WEIGHTS OF ABOUT THREE THOUSAND EGGS

By WILSON C. HANNA

DURING a number of years I have been determining the weights of eggs with a view of obtaining additional data and possibly opening a new line of research. This work has given me considerable pleasure, and some ornithologists and oologists have asked for a report of my methods and of the results of my tests.

As incubation advances eggs become lighter in weight, and an egg at the point of hatching may be as much as 11 percent lighter than the fresh egg. With age, eggs also lose weight. It is thus evident that, for reliable data, weights must be determined on eggs in the early stages of incubation, and this must be done either in the field or, if the eggs are collected, within a few days at most. I have followed the practice suggested.

I have used the metric system, reporting all weights to the nearest 1/100 of a gram. The balance used, in most cases, has been sensitive to 1/10,000 of a gram. A single egg has been weighed at a time, and I have not found it necessary to collect all eggs in order to obtain the weights.

The weight of the smallest Costa Hummingbird egg is 0.37 grams, while the weight of the largest Golden Eagle egg is 411 times as much or 152.15 grams. Ornithologists who are recording the weights of the birds may find some interesting results if they will compare their notes with mine.

In presenting the summary of my results I must give considerable credit and thanks to the following gentlemen, who have helped me in locating nests, and in climbing trees and cliffs: Fred Frazer, M. French Gilman, W. D. LaNiece, R. B. Herron, Ralph Jones, Albert Jones, N. K. Carpenter, Lewis Swinney, and Donald Still.

This table covers the weights of about three thousand eggs, of one hundred and twenty-four species and subspecies, all from points within a few hundred miles of Colton, California.

Under the heading "number of eggs" is given the number of eggs of the species that have been weighed, while in the next column "average weight" is the average weight of the eggs of each species. Where the weights of a large number of eggs of a single species have been determined, this average must represent the true weight, while where only a few eggs have been weighed there is a chance that the average will be changed when more data are obtained. The reader can judge the value of the average by the number of eggs weighed.

My friends have always asked for the maximum and minimum weights, and for a comparison with the other eggs of sets containing the extremes. These features are indicated under the last heading: "Sets showing maximum, minimum and normal." Usually I have deemed it best to list two or three complete sets so that the reader can see how sets with large, small, or normal eggs vary in size. The weights of eggs of one set are recorded in a horizontal row, and where there are more than four in the set the balance are grouped close to the others. In order to help in making comparisons I have listed the largest eggs of a set first (towards the left), and the smallest eggs in the set last (towards the right). The maximum and the minimum weights for each species are in italics. Take, for example, the Long-eared Owl *(Asio wilsonianus)*. Forty-two eggs were weighed, and the average weight was 22.36 grams; the first set of five contained the maximum egg, weighing *26.68* grams; the second set of four contained the minimum egg, weighing *16.22* grams; the third set of four is given as a normal set.

These results are given for what they are worth, and with the idea of getting others started at the work in other districts. With data at hand from other places this table may prove to be of much greater interest.

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
16	Ptychoramphus aleuticus	1	27.20	27.20			
25	Brachyramphus hypoleucus	5	35.22	*36.91*	35.62		
				36.43	*32.61*		
49	Larus occidentalis	72	89.14	*102.30*	101.85	94.55	
				76.80	73.75	*71.65*	
				92.00	89.89	84.08	
74	Sterna antillarum	17	7.95	*9.13*	8.48		
				7.25	7.21	*6.79*	
				8.12	7.80		
120c	Phalacrocorax a. albociliatus	13	45.12	*51.18*	46.29	45.99	45.68
				43.37	41.40	40.08	39.63
							38.62
127	Pelecanus californicus	21	110.28	*124.67*	122.37	118.87	
				104.99	103.10	*97.10*	
				112.60	112.10	108.10	
201c	Butorides v. anthonyi	8	16.87	*19.19*	18.83	17.73	16.65
				15.87	15.87	15.66	*15.11*
210.1	Rallus levipes	7	21.03	*21.85*	21.12	21.09	20.99
					20.91	20.80	*20.51*
278	Aegialitis nivosa	12	7.98	*8.71*	8.65	8.16	
				7.81	7.61	*7.59*	
				8.09	8.00	7.92	
292a	Oreortyx p. plumifera	25	10.41	*11.35*	11.32	10.62	10.48
				11.06	10.90	10.56	10.26
				10.69	10.68	10.48	9.51
				10.84	10.69	10.35	9.86
				10.81	10.58	10.22	9.63
				10.77	10.36	10.03	9.60
							8.71
294a	Lophortyx c. vallicola	28	8.93	*9.64*	9.47	8.82	8.61
				9.43	9.36	8.76	8.48
				9.16	8.86	8.72	7.92
				8.91	8.85	8.70	*7.74*
295	Lophortyx gambeli	17	9.19	*10.89*	9.50	8.76	8.69
				10.59	9.26	8.61	8.64
				10.34	9.27	8.84	8.47
				9.66	9.09	8.73	8.43
							8.40
316a	Zenaidura m. marginella	14	6.27	*7.15*	6.78		
				6.06	*5.14*		
				6.35	6.04		
319	Melopelia a. trudeaui	18	6.82	*8.93*	7.91		
				5.76	*4.82*		
				6.84	6.69		
320a	Chaemepelia p. pallescens	2	3.07	3.13	3.01		
325	Cathartes a. septentrionalis	10	78.57	*92.78*	91.89		
				69.22	*68.49*		
				78.30	72.71		
333	Accipiter cooperi	26	33.93	*38.80*	37.60		
				30.96	30.40	29.93	*28.72*
				34.42	34.37	33.71	33.54

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
337b	Buteo b. calurus	26	65.33	*81.06*	78.69	77.16	
				55.81	55.23	*52.71*	
				68.10	67.20	63.60	
339b	Buteo l. elegans	28	51.74	*55.25*	54.49	54.24	52.88
				48.36	*46.53*		
				52.17	51.48	51.27	
349	Aquila chrysaetos	17	134.48	*152.15*			
				113.87			
				134.00	132.50		
360a	Falco s. phalaena	36	13.75	*15.90*	15.35	15.35	15.29
							14.83
				10.81	10.53	10.51	*9.94*
				13.43	13.03	12.72	12.64
							12.47
365	Tyto a. pratincola	34	23.41	*26.43*	25.19	24.50	*19.47*
				25.53	24.86		
				24.49	23.50	22.67	22.64
				24.09	23.14	22.66	21.88
366	Asio wilsonianus	42	22.36	*26.68*	24.93	24.33	24.33
							24.21
				19.84	19.48	19.14	*16.22*
				22.92	22.83	22.71	22.05
373c	Otus a. bendirei	20	17.14	*19.48*	18.88	17.85	17.79
				17.09	16.86	16.70	*14.95*
				17.21	17.01	16.52	
373f	(part) Otus a. gilmani	3	15.51	16.14	15.43	14.96	
375d	Bubo v. pacificus	6	54.48	55.13	54.37	54.07	*52.34*
				56.00	55.00		
378	Speotyto c. hypogaea	14	10.84	*11.80*	11.50	10.80	10.70
					11.40	11.30	11.10
				11.51	11.06	10.34	10.09
					10.47	10.17	*9.49*
385	Geococcyx californianus	39	18.90	*21.54*	*15.44*		
				19.92	19.79	19.53	19.20
							17.82
387a	Coccyzus a. occidentalis	44	9.87	*11.20*	10.86	10.49	
				10.59	9.74	*7.69*	
				9.97	9.81	9.77	9.69
394e	Dryobates p. turati	7	2.10	*2.33*	2.33	2.24	2.23
				1.99	1.85	*1.74*	
396	Dryobates s. cactophilus	4	2.90	3.13	2.97	2.82	2.66
397	Dryobates nuttalli	19	2.94	*3.18*	2.97	2.74	2.71
				3.05	2.84	2.82	*2.61*
413	Colaptes c. collaris	45	7.21	*8.62*	8.36	8.36	7.93
						8.56	7.77
				6.64	6.45	6.32	6.03
							5.44
				7.32	7.05	6.94	6.77
						6.92	6.64
414	Colaptes chrysoides	3	7.06	7.11	7.09	6.98	
418b	Phalaenoptilus n. californicus	2	4.41	4.70	4.12		
421	Chordeiles a. texensis	6	5.67	*6.62*	6.46		
				5.34	*4.68*		
				5.62	5.28		
425	Aeronautes melanoleucus	38	2.02	*2.45*	2.45	2.36	
						1.27	
				2.16	2.00	1.99	1.93

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
429	Archilochus alexandri	18	0.44	*0.51*	0.47		
				0.39	*0.37*		
				0.46	0.43		
430	Calypte costae	28	0.42	*0.45*	0.44		
				0.39	*0.37*		
				0.43	0.40		
431	Calypte anna	6	0.51	*0.57*	0.54		
				0.48	*0.47*		
				0.52	0.48		
447	Tyrannus verticalis	18	3.39	*4.23*	4.05	3.99	3.96
				2.18	2.15	2.10	2.09
							2.06
				3.90	3.82	3.78	3.73
454	Myiarchus c. cinerascens	47	3.29	*3.96*	3.95	3.85	3.76
							3.62
				3.06	3.05	2.89	*2.78*
				3.44	3.39	3.34	3.28
							3.21
457	Sayornis sayus	7	2.29	*2.57*	*2.01*		
				2.54	2.34	2.29	2.29
							2.01
458	Sayornis nigricans	27	2.08	*2.40*	2.30	2.30	2.30
				2.01	1.97	1.84	*1.80*
				2.09	2.07	2.04	1.96
462	Myiochanes r. richardsoni	12	1.77	*2.03*	1.77	1.76	
				1.77	1.69	*1.64*	
				1.78	1.77	1.74	
464	Empidonax d. difficilis	17	1.59	*1.79*	1.62	1.61	1.49
				1.59	1.57	1.57	*1.40*
				1.62	1.60	1.52	
466	Empidonax t. trailli	35	1.68	*1.96*	1.93	1.86	
				1.49	1.43	*1.43*	
				1.77	1.73	1.66	1.56
469	Empidonax wrighti	3	1.65	1.66	1.66	1.64	
471	Pyrocephalus r. mexicanus	1	1.43				
474e	Otocoris a. actia	19	2.42	*2.85*	2.77	2.73	
				2.49	2.29	*2.17*	
				2.40	2.37		
481	Aphelocoma c. californica	24	6.05	*6.85*	6.79	6.59	6.48
							6.17
				5.30	5.30	5.20	*5.10*
486	Corvus c. sinuatus	10	21.22	*22.86*	22.74	22.42	21.20
							19.35
488b	Corvus b. hesperis	9	14.93	*15.94*	15.03	14.38	*13.49*
				15.47	15.18	15.06	14.91
							14.89
495a	Molothrus a. obscurus	39	2.26	*2.75*			
				1.62	*1.53*		
				2.24			
496a	Tangavius a. aeneus	1	4.06				
498e	Agelaius p. neutralis	30	3.77	*4.65*	4.55	4.35	
				3.62	3.27	3.72	*2.92*
				3.95	3.92	3.83	
501.1	Sturnella neglecta	9	6.00	*6.52*	6.33	6.31	6.16
							6.04
				6.10	5.85	5.62	*5.06*

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
504	Icterus parisorum	21	3.64	*4.13*	4.00	3.81	3.56
				3.21	3.14	*2.93*	
				3.65	3.62		
505a	Icterus c. nelsoni	11	2.32	*2.73*	2.61	2.56	
				1.98	1.96	1.93	*1.71*
				2.64	2.63	2.51	2.30
508	Icterus bullocki	84	3.02	*3.58*	3.56	3.24	3.04
				2.80	2.78	2.74	2.70
						2.76	*2.60*
				3.12	3.12	2.99	2.98
							2.93
510	Euphagus cyanocephalus	33	4.68	*5.32*	5.27	5.23	5.17
							5.11
				4.33	3.83	*3.82*	
				4.81	4.79	4.70	4.65
							4.60
519	Carpodacus m. frontalis	66	1.83	*2.45*	2.40	2.29	2.16
				1.91	1.88	*0.99*	
				1.93	1.85	1.82	1.72
529b	Astragalinus t. salicamans	7	1.33	*1.45*	1.44	1.36	1.30
				1.33	1.26	*1.15*	
530a	Astragalinus p. hesperophilus	27	1.05	*1.24*	1.16	1.15	1.14
				0.97	0.93	0.89	*0.87*
				1.15	1.13	1.09	1.07
531	Astragalinus lawrencei	9	1.04	*1.18*	1.15	1.13	1.11
				0.88	0.84	*0.82*	
543	Passerculus beldingi	3	2.25	2.27	2.24	2.23	
552a	Chondestes g. strigatus	40	2.81	*3.55*	3.41	3.13	
				2.38	2.31	2.26	*2.09*
				2.90	2.88	2.78	2.74
							2.61
560a	Spizella p. arizonae	15	1.47	*1.75*	1.66	1.61	1.61
				1.43	1.34	*1.26*	
				1.48	1.46	1.43	1.34
562	Spizella breweri	18	1.42	*1.63*	1.62	1.61	1.59
				1.33	1.24	1.21	*1.14*
				1.47	1.45	1.32	
565	Spizella atrogularis	60	1.56	*1.87*	1.81	1.71	
				1.26	1.21	1.12	*1.12*
				1.62	1.56	1.46	
.....	Passer domesticus	5	2.52	2.64	2.57	2.49	2.46
							2.43
567c	Junco o. thurberi	4	2.08	2.15	2.11	2.08	2.00
574	Amphispiza belli	23	2.01	*2.42*	2.33	2.31	2.19
				2.02	1.96	1.91	*1.69*
				2.05	2.01	2.00	1.96
574.1b	Amphispiza n. canescens	3	2.03	2.11	2.04	1.94	
580	Aimophila r. ruficeps	22	2.14	*2.48*	2.20	2.23	2.14
				2.19	2.16	2.12	*1.91*
				2.19	2.07	2.05	
581m	Melospiza m. cooperi	48	2.41	*2.87*	2.76	2.69	2.86
				2.52	2.36	2.07	*2.05*
				2.49	2.41	2.41	2.40
585d	Passerella i. stephensi	5	3.43	*3.66*	3.37		
				3.51	3.48	*3.14*	

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
588d	Pipilo m. megalonyx	27	4.13	*4.59*	4.41	4.38	4.33
				3.79	3.73	*3.37*	
				4.31	4.24	4.07	3.74
591.1a	Pipilo c. senicula	73	4.29	*5.30*	5.19	4.94	4.93
				4.03	3.60	3.54	*3.22*
				4.39	4.29	4.23	
592	Pipilo aberti	17	4.04	*5.59*	3.96	3.82	
				3.46	*3.03*		
				4.20	4.08	3.86	
592.1	Oreospiza chlorura	55	2.91	*4.02*	3.92	3.73	3.47
				2.69	2.66	2.50	2.43
							2.16
				3.04	2.97	2.93	
594	Pyrrhuloxia s. sinuata	14	3.54	*4.21*	3.96	3.74	
				3.31	3.19	*3.06*	
596	Zamelodia melanocephala	23	3.83	*4.37*	4.05	4.02	4.01
				3.52	3.47	*3.27*	
597a	Guiraca c. lazula	7	2.97	*3.19*			
				2.92	2.86	*2.83*	
599	Passerina amoena	36	1.94	*2.23*	2.15	2.13	2.02
				1.64	1.54	*1.41*	
607	Piranga ludoviciana	13	3.30	*3.83*	3.60	3.49	3.35
				3.44	3.22	3.16	3.02
							2.81
612	Petrochelidon l. lunifrons	33	2.04	*2.66*	2.56	2.44	
				1.81	1.79	*1.72*	
				2.16	2.13	2.11	1.87
616	Riparia riparia	1	1.38				
617	Stelgidopteryx serripennis	14	1.77	*2.00*	1.98	1.80	1.74
							1.68
				1.71	1.70	*1.66*	
				1.81	1.80	1.78	1.76
						1.69	1.68
620	Phainopepla nitens	17	2.78	*3.19*	2.91		
				2.53	*2.14*		
				2.94	2.74	2.74	
622b	Lanius l. gambeli	77	4.67	*5.72*	5.57	5.56	5.19
				3.96	4.12	4.12	4.07
						3.91	*3.82*
				4.70	4.90	4.90	4.50
627a	Vireosylva g. swainsoni	8	1.84	*2.21*	2.06	2.04	1.91
				1.71	1.67	1.62	*1.50*
629a	Lanivireo s. cassini	15	1.88	*2.24*	2.16	2.12	2.12
				1.63	1.63	1.59	*1.57*
				2.04	1.89	1.87	
632	Vireo h. huttoni	4	1.56	1.63	1.59	1.51	1.51
633a (part)	Vireo b. pusillus	9	1.33	*1.44*	1.41	1.41	
				1.25	1.23	*1.21*	
633a (part)	Vireo b. arizonae	34	1.41	*1.58*	1.54	1.54	1.51
				1.11			
643	Vermivora luciae	15	1.03	*1.21*	1.18	1.15	
				0.94	0.89	*0.80*	
				1.05	1.03	0.99	
652c	Dendroica a. brewsteri	12	1.43	*1.63*	1.60	1.59	1.54
				1.27	1.26	1.20	*1.13*
665	Dendroica nigrescens	6	1.36	*1.53*	1.46	1.43	
				1.26	1.26	*1.24*	

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
681c	Geothlypis t. scirpicola	8	1.64	*1.75*	1.68	1.65	*1.53*
				1.66	1.64	1.62	1.61
683a	Icteria v. longicauda	36	3.73	*4.48*	4.43	4.27	
				3.46	3.34	*2.91*	
				3.87	3.76	3.54	
685b	Wilsonia p. chryseola	2	1.175	1.18	1.17		
703a	Mimus p. leucopterus	20	3.97	*4.93*	4.16	3.78	3.41
				4.09	3.42	3.40	*3.30*
				4.17	4.12	3.85	3.76
707a	Toxostoma c. palmeri	61	5.86	*7.07*	6.81		
				5.35	5.21	*5.05*	
				6.01	5.78	5.74	
708	Toxostoma bendirei	56	4.59	*5.63*			
				4.11	3.99	*3.84*	
				4.65	4.62	4.54	4.27
710	Toxostoma redivivum	51	6.58	*8.06*	7.60	7.54	7.36
				5.20	5.10	*4.90*	
				6.73	6.56	6.31	
711	Toxostoma l. lecontei	21	4.86	*5.39*	5.33	5.10	
				4.58	4.42	*3.99*	
				4.96	4.91	4.69	
712	Toxostoma crissale	16	5.26	*5.63*	5.60	5.38	
				4.69	*4.58*		
				5.39	5.37	5.00	
713	Heleodytes b. couesi	71	3.57	*4.19*	3.88	3.79	3.45
				3.25	3.21	3.17	3.04
							2.91
				3.67	3.62	3.59	3.51
715	Salpinctes o. obsoletus	42	2.27	*2.73*	2.71	2.67	2.56
						2.60	2.48
				2.47	1.95	1.94	1.90
							1.84
717b	Catherpes m. punctulatus	65	1.73	*1.99*	1.92	1.80	1.78
						1.78	1.68
				1.64	1.62	1.62	1.51
							1.46
				1.79	1.74	1.73	1.71
719d	Thryomanes b. charienturus	22	1.46	*1.67*	1.61	1.61	1.57
							1.52
				1.47	1.45	1.37	1.34
						1.26	*1.11*
721a	Troglodytes a. parkmani	29	1.31	*1.62*	1.50	1.49	1.55
				1.58	1.56	1.56	1.40
				1.17	1.20	1.08	*0.96*
				1.28	1.17		
				1.40	1.36	1.32	1.29
							1.26
730	Sitta p. pygmaea	6	1.27	1.35	1.32	1.31	1.26
						1.27	1.14
733	Baeolophus i. inornatus	6	1.73	1.79	1.75	1.74	1.73
						1.70	1.66
738a	Penthestes g. baileyae	13	1.23	*1.39*	1.37	1.32	1.29
				1.35	1.34	1.31	
				1.14	1.13	1.12	*1.06*
					1.12	1.09	
742a	Chamaea f. henshawi	16	1.80	*2.06*	2.02	2.00	1.95
							1.86
				1.87	1.87	1.61	*1.53*

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
743	Psaltriparus m. minimus	97	0.76	*0.94*	0.90	0.86	0.81
					0.88	0.83	
				0.85	0.70	0.65	*0.50*
						0.60	
				0.78	0.78	0.76	0.73
					0.77	0.76	
746	Auriparus f. flaviceps	73	0.96	*1.12*	1.09	1.08	1.07
				0.92	0.88	0.85	*0.85*
751a	Polioptila c. obscura	70	0.94	*1.11*	1.07	1.05	1.05
				0.80	0.80	0.80	*0.70*
						0.80	
				0.91	0.99	0.98	0.95
752	Polioptila plumbea	13	0.92	*1.01*	0.95	0.94	0.93
				0.98	0.96	0.94	*0.84*
						0.89	
753	Polioptila californica	7	1.03	*1.10*	1.06	1.03	1.01
				1.05	0.99	*0.96*	
758	Hylocichla u. ustulata	18	3.46	*3.82*	3.82	3.77	
				3.53	3.42	*3.11*	
759e	Hylocichla g. sequoiensis	3	2.95	3.02	2.92	2.91	
761a	Planesticus m. propinquus	8	6.30	*7.16*	7.07	7.03	6.78
				5.72	5.63	5.65	*5.34*

Colton, California, February 21, 1924.

FROM FIELD AND STUDY

California Pelican: An Addition to the Arizona List.—In the autumn of 1914 or 1915, an adult California Pelican *(Pelecanus occidentalis californicus)*, which had alighted on a reservoir at the edge of the village, was shot by Mrs. J. L. Moore, at Dos Cabezos, Cochise County, Arizona. It came into the possession of Mr. E. O. Kelley, who had it mounted in a soaring attitude.

In the summer of 1919 this bird was suspended from the ceiling of the dining-room in the Montgomery Hotel, in Dos Cabezos, where I measured it. Its dimensions were: Right wing, 550 mm.; left wing, 532; tail, 160; tarsus, 84; exposed culmen, 323; middle toe with claw, 112. The proprietress of the hotel gave me history of the bird, which was later confirmed by the local storekeeper. Both had known of its capture at the time it was shot.—J. EUGENE LAW, *Altadena, California, March 20, 1924.*

A California Condor in Captivity.—On October 23, 1923, representatives of this Museum surprised and captured uninjured a young Condor *(Gymnogyps californianus)* in the mountains of Ventura County, near Fillmore, California. It was about three-quarters grown, evidently a bird of the previous spring, and was found in a nesting cave where probably it had been hatched, and from which it could not escape when the entrance was blocked.

The bird is now on exhibition at the Selig Zoo, Los Angeles, where it will be kept indefinitely. It is believed to be the only one of its species now in captivity.—L. E. WYMAN, *Los Angeles Museum, April 4, 1924.*

An Unique Swallow's Nest.—During the summer of 1922 a colony of Cliff Swallows *(Petrochelidon lunifrons)* occupied the frieze of a barn on the farm of Mr. A. F. Mossholder in the Tiajuana Valley, San Diego County, California. One day a nest containing three young birds about a week old fell to the ground. Mrs. Mossholder saw the catastrophe and endeavored to save the birds.