgar A. Mearns

No. 3456. Two Small Fishes. Pacific Ocean at the mouth (i.e. estuary) of the Tia Juana River, San Diego Co., Calif.

July 13, 1894. I shot and killed two Snowy Plover (*Aegialitis nirova*) that were standing beside the estuary, and these fishes were accidentally killed by the same shot, and both jumped out upon the ground. Edgar A. Mearns.

No. 3433.

A sackful of small
fishes from the
Pacific Ocean at the last
monument (No. 258) of the
Mexican boundary line.

July 16, 1894.

Edgar A. Mearns.

No. 1607.

One Toadfish.
Pacific Ocean at the mouth
of the Via Juana River, San
Diego Co., California.

July 17, 1894.

Edgar A. Mearns.

No. 210. Small Fish.

Pacific Ocean at the mouth of
the Via Juana River, near
the last monument of the
Mexican boundary survey.

July 17, 1894.

Edgar A. Mearns.

No. 226.

One Fish (Flounder) taken
from the gullet of a Cor-
morant (*Phalacrocorax albociliatus*),
No. 11,424, ♂ ad., shot in San
Diego Harbor, Sept. 3, 1894.

Edgar A. Mearns.

No. ?.

Flying-fish from Pacific
Ocean, near Catalina Island.
It flew on board the Revenue
Cutter "Walcott", and was
presented by Lt. West of
that vessel.

"A common species."
Edgar A. Mearns.

No. 221

Sack filled with Crustaceans,
fishes, lizards, beetles, mouse,
etc., from San Clemente Island,
Pacific Ocean. August 23, 1894.

Edgar A. Mearns.

No. 3350.

"Colorado Salmon" from a
laguna of Dalton River, on the
Colorado Desert, Lower Calif.,
about four (4) miles south of the
U. S. border. April 13, 1894.

Edgar A. Mearns.

3385.

Three Fishes (*Gila gracilis*) from
the Dalton River, Colorado
Desert, Lower California, about
4 miles south of the U. S. border.
April 13, 1894.

Edgar A. Mearns.

No. 3219.

Fish (genus *Gila*) from a
laguna of Dalton River, on the
Colorado Desert, Lower California,
near the U. S. border. April 12, 1894.

Collected by Mr. F. X. Holzner.
[Note - To fix the exact locality for each
specimen, I can give the number of the
nearest monument of the new survey as
soon as the list is sent me.]

Edgar A. Mearns.

No. 3351.

Four Fishes (genus Gila) from
a "laguna" at Seven Wells,
Dalton River, Colorado Desert,
Lower California, about
four (4) miles south of the
international boundary.

April 8, 1894.

Edgar A. Mearns.

No. 3354.

3 specimens of Fishes (Gila
gracilis) from a laguna of
Salton River at Seven Wells,
Colorado Desert, Lower Calif.
about 4 miles south of the
U.S. border.

April 11, 1894.

Edgar A. Mearns.

Name.	Sex and age.	Number of rows of labial papillae.	Distance between orbits.	Length to base of caudal.	Caudal.	Caudal fork (emargination).	Height of body.	Length of head.	Diameter of eye.	From tip of snout to eye.	Vertical line (scales)	Pet. D. and. l. l.	Pet. Lat. l. and Ventral.	Scales in longitudinal series above labial line.	Length of pectoral.	Length of ventral.	Length of anal.	Branchial.	Length of dorsal.	Height of dorsal anteriorly.	Height of dorsal posteriorly.	Dorsal.	Pectoral.	Ventral.	Anal.			
Gila	♀ ad.										88	24	13					3				9	17	9	9	Blue		
"	♀ ad.										106	24	13					3				9	16	9	9			
Catostomus cypho				inches																						Sho		
Gila				$16\frac{6}{16}$	$3\frac{1}{16}$	$1\frac{5}{16}$	4	$4\frac{3}{16}$	46	$1\frac{12}{16}$	72	13	12	69	$2\frac{12}{16}$	$2\frac{8}{16}$	$2\frac{15}{16}$	3	$3\frac{5}{16}$	$2\frac{4}{16}$	$1\frac{6}{16}$	15	17	10	7			
"				14	3	$1\frac{8}{16}$	$3\frac{8}{16}$	$3\frac{14}{16}$	$\frac{9}{16}$	$1\frac{4}{16}$	57	21	12	92	$2\frac{2}{16}$	$1\frac{12}{16}$	2	3	$1\frac{12}{16}$	$2\frac{5}{16}$	1	9	16	9	9			
"				inches	12	$2\frac{5}{16}$	$1\frac{3}{16}$	3	$3\frac{3}{16}$	$\frac{8}{16}$	$1\frac{1}{16}$	95	20	11	—	$1\frac{14}{16}$	$1\frac{8}{16}$	$1\frac{13}{16}$	3	$1\frac{5}{16}$	$1\frac{14}{16}$	$\frac{14}{16}$	9	16	9	9		
Catostomus cypho				$1\frac{7}{16}$	$13\frac{8}{16}$	$2\frac{12}{16}$	$1\frac{2}{16}$	$3\frac{5}{16}$	$3\frac{11}{16}$	$\frac{6}{16}$	$1\frac{11}{16}$	71	12	14	68	$2\frac{13}{16}$	$2\frac{4}{16}$	$3\frac{1}{16}$	3	$2\frac{14}{16}$	$1\frac{15}{16}$	$1\frac{4}{16}$	14	17	10	7	Cat	
Blunt-nosed Sucker			$\frac{4}{10}$	$1\frac{3}{16}$	$11\frac{4}{16}$	$2\frac{1}{16}$	$\frac{5}{16}$	$2\frac{5}{16}$	$2\frac{5}{16}$	$\frac{5}{16}$	$1\frac{5}{16}$	72	9	9	72	$2\frac{2}{16}$	$1\frac{14}{16}$	$2\frac{3}{16}$	3	$1\frac{12}{16}$	$2\frac{2}{16}$	$\frac{12}{16}$	11	15	9	7		
"			$\frac{4}{11}$	$1\frac{1}{16}$	$10\frac{12}{16}$	$1\frac{14}{16}$	$\frac{8}{16}$	$2\frac{8}{16}$	$2\frac{4}{16}$	$\frac{6}{16}$	$1\frac{4}{16}$	69	6	9	59	$1\frac{14}{16}$	$1\frac{9}{16}$	$2\frac{3}{16}$	3	$1\frac{8}{16}$	$1\frac{15}{16}$	$\frac{12}{16}$	11	15	10	7		
"			$\frac{5}{10}$	$1\frac{1}{16}$	$10\frac{8}{16}$	$1\frac{14}{16}$	$\frac{8}{16}$	$2\frac{7}{16}$	$2\frac{3}{16}$	$\frac{5}{16}$	$1\frac{5}{16}$	71	6	10	61	2	$1\frac{10}{16}$	2	3	$1\frac{12}{16}$	$1\frac{16}{16}$	$\frac{12}{16}$	11	16	10	7		
Sharp-nosed Sucker			$\frac{9}{10}$	$1\frac{2}{16}$	$13\frac{8}{16}$	$2\frac{8}{16}$	$\frac{13}{16}$	$2\frac{12}{16}$	$3\frac{4}{16}$	$\frac{7}{16}$	$1\frac{12}{16}$	64	10	9	62	$2\frac{12}{16}$	$2\frac{4}{16}$	3	3	$2\frac{2}{16}$	$2\frac{2}{16}$	$1\frac{4}{16}$	12	16	9	7		
"			$\frac{9}{11}$	$1\frac{10}{16}$	$12\frac{8}{16}$	$2\frac{10}{16}$	$\frac{12}{16}$	$2\frac{8}{16}$	3	$\frac{6}{16}$	$1\frac{8}{16}$	63	10	9	—	$2\frac{8}{16}$	$2\frac{2}{16}$	$2\frac{12}{16}$	3	$1\frac{14}{16}$	2	1	12	16	10	7		
"			$\frac{7}{10}$	mm.	31	300	54	19	65	74	13.	34	65	10	10	63	63	47	65	3	47	54	28	12	16	10	7	
"			$\frac{7}{10}$		29	281			62	69	11	34	67	0				69		43	54	30	12	16	10	7		

Height of body.	Length of head.	Diameter of eye.	From tip of snout to eye.	Lateral line (scales)	Pet. D. and. l. l.	Pet. Lat. l. and Ventral.	Scales in longitudinal series above lateral line.	Length of pectoral.	Length of ventral.	Length of anal.	Branchial.	Length of dorsal.	Height of dorsal anteriorly.	Height of dorsal posteriorly.	Dorsal.	Pectoral.	Ventral.	Anal.	
				88	24	13					3				9	17	9	9	
				106	24	13					3				9	16	9	9	
4	4 $\frac{3}{16}$	46	1 $\frac{12}{16}$	72	13	12	69	2 $\frac{12}{16}$	2 $\frac{8}{16}$	2 $\frac{15}{16}$	3	3 $\frac{5}{16}$	2 $\frac{4}{16}$	1 $\frac{6}{16}$	15	17	10	7	
3	3 $\frac{8}{16}$	3 $\frac{14}{16}$	9 $\frac{7}{16}$	1 $\frac{4}{16}$	57	21	12	92	2 $\frac{2}{16}$	1 $\frac{12}{16}$	2	3	1 $\frac{12}{16}$	2 $\frac{5}{16}$	1	9	16	9	9
3	3 $\frac{3}{16}$	3 $\frac{11}{16}$	9 $\frac{8}{16}$	1 $\frac{11}{16}$	95	20	11	—	1 $\frac{14}{16}$	1 $\frac{8}{16}$	1 $\frac{13}{16}$	3	1 $\frac{5}{16}$	1 $\frac{14}{16}$	1 $\frac{14}{16}$	9	16	9	9
3	3 $\frac{5}{16}$	3 $\frac{11}{16}$	9 $\frac{6}{16}$	1 $\frac{11}{16}$	71	12	14	68	2 $\frac{13}{16}$	2 $\frac{4}{16}$	3 $\frac{1}{16}$	3	2 $\frac{14}{16}$	1 $\frac{15}{16}$	1 $\frac{4}{16}$	14	17	10	7
2	2 $\frac{5}{16}$	2 $\frac{5}{16}$	9 $\frac{5}{16}$	1 $\frac{5}{16}$	72	9	9	72	2 $\frac{2}{16}$	1 $\frac{14}{16}$	2 $\frac{3}{16}$	3	1 $\frac{12}{16}$	2 $\frac{2}{16}$	1 $\frac{12}{16}$	11	15	9	7
2	2 $\frac{8}{16}$	2 $\frac{4}{16}$	9 $\frac{6}{16}$	1 $\frac{4}{16}$	69	6	9	59	1 $\frac{14}{16}$	1 $\frac{9}{16}$	2 $\frac{3}{16}$	3	1 $\frac{8}{16}$	1 $\frac{15}{16}$	1 $\frac{12}{16}$	11	15	10	7
2	2 $\frac{7}{16}$	2 $\frac{3}{16}$	9 $\frac{5}{16}$	1 $\frac{5}{16}$	71	6	10	61	2	1 $\frac{10}{16}$	2	3	1 $\frac{12}{16}$	1 $\frac{10}{16}$	1 $\frac{12}{16}$	11	16	10	7
2	2 $\frac{12}{16}$	3 $\frac{4}{16}$	9 $\frac{7}{16}$	1 $\frac{12}{16}$	64	10	9	62	2 $\frac{12}{16}$	2 $\frac{4}{16}$	3	3	2 $\frac{3}{16}$	2 $\frac{2}{16}$	1 $\frac{4}{16}$	12	16	9	7
2	2 $\frac{8}{16}$	3	9 $\frac{6}{16}$	1 $\frac{8}{16}$	63	10	9	—	2 $\frac{8}{16}$	2 $\frac{2}{16}$	2 $\frac{12}{16}$	3	1 $\frac{14}{16}$	2	1	12	16	10	7
65	74	13.	34	65	10	10	63	63	47	65	3	47	54	28	12	16	10	7	
62	19	11	34	67	0	10	63	63	47	65	3	47	54	28	12	16	10	7	

Blunt-nosed Sucker. — Scales very large above; rather crowded anteriorly. They increase rapidly in size from the lateral line upwards.

Sharp-nosed Sucker. — The ventrals reach nearly to the anal. Anals reach nearly to the caudal. Pectorals, in a specimen 12 inches long, reach to within 13 mm. of ventrals.

Catostomus (unique specimen). — The ventrals reach to the anal orifice; the anal falls considerably short of the caudal. Sides silvery, with a wine-colored stripe below the lateral line. Below white; fins, and around bases of fins, yellowish. Dorsal fin incised. D. 13; V. 10; A. 7. Between dorsal fin and lateral line, 18 rows of scales. Only one specimen, about a foot long, in a gunny-sack full taken in the Verde River, July 28, 1886. Three other species of Catostomus

"	"	$\frac{10}{13}$	31	295	57	19	65	75	11.5	38	64	10	9	63	61	50	65	3	42	54	24	11	16	9	7
"	"	$\frac{7}{11}$	27	260	50	15	57	64	12.	30	62	10	9	60	60	49	65	3	43	47	28	12	16	9	7
"	"	$\frac{7}{10}$	24	227	45	12	53	58	10.	28	65	10	10	63	52	43	55	3	37	45	23	12	16	10	7
"	"	$\frac{7}{10}$	26	247	46	13	55	60	10.5	26	68	10	9	65	55	46	60	3	44	47	25	13	16	10	7
Catostomus												18	17	-	-	-	-	-	-	-	-	13	10	7	
Blunt-nosed Sucker		$\frac{3}{8}$	17	180	43	14	44	40	7.	23	70	7	9	65	40	34	41	3	30	36	18	11	15	10	7
Catostomus cypho		$\frac{3}{10}$	20.5	197	53	27	52	50	9.	19	79	13	16(1)	79	42	34	43	3	42	37	18	15	18	10	8
Sharp-nosed Sucker (skin)		$\frac{9}{11}$	41	410	82	23	83	102	15.5	52	62	10	10	60	80	59	83	3	53	64	33	11	16	10	7
Sucker	See Journal, p. 182, Aug. 27, 1884.	$\frac{5}{10}$	23	232	48	-	54	63	9.5	33	60	-	-	-	41	31	39	-	37	38	-	12	16	9	8
Gila	See Journal, p. 184, Aug. 31, 1884			240	52	24	61	70	10.	-	84	-	-	-	-	-	-	-	29	38	18	9	13+	9	9
"	do										90	-	-	-	-	-	-	-	-	-	-	-	-	-	-
"	See Journal, p. 199, Sept. 11, 1884			280	55	-	75	76	11.	-	95	-	-	-	-	-	-	-	35	43	-	19	16	9	9
Catostomus cypho	See Journal, p. 393, July 24, 1885	$\frac{3}{10}$	42	435	80	37	-	115	12.	54	84	-	-	82	-	-	-	-	77	56	29	14	16	10	7
"	See Journal, page 414, July 31, 1885	$\frac{3}{10}$									84	"	25	Fins and scales mounted on paper.											

RETURN—Continued.

ADDITIONAL ARTICLES.

12 sp. *Catostomus*

Verde River, April 16, 1888.

No.	Length h + t.	Depth	Weight, g.	Dorsal	Pectoral	Ventral	Anal	Diagn. eye	Head length	Yield, length	Height, dorsal	Scales, lat. l.	Transverse rows bet. dorsal + l. c.	Transverse rows bet. l. c. + vent.
1729 ♀	310	70	14	12	15	8	7	10.5	75	51	50	70	11	14
1730 ♀	320	62	16	13	16	8	7	10	77	59	58	65	10	10
1731 ♀	280	47	12	12	14	8	7	10	74	57	52	43	11	9
1732 ♂	285	63	13	11	14	9	7	10	69	59	55	44	10	11
1733 ♂	260	62	11	11	15	9	7	9.5	62	45	48	63	11	10
1734 ♂	250	60	10	12	15	9	7	9.5	62	50	50	66	10	9
1735 ♀	235	55	8	12	16	9	7	9.5	59	45	45	64	11	9
1736 ♂	230	50	7	11	15	9	7	8.5	52	42	41	61	10	10
1737 ♀	270	60	11	12	15	9	7	9	66	47	52	63	11	11
1738 ♂	220	52	7	12	15	9	7	8	54	42	42	67	12	10
1739 ♀	225	51	7	11	16	9	7	8.5	54	46	48	62	11	9
1740 ♂	215	50	6	11	14	9	7	9	53	40	40	64	11	9

These (12 following) specimens are like the large skin preserved, which may be taken as the type.
 The color of the ventral surface varies from pure white to a beautiful yellow. The upper surface is dark. The line of division is sharply defined, varying from 3 to 5 rows of scales below the lateral line.

Catostomus insignis

Catostomus cyprin
 1743 ♀ ad. 435 95 39 14 16 9 7 10 111 70 60 77 15 13. Below orange-yellow. Back alive April 29, 1888.
 1745 245 60 10 12 15 9 7 9 65 45 44 65 12 10 *Catostomus* — same sp. as those above the line.

Note. Dr. A. K. Fisher sent

RETURN—Continued.

Catostomus (mouth inferior; upper lip thin with few rows of papillae). ADDITIONAL ARTICLES. Beaver Creek, May, 12, 1888.

No.	Sex and age	Weight of air.	Length H. & B.	Length of head.	Width of head.	Diameter eye	Length of caudal	Height of dorsal	Length of dorsal	No. of fin-rays			Scale l. l.	Scale in cross series between dorsal and l. l.	Scale from ll to ventral.	Depth of body	Rows of papillae, etc.
									Dorsal	Pectoral	Ventral	Anal					
*1757	♂	240	55	35	7.5	48	43	38	11	14	9	7	69	10	10	53	
1752	7	225	50	30	7	33	43	39	11	15	10	7	76	9	10		
1753	5	210	43	27	7	37	37	34	11	15	9	7					
1754	5	232	46	27	6.5	34	43	34	11	15	9	7					

Catostomus (mouth terminal; upper lip thick with many rows of papillae). Beaver Creek, May, 12, 1888.

1744	♀ ad	223	30	85	53	11	40	58	55	12	14	9	7	60	10	9	68
1747	ad	163	00	70	50	9.5	47	44	50	11	14	10	7	45	10	10	43
1748	ad	143	10	80	48	8	50	52	44	12	14	9	7	40	8	8	43
1749	7	220	54	37	8	40	44	36	12	14	9	7	62	11	9	55	
1750	7	232	53	40	8	42	44	39	12	17	10	7	60	10	9	53	
	8	240															

* This spec. appears to me to be unique in the collection.

Mearns Fishes.

Pack box shipped from

Yuma, Arizona, Mar. 10, 1894.

acc. 28058. Apr. 14, 1894.

No. 12. About 100 fishes from a spring,
near bank of Sonoyta River,
town of Sonoyta, Sonora, Jan. 18, 1894.

Fish 4 inches in length (no label)

Silver Lake, Santa Cruz R. near

Tucson, Ariz. Nov. 13, 1893.

22. Sonoyta R. Feb. 1, 1894

23. small fishes. " "

24. 15 " " as above.

25. 26 small fishes. Sonoyta Ck
Feb 1, 94.

26. 15 small fishes.

27. 28, 29. - Sonoyta R.
Feb. 1, 94.

43-46, Gila R. ^{near Adonde siding, Yuma Co.}
Feb. 26, 1894.

54. Three species of fishes Gila R.,
Gila City, Arizona, Mar. 4, 94.

56. Six spec. as above.

261 + 262. Santa Cruz Valley, Sonora, ^{Oct.} 1893.

265. " " " Oct. 23, "

603 + 604. Santa Cruz R. Tucson, Herbert Brown.

605. Bear Creek, Bear Valley, near Oro
Blanco, Ariz. Dec. 3, 1893.

This creek is a trib. of Altan R. (Gulf of Cal)
Found above ^{vertical} precipice 30 feet high,
How did the fish get there?

Ichthyological Memoranda.

There are notes on fishes in
Journal III, pp. ⁸⁶ 123, 182, 184, 199,
256, 286, 287, 393, 414, 418.

San Carlos trip, pp. 23 and 29.

Specimens of Fishes not Alcoholic:-

Fins & outline of Bony-tail (Gila) Aug 31, 1884, page 184.

Skin of Bony-tail (Gila ?) Sept. 11, 1884 " 199.

Skin of Catostomus cypho. July 24, 1885 " 393.

Fins & scales of " " " 31, 1885 " 414.

Skin of Sucker (not C. cypho)

Fins and scales of a species of Sucker.

" " " " " " "

Ichthyological Memoranda.

There are notes on fishes in Journal, III, pp. 86, 123,
182, 184, 199, 256, 286, 287, 393, 414, 418.

San Carlos trip, pp. 23 and 29.

Specimens of Fishes not Alcoholic:-

Fins and outline of Bony-tail (Gila) Aug. 31, 1884,
page 184.

Skin of Bony-tail (Gila ?) Sept. 11, 1884, page 199.

Skin of Catostomus cypho, July 24, 1885, page 393.

Fins and scales of Catostomus cypho, July 31, 1885,
page 414.

Skin of Sucker (not C. cypho)

Fins and scales of a species of Sucker.

" " " " " " "

Recd
Apr 15th
Fort Clark, Kinney Co., Texas.

April 13, 1898.

Dear Mr. Bean

I send you herewith enclosed an outline of a fish. The head and fins will be sent later, in alcohol. Prof. Evermann and I had a talk about the catfishes of this region. He was unable to name our large mud cat. I have two or three species of them in a tank of alcohol. I have also collected four species of sun perch and some other fishes.

Have you identified the fishes of the Mex. Boundary yet?

Please give my regards to Prof. Evermann if you see him.

We are packed up for the war and nervously waiting for the order to move.

Yours truly
Edgar A. Mearns

Copy

Fort Clark, Kinney Co., Texas,

April 13, 1898.

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I send you herewith enclosed an outline of a fish. The head and fins will be sent later, in alcohol. Prof. Evermann and I had a talk about the catfishes of this region. He was unable to name our large mud cat. I have two or three species of them in a tank of alcohol. I have also collected four species of sun perch and some other fishes.

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Please give my regards to Prof. Evermann if you see him.

We are packed up for the war and nervously waiting for the order to move.

Yours truly,

(Signed) EDGAR A. MEARNES.

3.29.27

Copy.

Fort Clark, Brackettville, Texas,

March 20, 1893.

To Dr. F. W. True,

U. S. National Museum,

Washington, D. C.

Dear Sir:

x x x x x x x x x
x x x x x x x x x x

The fishes are of special interest as furnishing new material from classic ground from the type localities of the species described by Baird and Girard in the Mex. Bd. Rep., etc. I have examined about 20 species of fishes, and in most instances preserved specimens. In Las Moras creek are several forms of Lepomis pallidus and L. megalotis described by Bd. and Gir.; Micropterus nuецensis (M. salmoides); Heros cyanoguttatus, Tetragonopterus argentatus; Dorosoma cepedianum; Litholepis tristorchus; several species of Cats (Ictalurus and a round-tailed species seen but not examined;

several suckers (Maxastoma macrolepidotum, etc. etc.) etc. etc.

You might tear off the above note and hand it to Prof. Bean; and I will append the suggestion that he furnish me with a net (seine) like the one sent me at El Paso, and that in his report of the fishes gathered on the boundary line he also include those sent by me from Fort Verde, Arizona and the collection to be made here in Texas. My long-delayed notes on the Arizona fishes will be sent him when called for, though they are scattered through my notes in a way that will make it troublesome to collect them. If my memory serves me I have quite full notes on several species based on a good many specimens of each, with detailed measurements, formulae, notes of coloration and rough paper tracings.

x x x x x x x x x x

I remain

Sincerely yours,

(Signed) Edgar A. Mearns.

Note on Lepomis. - Fort Clark, Kinney County,
Texas (Las Moras Creek), March 15-20, 1893.

Lepomis pallidus?

No. 1.	Length 105 ^{mm}	Scales 6-40-12.	D 10-11	A 3-10	V 1-5.
2, ♀.	115 "	"	6-37-12.	" 11-11	" 3-10 " 1-5.
3.	110 "	"	5-41-10.	" 10-11	" 3-10 " 1-5.
4, ♂.	105 "	"	6-40-11.	" 10-11	" 3-10 " 1-5.
5	90 "	"	5-33-12.	" 10-11	" 3-9 " 1-5.
6	? 125 "	"	6-39-12.	" 10-11	" 3-10 " 1-5.
7	135 "	"	6-40-12.	" 10-11	" 3-10 " 1-5.
8	? "	"	6-39-13.	" 10-11	" 3-10 " 1-5.

Black spot near
anal and pectoral
fin. border of dorsal

In No. 1 the ventrals reach barely beyond base of anal. Pectoral reach to posterior border of anus.

In No. 5 the ventrals extend considerably beyond the base of anal. Spotted with blue on opercle. Orange spots near posterior border of dorsal and anal fins.

The above are all small specimens of their kind.

Description:-

Lepomis pallidus (Mitch.) Gil & Jor.

Depth, 57; length, 135; side of head, 42; diameter of eye, 9. Pectorals reaching past the vent; ventrals reaching the anal; opercular flaps small, rounded, dusky, with colorless border; vertical fins dusky, with some blue and more green. D 10-11, V 1-5, A 3-10. Cheeks with 5 rows of scales below eyes; mouth small, oblique; a small, blackish spot on last soft rays of dorsal - a larger one on soft rays of anal. Eye, mottled red and

hazel and ~~hazel~~ dusky (mostly red). Color above lateral line greenish olive, below lateral line yellow, with seven or eight faint transverse bands. Scales 6-40-12. Dorsal fins rather high. Quite a distinct fold in dorsal outline above eye.

aquilinus
nefastus
pallidus } = *L. pallidus*

heros = *L. heros* (near *pallidus*).

fallax
convexifrons } = *L. megalotis*.

longulus = *L. cyanellus*.

Plate 1 fig. 1 = *Pomotis heros* p. 6 = *L. heros*.

" 2 " 5 " *fallax* " 8

" 3 " 1 " { *aquilinus*
nefastus " 7 = *L. pallidus*

" 3 " 6 " *nefastus* = " = *L. megalotis*.

" 3 " 9 " *fallax*, s. *convexifrons* p. 8 =

" 4 " 1 *Callurus longulus*, Grd. p. 5 = *L. cyanellus*

" 4 " 5 *Pomotis speciosus* p. 5 = *L. pallidus*.

Moxostoma macrolepidotum. - Two small specimens placed in alcohol March 15, 1893, from Las Moras Creek, Ft. Clark, Kinney County, Texas. These were olivaceous above; dorsal fin colored like corresponding parts of body; vertical fins with irregular blackish markings including to a central spot; sides golden silvery, below pure white; lower fins tinged with red. Scales 6-45-5. D. 12 A. 7 V 8. Air bladder 3-celled. Outline, fins & scales of a larger specimen enclosed.

Mex. Bd. Rep.

Ictalurus lupus (Grd.) G. + X. ?

Weight about 5 lbs, Avoids. Length measured to base of caudal fin, 440 mm. Length of side of head, 118. Diameter of eye, 14. Distance between orbits, 73. Distance between posterior nasal apertures, 31 (its barbel, 31). Width of head, 100. Width of open mouth, 60. Nose to eye, 57. Depth of body opposite front of dorsal, 100. Emargination of tail, 5.5 (upper lobe perceptibly longest). Barbels $\frac{2-2}{2-2} = \frac{4}{4} = 8$, measuring (above) 104 - 31 and (below) 52 - 36 mm.

Height of adipose fin, measured posteriorly, 27 mm; greatest height of dorsal fin, 73; of anal, 51; of pectoral, 66; of ventral, 54. From tip of nose to base of dorsal spine, 158; thence to adipose fin, 195; from front of adipose fin to caudal, 125 mm. Lateral line complete. D, 1-6. A, 4-22. V, 8. P, 1-8.

Bony bridge from occiput to dorsal not quite continuous, the supraoccipital bone almost meeting the interspinal.

Color above dark olive; sides yellow; below pure white; fins dusky, with the fin-rays palest. Barbels blackish; eye mottled dusky and gold, with a yellow ring around the pupil. Speckled, especially above the lateral line with minute blackish spots. Caught in Las Moras Creek, Kinney Co., Texas, March 18, 1893 (See outline traced on paper.)

(over)

Ictalurus - Continued.

Ventral fins extending barely past base of anal. Pectoral spine serrated behind. Humeral process more than half of the length of the pectoral spine, in this respect resembling I. punctatus rather than I. laeustris.

Note: - There are "Round-tailed" Cats in Las Moras Creek and the Neneus River. No cats were taken after the alcohol tank came. If I had had a tank when I first came to this post, a much larger collection could have been made.

Edgar A. Mearns

Suckers — Sheet I.

Fort Verde, Arizona. August 27, 1884.

"The following is the description of a fish () caught in a dip-net, in Beaver Creek, a tributary of the Verde River, near Fort Verde, Arizona: The specimen, in size, is below the average, but was the only one caught to-day. Total length, 280 mm.; tail, 48; snout to occiput, 55; to eye, 33; to opercle, 63; depth of eye, 8.5; depth of head at orbit, 32; length of dorsal fin, 37; height of dorsal fin, 38; length of anal fin, 18; its depth, 39; ~~depth of anal~~ (length of pectoral, 31); depth of pectoral, 41; depth of body, midway between occiput and dorsal fin, 54. Fin rays: Caudal, 18; dorsal, 12; pectoral, 16; ventral, 9; anal, 8. Scales in lateral line, 60. Interorbital space 23; length of eye, 9.5. Upper lip with five (5) rows of tubercles. Lower lip also very full, with ten or more rows of tubercles."

Suckers — Sheet II.

"Notes on Fishes":—

"Largest specimen of Long-headed Sucker.—
Lat. l. 62 scales.

12 scales in cross series above l. l.

10 scales l. l. to ventral fin.

D. 11; P. 15; V. 9; A. 7."

"Black-sided Sucker.— Lat. l. 77.

8 scales above l. l.

12 rows below l. l. (to border of ventral).

D. 11; P. 15; V. 9; A. 7."

[Discr. of Catostomus cypho transferred to middle of sheet IV of that species.]

"Sharp-nosed, Long-headed Sucker":—

Lateral line of 64 scales. Scales in the longitudinal series next above the lateral line, 60. Rows of scales between the lateral line and dorsal fin, 8; between the lateral line and ventral fin, 10.

D. 11; P. 15; V. 9; A. 7.

Upper lip with about 8 rows of papillae;

(Suckers - Sheet III
(Sharp-nosed, Long-headed Sucker - Continued.)

lower lip with about 10 rows of papillae. Length (exclusive of caudal), 360 mm; caudal, 65 mm; caudal fork (i.e. emargination), 24; length of head, 97; from tip of snout to eye, 46; orbit, 15; eye, 11; from posterior border of eye to opercle, 43; depth of body, 77 mm.

Black-sided Short-headed Sucker.

Length of head, 64 mm; tip of snout to eye, 38; length of eye, 8; from eye to end of opercle, 26; height (depth) of body, 60; length, 270, exclusive of caudal, which measures 53 mm.

Fork of tail (emargination), 13. Scales of lateral line, 72. Scales in series next above lateral line, 71; "Scales in series above dorsal, 73 [don't know what I meant to write]". Peritoneum

black. Scales between dorsal + l. l. 7; bet. l. l. + ventral, 11. D. 11; P. 15; V. 9; A. 7. Upper lip with three rows of papillae. Lower lip with about 8 rows of papillae and not incised.

Suckers - Sheet IV

Big-headed Sucker. - Length (without tail), 300; tail 40; head, 50. Scales in lateral line, 66. D. 11; P. 15; V. 9; A. 7. Scales in longitudinal series above l. l., 60. Between dorsal + l. l. 9 rows of scales. Between lat. l. and ventral, 11 rows of scales.

In another specimen, about the same size, scales l. l. 62; above l. l., 58; between dorsal + l. l. 9 rows; bet. l. l. + ventral 11 rows of scales.

Suckers.

Fort Verde, Arizona, August 27, 1884. The following is a description of a fish () caught in a dip-net in Beaver Creek, a tributary of the Verde River, near Fort Verde, Arizona: The specimen, in size, is below the average, but was the only one caught to-day. Total length, 280 mm.; tail 48; snout to occiput, 55; to eye, 33; to opercle, 63; depth of eye, 8.5; depth of head at orbit, 32; length of dorsal fin, 37; height of dorsal fin, 38; length of anal fin, 18; its depth, 39; (length of pectoral, 41; depth of body, midway between occiput and dorsal fin, 54. Fin rays: Caudal, 18; dorsal, 12; pectoral, 16; ventral, 9; anal, 8. Scales in lateral line, 60. Interorbital space, 23; length of eye, 9.5. Upper lip with five (5) rows of tubercles. Lower lip also very full, with ten or more rows of tubercles.

Notes on Fishes. Largest specimen of Long-headed Sucker. Lat. 1. 62 scales. 12 scales in cross series above 1.1. 10 scales 1.1. to ventral fin. D. 11; P. 15; V. 9; A. 7.

Black-sided Sucker. Lat. 1. 77. 8 scales above 1.1. 12 rows below 1.1. (to border of ventral). D.11; P.15; V.9; A.7.

Sharp-nosed, Long-headed Sucker. Lateral line of 64 scales. Scales in the longitudinal series next above the lateral line, 60. Rows of scales between the lateral line and the dorsal fin, 8;

between the lateral line and the ventral fin, 10. D.11; P.15; V.9; A.7.

Upper lip with about 8 rows of papillae, lower lip with about 10 rows of papillae. Length (exclusive of caudal), 360 mm.; caudal, 65 mm.; caudal fork (i.e. emargination), 24; length of head, 97; from tip of snout to eye, 46; orbit, 15; eye, 11; from posterior border of eye to opercle, 43; depth of body, 77mm.

Black-sided, Short-headed Sucker. Length of head, 64 mm.; tip of snout to eye, 38; length of eye, 8; from eye to end of opercle, 26; height (depth) of body, 60; length, 270, exclusive of caudal, which measures 53 mm. Fork of tail (emargination), 13. Scales of lateral line, 72. Scales in series next above lateral line, 71; "scales in series above dorsal, 73 (don't know what I meant to write)". Peritoneum black. Scales between dorsal and 1.1., 7; bet. 1.1. and ventral, 11. D.11; P.15; V.9; A.7. Upper lip with three rows of papillae. Lower lip with about 8 rows of papillae, and not incised.

Big-headed Sucker. Length (without tail), 200; tail, 40; head, 50. Scales in lateral line, 66. D.11; P.15; V.9; A.7. Scales in longitudinal series above 1.1. 60. Between dorsal and 1.1. 9 rows of scales. Between lat.1. and ventral, 11 rows of scales.

In another specimen about the same size, scales 1.1., 62;

above l.l., 58; between dorsal and l.l., 9 rows; bet. l.l. and ventral, 11 rows of scales.

SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

MEMORANDUM.

Dr. Weaver sent a 16 gal
tank of alcoholic fishes
from the Verde River
(and tributaries) Arizona
to the Nat. Mus. in 1885.

He also deposited
a good series of Verde
fishes at the Am. Mus.,
New York.

Please include
this in the Mex.
Board. Report E. A. M.

Fishes of the Verde River, Arizona.

"On January 11, 1885, I netted a
large number of fishes. The largest
specimen was about six inches in
length, and others were not more
than an inch long. They were all
caught along the margin of the
Rio Verde, opposite to the post of Fort
Verde.

All of the larger ones
were Catostomidae, and the smaller
ones were minnows and the young
of the fish called "Bony-tail," "Gila
Trot", or "Verde Trot" (Gila _____),
at least I think they are the fry of
that species. They are preserved
in four bottles, ⁱⁿ alcohol. The largest
bottle contains the largest specimens.

They are all Catostomys cyphus Lockington.
Among them are a few specimens of
paler coloration, larger-headed, and
having 12 instead of 15 dorsal rays.

Another bottle contains about
fifty (50) minnows, and a few dark,

Fishes of the Verde River - Sheet 11.

spotted, terete, small-eyed fishes
resembling Rhinichthys atronasus.

The two small bottles
contain mixed specimens of the
several species and forms above
mentioned.

[These were sent to Am. Mus., N. Y.]

Fishes of the Verde River, Arizona.

On January 11, 1885, I netted a large number of fishes. The largest specimen was about six inches in length, and others were not more than an inch long. They were all caught along the margin of the Rio Verde, opposite to the post of Fort Verde. All of the larger ones were Catostomidae, and the smaller ones were minnows and the young of the fish called "Bony-tail", "Gila Trout", or "Verde Trout" (Gila _____), at least I think they are the fry of that species. They are preserved in four bottles in alcohol. The largest bottle contains the largest specimens. They are all Catostomus cypho Lockington. Among them are a few specimens of a paler coloration, larger-scaled, and having 12 instead of 15 dorsal rays.

Another bottle contains about 50 minnows, and a few dark-spotted, terete, small-eyed fishes resembling Rhinichthys atronasus.

The two small bottles contain mixed specimens of the several species and forms above mentioned.

(These were sent to Am. Mus., N. Y.)

Apr. 3, 1888.

Fort Verde, Arizona.

March 25th, 1888.

Prof. Sarsleton H. Bean
Dear Sir:

The case of alcohol arrived safely. There was no key. I had to pay \$3¹⁰ Ex. charges on it - from Prescott to Verde.

The streams have been very high from a general freshet. Verde River unfordable. It will be a fortnight before there will be any chance of successful collecting. I will send some small mammals, reptiles and batrachians if you wish, unless the fishes are too bulky. Please send key by return mail. I will do the best I can. Early in May, I shall be able to procure the trout.

I remain

Sincerely yrs

Edgar A. Mearns

Miss Weiss, Office of the Registrar

October 19, 1956

Ernest A. Lachner, Division of Fishes

Mearns: Data on fishes of S. W. U. S.

In addition to the attached accession papers (#28661), we have recently located and have filed in our division safe certain field records and "parts" of dried specimens collected by Mearns.

SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

MEMORANDUM.

Dr. Mearns Mex. Bol. fishes

44623 - 42.

acc. 27625.

45421 - 45.

45395 - 420.

acc. 28661.

Fish collected in Ruckus Canyon

Chiricahua Mts. Arizona

Agosia chryso-gaster H. Fisher

Compostoma pueri [type in Nat Mus (?)]

W W Price
found in a stream in Tanner's Canyon, 7000 ft
in Babacornari

Gila robusta

H. Fisher

Copy.

Accession 27625. Dr. E. A Mearns, U. S. A.

Tucson, Arizona, Nov. 3, 1893.

No. 117. One small fish, San Bernardino River,
Mex. Bd. L. at Monument 77, Aug. 20, 1893.

No. 123. About 200 fishes (3 species) from the
San Bernardino at Monument 77, Mex. Bd. Aug. 23, 93.

Nos. 124 & 125. Suckers? San Bernardino, Aug.
24, 1893. Put in tank by E. C. Merton.

No. 145. A number of small fishes from Cajon
Bonita Creek, Mex. Bd. Sept. 8, 1893.

No. 146. Suckers, 3 specimens, same as 145.

"Colorado Salmon"

"Box Cañon of Verde River, about 10 miles below Fort Verde, central Arizona, April 3, 1887."

"They had caught a dozen 'bony-tails' (Gila robusta?), the largest weighing 3 pounds, Avondupois; and Lieut. Smith had seen a huge Colorado Salmon." Many were afterwards seen that day. This fish was commonly caught in the Box Cañon of the Verde, below the Post; and, once or twice, small ones were captured by ranchmen in acequias. ^{higher up the Verde} Lieut. Herbert Whipple told me his men had captured some very large ones in shoal water in Bonito Fork, a stream of the Gila system not far from Fort Apache, Arizona. I afterwards caught many in the Colorado from Ft. Mojave to the Gulf, + also on the Dalton River of the Colorado Desert.

Colorado Salmon - Sheet 11

Fort Verde, Arizona. June 23, 1884.
"Took a Salmon in 'Poker' Johnston's sluice to-day."

"Colorado Salmon."

Box Canon, Verde River, about 10 miles below Fort Verde, central Arizona, April 3, 1887.

"They had caught a dozen 'bony-tails' (Gila robusta?), the largest weighing 3 pounds Avoirdupois; and Lieut. Smith had seen a huge 'Colorado Salmon'. Many were afterwards seen that day. This fish was commonly caught in the Fox Canon of the Verde, below the Post; and, once or twice, small ones were captured by ranchmen in acequias higher up the Verde. Lieut. Herbert Whipple told me his men had captured some very large ones in shoal water in Bonito Fork, a stream of the Gila system not far from Fort Apache, Arizona. I afterwards caught many in the Colorado, from Fort Mojave to the Gulf, and also on the Oalton River of the Colorado Desert.

Fort Verde, Arizona, June 23, 1884.

"Took a Salmon in 'Poker' Johnston's sluice to-day."

Xyrauchen texanus
Catostomus cypho.

One had been eaten by a Fish Hawk (Pandion haliaetus carolinensis) (No. 4900) shot at Indian Garden, Oak Creek, Arizona, June 14, 1886.

Very large ones snared in deep holes among the rocks, in Oak Creek, 30 miles above Fort Verde, Arizona. They rarely take a hook; but we caught many in Beaver Creek, by allowing a line with several hooks attached to sink in a deep hole which they occupied, and waiting until the school was over them, when they were hooked outside by a sharp swish of the pole and line. They are very good eating - much better than other suckers. Ranchers often catch them in acequias for food.

Fort Verde, Arizona. July 24, 1885.

"Catostomus cypho Lockington. Male adult. Verde River at Fort Verde, Arizona
"Humpbacked Sucker". Entire ventral

Catostomus cypho - Sheet II.

surface orange yellow, the pectoral and ventral fins very slightly dusky, their upper surface marked basally with dusky olive. Iris yellow, ^{with} greenish yellow granulation. Lower third of head, including end of snout, orange yellow in strong contrast with the flesh-colored mouth. Sides, salmon-color, granulated with dusky olive. Dorsum, dark olive-brown, including top of head; the anterior ridge of spine (i.e. hump) pale olive. Gills ~~pink~~ flesh-color; ~~the~~ yellow of ventral surface extending to the olive of the dorsum, and blending with it on the side of the head posteriorly. Dorsal fin, olivaceous; Anal fin, orange-yellow, indistinctly marked with dusky; caudal, yellowish olive. Peritoneum, black. Total length, 490 mm.; length to base of caudal, 435; from tip of snout to nostril, 44; to eye, 54; to center of pupil, 60; width (See Sheet III.)

Catostomus cypho - Sheet III.

d. orbit, 12; depth of orbit, 9.5; pupil, 4.8; from end of snout to preopercle, 85; to opercle, 115; distance between orbits, 42; length of caudal, 80; height of dorsal fin anteriorly, 56; posteriorly, 29 (29); width at base, 77; at upper edge when outspread, 80; emargination, 37 mm. Lateral line of 90 scales. Dorsal, 14; anal, 7; ventral, 10; Pectoral, 15; Caudal, 18. Transverse series of scales, between dorsal and ventral, 24 rows.

Fort Verde, Arizona. July 31, 1885.

"Mr. Jordan brought me a fine living male specimen of the hump-backed sucker (Catostomus cypho). I compared its colors with the description which I gave on page 343 [see above], and found that they were identical, except that the fins were somewhat rosy and ^{all of} the scales on the sides silver tipped. There (see sheet IV.)

Catostomus cypho - Sheet IV.

There were 84 scales in the lateral line, and 25 in the transverse series - between dorsal and ventral fins. The rows of papillae ~~papillae~~ are irregular on both jaws - about three on upper lip, and ten on lower. The fins, and parts of skin and scales, were mounted on paper and preserved. The front of the skeleton, with the head, were preserved to show the interneural bones, which give the singular dorsal outline (profile) to this sucker.

"Notes on Fishes: - x x x
" Catostomus cypho Lockington. Lat. l. 76 scales. Between l. l. and ventral 14 rows scales. Between dorsal and l. l. 13 rows. Peritoneum black. D. 15; P. 16; U. 9 (or 10?); A. 7 (or 8?). Upper lip with three rows of large papillae; lower lip incised to the base, with about 8 rows of papillae. Beneath,

Catostomus cypho - Sheet V

orange-yellow; above, darker olive-brown, with a strong pinkish tinge below the lateral line; each scale banded with silvery at tip.

Scales in longitudinal series, the next above the lateral line, 72. Length (exclusive of caudal), 360 mm; length of caudal fin, 70; height of dorsal, anteriorly, 55; posteriorly, 28; its length, 75. Length of pectoral, 66; Length of Ventral, 49. Length of anal, 63. Length of head, 102. From tip of snout to eye, 48; width of eye, 8.5; from posterior border of orbit to opercle, 51; width of mouth, 25; length of mouth, 25 mm.

Catostomus cypho.

(One had been eaten by a Fish Hawk) (Paudion haliaetus caroliensis) (No. 4900) shot at Indian Garden, Oak Creek, Arizona, June 14, 1886.

(Very large ones snared in deep holes among the rocks, in Oak Creek, 30 miles above Fort Verde, Arizona. They rarely take a hook; but we caught many in Beaver Creek, by allowing a line with several hooks attached to sink in a deep hole which they occupied, and waiting until the school was over them, when they were hooked outside by a sharp swish of the pole and line.) (They are very good eating - much better than other suckers. Ranchers often catch them in acequias for food.)

Fort Verde, Arizona, July 24, 1885. Catostomus cypho, Lockington. Male adult, Verde River at Fort Verde, Arizona. Humpbacked Sucker. (Entire ventral surface orange yellow, the pectoral and ventral fins very slightly dusky, their upper surface marked basally with dusky olive. Iris yellow with greenish yellow granulation. Lower third of head, including end of snout, orange yellow in strong contrast with the flesh-colored mouth. Sides, salmon-color, granulated with dusky olive. Dorsum, dark olive-brown, including top of head; the anterior ridge of spine (i.e. hump) pale olive. Gills flesh-color; yellow of ventral surface extending to the olive of the dorsum, and blending with it on the side of the head posteriorly. Dorsal fin olivaceous; anal fin, orange-yellow, indistinct-

ly marked with dusky; caudal, yellowish olive. Peritoneum black. Total length 490 mm.; length to base of caudal, 435; from tip of snout to nostril, 44; to eye, 54; to center of pupil, 60; width of orbit, 12; depth of orbit, 9.5; pupil, 4.8; from end of snout to preopercle, 85; to opercle, 115; distance between orbits, 42; length of caudal, 80; height of dorsal fin anteriorly, 56; posteriorly, 29; width at base, 77; at upper edge when outspread, 80; emargination, 37 mm. Lateral line of 90 scales. Dorsal, 14; anal, 7; ventral, 10; pectoral, 15; caudal, 18. Transverse series of scales, between dorsal and ventral, 24 rows.

Fort Verde, Arizona, July 31, 1885. (Mr. Jordan brought me a fine living male specimen of the hump-backed sucker (Catostomus cypho). I compared its colors with the description which I gave on page 393 (see above), and found that they were identical, except that the fins were somewhat rosy and all of the scales on the sides silver tipped.) There were 84 scales in the lateral line, and 25 in the transverse series - between dorsal and ventral fins. The rows of papillae are irregular on both jaws -- about three on the upper lip, and ten on the lower. The fins, and parts of skin and scales, were mounted on paper and preserved. ~~The~~ The front of the skeleton, with the head, were preserved to show the interneural bone, which gives the singular dorsal outline (profile) to this sucker. (2)

NOTES ON FISHES:-

Catostomus cypho Lockington. Lat. 1. 76 scales. Between l.l. and ventral 14 rows scales. Between dorsal and l.l. 13 rows. Peritorum black. D. 15; P. 16; V. 9 (or 10?); A. 7 (or 8?). Upper lip with three rows of large papillae; lower lip incised to the base, with about 8 rows of papillae. (Beneath, orange-yellow; above, dark olive-brown, with a strong pinkish tinge below the lateral line; each scale banded with silvery at tip.) Scales in longitudinal series, the next above the lateral line, 72. Length (exclusive of caudal), 360 mm.; length of caudal fin, 70; height of dorsal anteriorly, 55; posteriorly, 28; its length, 75. Length of pectoral, 66; length of ventral, 49; length of anal, 63. Length of head, 102. From tip of snout to eye, 48; width of eye, 8.5; from posterior border of orbit to opercle, 51; width of mouth, 25; length of mouth, 25 mm.

Gila (robusta?)

"Verde Bony-tail."

On July 12, 1886, a man brought about 30 pounds of Verde Bony-tails to Fort Verde, Arizona, for sale. The largest weighed $2\frac{1}{2}$ lbs. Avoir. They were very fat, and had been caught in a net.

Selecting a specimen 12 inches long, I counted 96 scales in the lateral line. Between the anterior portion of the dorsal fin and the lateral line were 24 rows; between lateral line and ventral fin 13 rows of scales.

Box canyon of Verde River, below Fort Verde, Arizona, April 3, 1887.
"Went fishing for 'Colorado Salmon' about midnight, and caught one 'bony-tail' (Gila robusta?) in a hole near camp, thus demonstrating that they do sometimes bite at night."

Gila (robusta?) - Sheet II.

"Verde Bony-tail."

Fort Verde, Arizona. August 31, 1884.

"To-day went fishing in Beaver Creek, near where it empties into the Verde River.

Caught 13 specimens of a species of Gila, which exhibited a regular gradation in size from the smallest measuring 79 mm. in length to the

largest. From these thirteen specimens I give the following description: Larg. + specimen - Length to base of caudal fin,

240 mm. Head (length of side), 70. Eye, 10. Greatest depth of body, 61. Finn-

rays - D. 9; P. 13; V. 9; A. 9; C. about 24. Length of dorsal fin, 29; its height

in front, 38. Lateral line with 84 scales.

Colors - Iris golden. Dorsal aspect dark, dotted with gold and silver; below, silvery white. Iris orange-tinted.

Sides with obsolete, blackish bands, most distinct towards the tail. Length of caudal, to tip of upper lobe, 52; to tip of

Gila (robusta?) — Sheet III.
lower lobe, 49; emargination, 24.

Height of posterior ray of dorsal, 18.
Dorsal fin is posterior to ventral.

The smallest specimen is lighter colored, and has a gold band extending from the superior extremity of the opercular opening to the base of the tail.

The specimen second in size had 90 scales in the lateral line. The flesh of a dove was used for bait in fishing for these fishes; and one or two were caught on fish, of their own species.

Hort Verde, Arizona. Sept. 11, 1884.
"Mrs. Mearns shot the first bird and caught the first fish [Gila] in the Verde River."

"3307 b. Verde Bony-tail (Gila)
Length to caudal, 280 mm.; greatest depth of body, 75; head, measured from snout to opercle, 76; length of eye, 11; length of dorsal, 35; height of dorsal, 43; caudal, 55. Fin-rays.

Gila (robusta?) — Sheet IV.
D. I, 9; P. 16 (about; much crowded posteriorly & hard to count); V. 9; A. 9.
Lateral line of 95 scales. Specimen made up in a skin; in American Mus. Nat. Hist., N. Y.

~~Head of Oak Creek, near Indian Garden.~~ August 12-14, 1885.
"Caught an abundance of fine 'Bony-tails' "

Gila (robusta ?) "Verde Bony-tail"

On July 12, 1886, a man brought about 30 pounds of Verde Bony-tails to Fort Verde, Arizona, for sale. The largest weighed 2-1/2 lbs. Avair. They were very fat, and had been caught in a net.

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Fort Verde, Arizona, August 31, 1884. To-day went fishing in Beaver Creek, near where it empties into the Verde River. Caught 13 specimens of a species of Gila, which exhibited a regular gradation in size from the smallest measuring 79 mm. in length to the largest. From these 13 specimens I give the following description: Largest specimen.- Length to base of caudal fin, 240 mm. Head (length of side), 70. Eye, 10. Greatest depth of body, 61. Fin rays.- D. 9; P. 13; V. 9; A. 9; C. about 24. Length of dorsal fin, 29; its height in front, 38. Lateral line with 84 scales. Colors.-- (Iris golden. Dorsal aspect dark,

9/2

dotted with gold and silver; below, silvery white. Fins, orange-tinted. Sides with obsolete blackish bands most distinct towards the tail.) Length of caudal, to tip of upper lobe, 52; to tip of lower lobe, 49; emargination, 24. Height of posterior ray of dorsal, 18. Dorsal fin is posterior to ventral. (The smallest specimen is lighter colored, and has a gold band extending from the superior extremity of the opercular opening to the base of the tail.)

The specimen second in size had 90 scales in the lateral line. (The flesh of a dove was used for a bait in fishing for these fishes; and one or two were caught on fish, of their own species.)

Fort Verde, Arizona, Sept. 11, 1884. "Mrs. Mearns shot the first bird and caught the first fish (Gila) in the Verde River."

3307 b. Verde Bony-tail (Gila). Length to caudal, 280 mm.; greatest depth of body, 75; head, measured from snout to opercle, 76; length of eye, 11; length of dorsal, 35; height of dorsal, 43; caudal, 55. Fin rays: D. 1.9; P. 16 (about, much crowded posteriorly and hard to count); V. 9; A. p. Lateral line of 95 scales. Specimen made up in a skin; in American Mus. Nat. Hist., N. Y.

(Oak Creek, near Indian Garden, August 12-14, 1885. "Caught an abundance of fine 'Bony-tails'".)

Gila (robusta?)

"Bony-tail"

Stomach of male ^{Osprey (Pandion)} shot at Fort Verde, Arizona, April 21, 1887, "contained suckers (not hump-backed) and Gila robusta."

Gila (robusta?) "Bony-tail"

(Stomach of male Osprey (Pandion) shot at Fort Verde, Arizona, April 21, 1887, contained suckers (not hump-backed) and Gila robusta.)

Dr. Mearns -

Aqualius	Apoose
Egila	Rhinichthys
Cyprinus	Pogonichthys
Natropis	Several other
Carpodes	genera
Tyrnuchen	Codoma
Catostomus	Catfish
Cyprinodon	Moxostoma
Pseudulus	Zygocentrus
Menidia	Gambusia
Petropodus	Heros
Haplochromis	
	Lepomis
	Micropterus
	Amphisternus?
Caranx	
Lepidosteus	
	Blennioid
Pepiderma	
Salmo	Anguilla

Acc. 20.877.

Dr. Mearns' Arizona Fish.

39571	Catostomus
2	
3	
4	
5	
6	
7	Salmo
8	"
9	"
39580	Catostomus
1	
2	
3	
4	
5	
6	
7	Cyprinus carpio
8	Moxostoma
9	"
39590	
2	

Specimens sent in alcohol
to Parleton & Bean.

Musk Turtle & Lizard April 10, 1888.

April 6, 1888.

8 Minnows in paper envelope.

12 Catostomus _____ ? The small-seated
Common Verde sucker. "Scarcely edible,
save in winter. Abundant in all streams, Color
below varying in specimens from pure white to
a handsome yellow. Name "Common Sucker."
Greatest spec. weighed 1 1/2 lbs. in weight.

2 Catostomus cypho: "Hump-back" or "Buffa-
-lo-fish". Beneath orange-yellow. Commonly
eaten & the best of the genus here, for food - unless
it be C. gracilis which I have never tried. Have
seen it as high as 4,500 feet altitude
& Specimens of Gila robusta. "Bony-tail" or
"Verde Trout". Bellies varying in color
from pure white to rosy salmon. Flesh
very bony but having an excellent flavor when
taken from cool mountain streams. It
inhabits the whole Gila Basin, ascending
even small streams to their sources. I have
found them in little brooks up to 6000 feet alt
(over)

The largest specimen in this S, weighed $2\frac{1}{8}$
lbs., Avair. ~~C~~

Localities at which Fishes were Collected
On the Mexican Boundary Line

1. Fort Clark, Kinney County, Texas. Altitude 308 meters. A good-sized stream heading at Ft. Clark called Las Moras Creek (trib. of the Rio Grande).
2. Rio Grande at El Paso, Texas. Altitude 1135 meters. Monument No. 1, Mexican boundary line.
3. Lake Palomas, Mimbres Valley, at monument No. 19, M. B. L. Altitude 1210 meters.
4. Cajon Bonita Creek. This is a beautiful mountain stream, emptying into the San Bernardino River 15 m below the Mexican line. It is tributary to the Yaque River. Altitude about 1375 meters. The right fork of this stream arises in springs about six miles south of monument No. 66, Mexican boundary line; but the ~~right~~ left fork rises close to the boundary. Two species of Kingfisher and the Osprey were found on this stream. In early July, 1892, a large quantity of fishes were netted. Among them were suckers and a fork-tailed, spotted catfish. In 1893, three small suckers were taken and preserved, on Sept. 8. Nearest boundary monument, No. 66.

5. San Bernardino River (tributary to the Yaqui^{River}); heads at Silver Creek and Rucker Cañon, in the Chiricahua Mountains^{Arizona}. Altitude, 1133 meters. Monument No. 77, U. S. G. Specimens Nos. 117, 123, 124, 125, Aug. 20-24, 1893.

6. San Pedro River, at monument No. 98, U. S. G. Altitude 1298 meters. There were fishes, also, in Tanner's Cañon, in the east side of the Huachuca Mountains, and in Barbaconovi Creek, also in the San Pedro Valley, Arizona. I think specimens were forwarded by us. At any rate Dr. A. K. Fisher and Mr. W. W. Price forwarded fishes from the little stream in Tanner's Cañon (which never reaches the San Pedro River unless in times of flood), and ^{also} Rucker Cañon, in the Chiricahuas.

7. Santa Cruz River at La Noria (Monument No. 111, U. S. G.); altitude 1393 meters; also at Tucson, north of monument No. 124, altitude 736 meters. Two small bottles were sent from the Santa Cruz River at Tucson, collected by Mr. Herbert Brown, which were not in the alcohol tank.

8. Pilitto Creek (= Fort Lowell, Arizona), near Tucson, alt. 615 meters. north of monument No. 118 U. S. G.

9. Bear Creek, Bear Valley, near monument No. 132, M. B. L. Altitude about 1200 meters. This stream flows into the Altar River, ~~and~~ ^{through which it} ultimately reaches the Gulf of California. One small, very handsome fish is abundant in this little thread of water. Plenty of specimens saved.
10. Sonoyta River, Sonora, at the Mexican towns of Sonoyta and Quitovaquito, monuments Nos. 168 and 172, M. B. L. This stream flows independently - mostly dry - to the Gulf of California.
11. Gila River, at Adonde Sidung, Gila City, and mouth of the Gila.
12. Colorado River, from the mouth of the Gila River to the Gulf of California.
13. Salton River, Colorado Desert, at Seven Wells (south of monument no. 213, M. B. L., in Lower California) and Gardner's Laguna (south of monument no. 216, M. B. L.). New River, on the Colorado River, also contained large fishes; but we did not fish there. When flooded Unlucky Lake, New River, is "full as fishes."

14. Pacific Ocean at monument No. 258, M.B.L.,
700 miles west of the initial monument
on the Rio Grande. Some of these fishes
were from the sea; others from the estuary
of the Lia Juana River. A few fishes
were subsequently collected on San
Clemente Island, 80 miles northwest of
San Diego Bay. Two small bottles with
fishes (Sticklebacks) from the Lia Juana were lately hand-
-ed in.

Edgar A. Mearns.

Localities at which Fish were Collected on the Mexican Boundary
Line.

---oooOooo---

1. Fort Clark, Kinney County, Texas. Altitude 308 meters. A good-sized stream heading at Ft. Clark, called Las Moras Creek (trib. of the Rio Grande).
2. Rio Grande at El Paso, Texas. Altitude 1135 meters. Monument No. 1, Mexican Boundary Line.
3. Lake Palomas, Mimbres Valley, at Monument No. 19, M. B. L. Altitude 1210 meters.
4. Cajon Bonita Creek. This is a beautiful mountain stream, emptying into the San Bernardino River 15 miles below the Mexican line. It is tributary to the Yaqui River. Altitude about 1375 meters. The right fork of this stream arises in springs about six miles south of Monument No. 66, Mexican Boundary Line; but the left fork arises close to the boundary. Two species of Kingfisher and the Osprey were found on this stream. In early July, 1892, a large quantity of fishes were netted. Among them were suckers and a fork-tailed, spotted catfish. In 1893, three small suckers were taken and preserved, on Sept. 8. Nearest boundary monument, No. 66

5. San Bernardino River (tributary of the Yaqui River); heads at Silver Creek and Rucker Canon, in the Chiricahua Mountains, Arizona. Altitude 1133 meters. Monument No. 77, M. B. L. Specimens Nos. 117, 123, 124, 125, Aug. 20-24, 1893.
6. San Pedro River, at Monument No. 98, M. B. L. Altitude, 1298 meters. There were fishes also in Tanner's Canon, in the east side of the Huachuca Mountains, and in Barbacomori Creek, also in the San Pedro Valley, Arizona. I think specimens were forwarded by us. At any rate Dr. A. K. Fisher and Mr. W. W. Price forwarded fishes from the little stream in Tanner's Canon (which never reaches the San Pedro River unless in times of flood) and also Rucker Canon, in the Chiricahuas.
7. Santa Cruz River at La Noria (Monument No. 111, M. B. L.); altitude 1393 meters; also at Tucson, north of Monument No. 124, altitude 736 meters. Two small bottles were sent from the Santa Cruz River at Tucson, collected by Mr. Herbert Brown, which were not in the alcohol tank.
8. Rillitto Creek (Fort Lowell, Arizona) near Tucson. Altitude 615 meters. North of Monument No. 118, M. B. L.

9. Bear Creek, Bear Valley, near Monument No. 132, M. B. L. Altitude about 1200 meters. This stream flows into the Altar River, through which it ultimately reaches the Gulf of California. One small, very handsome fish is abundant in this little thread of water. Plenty of specimens saved.

10. Sonoyta River, Sonora, at the Mexican towns of Sonoyta and Quitovaquito, Monuments Nos. 168 and 172, M. B. L. This stream flows independently -- mostly dry -- to the Gulf of California.

11. Gila River, at Adonde Siding, Gila City, and mouth of the Gila.

12. Colorado River, from the mouth of the Gila River to the Gulf of California.

13. Salton River, Colorado Desert, at Seven Wells (south of monument No. 213, M. B. L., in Lower California) and Gardner's Laguna (south of Monument No. 216, M. B. L.).

New River, on the Colorado River, also contained large fishes; but we did not fish there.

When flooded, Unlucky Lake, New River, is "full of fishes".

14. Pacific Ocean, at Monument No. 258, M. B. L., 700 miles west of the initial monument on the Rio Grande. Some of these fishes were from the sea; others from the estuary of the Tia Juana River. A few fishes were subsequently collected on San Clemente Island, 80 miles northwest of San Diego Bay. Two small bottles with fishes (Sticklebacks) from the Tia Juana were lately handed in.

(Signed) EDGAR A. MEARNS.

Dec. 9, 1896.

Dear Mr. Bean:

Did I give you the locations of the waters at which fishes were collected? If not, here is one:

Going from east to west, commencing at
1. Fort Clark, Kinney Co., Texas. Las Moras Creek. Altitude 308 meters. This stream runs into the Rio Grande, west of Eagle Pass.

2. Rio Grande at El Paso, monument No. 1, Mexican boundary line. Altitude 1135 meters.

3. Las Palomas Lakes, Mimbres Valley, south of monument No. 21, Mex. B. L. Altitude 1210 meters.

4. Cajon Bonita Creek (empties into ^{15 miles south of monument no. 77, Mex. B. L. line,} San Bernardino River; belongs to the Yaqui River system; heads in San Luis Mountains near monument No. 65, M. B. L.). Collected

suckers, Catfish, etc. in July, 1892 and altitude about 1375 meters where fishes were taken.

3 young suckers (shot) on Sept. 8, 1893.

5. San Bernardino River (Yaqui system) at Mon. No. 77, M. B. L. Altitude 1133 me-

Collecting Stations - Fishes - Sheet II.

= ters. Specimens collected in 1892; also nos. 117, 123, 124, 125, Aug. 20-24, 1893.

6. San Pedro River, at monument No. 98, M. B. L. Altitude, 1298 meters. This stream rises in ^{Donora,} Mexico, and flows to the Gila. On it are ducks, beavers, muskrats, and cottontails. We saw fishes (one species) in a small stream in Tanner's cañon of the Huachuca Mts. ^(many) and in Barbacomori Creek, tributaries - at least the latter - of the San Pedro. The little stream in the Huachucas dries before leaving the mountains. Dr. A. K. Fisher and W. W. Price have sent me specimens of the fish. We did not.

7. Santa Cruz R. at La Noria, monument No. 111, M. B. L. Alt. 1393 meters. This stream rises in Arizona, flows south into Donora, where it winds around the Patagonia Mts., and re-enters the U.S. to flow north to the Gila, ~~into~~ through

Collecting Stations - fishes - Sheet III.

much of its latter course is dry. The boundary line crosses the Santa Cruz R. twice, at Mon. 111, and at Mon. 118. We followed it from Mon. 111 to where it runs aground, below Tucson, a distance of nearly 60 miles. At Tucson (north of monument No. 124) the altitude is but 736 meters. Fishes were collected at La Noria in November and Dec., 1892. Two small bottles were sent, from Tucson, which were not in the alcohol tanks.

8. Rillito (look to the spelling) Creek, near Tucson, in foothills of Santa Catalina Mountains. Stream runs through old Fort Lowell. Altitude of Ft. Lowell, 615 meters. North of monument No. 118, ^{M. B. L.} Pajarito mountains.

9. Bear Creek, Bear Valley, near monument No. 132, M. B. L. Altitude about 1200 meters. This stream flows to the Altar River, which reaches the Gulf of California. One very beautiful fish was taken here in numbers.

Collecting Stations - Fishes - Sheet IV.

10. Sonoyta River, Sonora, at the Mexican towns of Sonoyta and Quitovaquito Springs (monuments 168 and 172). This stream flows independently, mostly dry, to the ~~Gila~~ Gulf of California. The altitude is low (I could furnish it).

11. Gila River from Cedone Sidnig, on the S. Pa. R.R. to the Colorado River, at Yuma, Arizona.

12. Colorado River, from the mouth of the Gila to the Gulf of Calif.

13. Salton River, Colorado Desert, at Seven Wells (monument 213), and at Gardner's Laguna (Mon. 216).

14. Pacific Ocean at monument No. 258, M. B. L., 700 miles, by boundary line, from initial monument (No. 1 on the Rio Grande). Some of these were from the sea, and others from the estuary of the Tijuana River. A few fishes were collected at San Clemente Island, 80 miles NW. of San Diego, ^{E. A. Mearns.}

Dear Mr. Bean:

I am still stuck
here at Clark. If I was
sure of remaining I would
send for another tank of
alcohol, as mine is full.
Would you like some of these
fork-tailed Cats. Please tell
me what it is.

Yours truly

Edgar A. Mearns

mailed
June 7
1898.

Oak Creek Brook Trout.

This description was taken from a fish about a foot long (See outline and fin formula Nat. 2), taken at Indian Garden, Oak Creek, Yavapai County, Arizona, June 12, 1886. This specimen was compared, on the spot, with several others the same size and smaller, which were practically like it.

That portion of the under surface which is included between the lines of the pectoral and ventral fins is pure white; sides to or above the lateral line greenish yellow. Above the lateral line the ground-color is olivaceous green, with black spots arranged in longitudinal series, these becoming larger and closer together from below upward until the dorsal aspect becomes almost black. The sides are yellow, mottled with black.

Oak Creek Brook Trout - Sheet II.

Upon the upper half of the head the color is the same as the back; but the black spots are larger and almost round. The sides of the head are brassy yellow. The spots upon the sides of the body are x-shaped or ~~x~~-shaped. The pectoral, ventral, and anal fins are unspotted and orange yellow in color. The caudal and dorsal fins are finely and thickly spotted with black upon a greenish yellow ground. The adipose fin is spotted with large, round, black spots. There are four rows of "gills". A number of individuals, all captured by Mrs. Lucy Ord Mason in Oak Creek, were examined as to the contents of their stomachs. In some a quantity of sand and small pebbles were found; one quartz pebble from a stomach was 10 mm in diameter and

Oak Creek Brook Trout - Sheet III.

worn smooth. Wasps, grasshoppers, and grubs which live in moss on the rocky bottom, were found in their stomachs.

In May, 1886, I saw a Brook Trout weighed, which had been caught the day before by Major William H. Drum, Twelfth Infantry, U.S. Army, and eviscerated so that it was quite dry when brought to the post. It weighed $2\frac{3}{4}$ pounds Avoirdupois. I must have weighed somewhat more than three pounds when taken from the water.

On May 11, 1896, a trout was caught measuring 325 mm in length, measured from nose to base of caudal fin, and 360 mm ($14\frac{1}{4}$ inches) in total length. Its weight was estimated at $1\frac{1}{2}$ pounds, Avoirdupois. A number of others were taken that day which measured 275 mm to

Oak Creek Brook Trout - Sheet IV.

the base of caudal fin, or 305 mm to end of tail; and this may be said to be the average of adult females.

I have heard of a Brook Trout caught in Oak Creek, measuring weighing six pounds Avoirdupois; but this is probably an exaggeration, as the persons who fish in Oak Creek now have never taken one larger than that caught by Major Drum in May, 1886. In three (3) specimens examined the vertebrae numbered 59 each.

On January 5, 1887, we visited Oak Creek, camping at Thompson's Ranch, 25 miles from Fort Verde, and remaining there until the 10th of January, when we returned to Verde. During this time considerable fishing was done by expert anglers, but only four (4) trout were taken.

Oak Creek Brook Trout - Sheet V

Two of these were unusually large, both being females, weighing about $2\frac{1}{2}$ pounds apiece.

Description. - Old female; full of large eggs. Estimated weight, $2\frac{1}{2}$ pounds Avondupois. Total length, $19\frac{1}{4}$ inches. Girth in front of dorsal fin, $10\frac{3}{4}$ inches. Length to base of caudal $17\frac{5}{8}$. Diameter of eye, $\frac{9}{16}$. From end of lower jaw to opercle, $4\frac{1}{4}$. Length (or height) of pectoral, $2\frac{3}{4}$. Height of dorsal, in front, $2\frac{1}{2}$; its height behind, $1\frac{7}{16}$. ~~Height~~ Height of dorsal along its base, $2\frac{1}{8}$. Height of adipose fin, $1\frac{3}{16}$. Depth of ventral fin, $2\frac{1}{4}$. Anal fin along anterior border, $2\frac{5}{8}$; along posterior border, $\frac{7}{8}$. Anal fin, length of base, $1\frac{3}{4}$. Caudal slightly forked. Dorsal and caudal fins yellowish, olivaceous, thickly spotted with black. Pectorals, ventrals, and anal orange-yellow, and only spotted along anterior edge. Sides of head

Oak Creek Brook Trout - Sheet VI

below eyes, old gold color, unspotted except in area just below and behind eyes, where the spots are perfectly round and rather sparse-black. Ventral aspect yellowish, immaculate. Sides to considerably above lateral line silvery grayish; spotting very sparse below (not extending to within an inch of lower fins), growing more numerous above (x-shaped - some roundish). Above dark olive, some scales with metallic bluish tips. Flesh reddish salmon. Peritoneum colorless. Scales of lateral line 120. Dorsal rays, 12. Ventral, 10; anal, 12; pectoral, about 16.

A small specimen (length 13 inches to end of caudal fin) differs in color only in being whitish in pectoral region below. Another large female measures $18\frac{1}{2}$ inches

Oak Creek Brook Trout - Sheet VII

in total length (to base of caudal, $16\frac{3}{4}$ inches) Fin rays. Dorsal, 12; pectoral, 16; ventral, 10; anal, 11. Flesh reddish salmon color.

Trout bite poorly at this season, but descend the stream much farther than in summer. June is the best month for fishing; but they are then only found high up towards the source of the brook.

Clear Creek Brook Trout (same as that of Oak Creek — Sheet VIII.)

This specimen, an adult male (see fins in envelope No. 2 and tracing No. 2), was taken from the canyon of Clear Creek, at its headwater, on July 25, 1887, by E. A. Mearns. The largest caught that day weighed about one pound avoirdupois and was about 15 inches long. Color above, a dark, vinaceous olive, becoming silvery below the lateral line, and yellowish on belly and opercles. Fins below, reddish orange; ~~those~~ above (dorsal), yellowish olive, thickly spotted. The ventral and anal fins are obscurely spotted with obsolete spots. The back and sides are densely spotted with black; the spots on the head, back, and adipose fin being rounded; those on sides; and posteriorly, being irregularly x-shaped. The iris is golden, as are the opercles and preopercles in places.

Clear Creek Brook Trout — Sheet IX.

These trout were mostly found in pools, and were easily taken with any sort of bait, although they did not bite as trout should, or as oak creek trout do, but took the bait in a sluggish manner. The water was cool rather than cold, and very clear. The stream ran in a cañon with walls over 1000 feet high, with Douglas's Spruce (*Pseudotsuga taxifolia*) forest at the bottom, together with much other vegetation such as *equisetaceae*, willow, aspen, walnut, maple, box-elder, pine, and hackberry. There is a dense growth of hop and grape vines, together with many shrubs, annuals, and ferns. The cañon's walls are of limestone above, sandstone below. We "headed" the water four miles, in entering the box cañon, and then

Clear Creek Brook Trout — Sheet X.

we were obliged to climb down the bed of the stream, over boulders and through the tangled brushwood and vines, encountering two rattlesnakes and one bear en route. We two persons ate sixteen (16) good-sized trout for dinner. The flesh was of a beautiful pink color, and seemed to us to have an excellent flavor. We caught about seventy-five (75) of them in two or three hours. In some of the clear pools there were no hiding places for the trout, and, more than once, the same fish was hooked a second time after being hooked and pulled out of water once.

Oak Creek Brook Trout — Sheet XI.

"Lieutenant Carrington and I started out with rod and gun, respectively, in quest of game and fish, and expecting trout for supper. I followed Oak Creek, a clear, cold mountain stream having its source in the San Francisco Mountains, about 14 miles from Flagstaff, Arizona. It is cold all through the year, and contains trout of delicious flavor, some of which are said to attain to nine pounds weight. Oak Creek is tributary to the Rio Verde, which it enters some 7 to 9 miles above Fort Verde. As I descended the stream for a mile and a half, I found it bordered with alders (*Alnus oblongifolia*) as fine and large as beach-trees in the north, and large sycamore and other deciduous trees, besides evergreen oaks (*Q. emoryi*) and cypress. * * * The trout refused to bite for me. Carrington — January 15, ~~1885~~ 1885.

Oak Creek Brook Trout - Sheet XII.

Oak Creek, August 12, 1885. "The Trout would not bite."

August 13. - "On the 13th a part of the party went up the stream a mile or two and fished all day. They only caught one fine trout, but plenty of "Bony-tails" (Gila)

Brook Trout. - Female, full of large eggs. Length ^(to end of tail) $19 \frac{3}{4}$ inches. Weight (guessed) $2 \frac{1}{2}$ pounds, around fin. Girth of body just in front of dorsal fin $10 \frac{3}{4}$ inches. Length to base of caudal, $17 \frac{5}{8}$ inches. Diameter of eye, $\frac{9}{16}$. Tip of lower jaw to end of opercle, $4 \frac{1}{4}$ inches. Length of pectoral fin, $2 \frac{3}{4}$. Length of dorsal, $2 \frac{1}{8}$. Height of dorsal in front, $2 \frac{1}{2}$. Height of dorsal behind, $1 \frac{7}{16}$. Height of adipose fin, $1 \frac{3}{16}$ (or, perhaps, $\frac{13}{16}$). Length of ventral fin, $2 \frac{1}{4}$. Length of anal fin, along its anterior border, $2 \frac{5}{8}$. Anal fin, depth on posterior border, $\frac{7}{8}$. Anal fin, length of base, $1 \frac{3}{4}$. Caudal slightly

Oak Creek Brook Trout - Sheet XIII.

forked. Caudal and dorsal fins yellowish olivaceous, "thickly spotted". Ventrals, ventrals, and anal, orange-yellow, and only spotted along anterior border. Sides of head brown eyes, old gold, unspotted, except an area just below and behind the eyes, where the spots are perfectly round, black, and rather sparse. Ventral aspect, yellowish, unspotted. Sides, to half an inch above lateral line, silvery-grayish; spotting very sparse below (the spots not extending to within an inch of the lower fins), growing more numerous above (X-shaped - some rounded). Above, dark olive, some scales with bluish, metallic tips. Flesh, reddish salmon. Peritoneum whitish or colorless. Scales l. l. 120. D. 12; V. 10; A. 12; P. about 16.

(Continued on sheet XIV.)

Oak Creek Brook Trout - Sheet XIV.

A small one, 13 inches total length, differs from the above (see sheet XIII) only in color, being whitish below, in the pectoral region.

Another trout, $18 \frac{1}{2}$ inches total length (to base of caudal $16 \frac{3}{4}$). D. 12; V. 10; P. 16; A. 11.

Date, 1887, Oak Creek, Ariz.

"Note. - No Reptiles or Batrachians were seen on the trip [to Oak Creek, Arizona, & Fort Verde, January 14-18, 1885]. A species of clam (*Unio* or *Anodonta* - see specimens Am. Mus. Coll.). The Trout could not be made to bite, though I saw several very large ones. Some small Minnows were seen at one or two places. No ichthyological specimens were preserved.

August 12-14, 1885, Oak Creek, Arizona
"I caught a mess of "Bony-tails" in
the evening; but Trout would
not bite."

WAR DEPARTMENT.

Post of *Fort Clark, Texas*

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*Mr. Barton A. Bean
Smithsonian Institution
Washington,
D. C.*