BIOLOGIA

CENTRALI-AMERICANA.

INSECTA.

NEUROPTERA.

EPHEMERIDÆ.

BY

THE REV. A. E. EATON, F.R.S.

ODONATA.

BY

PHILIP P. CALVERT, PH.D.

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Plates.

* [That for the Ephemeridæ is given on p. 1.—Ed.]

TABLE A (*continued*).

Locality.	State or Territory.	Temp. Zon	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
			MEXICO (*cont.*).				
Nuevo Laredo	Tamaulipas.	III	130	425	Barrett, O. W.	July.	
Oaxaca City	Oaxaca.	III		5070	Deam, C. C.	June 26–28, 1900.	
					Howard, L. O.	May, 1903.	
Ocotlan C	Jalisco.	IV	1524	5000	Calvert, P. P.	Aug. 29, 30, Sept. 1 1906.	Odonata taken along edge of swamp between Rio Lerma and Lake Chapala, and at Mexican Centr. R. R. Station.
Omealca	Vera Cruz.	III					
Omilteme	Guerrero.	IV	2438	8000		July, Aug., 1888.	8–10 miles about west of Chilpancingo, in the pine-forest in valley between mountains. (H. H. S. *in litt.*) *Cf.* Gadow, *l. c.*
Orizaba	Vera Cruz.	IV	1228	4030	Barrett, O. W.	June.	
"	" "			...	Boucard, A.		Cited by de Selys.
					Elwes, H. J.	March, 1888.	"Valley with streams, pastures, and rich vegetation, on alluvial and hard-limestone terrain." (Gadow.)
		...			Godman, F. D., Smith, H. H.	Dec., 1887.	
		.			Tower, W. L.	Sept. 1, 1903.	
Papachal	Sinaloa.	III	180–365	600–1200	Batty, J. H.	Dec. 9, 1903.	Bull. Amer. Mus. Nat. Hist. xxi. p. 339, xxii. p. 193.
Patzcuaro C	Michoacan.	IV	2134	7000	Deam, C. C.	July 13, 1900.	
	"	.			Rhoads, S. N.	April 7, 1899.	
Penon C	Distrito Federal.	IV	2225	7300	Barrett, O. W.	Oct. 27, 1898.	
Pinos Altos	Chihuahua.	V	2410	7900	Hepburn, B.	—	"Heavy forests of hemlock characterize the region." (Hovey, Bull. Amer. Mus. Nat. Hist. xxiii. pp. 437, 401, & fig. 2, map.)
Plan del Rio	Vera Cruz.	III	316	1040	Barrett, O. W.	July.	
Potrero ..	?				de Saussure, H.	1854–5.	Cited by Hagen, 1861.
Presidio	Vera Cruz.	III		...	Barrett, O. W.	June, July.	
"	(*see* Mazatlan).						
Puebla City C	Puebla.	IV	2160	7100	Richardson, W.	1889.	Biol. Centr.-Am., Moll. p. viii.
Puente de Ixtla	Morelos.	III	900	2950	Deam, C. C.	July 2, 3, 1900.	"Pleasant, fertile, varied open country, limestone terrain." (Gadow.)
Putla				...		—	"Cote du Pacifique," cited by de Selys.
Queretaro City C	Queretaro.	IV	1878	6160	Calvert, P. P.	Aug. 28, 1906.	
" " C		...			Deam, C. C.	Dec. 12, 1898.	
Rincon	Guerrero.	III	953	2800	Smith, H. H.	Oct., 1888.	Collector's figures for altitude; Romero gives 670 m. = 2200 ft.
Rio de las Balsas		? I			Barrett, O. W.	Dec. 7, 1898.	*See also* Balsas.
Rio Papagaio		II	365	1200	Smith, H. H.	Oct., 1888.	
Rio Verde		III	996	3270			
Salina Cruz	Oaxaca.	II	2	7	Deam, C. C.	Dec. 21, 1898.	"Porphyritic terrain; hilly, steep coast-range, varied by promontories and fresh- and salt-water lagoons." (Gadow.)
Saltillo	Coahuila.	IV	1600	5250		Sept. 22, 1906.	Odonata taken at the Baños de San Lazaro y la Asuncion on the northern edge of the town: also near river, by pools along the railroad near the Panteon; desert near at hand, *Yucca* and *Agave*.
San Angel C	Distrito Federal.	IV			Deam, C. C.	July 9, 1900.	
San Blas	Tepic.	II	...		Richardson, W.		
		.		...	Schumann.	July.	
San José de Guaymas	Sonora.	III	...	...	Howard, L. O.	April 10, 1898.	
San Lorenzo Cordova	Vera Cruz.	III	...		Trujillo, M.	June, July, 1889.	

INTRODUCTION TO THE ODONATA.

THE sources of the Odonate material treated in this Volume are shown by

TABLE A.—ALPHABETICAL LIST, BY COUNTRIES, OF THE LOCALITIES IN WHICH THE ODONATA WERE COLLECTED.

This list gives the State, Territory or Department, and the temperature zone in which each locality is situated, the approximate altitude in both metres and feet, the name of the collector, the date at which the collection was made, and any pertinent remarks. The temperature zones are denoted as follows:—I. Zone of mean annual temperature of more than 30° C. (86° F.), II. of 30°–25° C. (86°–77° F.), III. of 25°–20° C. (77°–68° F.), IV. of 20°–15° C. (68°–59° F.), V. of 15°–10° C. (59°–50° F.), VI. of less than 10° C. (50° F.). The extent of these zones is shown on Map No. 1, the explanation of which indicates the data on which it is based. The altitudes have been taken from Mr. H. S. Gannett's "List of Altitudes in Mexico, Central and South America" (Bull. Internat. Bureau Amer. Repub. xvii. no. 3, Sept. 1904), from data supplied by collectors, and from other special sources mentioned under each country.

MEXICO.

Special sources for the altitudes here given have been the lists by Drs. Felix and Lenk (Boletin Soc. Geog. y Estadist. Rep. Mex. iii. 1894), Romero's 'Geographical and Statistical Notes on Mexico' (New York, 1898), La Comision Geografico-Exploradora for the State of Vera Cruz (Revista Soc. Cien. Antonio Alzate, xxiii. pp. 31–32, 1905), Dr. Sapper for Yucatan, &c. (Petermann's 'Mittheil.,' Erganzungsband xxiv. no. 113, 1894, and xxvii. no. 127, 1899, and Boletin Inst. Geol. Mex. 1896). Only two of the collectors quoted have published itineraries, J. F. McClendon (Ent. News, xvii. pp. 26–27, 1906) and P. P. Calvert (*l. c.* xviii. pp. 231–237, 1907). Notes in the "Remarks" column quoted from "Gadow" are from Dr. Gadow's paper in Proc. Zool. Soc. London, 1905, ii. pp. 196–199. A "C" after the name of a locality indicates that it has been treated as falling in the central plateau.

Locality.		State or Territory.	Temp. Zone.	Altitude.		Collector.	Date.	[redacted]
				Metres.	Feet.			
Acaguisotla		Guerrero.	III	1067	3500	Smith, H. H.	Oct., 1888.	
Acambaro	C	Guanajuato.	IV	1860	6100	Rhoads, S. N.	Mar. 30, 1899.	
Acaponeta		Tepic.	II	90	300	Eisen & Vaslit.	Nov., 1894.	
Acapulco		Guerrero.	II	4	14	Agassiz, A.		
				...	...	Hassler Exp.	Aug., 1872.	Smithsonian Rep. 1872, p. 91.
					...	Smith, H. H.	Sept., 1888.	
				...	...	White, C. H.	April 17, 1891.	
								Cited by Hagen, 1861.
Apiabampo		Sonora.	III			(Batty, J. H.?)		
Aguascalientes	C	Aguascalientes.	IV	1884	6180	Calvert, P. P.	Aug. 27, 1906.	Odonata taken at ponds at the public bath-house near the Mexican Central R. R. Station and also a little farther westward, but on the eastern edge of the town.
				...	...	Deam, C. C.	Dec. 7, 1898.	
				...	...	Howard, L. O.	Sept., 1901.	

TABLE A (*continued*).

Locality.	State or Territory.	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
MEXICO (*cont.*).							
Ajusco, *see* Sierra de Ajusco.							
Altamira	Tamaulipas.	III	14	45	Hoag, M. E.	Aug. 1, Sept. 10, 20 1901; June 15–30, July 15, 1903	
Amatlan	Tepic.	III	780	2560	Batty, J. H.	Jan. 18, 1905.	
Amecameca C	Mexico.	V	2500	8180	Deam, C. C.	Jan. 5, 1899.	
C	"				Godman, F. D.	Feb. 1888.	
Amula	Guerrero.	IV	1830	6000	Smith, H. H.	Aug., Sept., 1888.	"Hamlet 8–10 miles east of Omiltemi, properly in the plateau, hilly, forest-covered, below the level of pines." (H. H. Smith *in litt.*)
Atlihuacan	Puebla.	...	...		de Saussure, H.	1854–5*.	Cited by Hagen, 1861.
Atoyac	Vera Cruz.	III	400	1314	Schumann.		
	" "				Smith, H. H.	April, May, 1888.	
Balsas	Guerrero.	?I	480	1574	[redacted]	1901.	Very mountainous; tropical vegetation. High and low forest interspersed with much brush-wood. The river, during the rainy season, brings down floods of yellow or brown water with rather little sand, but much comminuted vegetable matter. The bed is rocky, limestone, the banks mostly steep, but there are many sandy shelves above the high-water mark." (Gadow.) *See also* Rio de las Balsas.
Barranca Blanca	Tepic.	III	730	2400	Eisen & Vaslit.	Nov., 1894.	
Bleados, Hacienda de	S. Luis Potosi.				Palmer.	Oct. 1–3.	
Bocas, Las	Durango.	IV	2070	6800	Batty, J. H.	Aug. 11, 12, 1903.	A dry river-bottom on the Rio Florida." (Bull. Amer. Mus. Nat. Hist. xxii. p. 161, 1906.)
Cadereita	Nuevo Leon.				Couch.	1853.	
Camaron	Vera Cruz.	III	340	1120	(Smith, H. H.?)	June 16, 1888.	
Campeche	Campeche.	II			Dubosc.		*Teste* Dr. F. Ris.
Castillo, El C	Jalisco.	IV	1525	5000	McClendon, J. F.	June 24, July 27, 1903.	
Chapala C		IV	1525	5000	Calvert, P. P.	Aug. 30, 1906.	Odonata taken on lake-beach and (*Æshna lutsipennis*) in streets of town.
Chapultepec C	Distrito Federal.	IV	2320	7600	Barrett, O. W.	June 9, July 4, 1897	
C					Hay, R. H.	July 5, 1901.	
Chavarillo	Vera Cruz.	III	945	3100	Barrett, O. W.	April, 1899.	
Chichen Itza	Yucatan.	II			Cole, L. J.	Feb. 14, Mar. 1, 1904.	
Chihuahua (city) C	Chihuahua.	IV	1450	4750	Calvert, P. P.	Aug. 16–18, 1906.	Odonata scarce (2 spp.).
C					Kerr, M.		
Chilpancingo	Guerrero.	III	1975	4500	Smith, H. H.	June, Aug., Sept. Oct., 1888.	Alt. according to collector; Romero gives elevation of projected R. R. Station as 1200 met. (3937 feet). "In a wind-swept, shallow depression of Cretaceous terrain, surrounded by sparsely wooded hills, and meadows on the top of the ridge." (Gadow.)
Cholula C	Puebla.	IV	2145	7040	Deam, C. C.	Jan. 1, 1899.	
Coatepec	Vera Cruz.	IV	1250	4100	Barrett, O. W.	July.	On railroad south from Jalapa; coffee.
Coatzacoalcos		II	2	6	Deam, C. C.	Dec. 18, 1898.	
Coeula, Rio	Guerrero.	II	150–600	1500–2000	Barrett, O. W.	Dec., 1898.	

* The dates of de Saussure's visit to Mexico are taken from the biographical notice in 'Revue Suisse de Zoologie,' xiv. pp. 4–6 (1906).

TABLE A (*continued*).

Locality.	State or Territory	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
			MEXICO (*cont.*).				
Colima	Colima.	III	450	1475	Goldsmith, P. H.	July 26-31, 1905.	
Contreras C	Distrito Federal.	V	2470	8090	Barrett, O. W.	Oct., 1898.	
Cordoba	Vera Cruz.	III	900	2950	"	Jan. 27.	"Dense tropical vegetation." (Gadow.)
"			...	...	Howard, L. O.	May, 1903.	
"			...	...	Schaus, W.	May.	
"			...	...	de Saussure, H.	1854-5.	Cited by Hagen, 1861.
Cuautla	Morelos.	III	1216	3990	Tower, W. L.	Aug. 2 & 20, 1903.	
Cuernavaca		III	1525	5000	Barrett, O. W.	May, June, Sept., Oct., 1897; May, Aug., Sept., Nov., 1898.	"Fertile valleys of volcanic and limestone terrain, with little streams." (Gadow.)
"			...	...	Boucard, A.	—	Cited by de Selys.
"			...	...	Deam, C. C.	Jan. 3, 4, 1899; July 4–8, 1900.	
"			...		Smith, H. H.	June, 1888.	
"		III–IV	1460–2440	4800–8000	Tower, W. L.	July 31, Aug. 3–6, 1903.	
Cuesta de Misantla	Vera Cruz.				Trujillo, M.	—	Atlantic slope.
Diente	Nuevo Leon.	IV	1220	4000	Rhoads, S. N.	April 26, 1899; Jan. 9, 1903.	Near Monterey.
Dos Arroyos	Guerrero.	II	300	1000	Smith, H. H.	Sept., Oct., 1888.	
Dublan C	Hidalgo.	IV	2070	6800	Barrett, O. W.	June 10, 1897.	
Durango (city) C	Durango.	IV	1890	6200	"	Oct.	
Escuinapa	Sinaloa.	II	15–30	50–100	Batty, J. H.	June 7, 12, July 13 Aug. 11, 1904.	Long, flat plain covered mostly with thorny bushes, yuccas, and patches of high grass." (Bull. Amer. Mus. Nat. Hist. xxi. p. 339, xxii. p. 192.)
Eslava C	Distrito Federal.	V	2440	8000	Barrett, O. W.	Oct. 13, Nov. 2, 1898.	
Frontera	Tabasco.	II	...	...	Smith, H. H.	Jan., 1888.	
"	"	...	...		Westcott, O. S.	July 14–21, 1904.	
Fuente	Coahuila.	III	232		—	—	Near Saltillo.
Guadalajara C	Jalisco.	IV	1543	5060	Goldsmith, P. H.	Aug. 9–16, 1905.	
"			...	...	McClendon, J. F.	June 22-Sept. 21, 1903.	"Insects collected in the ravine of the Santiago and in some deserted parks." (McClendon.
=			...		Schumann.	July.	
"					Tower, W. L.	Sept. 11, 12, 1903.	
Guadalupe C	Distrito Federal.	IV	2195	7200	Hay, R. H.	July 4, 1901.	
C	"		...	...	Tower, W. L.	July 29, Sept. 1, 4, 1903.	
Guanajuato C	Guanajuato.	IV	2060	6760	Duges, A.		
Guzman C	Chihuahua.	IV	1340*	4400	Calvert, P. P.	Aug. 6, 7, 1906.	Odonata taken along small stream (outlet of a spring or well) flowing into lake near R. R. Station; country largely desert, lake permanent, its banks andesite lava.
Hermosillo	Sonora.	III	236	775	Calvert, P. P.	Aug. 11, 1906.	Very hot, Rio Sonora almost entirely dry; only one species of Odonata seen.
Huastec (? Huastepec)	? Oaxaca.		...	...	de Saussure, H.	1854–5.	Cited by Hagen, 1861. This is probably the locality cited by de Saussure in his Recherch. Zool. dans Mex. Amer. Centr., Orthopt. p. 404, as "les montagnes temperees de la Huasteca." But where are these "montagnes"?
Hustusco	Vera Cruz.	IV	1350	4430	Heyde.		
Iguala	Guerrero.	II	719	2360	Barrett, O. W.	Sept., 1898.	"In a wide plain, surrounded by limestone hills, with scanty vegetation." (Gadow.)

* Hovey gives the elevation of Guzman as 1190 m. (Bull. Amer. Mus. Nat. Hist. xxiii. 1907, map, fig. 2).

TABLE A (*continued*).

Locality.	State or Territory.	Temp Zone	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
MEXICO (*cont.*).							
Isthmus of Tehuantepec	Oxaca.	II			Sumichrast, F. E.	Sept., 1868–Sept., 1872.	Sumichrast's Odonata in the M. C. Z. are simply labelled "Isthmus of Tehuantepec, F. Sumichrast," without particular locality or date. Presumably they were gathered at the same time as his birds, listed by Lawrence (Bull. U.S. Nat. Mus. no. 4, 1876), where some 18 localities, chiefly on the western side of the Isthmus, are mentioned. "Western slope . . dry . . . without continuous forests, but with more scattered patches of mostly deciduous trees." (Gadow.)
Izamal	Yucatan.	II			Gaumer, G. F.		
Jalapa	Vera Cruz.	IV	1340	4400	Barrett, O. W.	April, Aug., Dec. 22, 1898.	
					Calvert, P. P.	Sept. 10–12, 1906.	Odonata taken along stream flowing through city, chiefly just above the mill-dam, and in woods south of city.
		...			Godman, F. D.	Nov., 1887.	
		...			Hay, R. H.	Aug. 13, 1901.	
		.			Hoege, C. F.	1879–1880, 1885–1886.	Deutsche ent. Zeitschr. 1897, p. 161.
					Rhoads, S. N.	Mar. 22, 1899.	
					Trujillo, M.		
Jojutla	Morelos.	III	890	2920	Barrett, O. W.	Nov. 15, 16, 1898.	
Jova, La	" Luis	IV	1483	4800	Hoag, M. R.	Aug. 10, 1903.	
Juanacatlan C	Jalisco.	...			McClendon, J. F.	July 22, 31, 1903.	
Lampazos	Nuevo Leon.	III	300	980	Deam, C. C.	July 11, 1900.	
Linares	" "	III	363	1190	Barrett, O. W.	July.	
Lumija	Chiapas.	III?			Westcott, O. S.	July 23–Aug. 4, 1904.	On Rio Grijalva, 200 miles from Bay of Campecho (Westcott *in litt.*).
Matamoros	Puebla.	III	1443	4737	Barrett, O. W.	June.	
	Tamaulipas.	III	40	130	Dr. Berlandier Lt. Couch.	———	Cited by Hagen, 1861.
Mazatlan	Sinaloa.	II		13	Crotch, G. R.	Oct., 1873.	
" Presidio de	"				Forrer, A.		
Medellin	Vera Cruz.	III	50	170	Smith, H. H.	Jun., 1888.	
Merida	Yucatan.	II	9	30			
Mexico (city) C	Distrito Federal.	IV	2240	7350	Barrett, O. W.	June, July, Sept., 1897.	
		...	...		Deam, C. C.	Dec. 15, 1898; July 1, 1900.	
		...	...	...	Forrer, A.		
		...			Godman, F. D.		
		...		...	Rogers, G. O.	1890.	
		...			Schumann.	June 21, 1888.	
		...	...	...	Smith, H. H.	May, 1888.	
Misantla	Vera Cruz.	III	410	1344	Godman, F. D.	March, 1888.	
Mitla	Oaxaca.	IV	1646	5400	Deam, C. C.	June 27, 1900.	
Monclova	Coahuila.	III	588	1930	Palmer.	(Aug., 1880?)	*Cf.* 13th Rep. Missouri Bot. Gard. pp. 68, 69.
Montamorelos	Nuevo Leon.	III		...	Barrett, O. W.	April.	
Monterey		III	495	1625	Barrett, O. W.	July.	
		...	...	...	Rhoads, S. N.	April 25, 1899.	
Morelia C	Michoacan.	IV	1890	6200	Godman, F. D.		
" C		...	...	...	de Saussure, H.	1854–5.	Cited by Hagen, 1861.
Nepantla C	Mexico.	IV		6450	Barrett, O. W.	Nov. 22.	
Nogales	Sonora.	IV	1173	3850	Calvert, P. P.	Aug. 12, 1906.	Odonata taken at very small cow pond at south end of town.

TABLE A (*continued*).

Locality.	State or Territory	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
					MEXICO (*cont.*).		
[illegible]	S. Luis Potosi.	IV	1792	5780	Hoag, M. E.	Sept. 1, 1901; Aug. 5, 1903.	
[illegible]	" " "	..	...	...	Palmer.	Sept., Oct.	
San Marcos	Jalisco.	III	985	3231	Goldsmith, P. H.	July 11–17, 1905.	
[illegible]	Coahuila.	III	1100	3600	Calvert, P. P.	Aug. 22, 1906.	Odonata taken at pond behind Mex. Centr. R. R. Station; a cotton-raising district.
Santa Ana	Chihuahua.	IV			Hepburn, B		
[illegible]	Distrito Federal.	V	2558	8390	Barrett, O. W.	Oct. 24, 1898. .	
[illegible]	Puebla.	IV	2145	6950	"	June.	
[illegible]	Vera Cruz.	III	...	...	Schaus, W.	April, Aug., 1906.	
[illegible]	Chihuahua.	IV	1225	4020	Calvert, P. P.	Aug. 19, 20, 1906.	Odonata taken at a small swamp and along the outflow from the sulphur-baths; cotton raised in vicinity.
Santiago Iscuintla	Tepic.	III	...	...	Schumann.	July.	Formerly in Jalisco and so quoted in the text, but the correction has been made in the tables in this Introduction.
[illegible]	Guerrero.	III	914	3000	Smith, H. H.	Oct., 1888.	
Soyapa	Durango.	III	760	2500	Batty, J. H.	Nov. 20, 1903.	On the Sinaloa boundary. (Bull. Amer. Mus. Nat. Hist. xxii. p. 161.)
didas.	Guerrero.	IV	2134	7000	Smith, H. H.	July, 1888.	3 miles south of Omilteme, southern side of mountain-range, very damp, vegetation luxuriant. (H. H. S. *in litt.*)
Sierra de Ajusco	Distrito Federal.	V	2845	9300	Hay, R. H.	July 18, 1901.	"Volcanic, well-wooded mountains." (Gadow.)
Sierra Madre	Tepic.	III–IV	...	...	Richardson, W.	1889.	
Sochitepec	Morelos.	III	1220	4000	Smith, H. H.	June, 1888.	
Tabi	Yucatan.	II	120	394	Godman, F. D.	Dec., 1887.	
Tacuba	Distrito Federal.	IV	2250	7380	Barrett, O. W.	July 22, Sept., 1897	
Tacubaya	" "	IV	2323	7620	[illegible]	July, Aug., Sept. 1898; Apr., 1899.	
Tampico	Tamaulipas.	III	10	30	de Saussure, H.	1854–5.	Cited by Hagen, 1861.
Tapachul	Chiapas.	II	180	590	Cook & Collins.	May 4–9, 1902.	
Teapa	Tabasco.	II	c. 250	c. 820	Smith, H. H.	Jan.–Apr., 1888.	
[illegible]	Oaxaca.	II	36	120	Deam, C. C.	Dec. 22–23, 1898.	"Sandy, varied terrain." (Gadow.) *See also* Isthmus of Tehuantepec.
Tekanto	Yucatan.	II	13	43	Exped. Acad. Nat. Sci. Philad.	Mar. 1, 1890.	Flat, dry, low bushes; few large trees; insects scarce. (Baker, Naturalist in Mex. p. 20.)
Temax	"	II	...	...	Gaumer, G. F.		
[illegible]	Tabasco.	II	60	200	Barrett, O. W.		
[illegible]	Vera Cruz.	IV	1218	3995	"	[illegible]	Terminus (1906) of R. R. running south from Jalapa.
Tepetlapa	Guerrero.	III	914	3000	Smith, H. H.	Oct., 1888.	
[illegible]	Tepic.	III	1036	3400	Eisen & Veslit.	Oct., Nov., 1894.	Proc. Calif. Acad. Sci. (3) Zool. i. p. 372.
[illegible]	"	III	900	2950	Goldsmith, P. H.	Aug. 22, 23, 1905.	
[illegible]	"			...	Schumann.	July.	
[illegible]	Vera Cruz.	IV	...	...	Rhoads, S. N.	Mar. 1–21, 1899.	Waterfalls near Xico; coffee.
[illegible]	Guerrero.	III	609	2000	Smith, H. H.	Oct., 1888.	Collector's figures for the altitude; Romero gives 300 m. = 984 ft. for the projected R. R. Station. "990'; river valley, volcanic. Andesite overlaid with red rubble." (Gadow.)
[illegible]	Distrito Federal.	IV	2286	7500	Barrett, O. W.	Aug., 1897; July 10, 1898.	
[illegible]	Vera Cruz.	II	3·5	11	"	July 29, 30, 1897.	

TABLE A (*continued*).

Locality.	State or Territory.	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
MEXICO (*cont.*).							
[redacted]	Distrito Federal.	IV	2256	7400	Barrett, O. W.	June 25, Sept., 1897.	
[redacted]	"	...			Tower, W. L.	Sept. 2, 1903.	
Tlalpam C.		IV	2320	7600	Barrett, O. W.	Sept., 1897.	
[redacted] C.	" "	...	.		Tower, W. L.	Sept. 3, 1903.	
Tolosa	Oaxaca.	II	52	170	Deam, C. C.	Dec. 24, 1898.	
Toluca	Mexico.	V	2620	8600	Calvert, P. P.	Sept. 19, 1906.	Odonata taken around pools in fields of agave and maize and along edges of drainage-subsidence field, all north of town.
[redacted]	Coahuila.	III	1130	3720	"	Aug. 21, 1906.	
Trajos (or Trojes) del Oro ...	?	...			de Saussure, H	1854–5.	Cited by Hagen, 1861.
Tuxpan	Jalisco.	III	1000?	3300?	McClendon, J.	Sept. 3–5, 1903.	
Tuxtla	Vera Cruz.	II	60	200	Barrett, O. W.	Aug., 1897.	
	Guerrero.	IV		...	Smith, H. H.	Aug., 1888.	Near Amula.
[redacted]	Chihuahua.	IV	...	...	Hepburn, B.		
[redacted]	Michoacan.	IV	...	...	Deam, C. C.	July 11, 12, 1900.	
[redacted]	"	...		...	Rhoads, S. N.	April 10–15, 1899.	
[redacted]	Yucatan.	II			Gaumer, G. F.		
[redacted]	Guerrero.	III	850	2800	Smith, H. H.	June, Sept., Oct., 1888.	Collector's figures for altitude; Romero gives 760 m. = 2500 ft. for projected R. R. Station.
Venta, La	"	II	91	300	"	Sept., 1888.	On the road between Dos Arroyos and Acapulco (H. H. S. *in litt.*).
Ventanas	Durango?	III	609	2000	Forrer, A.		
Vera Cruz (city)	Vera Cruz.	II	2	6	Barrett, O. W.	Jan. 15, 1899.	
" " "	" "	...			Smith, H. H.	April, 1888.	
Victoria	Tamaulipas.	III	450	1470	Barrett, O. W.	April, July.	
		...		...	Rhoads, S. N.	Jan., 1903.	
Xico	Vera Cruz.	IV	...	...	Barrett, O. W.	May.	On R. R. running south from Jalapa.
[redacted]	" "	...	...		Calvert, P. P.	Sept. 13, 1906.	Odonata taken near Texolo Falls and in coffee-plantation.
Xucumanatlan	Guerrero.	IV	2134	7000	Smith, H. H.	July, 1888.	Small settlement 2 miles north of Omilteme and essentially the same (H. H. S. *in litt.*).
Yautepec	Morelos.	III	1158	3800	Barrett, O. W.	April.	
Yurecuaro C.	Michoacan.	IV	1539	5050	Calvert, P. P.	Sept. 4, 1906.	Odonata taken along ditches close to Mex. Centr. R. R. Station.
Zapopan C.	Jalisco.	IV	1575	5170	Tower, W. L.	Sept. 11, 1903.	
Zopilote, *see* Venta de Zopilote.							
(Not given)	?	...			Deppe, F.	1824–27, 1828–1837.	Cited by Hagen, 1861. *Cf.* Biol. Centr.-Amer., Moll. pp. vi–vii.
[redacted]	?		...	...	Uhde, C. A.	1830–1845.	Cited by Karsch, 1891. *Cf.* Biol. Centr.-Amer., Moll. p. vii.
BRITISH HONDURAS.							
[redacted]	[redacted]	II			Blancaneaux, F.		
[redacted]	[redacted]			...	Miller, N.	Jan. 9, 1905.	
[redacted]	[redacted]	...	...	...	Williamson, E. B.	"	Collected along ditches and marshes close to town; rainy, Odonata not abundant.
[redacted]	[redacted]	II			Blancaneaux,		
Rio Sarstoon	[redacted]	II			"		

TABLE A (*continued*).

GUATEMALA.

Special sources for the elevations here given are Dr. Karl Sapper's papers (Petermann's 'Mittheil.,' Erganzungsband xxiv. no. 113, 1894, and xxvii. no. 127, 1899) and data furnished by the collectors. Of these latter, Messrs. G. C. Champion and E. B. Williamson have each published their itineraries in 'Entomological News' (vol. xviii. pp. 33–40, 1907, and vol. xvi. pp. 299–306, 1905, respectively). Mr. Williamson's narrative partly includes the itineraries of Messrs. Hine, Deam, and Miller also. Mr. W. R. Maxon has communicated some data by letter, and Mr. R. P. Currie has supplied a note on Cacao and Trece Aguas.

Locality.	Department.	Temp. Zone.	Altitude. Metres.	Feet.	Collector.	Date.	Remarks.
Aceituno	Guatemala.	IV			Champion.	April 9, 1879.	
Agua Caliente	Santa Rosa.	IV			Hine, Williamson.	Feb. 9, 1905.	
Amates, Los	Izabal.	II	77	252	Deam, C. C.	Feb. 6–12, 1905.	Humid, tropical; large bamboos, Monaca palms; pine and oak among the hills.
" "				...	Hine, J. S.	Jan. 18–20, Feb. 20, 26–28, 1905.	
				...	Miller, N. Williamson.	Jan. 18, 1905. Jan. 16–20, Feb. 13, 1905.	Collected at swamp near R. R. buildings and along tributary of Motagua River.
Amatitlan (Lago de)	Amatitlan.	IV	1189	3900	Hine, Williamson.	Feb. 6–8, 1905.	(1245 m., Sapper, 1899.) Collected along north and south shores of lake; white water-lilies and sedges.
Cacao	Alta Vera Paz.	III			Barber, H. S.	Mar. 24, 25, April 11, 12, 22, 1906.	A substation in the Finca Trece Aguas. 2½ hours' ride from Senahu and about 4 hours' ride from Panzos. (*Cf.* Proc. Ent. Soc. Wash. viii. p. 107, fig. 5.)
					Lewton, F. L.	April 12, 20, 1906.	
Cahabon	" " "	III		918	Champion.	Feb. 13–23, 1880.	Second-growth woods.
Cerro Zunil (Finca Las Nubes)	Quezaltenango.	IV	1219	4000		Aug. 20–Sept. 9, Nov. 19–Dec. 14, 1880.	Coffee-plantations, dense forest above.
Chacoj (La Hamaca)	Alta Vera Paz.	II	152	500		May 4–12, June 22, 23, 1880.	Polochic Valley. Tropical forest many palms.
Champerico	Retalhuleu.	II	5	19		Oct. 20–22, 1880.	Pacific coast.
Cohan	Alta Vera Paz.	IV	1320	4329			Krüger *in litt.*
Cubilguitz	" " "	III	300	984	Champion.	Mar. 10–20, 1880.	Humid forest on hills; valley and few trees.
Ducuas (Lago de)	Sacatepequez.	IV	1454	4769		June 26–July 21, 1879.	Coffee, Opuntia. Valley between the Volcan de Fuego and the Volcan de Agua.
Escuintla	Escuintla.	III		1108	Deam, Hine.	Jan. 31, 1905.	Rich and beautiful country, varied flora.
				...	Williamson, A. & E. B.	Jan. 31–Feb. 4, 1905.	Collected along a small stream near town.
Fuerte de San Felipe	Izabal.	II		...	Deam, Williamson.	Feb. 15, 1905.	Collected along Rio Dulce.
Gualan	Zacapa.	II	127	420	Deam, C. C.	Jan. 16–20, 1905.	
				...	Hine, J. S.	Jan. 11–15, 23, 1905.	
					Williamson, A. & E. B.	Jan. 11–15, 21–24, 1905.	Collected along Gualan River and tributaries, in irrigated fields and ditches; vegetation not luxuriant becoming dry and leafless.
Guatemala City	Guatemala.	IV	1487	4877	Champion.	Mar. 21–Apr. 2, Apr. 6–8, 10–16 July 22–Aug. 7, 1879; Jan. 8–12, 14–18, 1880; Jan. 3–11, Mar. 17–Apr. 3, 1881.	Open plains and deep barrancas scrub-oak and pine woods.
					Salvin, O.		
		...			Williamson.	Jan. 30, 1905.	

TABLE A (*continued*).

Locality.	Department.		Altitude. Metres.	Feet.	Collector.	Date.	Remarks.
GUATEMALA (*cont.*).							
Laguna	Amatitlan.	IV	1182	3877	Maxon & Hay.	Mar. 10, 1905.	
"		..			Williamson.	Feb. 6–8, 1905.	
Lanquin, San Agustin	Alta Vera Paz.	III	c. 380	c. 1250	Champion.	Feb. 12, 24–28, 1880	Second-growth woods and river bank.
Livingston	Izabal.	II	10	30	Deam, C. C.	Feb. 16, 1905.	
"	"				Maxon & Hay.	April 8, 1905.	
"	"	...	...	...	Williamson.	Feb. 14–20, 1905.	Collected in immediate vicinity of town and along left bank of Rio Dulce and its tributaries.
"					Wilson, H.	Feb.–Apr., 1885.	
Mazatenango	Suchitepequez.	III	365	1200	Hine, Williamson.	Feb. 3, 1905.	Collected along stream east of town.
"		..			Maxon & Hay.	Feb. 10–13, 1905.	
Morales	Izabal.	II	39	128	Hine, J. S.	Mar. 8, 1905.	On the bank of the Rio Motagua.
"		...			Williamson.	Feb. 13, 1905.	
Panima	Baja Vera Paz.	III	560	1836	Champion.	Oct. 8–15, 1879; April 24–28, 1880.	Hot tributary valley of the Polochic.
Pantaleon	Escuintla.	III	423	1385		Jan. 15–Feb. 3, 1881.	Sugar-cane and second growth.
Panzos	Alta Vera Paz.	II	35	110		May 19–22, 25–June 2, 1880.	Polochic valley. Fine tropical forests.
Parajso	Retalhuleu.	II	145	470		Oct. 18, 19, 1880.	Scrubby woods, bamboo.
Pencajche (Panjache?)	? (Baja Vera Paz	III	810	2656	Schumo, S. C.	Feb.	
Puerto Barrios	Izabal.	II	2	6·5	Deam, C. C.	Feb. 21–27, 1905.	
" "					Hine, J. S.	Mar. 4–13, 1905.	
"		...	...		Maxon & Hay.	Dec. 28, 1904.	
"					Williamson.	Feb. 20, 1905.	
Puerto de San Felipe (*see* Fuerte de San Felipe).							
Purula	Baja Vera Paz.	IV	1219	4000*	[illegible]son.	Oct. 2–5, 16, Nov 13, 14, 1879; Apr. 14–23, June 25–27, 1880.	Open; humid forest adjacent.
Rancho, El	Jalapa.	III	274	900	Deam, C. C.	Jan. 14, 1905.	Xerophytic plants.
"	"	"	"	"	Hine, Williamson.	Jan. 25, 26, 1905.	
" "	"	..	..	...	Maxon & Hay.	April 4, 1905.	
Reposo, El	Quezaltenango.	II	170–243	560–800	Champion.	Oct. 8–17, 23, 1880.	Second growth. Near Champerico.
Sabo	Baja Vera Paz.	III	884	2900*		Oct. 6, 7, 1879; Apr. 29–May 2, 1880.	Clearing in dense humid forest.
San Agustin	? Solola.		...	...			Cited by de Selys for *Epigomphus subtilissimus*.
Samarate	Guatemala.	III	860	2820	Hine, Williamson.	Jan. 27, Feb. 10, 1905	
San Felipe	Retalhuleu.	III	625	2050	Maxon & Hay.	Feb. 22, 23, 1905.	(*Not* the sameas Fuerte [or Puerto] de San Felipe, *q. v.*)
San Geronimo	Baja Vera Paz.	III	900	2950*	[illegible]	Aug. 10–Sept. 9, 13–Oct. 1, 18–Nov. 3, 8–12, Dec. 9–25, 1879; Jan. 4–6, 20–25, Mar. 26–Apr. 13, June 28–July 26, 1880.	Arid plain of Salama and adjacent pine-clad slopes of the Chuacus Mts. Small streams through sugar-cane fields.
San Isidro	Quezaltenango.	III	487	1600		Sept. 10–23, Dec. 15, 1880.	Second-growth woods.
San José	Escuintla.	II	3	10	Hine, Williamson.	Feb. 4, 5, 1905.	Odonata almost exclusively confined to mangrove-swamp, just back of beach and west of town.
" "		..			Maxon & Hay.	Mar. 16, 17, 1905.	
San Juan	Alta Vera Paz	III	548	1800	Champion.	Nov. 24–30, 1879 June 15–21, 1880	Forests, cleared in places for coffee-planting. Above La Tinta.
Santa Lucia	Escuintla.	III	335	1100	Hine, Williamson.	Jan. 31–Feb. 2, 1905.	Collected about open places in woods, along roads, in banana-fields, along river east, and in ravine west, of town.

* Collector's figures; Sapper, *ll. cc.*, gives 1560 m. for Purula, 1300 m. for Sabo, and c. 990 m. for San Geronimo.

TABLE A (*continued*).

Locality	Department.	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
GUATEMALA (*cont.*							
Santa Maria	Escuintla.	II	128	420	Williamson.	Feb. 4, 1905.	Collected along river west of town.
San Tomas	Izabal.	II	6	...	Deam, C. C.	Feb. 21, 1905.	
Seeanquim	Alta Vera Paz.	III	570	1869	Maxon & Hay.	Jan. 5, 11, 12, 1905.	
Sections 5, 11, Ferro Carril del Norte.	Izabal.	II	...	...	Williamson.	Feb. 13, 1905.	
Section 13, ibid.		II	...	...	,,	Jan. 10, 1905.	
Senahu	Alta Vera Paz.	III	850	2800*	Champion.	Nov. 17-23, 1879, June 3-14, 1880.	Humid forests cleared in places for coffee-planting.
Sepacuite		III	1020	3345	Griggs, R. F.	Mar. 16-20, 26, 27, April, 1902.	
		...		...	Maxon & Hay.	Jan. 2, 1905.	
Teleman		II	51	167	Champion.	May 13-18, 1880.	Tropical forests. Polochic valley.
Tinta, La		II	88	290	,,	Nov. 16, Dec. 1, 2, 1879.	Tropical vegetation. ,,
Tocoy	Baja Vera Paz.	III	609	2000		Nov. 4-6, 1879.	Arid country.
Torola	Escuintla.	III	305	1000	,,	Feb. 16-18, Mar. 1-3, 8-16, 1881.	Patches of forest.
Trece Aguas, Finca	Alta Vera Paz.	III	870	2853	Barber, H. S.	Mar. 24, 1906.	A large tract of land extending from near Panzos on the east to Senahu on the west.
					Cook, O. F.	April 22.	
Tumbador, El	San Marcos.	III	762	2500	Champion.	Oct. 30–Nov. 7, 1880.	Second-growth woods.
Volcan de Atitlan (San Agustin).	Solola.	III	760-915	2500-3000	,,	Dec., 1880.	
		...	...	...	Salvin, O.		
Zacapa	Zacapa.	II	183	602	Deam, Miller.	Jan. 22–25, 1905.	Well-watered region.
Zapote	Escuintla.	III	720	2360	Champion.	May 13 – June 22, 1879.	On the forest-clad southern slope of the Volcan de Fuego.
Zunil, *see* Cerro Zunil.							
HONDURAS.							
The altitudes given are according to Sapper (Zeitschr. Ges. Erdkunde, Berlin, 1902, pp. 231 *et seq.*). For collecting-notes, see Williamson, Ent. News, xvi. pp. 305–6.							
Puerto Cortez	Cortez.	II	...	...	Vogel, W. H.		
,, ,,	,,		...	...	Williamson, E. B.	Feb. 21, Mar. 2, 1905.	Collected among *Pontederia* along the wharf.
Ruatan Island		II	to 200	to 656	Gaumer, G. F.	1886 ?	*Cf.* Biol. Centr.-Am., Bot. iv. p. 111
San Pedro Sula	Cortez.	II	60	196	Burrison, H. K.		
				...	Frühstorfer, H.		
		...	...	...	Williamson, E. B.	Feb. 22–28, 1905.	Collected along streams west, and in ravine south, of town; Monaca palms, coffee, bananas.
,, ,, ,,	,,	...	...		Williamson, L. A.	Jan. 19, 20, 31, Feb. 1, 1907.	
Truxillo	Colon.	II	25	82	Townsend, C. H.	1887.	
NICARAGUA.							
	Chinandega.	II	57	187	Baker, C. F.		
Chontales	Chontales.	..			Janson, E.		
	Granada.	II	52	173	Baker, C. F.		
	Managua.	II	42	140	Chaves.		Cited by Butler, Entom. xxxiii. p. 191 (1900).
		II			Shakspear.	1779.	Cited by Donovan (1834).

* Collector's figures; Sapper, 1899, gives 1000 m.

Distribution of the Species.

Ornithologists' Union (*i. e.*, for geographical races intergrading with the nomenclatorial type of the species)—e. g., *Libellula* of a species but not occupying a different geographical area—e. g., *Ischnura ramburi*, var. *credula*, no. 124. In antique type extend also into California, Arizona, New Mexico, and Texas, but not beyond, nor into the West Indies nor South America. the 30th parallel; Mexico, as ordinarily understood, but excluding the peninsula of Yucatan (*i. e.* Campeche and Yucatan). Salvador is omitted, as no material therefrom has been seen, or recorded in the literature. I–V, temperature zones, as in the only record for a species as from the Mexican plateau is that of Guadalajara; since some doubt may exist as to the been printed in italics, thus, *IV C.*]

DISTRIBUTION.

Yucatan, Campeche and British Honduras.	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies	Elsewhere.	
			II P	III P				
II	II–IV A, III–IV P		II(IV A, II IV P	III P	+			
? III	IV A			...	+		Arizona.	
	II–III A, III–IV P						Texas, &c.	
				+	+			
II	II–III A, II P	II P	I P		+*		Texas.	
II	II–III A	II A				+	Texas, Florida.	
	III A			II P	+			
	II–IV A, III P		III A, II P	II P	+		Trinidad.	
	II A			+				
...	II–III A, III P		III A P	III P	+			
...			III–IV A					
...	?III A		IV					
	III A							
			IV A					
	III–IV A			...			Florida	
	III A				+			
				III P				
			III A					
			IV A					
	III A		III–IV A, IV P	+	+		Texas.	24.
	IV A						Arizona, New Mexico, Texas.	25.
			IV A	...	+			26.
				...			Texas,	27.
					+		Texas.	28.
			II P	...	+			29.
								30.
II	II–III A	II A	II III A, P	III P				31.
	II–III A, III P ("Honduras")		II P	III P				33.
	II–III A, II–IV P	II A P	II P	II–III P	+			35.
II	II–IV A		II–III A	III P				36.
			III A	+	+			37.
			III A	+				
...	III A							40.
...	III–IV A							41.

* *Hetaerina tricolor* occurs in British Guiana, *teste* J. S. Hine.

TABLE A (*continued*).

Locality.	Department.	Temp Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
NICARAGUA (*cont.*).							
Polson Rio Escondido	Chinandega. Siquia.	II II			McNeill, Richmond, C. W.	July 22, Aug. 30, 1892.	50 miles from Blewfields; International Planting Company's plantation, bananas, heavy tropical forest in rear, through opening in which flows a creel to join the river. (Proc. U.S. Nat. Mus. xvi. p. 481.)
Rio Machuca	Chontales.	II	120–150	70–500	Nichols, A. B.	Oct.	*Cf.* Rep. U.S. Isthmian Canal Comm., 1904.
COSTA RICA.							
Special sources of information on altitudes and temperatures of Costa Rica have been the notes of the collectors cited and various articles of Senor H. Pittier in 'Boletin del Instituto Fisico-Geografico de Costa Rica,' vols. i. & ii., in 'Anales' of the same, tomo iii., vi., in Meteorol. Zeitschr. Bd. xiii. & xix., and, for his own collections in Southern Costa Rica in 1897, his 'Informe sobre los trabajos practicados en el Instituto Fisico-Geografico Nacional de Costa Rica durante el ano 1896–1897 y presentado al Senor Secretario de Estado en el despacho de Instruccion Publica' (San Jose de Costa Rica, MDCCCXCVII).							
Azahar de Cartago	Cartago.	IV	1500	4920	Underwood, C. F.	May, 1903.	
	Guanacaste.	II	50	164			
	Puntarenas.	III	800–1000	2624–3280	Pittier, H.	Feb., 1897.	In some places in the text the collector's name has been erroneously given as Biolley.
Boca de Limon		II	250	820	"	Feb. 12, 1896.	
	Cartago.	III	...	...	Rogers, H.	1877.	*Cf.* Biol. Centr.-Am., Aves, i. p. ix.
		III	1900	3280	Biolley, P.	May, 1905.	
	San Jose.	IV	1200–1600	3936–5248		April, 1905.	Between Guadalupe and El Alto.
	Puntarenas.	IV	1200	3936	Pittier, H.	Feb. 27, Mar. 11, 1897.	
	San Jose.	III	300	984	Underwood, C. F.		
	Puntarenas.		...	...	Pittier, H.	Jan. 22, 1897.	
	San Jose.	IV.	1200	3936	Underwood, C. F.	Oct., 1903.	
Esparta	Puntarenas.	II	50	164	Biolley, P.	Jan., Feb., 1905; Feb., 1907.	late Prof. Biolley. Gannett quotes that of the town as 731 feet.
Guapiles	San Jose.	III	305	1000	Crawford, J. C., Jr.	Feb. 26, 1903.	
Irazu	Cartago.	IV–V	1829–2134	6000–7000	Rogers, H.	1877.	
Juan Vinas		III	1040	3410	Bruner, L.	Mar. 18, 1902.	
				...	Cary, Merritt.	Mar. 15–18, 22, 23, 1902.	
Monte Redondo	?	IV	1600	5250	Underwood, C. F.	Jan., 1903.	
Pacayas	?	...			Werckele, C.		
	Puntarenas.	III	600	1968	Pittier, H.	Jan. 19, 1897.	
Pozo Azul de Pirris	San Jose.	II	96	315	Underwood, C. F.	May, June, 1902.	
Puntarenas	Puntarenas.	II	3	10		May 17, 1871.	(Specimens in M. C. Z.)
	"	...	...	...	Biolley, P.	Feb., 1907.	
Puriscal	San Jose.	IV			Underwood, C. F.		
Quebrada del Congrejal	" "	III	600	1968	Biolley, P.	April, 1906.	
[redacted]	Puntarenas.				Pittier, H.	Feb. 18, 1897.	
Rio del Convento	"			...	"	Jan. 22, 1897.	
[redacted]	[redacted]	II	200	656	Biolley, P.	April, 1905; Jan., 1907.	
Rio Machuca	"	II–III	...	...	"	Jan., 1907.	
Rio Sucio	?	III	1000	3280	Rogers, H.	1877.	*Cf.* Biol. Centr.-Am., Aves. i. p. ix

* Not Cache, as cited in various places in the text.

TABLE A (*continued*).

Locality.	Department.	Temp. Zone.	Altitude. Metres.	Altitude. Feet.	Collector.	Date.	Remarks.
COSTA RICA (*cont.*).							
San Carlos	Alajuela	II	160	525	Schild & Burgdorf.		
San Francisco	" "	IV	1375	4500	Rogers, H.		
San Francisco de Guadalupe.	San José.	IV	1188	3900			
San Gabriel		...	...	...	Tristan, J. F.		Near San José.
San José		IV	1160	3816	Biolley, P.	Mar., May, July, Aug., Oct., 1905.	
	" "			...	Tristan, J. F.		
	" "	...		...	Underwood, C. F.	Mar., 1903.	
Santa Clara	" ?	II	200	656	Alfaro, A.		
	?	...		...	Tristan, J. F.		
Santa Maria de Dota	San José.	...		...		Jan., 1907.	
Surubres	Alajuela.	II	250	820	Biolley, P.	Feb., 1905; Jan., July, 1906; Mar., 1907.	
Tablazo	San José.	IV	1300–1600	4264–5248	"	May, June, 1905.	
Tarbaca *		IV	1500	4920	Underwood, C. F.	Nov., 1902.	
Tuis	Cartago.	III	750†	2460	Lankester, C. H.	June, 1907.	
Turrialba		III	500	1640	Tristan, J. F.		
PANAMA.							
For Mr. G. C. Champion's collecting-notes, see Ent. News, xviii. pp. 40–44 (1907).							
Boquete	Chiriqui.	III	1080	3550	Champion.	Aug. 9–11, 1881.	South-eastern slope of Volcan de Chiriqui.
Bugaba		III	304	1000	"	Many dates between Oct. 21, 1881, and Mar. 11, 1883.	Forests; sugar-cane, maize, rice, &c.
Chiriqui		...	...		Ribbe.		
Chorrera, La	Panama.	II	...	...	Dolby-Tyler, Charles H.	April 1 – May 15 1898.	20 miles west of Panama. Cited by Kirby, 1899.
Colon	Colon.	II			Howland, H. N.	July.	
Darien	Panama.	...			Festa.	1895.	Cited by Martin, 1896.
David	Chiriqui.	II	...	...	Champion.	Many dates between Apr. 22, 1881, and Mar. 13, 1883	Open savanas with scattered deciduous trees.
Eureka	Chiriqui Grande, Bocas del Toro.	II	...	...	McKenney, R. E. B.	Dec. 13, 1906.	
Long Point, Canaso Farm	Bocas del Toro.	II	...	...	"	May 12, 1906.	A little valley along the Cañaso River, among the foot-hills, about 5 miles inland in an air-line from Chiriqui Lagoon.
Matachin	Panama.	II	30	100	Thieme, O.	July, 1877.	*Cf.* Rep. U.S. Isthmian Canal Comm., 1904.
Obispo		II	30	100	Hassler Expedition.	July, 1872.	Ibid. and Smithson. Rep. 1872, p. 91.
Taboga Island		II	...		Mathew, G. F.		
Tolé	Chiriqui.	III	350	1150	Champion.	Jan. 4–10, 19–22, 1883.	Savanas, woods.
Volcan de Chiriqui		IV	1676	5500	"	June 6–8, 1882.	Dense forests.
		III	below 1220	below 4000	"		

* Cited as Sarbaca on p. 348.

† Collector's figures; the altitude is given as 2136 feet in 'Monthly Weather Review' (Washington, D.C.) for March 1906, p. 156.

THE distribution of the Odonata is shown in Table B.

TABLE B.—SYSTEMATIC LIST AND

[Trinomials are here used to indicate subspecies, as that term is employed in the Code of Nomenclature of the American
saturata croceipennis, no. 203. "Var." (=variety) is used to designate forms intergrading with the nomenclatorial type
are printed the names of the endemic species, &c.—i. e., those forms found in Mexico and Central America and which may
Northern America means all north of Central California, Arizona, New Mexico, Texas, and (east of this last) of
Nearly all the material from Honduras is from Puerto Cortez and San Pedro Sula and is here grouped with Guatemala.
Table A; A, Atlantic slope; P, Pacific slope; C, Central Mexican plateau, as shown on Map No. 1. In some cases
species having been taken at Guadalajara itself or from some of the deep barrancas near by, such single records have

Reference No.	Taxonomic Group.	Page.	Plate and Figure.	Northern America.	exico.
	CALOPTERYGINÆ (4 gen., 23 spp.).	19			
	Hetærina fuscoguttata	20, 23, 342-3	II. 33, 34		II–IV A (IV C ?)
	cruentata ..	21, 23, 343-3	II. 31, 32; III. 19		IV A C, III–IV P
	vulnerata	21, 24, 345	II. 30; III. 18		III–IV A, IV C, II–IV P
	americana	21 2, 26, 342, 345	II. 1–17		II A
	sempronia	21, 29			II A P
	tricolor	21, 29, 345	III. 1, 20		II–III A
	tilia	21–2, 31, 342, 345	III. 2–16		II P
	caja	21, 33			II A
	pilula	21, 33	II. 27, 35		II–III A, II P
	macropus	21, 34, 346			
	miniata	21, 37, 343, 346	II. 22, 29		
	capitalis	21, 22, 37, 342, 347	II. 21, 28		
	manuscula	22, 38, 348	II. 23		III A
	infecta	22, 38, 348	II. 18, 24		IV A
	tolteca	22, 40, 343, 348	II. 19, 25		
	rudis	22, 40	II. 20, 26		
	maxima	22, 41			
	Calopteryx dimidiata	41			+
	Amphipteryx agrioides	42, 348	III. 23, 28–30		III–IV A
	Cora marina	43	III. 31, 32		
	,, **semiopaca**	43, 45			
	,, **chirripa**	348			
	skinneri	348, 349			
	LESTINÆ (2 gen., 7 spp.).	45			
24.	**Archilestes grandis**	46, 350		+	II–IV A P, IV C
25.	**Lestes alacer**	47, 48, 350	III. 26		IV A, IV–V C, III P
26.	,, henshawi	350	X. 1		
27.	**simplex**	47, 49	III. 24		III–IV P
28.	**sigma**	48, 49, 351	III. 33		III A, II P
29.	,, forficula	48, 50, 352	III. 25		II–III A
30.	,, tenuatus	48, 50, 352			III A, II–III P
	AGRIONINÆ (24 gen., 112 spp. & var.).	51			
	Megaloprepus cœrulatus	51, 352			II–III A
	Pseudostigma aberrans	53, 54, 352	III. 17		II–III A
	,, accedens...	54, 55, 352	III. 22		III A
	Mecistogaster ornatus	55, 353			III–IV A, II–III P
	,, **modestus**	55, 56, 354			III A
	,, amalia ..	354			
	Thaumatoneura inopinata	53, 354, 355	III. 16, 21, 27		
	pellucida	354, 355			
	Paraphlebia zoe	59, 60			III–IV A
	,, **quinta**	59, 60	V. 1		
	,, **duodecima**	59, 60, 355	V. 2		

TABLE B

Reference No.	Taxonomic Group.	[illegible]	Plate and Figure.	Northern America.	Mexico.
42.	Paraphlebia abrogata	355			
43.	hyalina	59, 61			
44.	Philogenia championi	61	V. 3, 4		
45.	terraba	356	V. 8, 9		
46.	carrillica	356	VII. 6, 7, 12		
47.	Heteragrion tricellulare	62, 63, 357	V. 5		
48.	,, majus	62, 63	V. 6		
49.	,, chrysops	62, 63, 357	V. 7		
50.	erythrogastrum	62, 105, 357			
51.	Perilestes fra[illegible]	102			
52.	Hypocnra lugens	66, 358			
[illegible]	,, funcki	66, 67			
54.	Argia percellulata	70, 72, 74	IV. 5, 27		
55.	calida	70, 75, 361			
56.	wilsoni	70, 75	IV. 28, 28 a		
57.	,, mœsta	70, 73, 76, 358, 360, 361	IV. 20, 29, 29 a		
58.	translata	70, 73, 76, 361	IV. 18, 30, 30 a		
59.	tezpi	70, 73, 77, 362	IV. 19, 31, 31 a		
60.	terrira	358, 360, 362	X. 3, 3 a, 14		
61.	sedula	70, 74, 78, 358, 363	IV. 7, 32, 32 a		
62.	gaumeri	358, 360, 363	VIII. 41, 41 a; X. 2, 2 a, 20		
63.	nubila	70, 73, 79, 358, 360, 364	IV. 33, 33 aa; X. 6-8		
64.	,, frequentula	358, 360, 365	IV. 33 a; X. 9-11		
65.	ulmeca	70, 73, 81, 350, 366	IV. 9, 34, 34 a, 34 i		
66.	adamsi	70, 80, 360, 367	IV. 35, 35 a; X. 5		
67.	,, oculata	70, 73, 81, 367	IV. 11, 36, 36 a, 36 i-ii		
68.	herberti	70, 82	IV. 37, 37 a		
69.	populica	70, 73, 82	IV. 8, 38, 38 a		
70.	indicatrix	70, 73, 82, 359, 368	IV. 25, 39, 39 a		
71.	rogersi	70, 83	IV. 40, 40 a		
72.	,, tibialis	73, 84, 359, 369	IV. 15; VIII. 42, 42 a; X. 4, 4		
73.	,, underwoodi	359, 369, 370	VIII. 36, 37, 37 a		
74.	johannella	[illegible] 360, 370	X. 12, 12 a, 19		
75.	,, talamanca	359, 371	VIII. 34, 34 a		
76.	cuprea	71, 73, 84, 371	IV. 22, 41, 41 a		
[illegible]	,, cupraurea	71, 73, 85, 360, 371	IV. 24, 42		
78.	,, ænea	71, 73, 85, 360, 372	IV. 10, 43, 44, 44 a		
79.	orichalcea	71, 86			
80.	harknessi	71, 74, 87, 360, 361, 372	IV. 21, 45, 45 i		
81.	,, pipila	359, 360, 373	X. 16, 16 a, 18		
82.	barretti	71, 87, 359	IV. 46, 46 a		
83.	chelata	71, 88	IV. 47, 47 a		
84.	lacrymans	71, 73, 88, 360	IV. 16, 49, 49 a		
85.	tonto	71, 73, 89, 360, 373	IV. 17, 48, 48 a		
86.	[illegible]	71, 74, 89, 374	IV. 12, 50, 50 a		
87.	deami	71, 74, 90	IV. 13, 52, 52 a		
88.	tarascana	71, 74, 90, 374	IV. 14, 51-51 aa		
89.	,, variabilis	71, 73, 91, 360, 374	IV. 53, 54, 54 a; X. 21		
90.	medullaris	71, 92, 360, 374	IV. 6		
91.	rhoadsi	72, 92	IV. 55, 55 a		
92.	extranea	72, 74, 92, 375	IV. 3, 4, 56, 56 i		
93.	vivida	74, 94, 354, 361, 377	IV. 1, 2, 57-57 aa		
94.	,, plana	96	IV. 58		
95.	munda	96, 359			
96.	funebris	72, 97, 376	IV. 59		
97.	,, immunda	72, 74, 97, 375	IV. 60, 60 a		
98.	poecmana	73, 99, 360, 375	X. 15, 15 a, 24		
99.	violacea pallens	72, 74, 98, 376	IV. 25, 61, 61 a		
100.	agrioides	72, 74, 98	IV. 26, 62, 62 a		
101.	,, nahuana	72, 74, 99	IV. 62 aa		
102.	Argiallagma minutum	376	X. 35		
103.	Hesperagrion heterodoxum	103, 377	V. 11, 12; VI. 1-6		(IV?) A, IV C, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV A, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A P, IV C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A, III-IV C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	I-III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A, III-IV C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II A, IV C, I-III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-III A, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III-IV A, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-IV A P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-IV A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III IV A, IV C, II-IV I
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A, III-IV P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III IV A, IV C, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	II-IV A P, IV C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III-IV A, III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III-IV P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III-IV A, II-III P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III-IV P
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	III A
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	IV C, III P

(*continued*).

DISTRIBUTION.								
Yucatan, Campeche, and British Honduras.	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies.	Elsewhere.	Key-map No.
	III A			III P				42.
			(I) ? III P III A					43.
	III A			+				44.
	II-III A		III A III A, II P II P	III P II-III P	+ +			45.
	III A			—	+		Arizona, New Mexico.	46.
	II A							47.
II	II A, II-IV P II III A		II P II P IV A	+	+		Arizona, Texas. Texas. Lower California.	48.
II	II A II-III A, II IV P II A II A, III P	II A P +	II P III A, II P	+ II A			Arizona, Texas.	49.
	II-III A, III P		II P III A, III-IV P	III P III P	+			50.
	II A, III P	+	II P III A					51.
	II A		III A, II-III P III A III A III A	II-III P	+			52.
	II-III A		II P	II P	+			53.
	II-IV A, III P	II P	II P	II P	—		Lower California.	54.
	II-IV A P							55.
II	III IV A P		IV A III-IV A, IV P				Arizona.	56.
	III P III P		III A, IV P IV P					57.
	II-IV A, III P		III-IV A P		+			58.
							California, Texas.	59.
							Arizona.	60.
							Arizona.	61.
							Texas.	62.
	III P III A						Arizona.	63.
							California, Arizona, Texas.	64.
	II A						Arizona.	65.

TABLE II

Reference No.	Taxonomic Group.	Page.	Plate and Figure.	Northern America.	Mexico.
104.	**Anisagrion allopterum**	105, 378	V. 14, 18	=	P
105.	„ var.? **rubicundum**	105, 378		=	P
106.	„ **truncatipenne**	105, 106, 378	V. 17; X. 46		
107.	„ **lais**	105, 106, 378	V. 15, 19		
108.	**Enallagma civile**	107, 108, 110, 380		+	III–IV A P, IV C
109.	„ **pravarum**	108, 111, 380	V. 13	+	III–IV A C, II–IV P
110.	„ **semicirculare**	108, 112, 381		+	II–IV A, IV C, II–IV P
111.	„ **cornutum mexicanum**	381 (108, 112)			III–IV A, II–III P
112.	„ **cyathigerum**	380, 381	X. 39, 47		II–IV A, I–III P
113.	**Acanthagrion gracile**	115, 382	V. 20		
114.	**Telebasis collopistes**	116, 383	V. 27, 28	P	II–IV A, P
115.	**griffinii**	116, 117, 383	V. 31, 32		II A
116.	„ **filola**	116, 118, 383	V. 33, 34		II A
117.	**digiticollis**	116, 118, 384	21; X. 39, 40		III A
118.	„ **isthmica**	116, 118, 385	V. 29, 30		II A
119.	„ **salva**	116, 119, 385			
120.	**Leptobasis vacillans**	120, 386	V. 22–25	■	II–IV A P, IV C
121.	var. **atrodorsum**	121			II P, III A
122.	**Metaleptobasis bovilla**		VII. 21–23	■	II A, III P
123.	Ischnura ramburi	122, 123, 124, 387		+	II–III A, IV C, II P
124.	„ „ var. credula	122, 123, 125, 387			II–III A P, IV–V C
125.	**denticollis**	122, 123, 126, 387			IV A, IV–V C, III P
126.	„ **demorsa**	123, 128, 390	V. 35	+	IV A, IV–V C, II–IV P
127.	**Anomalagrion hastatum**	130, 390		+	II–III A P, IV C
128.	**Cleatura capreola**	131, 390	V. 26		II–IV A
129.	**Palæmnema desiderata**	134, 135	V. 39		III A
130.	„ **paulina**	134, 136	V. 40		III A
131.	„ **angelina**	134, 136, 392	VI. 7		III A
132.	„ **nathalia**	134, 136	V. 41		
133.	**domina**	134, 137	V. 42		II P
134.	**Neoneura amelia**	137, 138, 392, 393	V. 36; VI. 8; X. 25–26		II A
135.	**paya**	392, 393	X. 27, 38		
136.	**Protoneura peramans**	140, 141, 395	V. 48, 49	■	
137.	„ **cupida**	140, 142, 394, 395	V. 46, 47		
138.	**amatoria**	394, 395	X. 49–52		
139.	**aurantiaca**	140, 143, 394, 396	V. 44	■	II–III A
140.	**cara**	140, 143	V. 38, 45; VI. 9		I–II P
141.	**corculum**	395, 396	X. 41–44		
142.	**remissa**	141, 144, 397	V. 43; X. 45		II A
	Genera etc., 5 gen., 28 spp. & subspp.	146			
143.	**Progomphus zonatus**	145, 150	VII. 1–3		III P
144.	**clendoni**	149, 150	VII. 8, 9		III P
145.	„ **obscurus borealis**	149, 151, 398			IV C
146.	**pygmæus**	149, 151	VII. 4, 4 a		
147.	**Gomphoides velsella**	154, 156, 398	VII. 10, 10 a, 13, 14; X. 48		II A
148.	**elongata**	154, 155, 156			III A, *IV C*, II–III P
149.	„ **protracta**	154, 155, 157	VII. 15, 16		II–III A
150.	„ **ambigua**	154, 155, 157, 398	VII. 17, 18		III A P, IV C
151.	„ **obscura**	158			
152.	„ **suasa**	154, 155, 158	VII. 19, 20	■	III A P
153.	**pacifica**	154, 155, 158		■	*IV C*, II–III P
154.	**bifasciata**	155, 156, 159			II P
155.	**Erpetogomphus eutainia**	160, 162	VII. 24, 27, 39		II P
156.	**viperinus**	160, 161, 163	VII. 5, 5 a, 43	■	III–IV A, II–III P
157.	„ **elaps**	160, 161, 163, 398	VII. 44; X. 30–34		IV AC, III P
158.	**ophibolus**	160, 163	VII. 30–32, 46		III A
159.	**cophias**	160, 161, 164, 398	VII. 28, 33, 45; X. 47	■	III IV P
160.	**crotalinus**	160, 161, 165, 398			IV C, III–IV P
161.	„ **boa**	160, 165, 399	X. 53, 54		A
162.	**sipedon**	161, 165, 399	VII. 34, 40, 42		*IV C*, III–IV P

(*continued*).

DISTRIBUTION.

Yucatan, Campeche, and British Honduras	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies.	Elsewhere.
	+		V A, IV P				
	IV P		III A, IV P				
	II-III P						
	+						
	IV A P		——				California, Arizona, New Mexico, Texas.
	IV A		——				California, Arizona, New Mexico.
	II-III A, II-IV P		III A, II P		+		Lower California.
II	II A, IV P		——	II A		+	
	II-IV A, III P		II IV P		+		
	II A						
	II A		——				
	II A, III-IV P			+			
	II A						
	——		II P	II A			
II	II III A, III P		II P	II A			California, Arizona, Texas.
II	II A P	II A P	——				
	——		——				
	II A	II A					
II	II A						Texas, Florida.
II	II-IV A P	II P				+	California, Florida, Bahamas.
	——						California, Arizona.
	——						Arizona, New Mexico.
II	II-III A, IV P						Texas, Florida, Galapagos.
II	II A, II-IV P	II A	II P		+		
	("Honduras")						
	III P (? III A)						
	——		——				
	II-III A	II P					
	II A						
	III A						
	II A						
	II A		——				
	II A						
	II A						
	——		——		+		California, Arizona.
	——		——				Texas.
	——			II P			
	——		IV P				
	——		——	II P			
	III A P						
	III A		IV P				

TABLE B

Reference No.	Taxonomic Group.	[illegible]	Plate and Figure.	Northern America.	Mexico.
163.	Erpetogomphus designatus	160, 162, 166, 390		+	III AC
164.	" menetriesii	168		...	.....
165.	Cyanogomphus (?) tumens	169	VII. 11, 11 a, 41	...	III A
166.	Epigomphus camelus	170, 172	VIII. 1–3	...	.....
167.	" quadracies	170, 171, 172	VII. 36; VIII. 4, 5	...	.....
168.	" verticicornis	410		...	.....
169.	" tumefactus	171, 172	VIII. 6, 7	...	.....
170.	" subobtusus	171, 172, 390	VII. 37; VIII. 8, 9		+
	CORDULEGASTRINÆ (1 gen., 2 spp.).	172			
171.	Cordulegaster diadema	173			IV A C, III P
172.	" godmani	173			IV P
	ÆSHNINÆ (6 gen., 23 spp.).	174			
173.	Anax longipes	176	VIII. 10	+	IV AP
174.	" amazili	176, 177			III P
175.	" junius	176, 177, 399		+	III–IV A C P
176.	" walsinghami	176, 178			
177.	Staurophlebia reticulata	178			
178.	Æshna cornigera	179, 182, 400		-	III–IV A, IV C, III P
179.	" multicolor	180, 183, 400		+	III IV A P, IV–V C
180.	" dugesi	180, 184	VIII. 11, 12		IV C
181.	" williamsoniana	180, 185	VIII. 13, 14, 19		III P
182.	" brevifrons	181, 186	VIII. 15, 16		II P
183.	" luteipennis	181, 186, 400			IV A C, III P
184.	" [illegible]	181, 187		+	
185.	" [illegible]	182, 187	VIII. 17, 18	+	II–III A
186.	" adnexa	182, 188			II–III A, 15
187.	" perrensi	182, 188	VIII. 26, 27		III A
188.	Gynacantha trifida	189, 191	VIII. 28, 29	-	III A
189.	" septima	190, 191	VIII. 20, 21		II A
190.	" mexicana	190, 192	VIII. 22, 23		A
191.	" [illegible]	190, 193			IV C
192.	" fibinia	190, 194, 400	VIII. 24, 25; X. 17		II–III A
193.	" membranalis	190, 194	VIII. 30, 31		
194.	Oplonaschna armata	195	VIII. 32, 33		III–IV P
195.	Triacanthagyna heros	196			+
	CORDULIINÆ (1 gen., 1 sp.).	197			
196.	Macromia sp.	197			III A
	LIBELLULINÆ (28 gen., 97 spp. &c.).	198			
197.	Plathemis subornata	205, 401		+	IV C
198.	Libellula auripennis	206, 208		+	II III A
199.	" comanche	401		+	IV C
200.	" foliata	207, 208			+
201.	" hercules	207, 209			III A
202.	" saturata	207, 210, 401			III–IV A, IV C, III–IV P
203.	" croceipennis	207, 212			III–IV A, II–III P
204.	" modesticia	207, 213		■	IV–V C, IV P
205.	" luctuosa	213, 401		+	IV C P
206.	Pseudoleon superbus	214			III–IV A, II–III P
207.	Ephidatia longipes cubensis	216	IX. 1–5		III A
208.	Cracis imbuta	217, 218, 402	IX. 6		II P
209.	" fastigiata	217, 219, 402	IX. 7, 8		+
210.	Tholymis citrina	220	IX. 9–11		III A
211.	Micrathyria didyma	221, 223, 402	IX. 12		II–III A P, IV C
212.	" aequalis	221, 225	IX. 13–15		? III A

(continued).

DISTRIBUTION.

Yucatan, Campeche, and British Honduras.	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies.	Elsewhere.	Reference No.
..	("Honduras")	...	—	...	+	+	Lower Calif., Arizona, N. Mex., Texas,	274.
II	—		....	...	?		Lower California, Arizona. [Galapagos.	275.
II	II–IV A, III–IV P	A	II P	+ (II P?)	+	+		276.
	II A		▙		+	+		277.
	—	...	—		+	■	Texas.	278.
	II A		—	II A				279.
	III A, IV P		IV AP				Lower California. [Ajan (Asia).	280.
II	—	▬	—	■		▬	California, Arizona, N. Mexico, Texas,	281.
	IV P	...	—		+	+	Lower California, Florida, Bahamas.	282.
	—		—		+	+	Galapagos.	283.
	II A							284.
...	—	-	▟	▛	▙		Texas, Florida, Bahamas.	285.
II	—	...	—		▟		California, Arizona, New Mexico, Texas.	286.
	II A	...	—	II P	+	+		287.
	—		—		+			288.
	II P		—		+	+		289.
...	—	▬	—	..	+	+		290.
II	II A, IV P	...	—	II P	+	+	Texas.	291.
	II A		—	▙	+	+	Bermudas?	292.
	II–III A P		IV P	II A P	+	+	Texas, Florida. [Bermudas	298.
			—				California, Texas, Florida, Bahamas,	
20	62 (63)	16 (58)	41 (61)	40 (58)	56	37		
35	161 (186)	20 (143)	101 (165)	86 (142)	112	56		

by adding to those actually found there those which have been taken both north and south.

in the States of Tabasco or Chiapas, but not north of the Isthmus of Tehuantepec. Geographically therefore they belong (nos. 69 and 147) are as yet only known from Tabasco, while the other 9 have been found also in Guatemala or farther south, together, will represent the Odonate fauna of the region between the Isthmuses of Tehuantepec and Nicaragua, comprising between the Isthmuses of Nicaragua and Darien, or 141 species, &c.

The types of the following species require to be exactly specified:—*Argia tezpi*, type ♂, San Jose del Cabo, Baja California (coll. Calif. Acad. Sci.), *not* Tepic, as erroneously stated in the Explanation of Plate IV.; *A. tonta*, type ♂, Tombstone, Arizona, and *A. agrioides nahuana*, type ♂, Mexico City (both in coll. P. P. C.); *A. gaumeri*, type ♂, Izamal; *A. frequentula*, type ♂, San Pedro Sula, *A. pipila*, type ♂, Escuintla, and *A. pocomana*, type ♂, Mazatenango (these last three in coll. E. B. Williamson); *Enallagma basidens*, type ♂, Texas (coll. A. N. S.); *Leptobasis vacillans*, var. *atrodorsum*, type ♂, Santiago Iscuintla; *Ischnura damula*, type ♂,

(*continued*).

DISTRIBUTION.							Reference No.
Yucatan, Campeche, and British Honduras.	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies.	Elsewhere.	
							Texas.	163.
								164.
	III P		III A					165.
			....					166.
			III A					167.
	III–IV A		III A					168.
			III IV A					169.
								170.
	IV A		IV A				Arizona.	171.
								172.
	III A		III A		+	+	Florida.	173
					+	+	[China, &c.	174
	+					+	Texas, Florida, Bermudas, Hawaiian Is.,	175
	(“Honduras”)	II A					California, Arizona.	176.
								177.
II	III A, III IV P		IV A		+		Lower California.	178.
	III A		IV A	III P			California, Arizona, N. Mexico.	179.
								180.
								181.
					+			182.
	III A		III A, IV P		+		Lower California.	183.
							Florida.	184.
II				+	+		Trinidad.	185.
	II A							186.
					+			187.
	II A		III A		+	+	California, Florida.	188.
	III A P			II A *	+	+		189.
	II A				+†			190.
	III P			II A	+		California, Florida.	191.
	III A P			III P	+			192.
					+			193.
	IV A						Arizona.	194.
							Texas, Florida.	195.
								196.
							California, Arizona, N. Mexico, Texas.	197.
						+	Texas, Florida.	198.
	IV A P		IV A				California, Texas.	199.
II	III–IV A, III P		III A P					200.
								201.
							California, Arizona.	202.
	+		III A, IV P				Lower California, Texas.	203.
							California.	204.
							New Mexico, Texas.	205.
	II–III A						Lower California, Arizona.	206.
	II A					+		207.
	II–III A P		II P	A, II III P		+		208.
	II A		II P	III P	+			209.
	II A		...	+	+	+		210.
II	II–III A		II P		+	+	Lower California.	211.
	A, III P				+			212.

* Since the printing of the Supplement, I have received, from Dr. R. E. B. McKenney, a male of *Gynacantha septima* which he took at “8 P.M. on door of house, Eureka, District of Chiriqui Grande, Province of Bocas del Toro, Panama, Dec. 13, 1906.”

† *G. mexicana* is represented by specimens from Ecuador captured by Prof. F. Campos R.

TABLE B

Reference No.	Taxonomic Group.	Page.	Plate and Figure.	Northern America.	Mexico.
213.	Micrathyria hagenii	222, 225, 402	IX. 16–18		III A, II–III P
214.	" didyma	222, 226	IX. 19–21		III A
215.	" ocellata	222, 226	IX. 22, 23	...	III A
216.	" **schumanni**	223, 227, 402	VIII. 39, 40; IX. 24		*IV C*, III–IV P
217.	" aequalis	223, 228, 402			II–III A P, *IV C*
218.	" debilis	223, 229	IX. 25–27		II–III A, IV C
219.	" eximia	223, 230, 403	IX. 28–30		
220.	Nephepeltia phryne	230, 231	IX. 31–33		II–IV A P, III–IV C
221.	Orthemis ferruginea	232, 234, 403	IX. 34		
222.	**biolleyi**	233, 237, 403	IX. 36, 37		III A, II–III P
223.	" levis	238, 239	IX. 38, 39		
224.	" cultritor	234, 239			II A, *II C*
225.	Cannaphila angustipennis	230, 241, 403			III–IV A
226.	" vibex	239, 243			III A P
227.	Anatya normalis	241, 245, 403			III A
228.	guttata	244, 245			III A, IV C, II–III P
229.	**Erythrodiplax funerea**	248, 249, 403			II–IV A, II–III P
230.	" umbrata	248, 251, 404			II–III A, *IV C*, II P
231.	" ochracea	248, 255, 404	IX. 40		
232.	" erichsoni ?	248, 256	IX. 42		
233.	" unimaculata	249, 258			[II–IV A, IV C, III–IV P]
234.	" connata	249, 279, 287, 404			
235.	var. b	259, 260			II–III A
236.	*d*	258, 260, 404			II–IV A
237.	*e*	259, 260, 404			II–III A
238.	*a'*	259, 261, 404	IX. 41		IV C, IV P
239.	*b'*	259, 263			II A, IV C, III–IV P
240.	*c'*	259, 264, 404			IV A C
241.	*d'*	259, 265, 404			IV C, III–IV P
242.	minuscula	259, 286, 404			
243.	" berenice	249, 267			
244.	**neva**	249, 268		+	III A, II P
245.	Erythemis velox	249, 270			
246.	" simplicicollis	272, 405			II–IV A, IV C, I–III P
247.	" connata	272, 275, 405	VIII. 43		*IV C*, III P
248.	**Brechmorhoga vivax**	272, 276, 405	VIII. 43, 44; X. 13		
249.	præcox	278, 280, 405	VIII. 46–48		II–IV A
250.	**postlobata**	279, 281, 405	VIII. 49		II–IV A
251.	**tepeaca**	279, 283			II, III P
252.	" **mendax**	405, 406	X. 55–56		IV A, III P
253.	" **pertinax**	279, 283			III P
254.	rajax	280, 283	VIII. 38		III A P
255.	" nubecula	280, 285			
256.	" inequiunguis	280, 285			II–III A
257.	**Marrothemis musiva**	280, 286, 406			II–III A P
258.	" **nacuhuitana**	288, 289	IX. 43–45		III A
259.	" hemichlora	288, 290, 406			II–IV A, I–III P
260.	" inguta	288, 290, 406			II–III A
261.	Paltothemis lineatipes	289, 291, 407			II–III A P, *IV C*
262.	Miathyria marcella	292			III A, III–IV P
263.	" simplex	294, 407			II–III A P, IV C
264.	Tauriphila australis	294, 295			II–III A, II P
265.	" **azteca**	296, 297	IX. 46, 47		III A
266.	" argo	297, 298			II–III A, *IV C*
267.	Tramea cophysa ?	297, 299	IX. 48, 49		
268.	longicauda, var. ?	300, 301			III A, IV C
269.	insularis	300, 303			II P
270.	" abdominalis	300, 303			IV A
271.	lacerata	300, 304		+	IV A, IV C
272.	" onusta	301, 305		+	III A
273.	Pantala flavescens	301, 305			II–IV A F, IV C
		307, 407		+	II–IV A, II–III P, III–IV C

(*continued*).

DISTRIBUTION

Yucatan, Campeche, and British Honduras.	Guatemala and Honduras.	Nicaragua.	Costa Rica.	Panama.	South America.	West Indies.	Elsewhere.	Reference No.
II	II A		II P	II P		+	Lower California, Texas.	213.
	—		†	...		+		214.
	II A P			...	+			215.
...	II P		II P					216.
	II A	II P		...	+	+	Lower California.	217.
	II A			...	...	+		218.
	II A		—	II P	+			219.
	II A			+	+			220.
II	II III A P		III-IV A, II-IV P	II P		+		221.
	II A		II P	III P				222.
...	II A, II-III P		—	...	+			223.
...				III P	+			224.
=	II A, III P	■	III A, II P	II A, III P		+		225.
	III A P		III-IV A	III P	+			226.
■	II A		II P	III P	+			227.
‖	—			...	+			228.
II	III A, II-III P		III A, II P	II A P			Occasional in California.	229.
II	II-III A, II P		II P	II A	+	+	Texas, Florida, Bahamas.	230.
II	II A, II-III P		II P	II A	+	+		231.
	—		II P	II A *	+			232.
				II A	+			233.
	[II-IV A, IV P]		[III A, II-IV P]	[II A P]	[+]		†	
	II-IV A							234.
	II III A		III A, II P	...	+			235.
■	II III A, IV P		III A		+			236.
	II A		II IV P	II A (P?)	+			237.
	—		—	...	+	+		238.
	—			II A *	+			239.
	—		—					240.
	—	■	III A		+		Lower California.	241.
	—		—	II P	+	+	Florida.	242.
								243.
	II P		—	II A		▸	Bahamas.	244.
II	II-III A, III-IV P		II P	II P	+		N. Mexico, Texas, Lower California.	245
	III A							246
	II III A, III P		—	...	+			247
	III A P		III A, II-IV P	+				248.
	II III A, III P		—	+	+			249.
								250.
								251.
■	■	■	—	...	...		Lower California, Texas.	252.
	III-IV A		III-IV A					253.
	III A		III A, IV P	...	+			254.
•	—	■	.....	+	+			255.
	II-III A, III P			II P	+		Lower California.	256.
				=	+			257.
■	II-III A, III P		IV A, II P		+	...	Lower California.	258.
	II-III A, III P		II P	+	+			259.
	II-III A		II P	II A	+			260.
•	III-IV A		III-IV A, IV P		+	...	California, Arizona, New Mexico, Texas.	261.
	II A	II P	III A	II P	+	+		262.
	II A		—	...	+	+		263.
±	—	■		...	+	+		264.
								265.
	II A		—	...	+			266.
	II A			II P	+	+	Galapagos.	267.
II	II A				+			268.
II	II A		IV P			+	Florida, Bahamas.	269.
	II-III A		—	■	+	+	Florida, Bermudas.	270.
							California, Arizona, Texas, Hawaiian Is.	271.
	—		—	+		+	California, New Mexico, Texas, Florida.	272.
•	II-III A, III P		III A, II-IV P	II A	+	+	Arizona, Texas, Old World excl. Europe.	273.

* Specimens of *Erythrodiplax erichsoni*? and *E. connata b*' were received, after the printing of the Supplement, from Dr. R. E. B. McKenney, labelled "Flying against lantern, 11 p.m., May 12, 1906, at Long Point, Caimso Farm, Province of Bocas del Toro [Panama]."

† The distribution of ***Erythrodiplax connata*** as given on this line is a summary of the data on the following eight lines.

TABLE B

Reference No.	Taxonomic Group.	Page.	Plate and Figure.	Northern America.	Mexico.
274.	Pantala hymenæa	307, 309, 407	—	+	III–IV A, II P
275.	Perithemis domitia intensa	310, 311, 408	VI. 10–18		III A, IV C, II–IV P
276.	,, iris, i, ii, iii	310, 313, 408		...	II–III A P
277.	,, mooma	311, 314		...	II–III A, IV C, II P
278.	,, tenera	311, 316, 408		+	III A, III C
279.	**Rhodopygia hinei**	318, 319			
280.	**Sympetrum illotum virgulum**	321		...	III–IV A P, IV–V C
281.	,, corruptum	320, 323, 408		+	III–IV A C P
282.	Cannacria farvata	325		...	III A, IV C
283.	,, hetes i	325, 326		...	II–III A, IV C, II P
284.	**Platyplax sanguiniventris**	327	IX. 55–58	...	III A
285.	Erythemis simplicicollis	330, 331		+	III A, IV C
286.	,, ,, collocata	330, 332, 409		+	(III A ?) III–IV C, IV P
287.	,, peruviana	330, 333		...	II–III A
288.	,, mithroides	330, 334		...	II–III A
289.	,, sitala	330, 335		...	II–III A, *IV C*
290.	,, verbenata	330, 336		...	II–IV A, II (–III ?) P
291.	,, hæmatogastra	331, 338		+	
292.	Lepthemis vesiculosa	339		...	III A, II–III P
293.	Pachydiplax longipennis	341		+	III A, III–IV C
	Total number of genera 71			24	62
	Total number of species, subspecies, and varieties 293			89	219 (221)

The parentheses in this table enclose the probable numbers of genera and of species, &c., in the areas in question, obtai

The total of 219 species, &c., for Mexico includes 11 species (nos. 9, 69, 70, 114, 115, 117, 142, 147, 212, 257, 264) found to Central America, so that the total of Mexican species north of the Isthmus of Tehuantepec is 208. Of these 11, two The columns for (*a*) Yucatan, Campeche, and British Honduras, (*b*) Guatemala and Honduras, and (*c*) Nicaragua, read 165 species, &c. Similarly, the columns for Costa Rica and Panama, read together, will give the known Odonate fauna

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The type specimens of the new forms described in this work are those which have been figured on the Plates, the male preferably to the female, except where the latter alone was originally described, e. g. *Telebasis digiticollis*. Where several specimens of the same species have been figured, that one which has furnished the principal figure or figures is the type. The locality of each specimen figured is given in the Explanations of the Plates, and by reference to the list of material studied, given under each species in the text, the ownership of the type can be determined.

Zuni, New Mexico; *Erpetogomphus sipedon*, type ♀, Guadalajara, found by Schumann; *Micrathyria didyma hypodidyma*, type ♂, Coroico; *Dythemis maya*, type ♂, San Geronimo; *Brechmorhoga vivax*, type ♂, Zapote; *Tauriphila azteca*, type ♂, Guadalajara.

The fact of having served as the original of a given figure has been indicated by a label attached to the specimen in question. The types belonging to Dr. Godman are to be deposited in the British Museum of Natural History; the first set of duplicates from his collection, falling to the writer, will be placed in the Academy of Natural Sciences of Philadelphia. The material quoted on pages 218 *et seq.* as of the Kahl Collection has been acquired by the Carnegie Museum of Pittsburgh, Pennsylvania. Various exchanges of duplicate specimens between the public and private collections concerned have been authorized.

In conclusion, I wish to express my thanks for the aid afforded by the Curators and Directors of various Museums, and the owners of certain private collections, whose names are mentioned on page 17 and elsewhere in the text, but especially to Dr. F. D. Godman, Editor of the 'Biologia,' for the very liberal manner in which he has permitted the extension of this account of the Odonata far beyond the limits which we had expected would be necessary; to Mr. G. C. Champion, Dr. Henry Skinner, and my wife, for all the manifold assistance which they have so kindly rendered.

A discussion on the relations of the Odonata of Mexico and Central America to those of other areas, to temperature, rainfall, and other environmental factors, originally prepared for this work, has been withdrawn for publication elsewhere.

P. P. C.

Philadelphia, November 1908.

Fam. ODONATA *.

The following account of the Odonata † of Mexico and Central America is based on material contained in the collections of:—

(1) Mr. F. D. Godman, Editor of this work, brought together by the field-labours of its possessor and the late Osbert Salvin, of Messrs. G. C. Champion, H. H. Smith, H. J. Elwes, Schumann, H. Rogers, F. Blancaneaux, A. Forrer, M. Trujillo, G. F. Gaumer, W. B. Richardson, and, more recently, Mr. and Mrs. S. N. Rhoads.

(2) Mr. Robert McLachlan, of London, including types of species described by him and by Baron E. de Selys-Longchamps, or specimens identified by these two authorities.

(3) The Museum of Comparative Zoology at Cambridge, Mass. (abbreviated M. C. Z.), thanks to Mr. Samuel Henshaw, comprising, among others, the Hagen collection and series gathered by Messrs. Alexander Agassiz, F. Sumichrast, H. Wilson, G. R. Crotch, and C. H. Van Patten.

(4) The Academy of Natural Sciences of Philadelphia (A. N. S.).

(5) The United States National Museum at Washington, D.C. (U. S. N. M.), thanks to Mr. W. H. Ashmead.

(6) The American Museum of Natural History in New York (A. M. N. H.), thanks to Mr. Wm. Beutenmüller.

(7) Mr. C. C. Adams, of Chicago, Illinois.

(8) Mr. C. C. Deam, of Bluffton, Indiana, communicated by the kindness of Mr. E. B. Williamson.

(9) The writer (abbreviated P. P. C.). The Mexican material possessed by Mr. Adams and myself is, in large part, the result of recent collections by Mr. O. W. Barrett, of Clarendon, Vermont, to whose liberality and interest it is a pleasure to testify.

It is also proper to include in this list (10) the collections from Mexico in the possession of the California Academy of Sciences at San Francisco, which, although already reported upon ‡, must be frequently quoted in the following pages.

When no mention is made of the collection in which a given species is represented, that of Mr. Godman is to be understood.

* By Philip P. Calvert, Ph.D., Instructor in Zoology, University of Pennsylvania, Philadelphia, Pa., U.S.A.

† My preference is to regard the Odonata as an *Order*, following the later views of Brauer, Packard, and others: but to preserve uniformity of treatment for the various groups of Neuroptera included in this volume, the Odonata are here considered as a Family, in deference to the wishes of the Editor.—P. P. Calvert.

‡ "The Odonata of Baja California, Mexico." By Philip P. Calvert. Proc. Cal. Ac. Sci. (2) iv. pp. 463–558, pls. xv.–xvii. (Feb. 19, 1895).

"Odonata from Tepic, Mexico, with Supplementary Notes on those of Baja California." By Philip P. Calvert. *Loc. cit.* (3) Zool. i. pp. 371–418, pl. xxv. (May 22, 1899).

Anything like a summary of the Odonate-fauna of this region must be left until the conclusion of the work. One remark may be made in this place. It is that the material which it has been possible to study reveals so many variations and data for discussion of general questions that I have thought it necessary to state, under each species, the number of individuals which I have actually examined in writing of them. Much, indeed, of the value of what I have here written depends on comparisons made from *numerous*, and not from a few, individuals. And on the other hand, it is to be understood that, where I cite localities without any statements as to the number of individuals, such citations are from pre-existing literature, or from manuscript communications, or from my own previous studies, and not from examinations made expressly for the present work. The reader who wishes to test my conclusions concerning any species has therefore to consult the list of localities quoted in order to learn the extent of the material on which my assertions are based.

The terminology employed is, for the most part, that of my "Introduction to the Study of the Odonata" (Transactions of the American Entomological Society, xx. pp. 152*a*–218, Philadelphia, 1893).

I. ZYGOPTERA.

Front and hind wings similar in shape, or nearly so, without a membranule, with a quadrilateral. Males having the sternites of the eleventh abdominal segment developed as *two* clasping-organs—the so-called inferior, terminal, abdominal appendages. Nymphs with three caudal tracheal gills.

AGRIONIDÆ.

Head transversely elongated, eyes separated from each other; lateral lobes of the labium two-jointed, middle lobe bifid. Females with genital valves.

Synopsis of the Subfamilies.

Median sector separating from the principal nearer to the arculus than to the nodus.

Antenodals five or more, cross-veins in the postcostal area beginning before the level of the apex of the quadrilateral ——— 1. CALOPTERYGINÆ.

Antenodals two, cross-veins in the postcostal area beginning at the level of the apex of the quadrilateral ——— 2. LESTINÆ.

Median sector separating from the principal nearer to the nodus than to the arculus.

Antenodals two to five, but usually two ——— 3. AGRIONINÆ *.

* The reasons leading to these modifications of the usual classification of the Zygoptera are discussed in an article entitled "On the Systematic Position of *Thaumatoneura inopinata*, McLachlan (Order Odonata), with some Remarks on the Classification of the Suborder Zygoptera," which will shortly be published in the Entomologists' Monthly Magazine (London).

Subfam. *CALOPTERYGINÆ.*

Key to the Genera of the present faunal district.

§ 1. Lower sector of the arculus arising from near the middle of the latter, upper sector arising farther forward.

Antecubitals (or antenodals) in the costal and subcostal spaces approximately equal in number. Quadrilateral approximately equal in length to the median space or much longer ——— Legion Calopteryx.

Median space with cross-veins, arculus not bent; pterostigma, when present, of one cell only; males with the front wings having the postcostal space of more than two rows of cells and a red basal spot in all the species of this fauna ——— Genus Hetærina.

Median space free, arculus bent where its sectors arise; pterostigma, when present, of more than one cell; first antennal joint much shorter than the second ——— Genus Calopteryx.

Antecubitals in the costal space at least twice as numerous as those in the subcostal space. Quadrilateral much shorter than the median space ——— Legion Amphipteryx.

Quadrilateral free, postcostal cross-veins beginning before the apex of the quadrilateral, some postcubitals between the pterostigma and the costa ——— Genus Amphipteryx *

§ 2. Lower and upper sectors of the arculus arising together from the upper end of the latter ——— Legion Thore.

Median sector unbranched, no supplementary sectors between the short sector and the superior sector of the triangle †, only one antecubital distinctly thicker than the others ——— Genus Cora.

HETÆRINA.

Hetærina, Selys, Syn. Calopt. p. 30 (1853); Monogr. Calopt. p. 96 (1854) [1]; Kirby, Cat. Odon. p. 104 (1890).

For some years it has been known that the division of the species of *Hetærina* into two primary groups, based on the absence or the presence of a pterostigma [1], is untenable, since a number of species have been found to vary from the one condition to the other, each within its own specific limits. The subordinate divisions depending on the presence or absence of red or brown spots on the tips of the wings of the males are also unsatisfactory, since, even in those species in which such spots are present,

* Baron de Selys gave [Bull. Acad. Belg. (2) vii. p. 450 (1859)] as a character separating *Amphipteryx* from *Dineura* (=*Diphlebia*) that the former had no supplementary sectors between the short sector and the superior sector of the triangle. The present material of *Amphipteryx* does not sustain this statement, owing to the considerable percentage of individuals in which such supplementary sectors exist.

† This character, which distinguishes *Cora* from the genus *Thore*, is subject to exception in 5·5 per cent. of the present material of *Cora marina* (specimens from San Geronimo), but otherwise it seems good.

they are often quite late in appearing. No identification of a male *Hetærina* is certain unless its terminal abdominal appendages have been examined and the determination based thereon, although in some species a high degree of probability may be reached without reference to those structures. For the females, however, very few structural characters are known to exist; in some species we are uncertain whether the females are correctly referred to the corresponding males, while in other cases it seems impossible to find any constant differences between females of species whose males are readily distinguished.

Bearing all these facts and difficulties in mind, we present a key to the species of *Hetærina* known from the present fauna, in the hope that it will prove more exact than those previously published *. Since one has not unfrequently to attempt the identification of *Hetærinæ* in which the apex of the abdomen is lost, some subsidiary characters have been introduced to afford aid in such cases. Finally, since not a generic or specific character appears to exist which does not suffer some percentage of variation, it will not be surprising if readers of this work find individuals which "do not fit" the key. It is claimed, however, that, so far as the present material goes, these characters seem less variable than those previously employed for this purpose.

Key to the Mexican and Central-American Species of Hetærina.

§ I. Hind wings with but one row of cells between the lower sector of the triangle and the hind margin of the wing beyond the level of the apex of the quadrilateral. Labrum black, with a yellow spot each side. Male with a rounded brown spot on the tips of all four wings; female unknown . . . . . 1. *fuscoguttata*.

§ II. Hind wings with two rows of cells (not more) in a considerable part of the area mentioned in § I. Labrum variously coloured.

Males.

a. Inferior terminal abdominal appendages well developed, at least one-third as long as the superiors.

b. Inferior appendages not, or but slightly, enlarged at the tip.

c. Tips of the wings brown or uncoloured.

d. Basal spot of both front and hind wings chiefly or wholly red when mature.

* It should also be stated that, in drawing up this key, one or more specimens of the following South-American species have been studied, with the result that they all fall within § II.: *duplex* ♂, *simplex* ♂ ♀, *sanguinea* ♂, *rosea* ♂ ♀, *caja* ♂ ♀, *dominula* ♂, *auripennis* ♂, *hebe* ♂, *sanguinolenta* ♂ ♀, *læsa* ♀, *carnifex* ♂ (♀?), *longipes* ♂, *moribunda* ♂, *brightwelli* ♂. Of the 42 "species" of *Hetærina* enumerated by Kirby in his Catalogue, 35 have been examined for this purpose.

That the sections (§ I., II., III.) are not to be regarded as of generic or subgeneric rank is shown by the fact that in at least one species, *majuscula*, the male falls in one section, the female in another.

e. Labrum partly or chiefly yellowish or pale brown; tips of the hind wings with no rounded brown spot . 2. *cruenta*; 3. *vulneratata*; 4. *americana* (to be distinguished by their appendages, see Tab. II.)

ee. Labrum entirely black, with a metallic blue reflection; tips of the hind wings with a rounded brown spot ——— 5. *sempronia*.

dd. Basal spot of front wings red, of hind wings brown, when mature.

Red basal spot of front wings not bordered with brown externally, basal spot of hind wings not reaching to nodus ——— 6. *tricolor*.

ff. Red basal spot of front wings bordered with brown externally, basal spot of hind wings reaching to the nodus or beyond . . 7. *titia*.

cc. Tips of the front wings clear, of the hind wings with a small rounded red spot, when mature ——— 8. *caja*.

bb. Inferior appendages distinctly enlarged at tip.

g. This enlargement subspherical; a rounded red spot on the tip of each hind wing, when adult ——— 9. *pilula*.

gg. This enlargement having the form of a racquet; a rounded brown spot on the tips of all the wings, except in the var. *sublimbata* . . 10. *macropus*.

Inferior appendages rudimentary ——— 11. *miniata*; 12. *capitalis* (easily separated by the form of their superior appendages, see Tab. II.).

Females.

Labrum in part, at least, yellow.

b. Metallic green on either side of the thoracic dorsum (mesepisternum) divided into two spots, the anterior contiguous to the mid-dorsal carina, the posterior separated from it by buff or brown ——— 6. *tricolor*.

bb. Metallic green * of each mesepisternum continuous, contiguous to the mid-dorsal carina (or nearly so) throughout its entire length.

c. Metallic green of each mesepisternum not reaching outward to the humeral suture ——— 8. *caja*; 2. *cruentata* (apparently not distinguishable).

cc. Metallic green of each mesepisternum reaching outward to the humeral suture, at least at its posterior (upper) end.

d. The same metallic green at its anterior (lower) end one-half (or less) as wide as the mesepisternum itself.

e. Dorsal carina of the 10th abdominal segment not terminating posteriorly in a spine; pterostigma absent ——— 3. *vulnerata*.

ee. Dorsal carina of the 10th abdominal segment terminating posteriorly in a spine which projects beyond the apical margin.

f. Pterostigma, if present, obscure in colour ——— 10. *macropus*.

ff. Pterostigma, if present, white and opaque ——— 7. young *titia* (where the pterostigma is absent these two species seem indistinguishable).

dd. The same metallic green almost as wide throughout as the mesepisternum.

* Note that the metallic green is replaced by coppery-red in some individuals.

g. Wings darker (yellowish or brownish) in the apical part of the hind wings ——— 7. old *titia*.

gg. Wings darker (yellowish or yellowish-brown) in the basal part of both pairs ——— 4. *americana*.

aa. Labrum entirely black, with metallic green or blue reflections.

h. Hind wing 28·5 to 32 mm. long ——— 12. *capitalis*.

hh. Hind wing 36·5 mm. long ——— 13. *majuscula*.

§ III. Hind wings with three† rows of cells in the area mentioned in § I. Labrum black, with a metallic green or blue reflection.

Males.

a. Inferior appendages rudimentary . . 13. *majuscula*; 14. *infecta*; 15. *tolteca* (distinguished by their superior appendages, see Tab. II.).

aa. Inferior appendages well developed ——— 16. *rudis*.

Females.

a. Postcostal area of the front wings not very densely reticulated.

b. Postcostal area of the front wings with 2 or 3 rows of cells between the postcosta and the hind margin. Median space and quadrilateral with an average of 7 cross-veins each ——— 14. *infecta*.

bb. Postcostal area of the front wings irregular, with a maximum of 5 cells (not rows) on a straight line from postcosta to hind margin. Median space and quadrilateral with an average of 11 cross-veins each . . . 16. *rudis*.

aa. Postcostal area of the front wings very densely reticulated, the cells not arranged in distinct rows, often 8 or 9 cells on a straight line from postcosta to hind margin ——— 17. *maxima*.

The following sexes are unknown:—The male of *maxima*; the females of *fuscoguttata*, *sempronia*, *pilula*, *miniata*, *tolteca*.

It may also be of use to the student, who has, unfortunately, to deal with broken material, to enumerate the species which *when adult* possess certain features of coloration, &c., in the wings, an asterisk (*) indicating that the species in question varies as regards the feature stated:—

Males only.

Tips of the wings clear:—4. *americana* *; 2. *cruentata* *; 3. *vulnerata* *; 12. *capitalis* *; 15. *tolteca* (?).

Tips of the hind wings only with a red spot:—8. *caja*; 12. *capitalis* *; 9. *pilula*; 14. *infecta*.

Tips of both wings with a red spot:—11. *miniata*; 12. *capitalis* *; 13. *majuscula* *; 16. *rudis*.

† Occasionally, in individuals of *H. americana*, there are three rows of cells in this area, but the labrum is in large part yellowish.

Tips of both wings edged with brown :—2. *cruentata* * ; 3. *vulnerata* * ; 6. *tricolor* * ; 7. *titia* ; 10. *macropus*, var. *sublimbata*.

Tips of both wings with a rounded brown spot :—10. ***macropus*** (except var. ***sublimbata***) ; 1. ***fuscoguttata***.

Tips of hind wings only with a rounded brown spot :—5. *sempronia*.

Males and Females.

Pterostigma always absent, so far as at present known :—1. *fuscoguttata* ; 2. *cruentata* ; 3. *vulnerata* ; 8. *caja*.

Pterostigma regularly varying from present to absent :—4. *americana* ; 6. *tricolor* ; 7. *titia* ; 10. *macropus* ; 12. *capitalis* ; 15. *tolteca* (?) ; 16. ***rudis***.

Pterostigma never absent, so far as at present known :—5. *sempronia* ; 11. *miniata* ; 13. *majuscula* ; 14. *infecta* ; 17. *maxima*.

1. Hetærina fuscoguttata. (Tab. II. figg. 33, 34.)

Hetærina fuscoguttata, Selys, Ann. Soc. Ent. Belg. xxi., Compt. Rend. p. xxi (1878) [1] ; Bull. Acad. Roy. Belg. (2) xlvii. p. 367 (1879) [2] ; Kirby, Cat. Odon. p. 107 (1890) [3].

Hab. Panama [1 2], Bugaba (*Champion* : 1 ♂).

De Selys's second description is much the more detailed. Compared with it, the present male is a little smaller—abdomen 40·5 mm., hind wing 26·5 mm. The basal red, or rather pink, spot of the front wings occupies also the submedian space outward to the level of the middle of the quadrilateral ; and on the hind wings, instead of being "nulle," it exists as a pink cloud in the submedian space from the wing-base two-thirds of the way to the arculus. There are four yellow stripes on either side of the thorax, viz., at the humeral, first and second lateral sutures, and on the met-epimeron just above the latero-ventral metathoracic carina. The metasternum of this male is pruinose. The inferior appendages are half as long as the superiors, instead of "un tiers plus courts." Two or more double cells exist within the median space on all the wings. The apical brown spots on the wings are scarcely more densely reticulated than adjacent uncoloured areas.

2. Hetærina cruentata. (Tab. II. figg. 31, 32 ; Tab. III. fig. 19.)

Calopteryx cruentata, Rambur, Nevr. p. 228 (1842) [1].

Hetærina cruentata, Selys, Syn. Calopt. p. 39 (1853) [2] ; Monogr. Calopt. p. 127, t. 4. fig. 3 (wing) ; t. 12. fig. 1 (apps.) (1854) [3] ; in Sagra's Hist. Cuba, Ins. p. 461 (1857) [4] ; Walker, List Neur. Ins. Brit. Mus. iv. p. 625 (1853) [5] ; Hagen, Neur. Am. p. 59 (1861) [6] ; Proc. Bost. Soc. Nat. Hist. pp. 23, 28 (1875) [7].

♀? ***Calopteryx luteola***, Ramb. Nevr. p. 223 (1842) [8].

Hetærina luteola, Kirby, Cat. Odon. p. 105 (1890) [9].

Hab. Mexico [3], Misantla (*Godman* : 7 ♂, 2 ♀), Jalapa (*M. Trujillo* : 2 ♂. 4 ♀ ; *Rhoads* : 1 ♀ ; *Barrett, coll. P. P. C.* : 1 ♀ ; *and in coll. Adams, P. P. C. det.*), Coatepec

♂. Although *H. capitalis* has been regarded as only a smaller race of *H. majuscula* [1 6], yet it may, from the material now examined, be regarded as specifically distinct on the structural character (mentioned in part by de Selys [3]) of the superior appendages of the male (*cf.* our figg. 21 and 23); and in the presence of only two rows of cells between the second sector of the triangle and the hind margin of the hind wings, while there are three rows in *H. majuscula*.

Other differences stated from time to time are not so constant. Thus as regards size, that of the present material, added to the recorded measurements [2], shows that the abdomen of *H. capitalis*, ♂, varies from 35–44 mm., and the hind wing, ♂, 28–33·5 mm. (the latter figures from the Sta. Fé de Bogota male). The corresponding figures for *H. majuscula*, ♂, are: abdomen 46–48, hind wing 35–37. The red of the basal spot of the front wings invades a considerable part of the costal space in the males from San Gerónimo and Chiriqui. The pterostigma varies in length, even in the wings of the same individual, the extremes being the surmounting of two cells (San Gerónimo), and existing as merely a thickened, more oblique postcubital (Zapote).

♀. The two females from Zapote fall within the previously known size-limits: abdomen 32–36 mm., hind wing 28·5–32. The stripes on the sides of the thorax are metallic green, not blackish. The tip of the dorsal carina on segment 10 is bifid or trifid; on either side of it, at a short interval, is an acute tooth, projecting from the hind margin of the same segment, much as in *H. tricolor*.

The single broken female of *H. majuscula* seen does not admit of any statement as to possible specific differences in this sex other than the size.

13. **Hetærina majuscula.** (Tab. II. fig. 23.)

Hetærina majuscula, Selys, Syn. Calopt. p. 47 (1853) [1]; Monogr. Calopt. p. 151, t. 13. fig. 1 (apps. ♂) (1854) [2]; Bull. Acad. Belg. (2) xlvii. p. 368 (1879) [3]; Walker, List Neur. Ins. Brit. Mus. iv. p. 634 (1853) [4]; Hagen, Proc. Bost. Soc. Nat. Hist. xviii. p. 28 (1875) [5]; Kirby, Cat. Odon. p. 107 (1890) [6].

Hab. Costa Rica, Caché [4 ♂], Irazu 6000–7000 feet [2 ♂, 1 ♀] (*Rogers*).—Colombia [1]; Guiana, Surinam [2].

The present material is the same as that described by de Selys [3], and bears pin-labels in his handwriting. (See also the remarks under *H. capitalis*, supra.)

14. **Hetærina infecta,** sp. n. (Tab. II. figg. 18, 24.)

♂. Labium brown (*young*) or black (*adult*); labrum black, with a more or less metallic blue or green reflection. Epistoma metallic blue or green. Base of mandibles yellowish. Second joint of antennæ yellow (*young*) or black (*old*). Remainder of the head dark metallic green, becoming blackish with age. Prothorax metallic green; hind lobe triangular. Mid-dorsal thoracic carina ochreous (*young*) or black (*old*); on either side of it a metallic green band, wider at its upper end, where it reaches the humeral suture. A humeral band (narrower above, nearly as wide below as the metallic green band just mentioned) and the metapleuron ochreous or brownish-yellow, but the mesepimeron, metepisternum, and

metepimeron each with a metallic green stripe; that on the metepisternum is broken into an upper and a lower spot in the young.

Abdominal segments 1 and 2 metallic blue or green, 3–6 light brown, 7–10 black (*young*), or all more or less blackish (*old*).

Legs pale brown (*young*) or black (*old*).

Wings clear (becoming somewhat smoky with age). Pterostigma pale grey (*young*) or black (*old*), surmounting 1_2 to $3\frac{3}{4}$ cells. Red at the base of the front wings, commencing at the median vein, reaching outward two to three cells beyond the quadrilateral, touching the hind margin of the wing in the basal half of the spot, but separated from it by the width of one cell in the distal half; some of the cells in the costal and subcostal spaces brown or brown and red. Red at the base of the hind wing extending from the costa to one row of cells below the postcosta and outward to the end of the quadrilateral; mixed with brown in the costal and subcostal spaces. Tips of the front wings slightly brown, of the hind wings with a red, or brown and red, spot ("gouttelette"), which is not more densely reticulated than the adjacent uncoloured portion; these are absent in the young, which also lack the whiteness present on the cross-veins, between the median and postcosta, on the under surface of the basal red of the wings of the old. The basal red spots are very pale, in the teneral individuals, especially on the hind wings. About 12 median cross-veins, 9–13 in the quadrilateral, 30 antecubitals on the front wings. Reticulation mostly black, but red in the basal spots.

Superior appendages about twice as long as segment 10; viewed from above, straight in their basal two-thirds, bent toward each other in their apical third, apices subtruncate, inner margin with two teeth in the middle third, the proximal of which is the larger and more obtuse; opposite the interval between the two teeth is a short denticulated ridge on the upper-inner surface of the appendage. Viewed obliquely from above, at 45° with the horizontal, the two teeth are seen to form a dilatation of the lower margin of the appendage as well, the interval between the two teeth being less distinct, the distal tooth being more tubercular, the proximal showing a small tubercle between it and the distal. Inferior appendages rudimentary, with a terminal pencil of hairs.

♀. Differs from the male as follows:—Second antennal joint remains yellow in age. The humeral band often, but not always, wider than the metallic green band between it and the mid-dorsal carina. Lower half of the metallic green stripe on the metepisternum less developed than the upper half. Abdominal segments 3–5 often, but not always, metallic green in young.

Wings pale yellowish at base; articulation reddish-brown, becoming darker toward the apices; no apical spots; about 7 median cross-veins, 7 in the quadrilateral, 25 antecubitals in the front wings.

Tenth abdominal segment with mid-dorsal carina moderate, its apex trifid; dorsal apical margin prolonged on either side of the carina and denticulated. Appendages as long as segment 10, conical, acute. Genital valvules reaching not quite as far as apex of segment 10; apical half of the inferior margin denticulated.

Abdomen, ♂ 41–47, ♀ 33–37; hind wing, ♂ 30–34, ♀ 30·5–34·5 mm.

Hab. MEXICO, Presidio in Vera Cruz (*Barrett, coll. P. P. C.*: 1 ♀), Atoyac (*H. H. Smith, Schumann*: 24 ♂, 22 ♀); ?GUATEMALA, Panima in Vera Paz (*Champion*: 2 ♀ of large size, one having hind wing 36 mm. long, may belong here).

The specific name refers to the rudimentary ♂ inferior appendages.

In the collection of the United States National Museum are three males and one female from "Mexico," all of large size, and with the terminal portion of the abdomen lost. They are doubtless conspecific, but the absence of the appendages renders it impossible to certainly identify them. They belong in all probability to *H. infecta* or to *H. capitalis*. I refer them to the former on account of their size, habitat, and the greater number of cells in the wing-reticulation, as shown, *e. g.*, in having *part* of the area between the second sector of the triangle and the hind margin of the hind wings with three rows of cells, while in *H. capitalis* there are but two rows here. The

dimensions of these doubtful individuals are: first four abdominal segments, ♂ 19·5–21, ♀ 17 mm.; hind wing, ♂ 35–37·5, ♀ 35 mm.

15. **Hetærina tolteca**, sp. n. (Tab. II. figg. 19, 25.)

♂ (*adult*). Differs from *H. infecta* in the following respects only:—Hind lobe of the prothorax not triangular, much less projecting. Metallic green stripe on the metepisternum present only on the upper half: stripe on the metepimeron dark brownish, although with some metallic green reflection. Abdomen similar to that of *H. infecta*, but most of the segments have a metallic blue reflection. Pterostigma ill-developed, hardly coloured, surmounting half a cell or reduced to a single more oblique vein, which is slightly clouded. Red (pale) at the base of the hind wings confined to the quadrilateral, submedian space, and one row of cells below the postcosta; in the median space it hardly exists; the subcostal space pale brown from the base to 3 or 4 cells beyond the level of the distal end of the quadrilateral, this brown extending to some extent into the costal space. Tips of the hind wings with a smoky spot *, less marked on the front wings, the reticulation no denser than in adjacent uncoloured areas. About 16 median cross-veins, 13 in the quadrilateral, 33 antecubitals on the front wings.

Superior appendages about twice as long as segment 10; viewed from above, straight in the basal half, curved toward each other in the distal half, apices rounded; widest in the middle third, where the inner margin is dilated with a quite sinuous outline. Viewed obliquely from above, at 45° with the horizontal plane, the inferior margin presents three successive convexities extending from one-third to four-fifths of the length of the appendage: of these three the basal is the most convex, the second the least convex, and above it, on the upper-inner surface of the appendage, is a short ridge. Inferior appendages rudimentary.

Abdomen, ♂, 46; hind wing, ♂, 35 mm.

Hab. Mexico, Jalapa (*M. Trujillo*: 1 ♂).

16. **Hetærina rudis**, sp. n. (Tab. II. figg. 20, 26.)

♂. Labium and labrum black, the latter with some metallic blue reflection. Nasus metallic blue or green. Bases of mandibles yellow. Remainder of the head dark metallic green or black.

Prothorax dark metallic green; hind lobe rounded. Thorax black, with a metallic green reflection in some individuals; a narrow line on the humeral (not reaching the wing-base) and on the first lateral sutures, a stripe on the second lateral suture, and a slightly wider stripe along the hind margin of the metepimeron, deep yellow or orange, as also are some small spots on the pectus and bases of the legs; yellow of the first and second lateral sutures confluent below.

Legs black. Abdomen blackish.

Wings hyaline or decidedly smoky throughout. Pterostigma dark brown, varying from surmounting two cells to being reduced to a single, thickened, more oblique postcubital. Tips of all the wings mostly with a small red spot, whose reticulation is no denser than the adjacent uncoloured areas; it is larger on the hind wings and may be absent on the front pair. Basal red spot on the front wings reaching from the median vein to the hind margin and outward to five or six cells beyond the apex of the quadrilateral, its outer edge quite convex; subcostal space outward to level of apex of quadrilateral brown, mixed with some red, and overflowing into some of the cells of the costal space. Basal red spot on the hind wings reaching from the median vein to one row of cells below the postcosta and outward to the apex of the quadrilateral; costal and subcostal spaces brown outward to the same level or slightly farther. About 14 cross-veins in the median space, 15 in the quadrilateral, 30 antecubitals in the front wing.

Superior appendages one and a half times as long as segment 10. Viewed from above, moderately curved throughout, widest in the basal half, with the inner edge almost straight; apical half showing three successive convexities on the inner margin, the apex taking part in the third of these. Viewed obliquely from above, at an angle of 45° with the horizontal plane, the inferior margin is nearly straight in its

* I do not believe this male to have perfectly mature colours, hence this spot may be brown or red in the adult.

basal half, while its apical half forms a single strongly convex curve; above where the straight basal half and convex apical half of this lower margin meet, on the inner surface of the appendage, is a well-developed ridge, which gives the appearance of the first of the three convexities seen in dorsal view mentioned above. Inferior appendages slender, a little more than one-third as long as the superiors, convergent at their apices, which are somewhat upcurved and slightly bifid.

♀. Differs from the male as follows:—A large part of the second antennal joint yellow. Thorax decidedly metallic green; yellow stripes as in male, that on the humeral suture wider, but not more than one-third as wide as the adjacent antehumeral green. Wings smoky; no spots at the tips; costal and subcostal spaces yellow from the base to the nodus; about 10 cross-veins in the median space, 11 in the quadrilateral. Postcostal space of front wings denser than usual in females, occasionally five cells between postcosta and hind margin.

(Last six abdominal segments lost.)

Abdomen, ♂ 45–47, ♀ (segments 1–4, 16 mm.); hind wing, ♂ 35, ♀ 36·5 mm.

Hab. GUATEMALA, San Geronimo, Vera Paz (*Champion*: 12 ♂, 1 ♀).

The specific name has reference to the superior appendages of the male.

17. Hetærina maxima.

Hetærina maxima, McLachlan, Ent. Monthly Mag. xv. p. 244 (April 1879) [1]; Selys, Bull. Acad. Belg. (2) xlvii. p. 369 (1879) [2]; Kirby, Cat. Odon. p. 106 (1890) [3].

Hab. COSTA RICA, Irazu [1–3] 6000–7000 feet (*Rogers*: 1 ♀).

To forestall and to satisfy any suspicions on the part of those who have not seen the unique type of *H. maxima*, now before me, I may say that a careful examination leaves not the slightest ground for thinking that the wings and abdomen formerly belonged to different individuals. The specimen shows no sign of ever having been broken and subsequently mended. These statements are made because the peculiarity of this species is the denseness of the postcostal reticulation on the front wings, a character usually confined to the *males* of *Hetærina*. The female of *H. rudis* (*q. v.*) seems, however, to furnish a transition to *H. maxima* in this respect.

CALOPTERYX.

Calopteryx, Leach, Edinb. Encyc. ix. p. 137 (1815).
Agrion, Kirby, Cat. Odon. p. 96 (1890).

A holarctic genus.

1. Calopteryx dimidiata.

Calopteryx dimidiata, Burmeister, Handb. d. Ent. ii. p. 826 (1839) [1]; Hagen, Psyche, v. p. 245 (1889) [2]; Calvert, Ent. News, i. p. 74 (1890) [3]; Trans. Am. Ent. Soc. xxv. p. 50 (1898) [4].
Agrion dimidiatum, Kirby, Cat. Odon. p. 97 (1890) [5].

Hab. UNITED STATES, Kentucky [1], Georgia [2], Florida [4].—HONDURAS (*coll. P. P. Calvert*: 1 ♂).

The single male quoted is the sole evidence for the inclusion of this genus and species in the present work. As has already been mentioned [3], it was given to me by

2. Hyponeura funcki.

Hyponeura funcki, Selys, Monogr. Calopt. p. 275 (1854) [1]; Bull. Acad. Belg. (2) xx. p. 381 (1865) [2].

♂. Black paramedian stripes on thoracic dorsum reaching from anterior mesepisternal border to axillary callus, contiguous with the mid-dorsal carina for their entire length. In older males the humeral and posthumeral black stripes fuse for their upper halves or entire length. Segment 8 with no pale markings or merely a trace of a pale basal lateral stripe.

♀. Paramedian black stripes on thoracic dorsum occupying the middle half to three-fourths of the distance from axillary callus to anterior mesepisternal border.

♂ ♀. Pterostigma on the front wings surmounting 2+ (49 % ♂, 47 % ♀), 1+ (27 % ♂, 34 % ♀), or 2 (24 % ♂, 19 % ♀) cells; on the hind wings 2+ (49 % ♂, 65·5 % ♀), 1+ (30·6 % ♂, 19 % ♀), or 2 (20·4 % ♂, 15·5 % ♀) cells.

Antenodal cells on the front wings 7 (51 % ♂, 53 % ♀), 6 (38 % ♂, 44 % ♀), 6+ (9 % ♂, 1·6 % ♀), 8 (2 % ♂), or 7+ (1·6 % ♀); on the hind wings 6 (77 % ♂, 69 % ♀), 5 (19·5 % ♂, 31 % ♀), or 5+ (3·5 % ♂).

Hab. Mexico, Guadalajara [1 ♂], Mexico city [1 ♂] (*Schumann*), Cuernavaca (*coll. Dmea*), Atoyac (*H. H. Smith*, *Schumann*: 17 ♂, 27 ♀), and Chavarillo (*Barrett*, *coll. P. P. C.*: 8 ♂, 5 ♀) in Vera Cruz; Guatemala, San Geronimo (*Champion*: 1 ♂).—Colombia [1 2]; Venezuela, Cumana [2].

ARGIA.

Argia, Rambur, Névr. p. 254 (1842) [1]; Selys [and Hagen], Bull. Acad. Belg. (2) xx. p. 382 (1865) [2]; Kirby, Cat. Odon. p. 137 (1890) [3].

The genus *Argia*, while not confined to Tropical America *, is most numerous there and forms a characteristic feature of the fauna. Few Odonata are more difficult to identify specifically, so that I have been obliged to devote a large amount of time to the study of this genus. I had planned a revision of the North-American species before undertaking the present work, but the former task has been merged in the latter. The difficulties experienced have led me to a perhaps more comprehensive treatment than has been given to other parts of the subject, and all the species which I have been able to examine are here described on a uniform and methodical plan. Before explaining some details of these descriptions, it seems desirable to name the chief aids which I have had in identification.

In previous years I have compared specimens in my collection with types of a few species in those of Baron de Selys and of Dr. Hagen. Thanks to the kindness of Mr. Samuel Henshaw, I have had free use of a series of drawings made by Dr. Hagen in 1864 to illustrate the appendages of the males of this genus, but never published. Of the forty-seven species recognized in the Synopsis of 1865 [2], forty are thus figured. These drawings have been of the greatest service, for, made from the types, they shed a flood of light on the obscurity of the too brief descriptions.

* The extra-American species, three in number, inhabit the Kurile Is., the Moluccas, and the Cape of Good Hope respectively; but the Moluccan species, *A. optata*, Hagen, may not be congeneric. In America some species reach as far north as Maine, others south to Buenos Aires.

Structural features must play a large part in specific identifications of *Argia*, not only because of their intrinsic value * but also because of the fading of colours after death; moreover, some species differing but slightly in coloration possess dissimilar structural characters (*e. g. A. fissa*, *A. deami*, *A. tarascana*). On account of loss of colour, many types of de Selys and of Hagen are now unrecognizable except by the terminal abdominal appendages of the males and the mesostigmal laminæ and mesepisternal tubercles of the females.

The mesostigmal laminæ are the "thoracic processes" or "laminated processes of the thorax" of Hagen (1861) and the "lames du devant du thorax," "lames anterieures (ou elevees) du thorax" of de Selys [2]. I have called them mesostigmal laminæ as more accurately defining their position, since each lamina is a prolongation posterior and superior to the mesostigma, or spiracle situated in the anterior part of the mesothorax (see Tab. IV. fig. 1).

To the best of my knowledge, the mesepisternal tubercles of the females have not been previously noticed in the literature of *Argia*. When present, they are two in number (right and left), one near the lower end of each mesepisternum to the outer side of the corresponding mesostigmal lamina. They are well developed in *A. translata* and *A. tezpi* (see Tab. IV. figg. 18, 19), are present in *A. mœsta*, *A. cuprea*, *A. harknessi*, *A. variabilis*, *A. vivida* and its variety *plana*, reduced in size in *A. ulmeca*, *A. deami*, and *A. extranea*, and very small or absent in *A. percellulata*, *A. sedula*, *A. pulla*, *A. oculata*, *A. popoluca*, *A. indicatrix*, *A. cupraurea*, *A. œnea*, *A. difficilis*, *A. tonto*, *A. lacrymans*, *A. fissa*, *A. tarascana*, *A. immunda*, *A. violacea* and var. *pallens*, *A. agrioides* and var. *nahuana*, *A. fumipennis*, *A. tibialis*, and *A. apicalis*.

The mesostigmal laminæ and mesepisternal tubercles are female sexual characters, but whether they are employed in coition, as places of attachment for the male abdominal appendages, or not, is unknown.

The shape of the male appendages and of the female mesostigmal laminæ is mostly so difficult of accurate description that I have relied entirely upon figures (Tab. IV.) to display it.

As regards the descriptions given below of the colours of *Argia*, it is to be noted that the width of *a single* pale (blue, violet, &c.) antehumeral stripe (*i. e.* on one side of the body) is compared with that of the *entire* dark (black, brown, &c.) mid-dorsal stripe (*i. e.* on both sides of the mid-dorsal carina). It therefore follows that where the width of "the pale antehumeral stripe" is *more* than one-half that of the dark mid-dorsal, the predominant colour of the thoracic dorsum is pale. A pale antehumeral stripe *less* than half as wide as the dark mid-dorsal means a predominantly dark thoracic dorsum. The humeral stripe, when present, is dark-coloured and is sometimes described as "forked above," meaning thereby that a dark mesepimeral

* Selys has made a similar statement [2], p. 381.

stripe is fused with the humeral stripe proper at its lower, but not its upper, end. The colour of the labrum appears to vary but little; when no statement is made concerning it either in the Key to the Species or in the specific description, it is to be understood as being pale.

The measurements of the pterostigmata have been made with an eye-piece micrometer in a low-power compound microscope. The dimension given is the length along the costal margin. It is not pretended that the extremes of size have been given for each species, but merely the results obtained from a few individuals taken at random. Even so they will probably be found useful, as the size of the pterostigma is, to a certain degree, a specific character.

Much time and care has been devoted to the gathering of statistics relative to the number of antenodal cells and of those surmounted by the pterostigma. Nearly every specimen enumerated under each species has been tabulated in regard to these points, involving an examination of about five thousand wings. These two details of neuration were employed by Hagen [2] as means for subdividing the genus into sections. It will be seen that considerable variation in these numbers exists. On the whole, antenodal cells are less variable than subpterostigmal cells, but neither feature is sufficiently constant for the purpose for which Hagen used them, and the same negative result is reached on testing a third of his characters, viz. the place of termination of the superior sector of the triangle. All neurational differences observable among various species of *Argia* are too variable to serve as a basis for subdivision of the genus.

After many efforts to arrange the species of the present fauna into natural groups, the attempt has been abandoned. The alliances suggested by one set of characteristics appear to be contradicted by others having equal weight. The key here offered has very little pretension to expressing natural relationships. It is only given in the belief that it is better than no key at all, and as being the least unsatisfactory of those which I have successively drawn up and discarded.

Artificial Key for the identification of Mexican and Central-American Species of Argia *.

Males.

(N.B.—All identifications made by this key should be checked by comparison of the appendages with figg. 27–62, Tab. IV.)

§ I. Total area of dark colours on abdominal segments 3–6 and thoracic dorsum *greater* than the total pale area on the same parts.

1. Thoracic dorsum not brilliantly metallic.

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* The species in square brackets marked with an asterisk have been taken in Texas or Arizona, and may occur in Northern Mexico, but have not yet been observed within the faunal limits of this work.

A. Labrum pale.

B. Pale colours on dorsum of segments 3–6 limited to a transverse basal ring and at most a fine mid-dorsal line; rear of the head chiefly black, except in *A. percellulata* and *A. sedula*.

C. Segment 8 mostly black on dorsum.

D. Segment 9 mostly pale on dorsum.

E. Superior appendages bifid at tip.

a. Pale antehumeral stripe half as wide as dark mid-dorsal, inferior appendages not bifid at tip ——— 1 *percellulata*.

aa. Pale antehumeral stripe one-third as wide as dark mid-dorsal, inferior appendages bifid ——— 2 *calida*.

aaa. Pale antehumeral stripe one to three times as wide as dark mid-dorsal, inferior appendages bifid ——— [*tibialis*, Rambur *.]

aaaa. Pale antehumeral stripe absent, inferior appendages bifid. 3. *wilsoni*.

EE. Superior appendages not bifid, inferior appendages higher than long ——— 4. *mœsta*.

DD. Segment 9 mostly black on dorsum.

Superior appendages not bifid at tip, basal half to fourth of dorsum of 9 pale ——— 5 *translata*.

Superior appendages bifid at tip, apical third (or only a pair of apical spots) of 9 pale . . . . . 6. *texpi*.

CC. Segments 8 and 9 pale on dorsum, each side with an inferior black stripe.

Inferior appendages bifid ——— 7 *sedula*.

Inferior appendages trilobed (profile) . . . . . 8. *pulla*.

BB. Pale colours on dorsum of segments 3–6 consisting of a transverse basal ring, and a mid-dorsal stripe on some or all of them, tapering posteriorly; 8 mostly blue on dorsum; rear of head chiefly black.

F. Superior appendages distinctly bifid, inner branch much longer than the outer.

Segment 8 with no apical dorsal black spot; mid-dorsal pale stripe on 3 and 4 only ——— 9 *ulmeca*.

Segment 8 with an apical dorsal black spot, mid-dorsal pale stripe on 3–6 ——— 10 *adamsi*.

FF. Superior appendages variously formed, but not distinctly bifid; no apical, dorsal, black spot on 8.

11. *oculata*.
12. *herberti*.
13. *popoluca*.
14. *indicatrix*.

} Most readily distinguished by their appendages, see Tab. IV figg. 36–39.

AA. Labrum black.

Pale colours on segments 3–7 consisting only of a transverse ring, and a mid-dorsal stripe tapering posteriorly on 3 and a small mid-dorsal basal spot on 4 ——— 15 *rogersi*.

2. Thoracic dorsum brilliant metallic copper.

G. Labrum chiefly metallic copper, at least in its basal half, apical half or only its front edge yellow. Lower branch of inferior appendage less robust than the upper branch.

H. Segments 3–8 black on dorsum, with only a narrow, basal, blue ring, 9–10 blue on dorsum ——— 17. *cuprea*.

HH. Segments 3–7 black on dorsum, basal half of 3–6 blue, 8–10 blue on dorsum ——— [*jocosa*, Hagen †.]

HHH. Segments 3–6 blue on dorsum, apical fourth to third black, 7 black with basal blue ring, 8–10 blue on dorsum ——— 18. *cupraurea*.

GG. Labrum yellow or orange throughout. Lower branch of the inferior appendage more robust than the upper branch.

J. Segments 3–6 blue or violet on dorsum, apical fifth black; 7 black, 8–10 blue on dorsum ——— 19. *aenea*.

JJ. Segments 3–8 black on dorsum, basal half of 3–6 blue; 9–10 blue . 20. *orichalcea*.

§ II. Total area of dark colours on abdominal segments 3–6 and thoracic dorsum *less* than the pale area on the same parts.

1. Dorsum of segment 7 chiefly black (except in *A. chelata*), rear of head chiefly black (except in *A. apicalis*), postnasal black streaks on 3–6; 8 and 9 blue, with an inferior black stripe each side; superior appendages distinctly bifid, inner branch longer (except in *A. apicalis*).

K. Inferior appendages longer than high.

L. Black mid-dorsal thoracic stripe wider than the carina.

Inferior appendages not deeply excised at tip ——— 21. *harknessi*.

Inferior appendages deeply bifid at tip, lower branch longer than upper ——— 22. *barretti*.

LL. Black mid-dorsal thoracic stripe not wider than the carina . . . [*apicalis*, Say *.]

KK. Inferior appendages higher than long ——— 23. *chelata*.

2. Dorsum of segment 7 chiefly blue (except in *A. tonto*), rear of the head pale, no postbasal black stripes on 3–6, 8 and 9 blue, almost unspotted (except in *A. tonto*); superior appendages variable, but when bifid the branches are subequal (except in *A. lacrymans*).

[*tonto* *]

24. *lacrymans*.
25. *fissa*.
26. *deami*.
27. *tarascana*.

Most readily distinguished by their appendages, see figg. 48–52, Tab. IV.

3. Dorsum of segment 7 blue for its entire length, rear of head largely or chiefly black, a continuous inferior black stripe on each side of 3–9 for almost their entire length, superior appendages not bifid at tip.

28. *variabilis* (and *medullaris*?

4. Dorsum of segment 7 chiefly black (or if blue then with black postbasal

† Known from Colombia, may occur in Panama and Costa Rica.

stripes on 3–6, or an inferior black stripe on each side of 8 and 9, or with both, hence different from section 2); rear of the head pale, with or without black postbasal streaks on 3–6, 8–10 at least blue on dorsum; superior appendages variable, but when bifid the branches are subequal.

M. Superior appendages almost entire at tip, the inner margin with a small, subacute, anteapical projection.

N. Antenodal cells on front wings 4.

O. Inferior appendages rounded, not bifid at tip, but with an anteapical tooth on the upper margin; dark postbasal streaks present on 3–6, and confluent with the apical black ——— 29. *rhoadsi*.

OO. Inferior appendages bifid at tip, lower branch distinctly longer than the upper; black postbasal streaks present on 3–6, usually not confluent with the apical black ——— 30. *extranea*.

OOO. Inferior appendages bifid at tip, lower branch equal to or shorter than the upper.

Black postbasal streaks present on segments 3–6 . . . 31. *vivida* and varieties.

Black postbasal streaks absent from segments 3–6 . . . . 32. *funebris*.

NN. Antenodal cells on the front wings 3; postbasal black stripes present on segments 3–6, 8 and 9 pale, each side with an inferior black stripe ——— 33. *immunda*.

MM. Superior appendages trilobed or bilobed at apex, inner margin rounded and convex before the apex; antenodal cells on the front wings 4.

Pale colours on the thorax, and segments 3–6 violet, humeral stripe present, no postbasal black stripes on segments 3–6, 8 and 9 blue with an inferior black stripe each side ——— [*violacea*, Hagen*.]

Pale colours on thorax, and segments 3–6 reddish-violet, humeral stripe a mere line, otherwise as in *violacea* ——— 34. *violacea*, var. *pallens*.

Pale colours on thorax, and segments 3–6 blue, humeral stripe present and forked, no postbasal black stripes on 3–6, 8 and 9 blue with no black stripes ——— 35. *agrioides*.

Pale colours and humeral stripe as in *A. agrioides*, segments 3–6 with black postbasal stripes confluent with the apical black, 8 and 9 with a black stripe each side as long as the segments . . *agrioides*, var. *nahuana*.

Females.

(N.B.—All identifications made by this key should be checked off with the figures of mesostigmal laminæ, see figg. 1–26, Tab. IV.)

§ I. Dorsum of abdominal segments 3–6 mostly black.

A. Dorsum of segments 8 and 9 pale, with black markings.

B. These markings consisting of two stripes occupying only the basal half of segments 8 and 9.

C. Black dorsal stripes on segments 8 and 9 not confluent.

Pterostigma long, 6 or 5 antenodal cells on the front wings, no mesepisternal tubercles ——— 1. *percellulata*.

CC. Black dorsal stripes on segments 8 and 9 more or less confluent with each other, four antenodal cells on the front wings.

D. Mesepisternal tubercles present but small, four antenodal cells on the hind wings, segment 10 pale on dorsum ——— 9. *ulmeca*.

DD. Mesepisternal tubercles absent, three antenodal cells on the hind wings.

E. A pale mid-dorsal stripe on segments 3–5, 10 black on dorsum, with a pair of small pale spots ——— 11. *oculata*.

EE. A pale mid-dorsal stripe on segment 3 only, or absent altogether.

F. Segment 10 pale on dorsum, labrum black, wings clear . . . 16. *difficilis*.

FF. Segment 10 black on dorsum, labrum pale, wings yellow or smoky ——— 14. *indicatrix*.

BB. These markings consisting of two stripes as long as segment 8 and nearly as long as 9; five antenodal cells on the front wings, four on the hind.

G. Mesepisternal tubercles well developed.

H. Segment 10 pale, with a pair of brown or black spots on dorsum . 5. *translata*.

HH. Segment 10 pale, unspotted on dorsum.

J. Thoracic dorsum with no coppery-red reflection . . . . . 6. *tezpi*.

JJ. Thoracic dorsum, and usually the vertex, nasus, and labrum also, with a coppery-red reflection ——— 17. *cuprea*.

GG. Mesepisternal tubercles absent; segment 10 pale, unspotted on dorsum. Thoracic dorsum and vertex with some coppery reflection.

Labrum with some dark metallic colouring at base ——— 18. *cupraurea*.

Labrum yellow, with no metallic colouring . . . . . 19. *ænea*.

AA. Dorsum of segments 8 and 9 black, a pale line on 3–6, 10 pale on dorsum, no mesepisternal tubercles ——— [*tibialis*, Rambur*.]

AAA. Dorsum of segment 8 black, a pale blue spot either side at base; 9 blue on dorsum; no mesepisternal tubercles ——— 12. *popoluca*.

AAAA. Dorsum of segment 8 blue, of 9 black, with apical half (or a pair of apical spots) blue; a pale mid-dorsal stripe on 3 and 4 at least, 10 black; mesepisternal tubercles present ——— 28. *variabilis*.

AAAAA. Dorsum of segments 8 and 9 pale, unspotted, antenodal cells three on all wings ——— 8. *pulla*.

§ II. Dorsum of abdominal segments 3–6 chiefly pale.

1. Postbasal black stripes present on segments 3–6, and confluent with the apical black (except on 3 and 4 in *A. tonto*). (Some specimens of *A. violacea*, *A. extranea*, and *A. vivida* will fall here, instead of under "2.")

Mid-dorsal and humeral black stripes reduced to mere lines or absent, mesepisternal tubercles present ——— 4. *mæsta*.

Mid-dorsal and humeral black stripes present, mesepisternal tubercles absent ——— 24. *lacrymans* and [*tonto**].

2. Postbasal black stripes present on segments 3– or 4–6, but not usually confluent with the apical black.

K. Segments 8 and 9 pale, without black on dorsum (except on 9 in many specimens of *A. vivida* and *A. extranea*).

L. Antenodal cells on the front wings four.

M. Black mid-dorsal thoracic and humeral stripes and mesepisternal tubercles present.

Mesostigmal lamina rounded externally ——— 30 *extranea*.

Mesostigmal lamina angulate externally ——— 31 *vivida* and vars.

MM. Black mid-dorsal thoracic and humeral stripes reduced to lines or absent, mesepisternal tubercles absent ——— 7 *sedula*.

LL. Antenodal cells on the front wings three, mid-dorsal thoracic stripe present, humeral stripe reduced to a line, no black marks on dorsum of segment 9, mesostigmal lamina rounded externally, mesepisternal tubercles absent ——— 33 *immunda*.

KK. Segments 8 and 9 pale, 8 with a black stripe on each side of dorsum as long as or nearly as long as the segment, 9 with a similar stripe on the basal half.

N. Antenodal cells five on the front wings, four on the hind, mesepisternal tubercles present ——— 21 *harknessi*.

NN. Antenodal cells four on the front wings, three on the hind, mesepisternal tubercles absent.

O. Mesostigmal lamina prolonged at the mesial end in a slender process.

Mid-dorsal thoracic stripe wider than the carina . . . . [*violacea*, Hagen *.]

Mid-dorsal thoracic stripe hardly wider than the carina, humeral stripe a mere line ——— 34 *violacea*, var. *pallens*.

OO. Mesostigmal lamina rounded, with no slender prolongation; mid-dorsal thoracic stripe wider than the carina, humeral stripe present.

Black stripes on dorsum of segments 8 and 9 not reaching to the apices of the segments ——— 35 *agrioides*.

Black stripes on dorsum of segments 8 and 9 reaching to the apices of the segments ——— *agrioides*, var. *nahuana*.

3. Posthasal black streaks absent on segments 3–6, apical black reduced to a spot each side, 8–10 pale, unspotted.

25. *fissa*.
26. *deami*.
27. *tarascana*.

Separable by the form of the mesostigmal laminæ: see figg. 12–14, Tab. IV.

1. **Argia percellulata**, sp. n. (Tab. IV. figg. 5, 27.)

Rear of the head black above, pale below. Pale antehumeral stripe one-half as wide as the black mid-dorsal. Humeral stripe deeply forked for its upper four-fifths to three-fourths, the humeral stripe proper a mere line (absent in teneral individuals); the mesepimeral stripe before uniting with the humeral stripe proper is three-fourths to equally as wide as the pale antehumeral. Segment 2 dark brown (probably black in adult), with a mid-dorsal elliptical yellow spot on basal two-thirds continued as a line to apex, or a mid-dorsal line for the entire length of the segment, and each side with an inferior yellow line; 3–7 dark brown or black, with a transverse basal ring, a fine mid-dorsal line (absent on the more posterior segments), and a lateral streak, pale; 8 blackish, with a transverse basal ring, a small mid-dorsal anteapical spot, and an inferior lateral streak, pale; 9 pale (blue ?), each side with an inferior black stripe as long as the segment.

from every month in the year, but nothing is known as to how continuous its appearance may be in any given locality.

Considerable variation exists, even in individuals from the same locality, as to the degree to which the tip of the superior appendage of the male is bifid, and in the acuteness of the outer branch of the same. The shape of the inferior appendage, seen in profile, is especially characteristic of this species.

The mesostigmal lamina of the female is small, similar in shape to that of *A. agrioides* (Tab. IV. fig. 26).

9. **Argia ulmeca,** sp. n. (Tab. IV. figg. 9, 34, 34 *s*, 34 *i*.)

♂. Rear of the head black, a pale stripe along the eye-margins. Pale (blue or violet) antehumeral stripe from three-fifths to two-fifths as wide as the black mid-dorsal. Humeral stripe forked at its upper end in younger males; at mid-height from two-thirds as, to slightly wider than, the pale antehumeral. Segment 2 black, an oval, dorsal, blue or violet spot in the basal two-thirds, and each side with a pale inferior stripe; 3–7 black, with a transverse, basal, blue ring, prolonged on 3 to the middle or to two-thirds the length of the segment, and on 4 to from one-sixth to one-third its length; 8 and 9 blue, each side with an inferior black stripe as long as the segment, or absent in the basal fourth; occasionally 8 has also a pair of black anteapical dorsal spots.

♀. Differs from the male as follows:—Humeral stripe forked. Blue mid-dorsal prolongation on segments 3 and 4 sometimes reaching to three-fourths the length of these segments, or on 4 sometimes not more than a line, and a trace of such a line on 5; 7 in some specimens with an inferior yellow line each side; 8 and 9 luteous (?), each side with an inferior black stripe as long as the segments and a superior black band on the basal two-thirds or half, all four of these being confluent at the base of each segment.

♂ ♀. Pterostigma of the front wings 1·1 mm. long, surmounting more than one cell (92·3 % ♂, 100 % ♀) or one (7·6 % ♂); of the hind wings 1·1–1·25 long, surmounting more than one cell (100 % ♂ ♀).

Antenodal cells on the front wings 4 (77 % ♂, 96 % ♀), 5 (23 % ♂), or 3+ (4 % ♀); on the hind wings 4 (100 % ♂, 88 % ♀) or 3 (12 % ♀).

Dimensions.—Abdomen, ♂ 32·5–35·5, ♀ 29·5–32; hind wing, ♂ 23·5–26, ♀ 23·5–25 mm.

Hab. Mexico, Chavarillo (*Barrett, coll. P. P. C.*: 2 ♂, 1 ♀) and Atoyac (*Schumann, H. H. Smith*: 7 ♂, 12 ♀) in Vera Cruz, Acaguizotla [1 ♂] and Rincon in Guerrero [2 ♂] (*H. H. Smith*); Honduras, Rio Sarstoon (*Blancaneaux*: 1 ♂).

Taken in April and May in Vera Cruz, in October in Guerrero. Resembles *A. oculata* to some extent. In addition to the differences given in the key, *A. ulmeca* possesses a longer pterostigma. The specific name is derived from the Ulmecs, a tribe said to have preceded the Toltecs in Mexico.

10. **Argia adamsi,** sp. n. (Tab. IV. figg. 35, 35 *a*.)

♂. Rear of the head black. Pale antehumeral stripe one-third to one-fourth as wide as the black mid-dorsal. Humeral stripe one and a half times as wide as the pale antehumeral, forked or not above, reaching to the first lateral thoracic suture. Segment 2 blue, each side with a superior black stripe widened before the apex (which it reaches), but narrowed behind, united with its fellow by a very narrow, transverse, apical, black ring, and an inferior, ill-defined, blackish stripe; 3–7 black, blue at base, prolonged on mid-dorsal line on the basal four-fifths (on 3) to two-fifths (on 6), tapering posteriorly; 8 and 9 blue, each side with an inferior black stripe as long as the segment, 8 (in addition) with an isolated, mid-dorsal, black spot on the apical fifth.

del Norte, Los Amates [2 pairs + 22 ♂, 6 ♀], Gualan [8 ♂]; HONDURAS, San Pedro Sula [one pair + 41 ♂, 9 ♀] (*Williamsons, Deam, Hine, colls. Wllmsn., O. S. U.*): NICARAGUA (*U. S. N. M.*: 1 ♀); COSTA RICA, Surubres (*Biolley, coll. Kahl*: 1 ♀], Rio Machuca (*Biolley, colls. A. N. S., Wllmsn.*), Cache as before, Juan Vinas (*Cary, U. S. N. M.*: 1 ♂); PANAMA, Colon (*Howland, coll. Needham*: 1 ♀).

Following are some observations by Mr. Williamson on this species:—"Los Amates. In rank vegetation along stream below Los Amates. Jan. 17, 1905, same situation as *Anomalagrion hastatum*." "San Pedro, Feb. 28, 1905. At mouth of gulch."

It will be observed that *frequentula* and *pulla* occur in the same localities (Teapa, Livingston, Los Amates, Gualan, San Pedro Sula, Surubres) and even on the same day (*e. g.* Feb. 28, 1905, by E. B. Williamson; Jan. 19 and 20, 1907, by L. A. Williamson; both at San Pedro Sula).

I am not able to certainly distinguish between the females of *frequentula* and *johannella*, unless the following character suffices: in the former the costal and distal sides of the pterostigma are subequal, while the latter has the costal side distinctly longer than the distal.

Argia ulmeca (p. 80).

♂. The example from San Pedro Sula has the upper end of the well-developed black humeral stripe fused with that of the mid-dorsal; abdomen 31, hind wing 22·5 mm.

Those from the Pacific slope of Guatemala show some departure from the type in having: (*a*) the black humeral stripe reduced to a very narrow stripe or even a line, which in at least two examples is present only on the upper end of the humeral suture; (*b*) a black line at the upper end only of the second lateral thoracic stripe, instead of on the entire length thereof as many—but not all—of the original material possess; (*c*) often, but not always, no prolongation of the basal blue ring on abdominal segment 4 to form a short mid-dorsal stripe; (*d*) smaller size, see below. In a considerable proportion, but not in all, the upper ends of black humeral and mid-dorsal thoracic stripes are fused, in some only on one side of the thorax.

♀. The females from the same part of Guatemala also show these departures from the type, as (*a*) the black humeral stripe in some entirely absent, except for an inferior mesepimeral spot, but transitions to the type are afforded as by the presence of a black line on the humeral suture unconnected with the mesepimeral spot, by the presence of a black line on the upper part of the suture and a black mesepimeral line unconnected with each other, and by the existence of a narrow stripe on the whole length of the humeral suture widening below into the inferior mesepimeral black spot; (*b*) as in ♂; (*c*) in *some* no prolongation of the basal blue ring on 4; (*d*) as in ♂.

♂ ♀. Twenty males (Mazatenango 8, S. Lucia 6, Escuintla 6) and seven females cited below give the following statistics and dimensions:—Pterostigma, front wings, surmounting more than one cell (97·5 % ♂, 100 % ♀) or one cell (2·5 % ♂); of the hind wings surmounting more than one cell (100 % ♂ ♀).

Antenodal cells on the front wings 4 (87·5 % ♂, 71·5 % ♀), 5 (2·5 % ♂, 14·3 % ♀), 3+ (5 % ♂, 7 % ♀), 4+ (7 % ♀), or 3 (5 % ♂); on the hind wings 4 (72·5 % ♂, 35·7 % ♀), 3 (25 % ♂, 64·3 % ♀), or 3+ (2·5 % ♂). Abdomen, ♂ 26·5–30, ♀ 26–28·5; hind wing, ♂ 19–22, ♀ 21–23 mm.

To the localities given, add:—MEXICO, Jalapa (*Calvert, coll. P. P. C.*: 1 ♂); GUATEMALA, Mazatenango (*Maxon & Hay, U. S. N. M.*: 4 ♂, 1 ♀) [28 ♂, 2 ♀ + 1 pair], Santa Lucia [24 ♂, 1 ♀ + 1 pair], Escuintla [10 ♂, 1 ♀] (*Williamson, Hine, colls. Wllmsn., O. S. U.*); HONDURAS, San Pedro Sula (*Wllmsn., coll. ejusd.*: 1 ♂).

At Jalapa and at San Pedro Sula the examples taken were associated with *Argia oculata*.

Some Neuropterists may consider the Pacific Guatemalan specimens to be sufficiently distinct to receive a subspecific or racial name, but I think the transitions to the typical *ulmeca*, as indicated above, justify retaining all under the name here employed. I can find no structural differences.

Argia adamsi (p. 80). (Tab. X. fig. 5.)

♂. The black humeral stripe is twice as wide as the pale antehumeral, in some. The black apical dorsal spot on abdominal segment 8 is broken into two spots in one male from Surubres.

♀ (hitherto unknown). Differs from the male as follows: labrum black; superior black stripe on each side of 2 wider, united with its fellow of the opposite side in basal and apical thirds, thereby leaving only a small elongate blue spot on the median dorsal third; mid-dorsal blue stripe on 3–6 narrower, reaching to two-thirds length of 3, half of 4, two-fifths of 5, one-fifth of 6; 8 and 9 each side with an inferior black stripe as long as the segments and a superior black stripe from base to two-thirds of 8, to half of 9, the two superiors confluent at base, and on 9 with the inferiors also at base; 10 blue, sides inferiorly black.

♂ ♀ (including the three cotypes). Pterostigma of the front wings surmounting more than one (84·6 % ♂, 100 % ♀), or one (15·4 % ♂) cell; of the hind wings surmounting more than one (96 % ♂, 100 % ♀), or one (4 % ♂), cell.

Antenodal cells on the front wings 4 (92 % ♂, 62·5 % ♀), 3+ (4 % ♂, 25 % ♀), 3 (12·5 % ♀), or 4+ (4 % ♂): on the hind wings 3 (84·6 % ♂, 100 % ♀), 3+ (7·7 % ♂), or 4 (7·7 % ♂).

Dimensions.—Abdomen, ♂ 25–28·5, ♀ 24–26; hind wing, ♂ 17·5–21, ♀ 19–21 mm.

To the localities given, add:—Costa Rica, Rio Jesus Maria (*Biolley*: 2 ♂, 2 ♀), Esparta [2 ♂], Surubres [7 ♂, 2 ♀] (*Biolley, coll. Kahl*).

Argia oculata (p. 81).

Argia oculata, Hagen, Bull. Mus. Comp. Zool. xxxix. t. 1. figg. 12, 12 *a* (apps. ♂) (1902) [2].

♀. None of the specimens of this sex previously referred to *oculata* were labelled as having been taken *in coitu*. The supplementary material includes nine pairs, the male in each case being undoubtedly *oculata*; the females differ considerably from each other, and consequently give rise to several questions.

The two females from Jalapa taken *in coitu* have the labrum pale blue or green narrowly edged with black, partly or entirely traversed by a median black line: there is no pale mid-dorsal stripe or line on abdominal segments 4–6, no prolongation of the transverse basal black band of 8 as stripes on the dorsum: their size is larger than any others recorded: abdomen 32, hind wing 26–27 mm. One of them has the blue antehumeral stripe half as wide as the black mid-dorsal, black humeral 1½ times as wide as blue antehumeral, oval spot on 2 blue, the narrow transverse basal blue ring on 3–7 interrupted mid-dorsally and on 3 not connected with the mid-dorsal blue *line*, 10 black with two blue dorsal spots, mesostigmal lamina more like fig. 24, Tab. IV., than fig. 11. The other female has blue antehumeral stripe one-third as wide as black mid-dorsal, black humeral equal in width to the blue antehumeral, the narrow transverse basal blue rings on 3–7 not interrupted, confluent on 3 with a narrow blue mid-dorsal stripe, 10 obscure, mesostigmal lamina as in fig. 11, Tab. IV.

Of the seven pairs from San Pedro Sula, two females have pale labra, the other five black. The two with pale labra have a mid-dorsal blue stripe on 3 and 4 and a line on 5, dorsum of 10 chiefly or wholly blue, the mesostigmal lamina like fig. 11 or intermediate between figs. 11 and 15. The other five females with black labra have the mesostigmal lamina very like fig. 15 (*difficilis*), the mid-dorsal blue stripe on 3–5, or on 3 only with or without a pale line on 4; dorsum of 10 blue, or black with two blue spots. The dimensions of these San Pedro females fall within those given *antea*.

or swamps. Actions similar to [*Ischnura*] *verticalis*. Fresh ♀♀ thorax bright green"; and at Puerto Cortez, Mar. 2, 1905: "In *Pontederia* beds 20 feet from ocean." Prof. Biolley records this species at Surubres as from "Herbes d une rigole."

PALÆMNEMA (p. 133).

Palæmnema angelina (p. 136).

Two females from Cacao, Alta Vera Paz, Guatemala (*Lewton, U. S. N. M.*) may belong here. One has abdomen 35 mm., hind wing 26·5 mm., postcubitals on the front wings 25, on the hind wings 24, 23. The other has abdomen 32·5 mm., hind wing 28·5 mm., postcubitals on the front wings 19, 18, on the hind wings 17, 18.

Palæmnema sp.

A male from Pozo Azul de Pirris, Costa Rica (*Underwood, M. C. Z.*), with 22, 23 postcubitals on the front wings, 21, 19 on the hind, stigma of the front wings surmounting 1+ cells, its costal edge ·8–·9 mm. long, hind wing 22·5 mm. in length, is of the *angelina-nathalia-domina* group, but is not further determinable owing to the loss of the abdomen beyond the fifth segment.

NEONEURA (p. 137).

Three species of this genus are now known, or likely, to be present in this fauna, and may be separated as follows, in addition to the differences (figured) in the appendages of the males :—

	N. amelia.	*N. paya* (♀ unknown).	[*N. aaroni.*]
Dorsum of abdominal segments 2 and 3, ♂,	chiefly orange-red.	chiefly orange.	brown or black, 3 with a pale mid-dorsal line.
Dorsal surface of head and thorax, ♂,	bright orange-red.	pale ochre-brown.	pale brown (young) to bright brick-red.
Black mid-dorsal thoracic stripe, ♂,	present.	absent.	present (interrupted in young).
Black mesepimeral black stripe, ♂,	usually present.	absent.	present in old only.
Black line on second lateral thoracic suture,	uninterrupted for entire length of suture.	uninterrupted for entire length of suture.	absent, or if present very fine and interrupted.
A black dot at about two-thirds height of the obsolete first lateral thoracic suture, ♂ ♀,	present.	present.	absent, except in old males.
Hind margin of hind lobe of prothorax, ♀ (*cf.* Tab. X. figg. 26, 29),	trilobed, median lobe larger than the lateral lobes.	....	not trilobed, but median part convexly produced (= middle lobe of the other species).

In line 23, page 137, *antea*, change "or" to "and" and "fauna" to "faunæ."

Neoneura amelia (p. 138). (Tab. X. figg. 25, 26.)

Neoneura amelia, Baker, Invert. Pacif. i. p. 86 (1905) [1].

♂. The black mesepimeral stripe is reduced to an inferior spot in the males from Fuerte de San Felipe and Chinandega and in some from Los Amates, and is entirely absent (as in all females) in two from the last locality.

♀. (Previous description based on a single imperfect specimen.) Head and thorax pale brown, with the following black markings in addition to those described: two spots on each side of the vertex touching the eye-margin, the anterior spot connected with a black line which runs toward, but not to, the lateral ocellus and bends (a spot at the angle) toward the hind margin of the head, only a short transverse line on each side of the rear of the head superiorly. Abdomen greenish-yellow, 2–7 with an ill-defined black longitudinal line or stripe each side, not quite attaining either anterior or posterior end of each segment, in some absent on 6 or 7, the dorsal interval between the stripes more or less filled in with brown or black, each of the two ends of 3–7, however, often presenting the appearance of having a mid-dorsally interrupted yellowish ring, 8–10 obscure with darkish markings. Appendages subequal in length to 10. Genital valvules reaching to, or nearly to, the level of the tips of the appendages, their "palps" much farther. Legs pale yellowish, femora superiorly, and distal part of tibiæ inferiorly, with a dark line. Postcubitals on hind wings 8–9, 8 predominating. Abdomen 23–25, hind wing 16·5–18 mm.*

To the localities given, add:—GUATEMALA, Fuerte (or Puerto) San Felipe [1 ♂] on Lake Izabal, Los Amates [2 pairs + 23 ♂, 3 ♀] (*Williamson, Deam, Hine, colls. Willmsn., O. S. U.*); NICARAGUA, Chinandega [1] (*Baker, coll. P. P. C.*: 1 ♂).

Mr. Williamson made these two notes on this species at Los Amates on Feb. 16 and 18, 1905, respectively: "♂. Along stream below Los Amates on vegetation and twigs over water. Active." "♂. Very active, over water usually on dead twigs. ♂ holds ♀ while oviposition takes place. In couple ♀ hangs straight down from first segment [of] ".

Neoneura paya, sp. n. (Tab. X. figg. 27, 38.)

Neonura amelia, Calvert, *antea*, p. 138 (in part.; the 2 ♂ from Livingston mentioned in footnote).

♂. Dorsal surface of head and of thorax pale ochre-brown to orange, labium cream-colour; the following black, those enclosed in parentheses absent in some: a mid-basal and a lateral marginal spot on the labrum; two short streaks, fused into one in some, on each side of the nasus; apex of the third antennal joint and remainder of the antenna, two dots on each side of the vertex at the eye-margin, from the anterior of these dots a line toward, but not reaching, the lateral ocellus of the same side (and ending in a dot), the posterior dot confluent with the black of the rear of the head in some; (the mesial margin of each lateral ocellus,) a short transverse line behind the ocelli, rear of the head except for a yellow band along each eye-margin, two (or three) dots on the front prothoracic lobe, the median groove and two (or three) spots on each side of the middle prothoracic lobe, the transverse depression in front of the inferior fork of the mid-dorsal thoracic carina, a line on the humeral and on the second lateral thoracic suture, a dot on the site of the obsolete first lateral thoracic suture, about half-way from metastigma to superior metapleural margin (and a line above the dot). Sides of thorax behind the humeral suture paler, more yellowish.

Abdominal segments 1–3 orange, a dorsal basal spot on 1, an elongate spot on each side of 2, a stripe on each side of 3 for almost the entire length of the segment and meeting its fellow of the opposite side on the dorsal apical sixth, brown or blackish; 4–10 black or blackish, 4–7 or 8 with a narrow transverse basal ring and a mid-dorsal line, yellow; more than the posterior half of 10 pale brown in some, ventral

* In addition to the supplementary material listed above, I have examined two pairs and 14 ♂ taken at Livingston, Guatemala, by Mr. Williamson.

surface of 1–7, or even 1–10, pale yellow except the sternites of all and the apex of 3–7, which are blackish. Hind margin of segment 10 denticulated and with a shallow median excision.

Superior abdominal appendages half, or less than half, as long as segment 10, bent downward and inward at a right angle as seen in most dried specimens, but when extended each appendage is more than half as long as 10, is bifid for two-thirds its own length, the upper and lower branches of subequal length and thickness (profile view), apices of the branches slightly curved toward each other, interval between the two branches subequal to or a little greater than the thickness of either branch; tip of lower branch ending in two small points or teeth. Inferior appendages slightly longer than the superiors, pale brown.

Legs pale yellow, knees blackish, superior surface of first tibiæ, two rather indistinct transverse fasciæ on all of the femora, and in some also on each of the other tibiæ, subfuscous; femora with an interrupted blackish superior stripe becoming continuous and darker with age.

Wings hyaline, 9–11 postcubitals (most frequently 10, 66⅔ %) on the front wings, 8–10 (most frequently 8, 50 %) on the hind.

Dimensions.—Abdomen 26·5–27·5, hind wing 16–17 mm. ♀ unknown.

Hab. GUATEMALA, Puerto Barrios (*Hine, O. S. U.*: 8 ♂), **Section 11, Ferrocarril del Norte** (*Williamson, coll. ejusd.*: 1 ♂).

The specific name proposed is that of an Indian tribe.

[**Neoneura aaroni** (p. 139). (Tab. X. figg. 28, 29.)

The additional figures will make clearer one of the differences between this and the other two species.]

PROTONEURA (p. 140).

Two new species necessitate the following modifications of the Key on page 140:—

The clause "superior sector of the triangle ending a little beyond the cross-vein descending from the nodus" is to be taken out of the characters of division I. and made subdivision 1 of I., to include *peramans*, *cupida*, *amatoria*, sp. n., *aurantiaca*, and *cara*.

Change CC to CCC, and insert a new CC as follows:—

CC. Thoracic dorsum predominantly black, an orange antehumeral stripe, one-tenth to one-sixth as wide as the mid-dorsal black, reaching upward three-fifths' to three-fourths' way toward the base of the front wing (♂), or a yellow posthumeral line (♀), mid-dorsal thoracic carina orange or yellow; abdominal segments 3–6 of ♂ chiefly orange-red, black at apices and along sides; ♀ not distinguishable from that of *cupida* if the latter has been correctly identified ——— 2. *amatoria*.

(*Cupida* ♂ has the blue antehumeral stripe one-half to one-third as wide as the black mid-dorsal stripe and reaching upward to the front wing base, the mid-dorsal thoracic carina black, abdominal segments 3–6 black with a narrow transverse basal blue ring. *Aurantiaca* ♂ has the orange-yellow antehumeral stripe wider than the mid-dorsal black, reaching upward to the front wing base, mid-dorsal thoracic carina black, 3 chiefly orange, 4–6 black with a very narrow transverse basal pale ring.)

Between BB and II. insert subdivision 2 of I. as follows:—

2. Superior sector of the triangle ending *at* the cross-vein descending from the nodus; nodal sector on the hind wings arising nearest the fourth postcubital, thoracic dorsum chiefly pale blue (♂) or metallic green (♀),

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[Names in small capitals refer to Families, &c.; those in roman type to the chief reference to each species included in the work: those in italics to species incidentally mentioned, synonyms, &c.]

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— *imbuta*
— *infumata*
— *quadra*
— *suemensii*
Urothemis guttat[illegible]

Zoræna
ZYGOPTERA

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PLATE II.

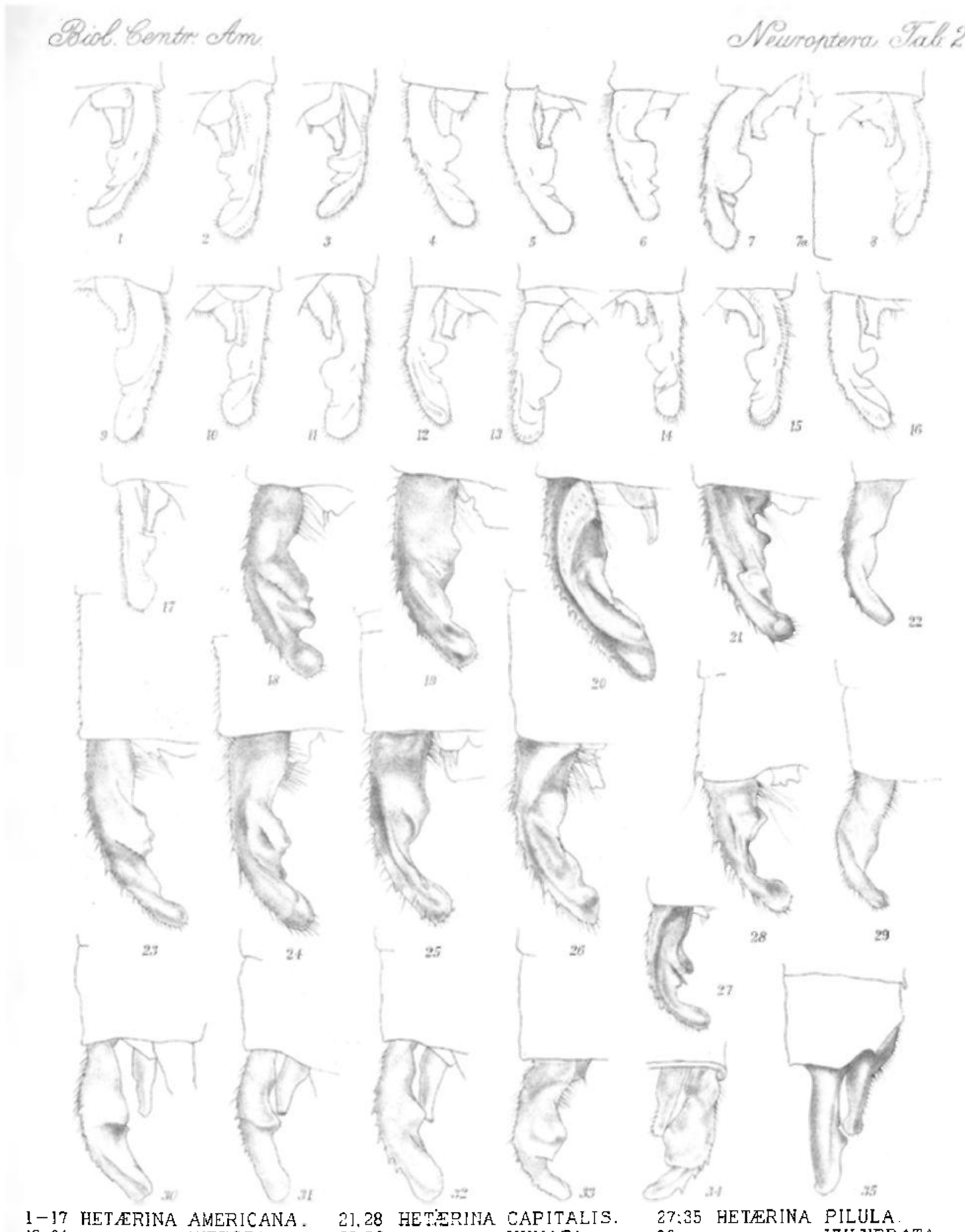
[All the figures from drawings by Miss Amelia C. Smith, with the aid of microscope and camera lucida.]

Figg. 1–17. *Heterina americana*, Fabr. A superior and an inferior abdominal appendage of a male in each figure, to show variation in these structures: unless otherwise stated, the views are *oblique* and show the *upper* and *inner* surfaces of the appendages. The individual from which each figure was drawn has a pterostigma on the wings, unless its absence is expressly stated. The decimal following the explanation of each figure denotes the fractional part of the distance from base to nodus which is occupied by the basal red spot of the front wings in the individual from which the figure was made.

Fig. 1. Right side. Texas (*A. N. S.*). ·67.
2. „ „ Round Mt., Texas (*coll. P. P. C.*). ·73. I believe that this represents the form of appendage in Walsh's *H. texana*.
3. „ „ Jojutla (*coll. P. P. C.*). ·6.
4. Left side. Texas (*M. C. Z.*). 1·17 (*i. e.*, red extending beyond the nodus).
5. „ „ Pecos River (*M. C. Z.*). ·91.
6. „ „ Acambaro. ·48.
7. „ „ California (*A. N. S.*). No pterostigma. ·87.
7*a*. „ „ Abdominal segment 10, on same scale as fig. 7, to show its relative length.
8. Right side. San Bernardino, California (*coll. P. P. C.*). No pterostigma. ·7.
9. „ „ California (*A. N. S.*). No pterostigma. ·89.
10. „ „ San Bernardino, California (*coll. P. P. C.*). No pterostigma. ·76.
11. „ „ Acambaro. ·42.
12. Left side. Guadalajara. ·65.
13. „ „ Profile view, inner surface. Acambaro. ·46.
14. Right side. Guatemala (*M. C. Z.*). ·45.
15. „ „ Chilpancingo. ·78.
16. Left side. Guadalajara. ·78. I believe that this represents the form of appendage in Walsh's *H. sclerata*.
17. „ „ Profile view, inner surface. Tucson, Arizona (*M. C. Z.*). ·48.
18. *Heterina infecta*, sp. n., ♂. Atoyac. Oblique * view of left superior appendage.
19. *H. tolteca*, sp. n., ♂. Jalapa. Oblique view left sup. app.
20. *H. rudis*, sp. n., ♂. San Geronimo. Oblique view left sup. and inf. apps.
21. *H. capitalis*, Selys, ♂. Volcan de Chiriqui. Oblique view left sup. app.
22. *H. miniata*, Selys, ♂, type. Chiriqui. Dorsal view left sup. app.
23. *H. majuscula*, Selys, ♂. Cache. Oblique view left sup. and inf. apps., and outline of 10th abd. seg.
24. *H. infecta*, sp. n., ♂ of fig. 18. Dorsal view left sup. and inf. apps., and outline of 10th abd. seg.
25. *H. tolteca*, sp. n., ♂ of fig. 19. Dorsal view left sup. and inf. apps., and outline of 10th abd. seg.
26. *H. rudis*, sp. n., ♂ of fig. 20. Dorsal view left sup. and inf. apps., and outline of 10th abd. seg.
27. *H. pilula*, sp. n., ♂. Teapa. Dorsal view left sup. and inf. apps.
28. *H. capitalis*, Selys, ♂ of fig. 21. Dorsal view left sup. app., and outline of 10th abd. seg.
29. *H. miniata*, Selys, ♂ of fig. 22. Oblique view left sup. app., and outline of 10th abd. seg.
30. *H. vulnerata*, Selys, ♂. Orizaba. Oblique view left sup. and inf. apps., and outline of 10th abd. seg.
31. *H. cruentata*, Rambur, ♂. Orizaba. Id.
32. *H. cruentata*, Rambur, ♂. Irazu. Id.
33. *H. fuscoguttata*, Selys, ♂. Bugaba. Dorsal view left sup. app., and outline of 10th abd. seg.
34. *H. fuscoguttata*, Selys, ♂ of fig. 33. Oblique view right sup. and inf. apps.
35. *H. pilula*, sp. n., ♂ of fig. 27. Profile view right sup. and inf. apps. and 10th abd. seg.

In figg. 1–35 the magnification is about 20.

* Oblique in the explanation of this Plate means always a view showing the upper-inner surface.



1–17 HETÆRINA AMERICANA.
18, 24 „ INFECTA.
19, 25 „ TOLTECA.
20, 26 „ RUDIS.
21, 28 HETÆRINA CAPITALIS.
22, 29 „ MINIATA.
23 „ MAJUSCULA.
27, 35 HETÆRINA PILULA.
30 „ VULNERATA.
31, 32 „ CRUENTATA.
33, 34 „ FUSCOGUTTATA

PLATE IV.

[All the figures are drawn with the camera lucida to the same scale.]

Figs. 1–26. Left mesostigmal lamina of females, seen from above and slightly in front.

Figg. 1, 2. *Argia vivida*, Hagen. Texolo. *l*, the mesostigmal lamina; *ms.*, mesostigma; *te.*, mid-dorsal thoracic carina where it forks at its lower end; *pt.*, hind margin of prothorax. One-half of *te.* is shown in all of figg. 1–26, but *pt.* is omitted in many and *ms.* in all but fig. 1.
3, 4. *A. extranea*, Hagen. Texolo.
5. *A. percellulata*, sp. n. Atoyac.
6. *A. medullaris*, Hagen? (= *variabilis*?, Selys). Zapote.
7. *A. sedula*, Hagen. Monterey.
8. *A. popoluca*, sp. n. Teapa.
9. *A. ulmeca*, sp. n. Atoyac.
10. *A. ænea*, Hagen. Tepetlapa.
11. *A. oculata*, Hagen. Atoyac.
12. *A. fissa*, Selys. San Geronimo.
13. *A. deami*, sp. n. Dublan.
Fig. 14. *Argia tarascana*, sp. n. Acambaro.
15. *A. difficilis*, Selys. Bugaba.
16. *A. lacrymans*, Hagen. Cuernavaca.
17. *A. tonto*, sp. n. Tombstone, Ariz.
18. *A. translata*, Hagen. San Lorenzo.
19. *A. tezpi*, sp. n. Savana Grande. (In 18 and 19 the dotted curves show the position of the inferior mesepisternal tubercle.)
20. *A. mæsta*, Hagen. Arizona.
21. *A. harknessi*, Calvert. Tepic.
22. *A. cuprea*, Hagen. Diente.
23. *A. indicatrix*, sp. n. Teapa.
24. *A. cupraurea* (Selys, MS.), sp. n. San Esteban.
25. *A. violacea*, Hagen, n. var. *pallens*. Guadalajara.
26. *A. agrioides*, Calvert. Los Angeles, Calif.

Figg. 27–62. Profile views, left side, of the tenth abdominal segment and the appendages of males: *s* and *ss*, inner surface of right superior appendage seen obliquely from above; *i* and *ii*, profile views of outer surface of left inferior appendage.

Fig. 27. *Argia percellulata*, sp. n. Atoyac.
28, 28 *s*. *A. wilsoni*, sp. n. Livingston, Guat.
29, 29 *s*. *A. mæsta*, Hagen. Texas.
30, 30 *s*. *A. translata*, Hagen. Atoyac.
31. *A. tezpi*, sp. n., Tepic; 31 *s*, id., Dos Arroyos.
32, 32 *s*. *A. sedula*, Hagen. Texas.
33. *A. pulla*, Hagen, Tepic; 33 *s*, id., Teapa; 33 *ss*, id., Presidio.
34, 34 *s*. *A. ulmeca*, sp. n, Atoyac; 34 *i*, id., another individual.
35, 35 *a*. *A. adamsi*, sp. n. Bugaba.
36, 36 *s*. *A. oculata*, Hagen, Atoyac: 36 *i*, id., Tepetlapa; 36 *ii*, Jalapa.
37, 37 *s*. *A. herberti*, sp. n. Amula.
38, 38 *s*. *A. popoluca*, sp. n. Teapa.
39, 39 *s*. *A. indicatrix*, sp. n. Teapa.
40, 40 *s*. *A. rogersi*, sp. n. Cache.
41, 41 *s*. *A. cuprea*, Hagen. Teapa.
42. *A. cupraurea* (Selys, MS.), sp. n. David.
43. *A. ænea*, Hagen, Tepic; 44, 44 *s*, id., Misantla.
45. *A. harknessi*, Calvert, Tepic, from type; 45 *i*, id., Savana Grande.
46, 46 *s*. *A. barretti*, sp. n. Linares.
47, 47 *s*. *A. chelata*, sp. n. Irazu.
48, 48 *s*. *A. tonta*, sp. n. Arizona.
Fig. 49, 49 *s*. *Argia lacrymans*, Hagen. Omiltemc.
50. *A. fissa*, Selys, Tepic; 50 *s*, id., Chilpancingo.
51, 51 *s*. *A. tarascana*, sp. n., Cuernavaca; 51 *ss*, id., Acambaro.
52, 52 *s*. *A. deami*, sp. n. Dublan.
53. *A. variabilis*, Selys. Vera Cruz; from type in the M. C. Z.
54, 54 *s*. *A. variabilis*, Selys (*medullaris*, Hagen?). San Geronimo.
55, 55 *s*. *A. rhoadsi*, sp. n. Monterey.
56. *A. extranea*, Hagen, Tepic; 56 *s*, 56 *i*. id., Caché; 56 *ii*, id., Jalapa.
57, 57 *s*. *A. vivida*, Hagen, Texas; 57 *ss*, id., Texolo.
58. *A. vivida*, n. var. *plana* (Hagen, MS.). Sierra de las Aguas Escondidas.
59. *A. funebris*, Hagen. Mexico; from type in M. C. Z.
60, 60 *s*. *A. immunda*, Hagen. Venta de Zopilote.
61, 61 *s*. *A. violacea*, Hagen, n. var. *pallens*. Tucson.
62. *A. agrioides*, Calvert, Texas, type: 62 *s*, id., Lower Purisima, type; 62 *ss*, id., new race *nahuana*, Mexico city.

STRUCTURAL CHARACTERS OF SPECIES OF THE GENUS ARGIA.

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PLATE X.

[All the figures on this Plate, with the possible exception of figg. 55, 56, have been drawn with the aid of the camera lucida.]

Fig. 1. *Lestes henshawi*, sp. n., ♂. Camino de la Palma, April 1905. Oblique view of the right sup. and inf. apps. × 22.

2. *Argia gaumeri*, sp. n., ♂. Fuerte de San Felipe, Feb. 15, 1905. Profile view, left side, apex of abdomen. 2 *a*, oblique dorsal-inner view of right sup. app. × 22.

3, 3 *a*. *A. terira*, sp. n., ♂. Camino de la Palma, April 1905. Id. × 22.

4, 4 *a*. *A. difficilis*, Selys, ♂. Esparta, Jan. 1905. Id. × 22.

5. *A. adamsi*, Calv., ♀. Surubres, Feb. 1905. Anterior end of mesothorax, showing mesostigmal lamina *. × 22.

6, 7, 8. *A. pulla*, Hagen. Pair, S. Pedro Sula, Feb. 28, 1905. 6, 7. Left profile and inferior views of apex of abdomen, ♂. 8. Anterior end of mesothorax *, ♀. × 22.

9, 10, 11. *A. frequentula*, sp. n. Pair, San Pedro Sula, Feb. 28, 1905. 9, 10. Left profile and inferior views, apex of abdomen, ♂. 11. Anterior end of mesothorax *, ♀. × 22.

12, 12 *a*. *A. johannella*, sp. n., ♂. Juan Viñas, March 18, 1902. Left profile view, apex of abdomen, and oblique dorsal-inner view of right superior appendage. × 22.

13. *Dythemis cannacriodes*, Calv., ♂. San Isidro. Ventral view, inferior appendage. × 12. (To replace Tab. VIII. fig. 43.)

14. *Argia terira*, sp. n., ♀. Camino de la Palma, April 1905. Anterior end of mesothorax *. × 22.

15, 15 *a*. *A. pocomana*, sp. n., ♂. Mazatenango, Feb. 3, 1905. Left profile view of apex of abdomen and oblique dorsal-inner view of right sup. app. × 22.

16, 16 *a*. *A. pipila*, sp. n., ♂. Escuintla, Jan. 31, 1905. Id. × 22.

17. *Gynacantha tibiata*, Karsch, ♂. Panima. Apex of left sup. app. × 5. (To replace Tab. VIII. fig. 24 *b*.)

18. *Argia pipila*, sp. n., ♀. Escuintla, Jan. 31, 1905. Anterior end of mesothorax *. × 22.

19. *A. johannella*, sp. n., ♀. Juan Viñas, March 18, 1902. Id * × 22.

20. *A. gaumeri*, sp. n., ♀. Fuerte de San Felipe, Feb. 15, 1905. Id.* × 22.

21. *A. variabilis*, Selys, ♀. Juan Viñas, March 18, 1902. Id.* × 22.

22, 23. *Argia* intermediate between *pulla* and *frequentula*, ♀ ♀. 22. Jojutla, Nov. 16. 23. Tepic, Oct., 1894. Id * × 22.

24. *A. pocomana*, sp. n., ♀. Mazatenango, Feb. 3, 1905; taken pairing with ♂ of figg. 15, 15 *a*. Id.* × 22.

25, 26. *Neoneura amelia*, Calv. Pair, Los Amates, Jan. 18, 1905. Hind lobe of prothorax, 25 ♂, 26 ♀. × 30.

27. *N. paya*, sp. n., ♂. Puerto Barrios, March 4, 1905. Id. × 30.

28, 29. *N. aaroni*, Calv. Texas. Id. 28 ♂, 29 ♀. × 30.

30–34. *Erpetogomphus elaps*, Selys, ♂. Left first hamule. 30. Rincon, Oct. 31. Chilpancingo, Sept. 32. Cuernavaca, Aug. 3, 1903. 33. San Geronimo. 34. San Jose, Costa Rica, May 1905. × 17.

35. *Argiallagma minutum*, Selys, ♂. Los Amates, Jan. 16, 1905. Left profile view of apex of abdomen. × 34.

36. 37. *Enallagma cultellatum*, Hagen, ♂. Amatitlan, Feb. 7, 1905. 36. Id. 37. Dorsal view of appendages. × 20.

38. *Neoneura paya*, sp. n., ♂. Puerto Barrios, March 4, 1905. Oblique left dorsal view of apex of abdomen. × 35.

39, 40. *Telebasis digitiocollis*, Calv., ♂. Los Amates, Jan. 19, 1905. Dorsal and left profile views of apex of abdomen. × 25.

41–44. *Protoneura corculum*, sp. n. Livingston, Feb. 18, 1905. 41. Dorsal view of anterior end of mesothorax, ♀, × 22. 42. Left side of same, ♀, × 66. 43. Left profile view of apex of abdomen, ♂, × 22. 44. Left hind wing, ♂, × 11·3.

45. *P. remissa*, Calv., ♂. San Pedro Sula, Feb. 26, 1905. Left hind wing. × 11·3.

46. *Anisagrion truncatipenne*, Calv., ♂. Santa Lucia, Feb. 1, 1905. Left profile view of apex of abdomen. × 25.

47. *Erpetogomphus caphias*, Selys, ♀. Omilteme. Region of vulvar lamina. × 8. (To replace Tab. VII. fig. 33.)

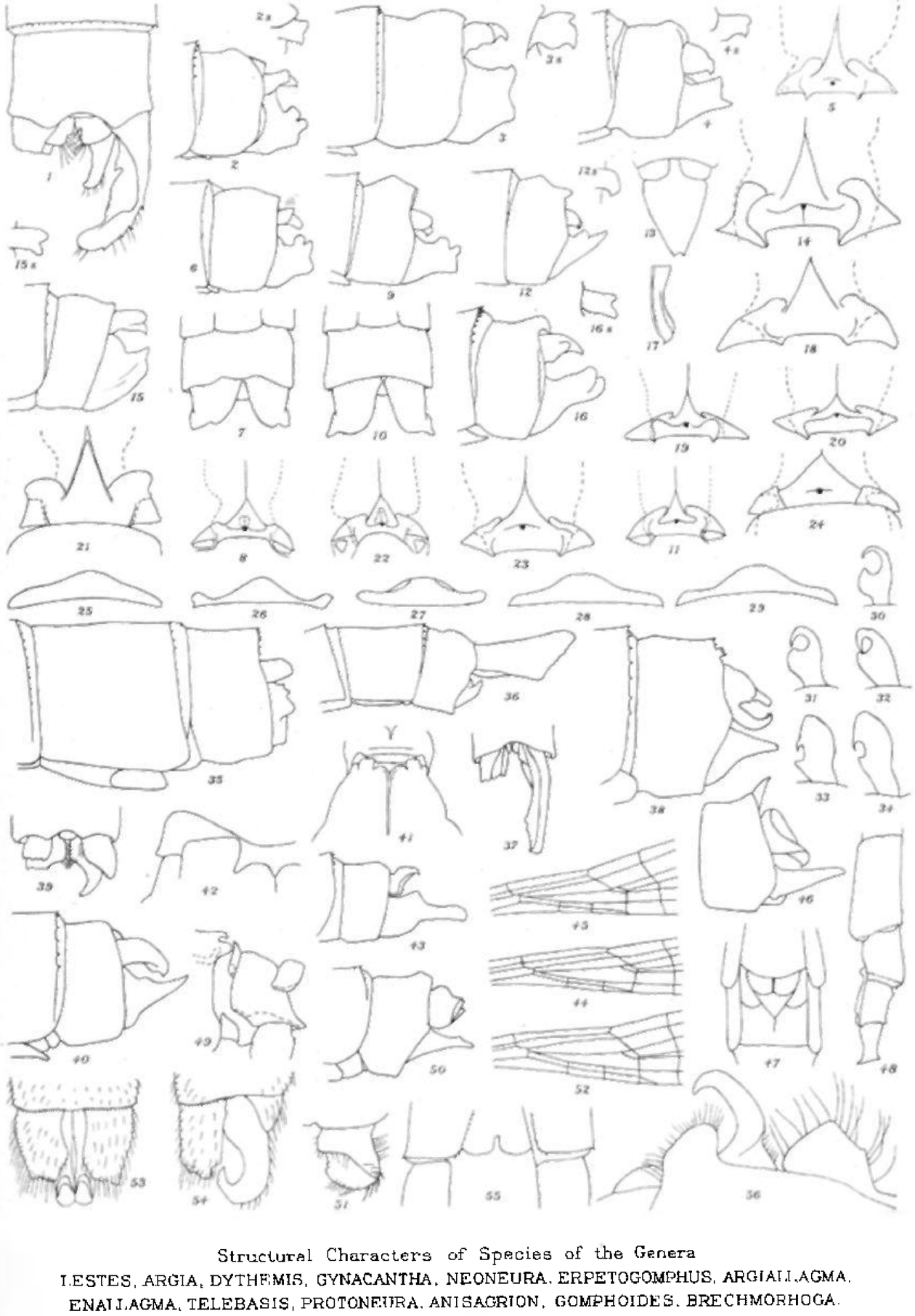
48. *Gomphoides volsella*, Calv., ♂. Teapa. Left profile view of apex of abdomen. × 5·3. (To replace Tab. VII. fig. 14.)

49–52. *Protoneura amatoria*, sp. n. San Pedro Sula, Feb. 28, 1905. 49. Right profile view of prothorax and anterior end of mesothorax, ♀, showing mesostigmal process on latter, × 22. 50. Left profile view of apex of abdomen, ♂, × 22. 51. Dorsal view of right sup. app., ♂, × 44. 52. Left hind wing, ♂, × 11·3.

53, 54. *Erpetogomphus boa*, Selys, ♂. Vera Cruz. Dorsal and right profile views of (broken) apex of abdomen of type in Museum at Brussels. (From drawings sent by M. G. Severin through M. R. Martin.)

55, 56. *Brechmorhoga tepeaca*, sp. n. 55. Vulvar lamina, ♀, Cuernavaca, × 18·5. 56. Left profile view, genitalia of second abd. seg., ♂, Coatepec, × 25.

* The dotted lines show the outlines of the black mid-dorsal thoracic stripe.



Structural Characters of Species of the Genera
LESTES, ARGIA, DYTHEMIS, GYNACANTHA, NEONEURA, ERPETOGOMPHUS, ARGIALLAGMA,
ENALLAGMA, TELEBASIS, PROTONEURA, ANISAGRION, GOMPHOIDES, BRECHMORHOGA.