

# ANIMAL LOCOMOTION

AN ELECTRO-PHOTOGRAPHIC INVESTIGATION  
OF CONSECUTIVE PHASES OF  
ANIMAL MOVEMENTS

BY  
EADWEARD MUYBRIDGE

PUBLISHED UNDER THE AUSPICES OF THE  
UNIVERSITY OF PENNSYLVANIA

PROSPECTUS  
AND  
CATALOGUE OF PLATES

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THE PLATES PRINTED BY THE PHOTO-GRAVURE COMPANY OF NEW YORK

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# ANIMAL LOCOMOTION.

By EADWEARD MUYBRIDGE.

PUBLISHED UNDER THE AUSPICES OF THE UNIVERSITY OF PENNSYLVANIA.

Mr. EADWEARD MUYBRIDGE,

*University of Pennsylvania, Philadelphia, U. S. A.:*

We, the undersigned, each hereby subscribe for the number of copies written in association with our respective names, of your work on ANIMAL LOCOMOTION; each copy to contain *One Hundred Plates*, as described in the prospectus; at the subscription price of ONE HUNDRED DOLLARS for each copy, payable upon the delivery of the work.

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1	41	81	121	161	201	241	281	321	361	401	441	481	521	561	601	641	681	721	761
2	42	82	122	162	202	242	282	322	362	402	442	482	522	562	602	642	682	722	762
3	43	83	123	163	203	243	283	323	363	403	443	483	523	563	603	643	683	723	763
4	44	84	124	164	204	244	284	324	364	404	444	484	524	564	604	644	684	724	764
5	45	85	125	165	205	245	285	325	365	405	445	485	525	565	605	645	685	725	765
6	46	86	126	166	206	246	286	326	366	406	446	486	526	566	606	646	686	726	766
7	47	87	127	167	207	247	287	327	367	407	447	487	527	567	607	647	687	727	767
8	48	88	128	168	208	248	288	328	368	408	448	488	528	568	608	648	688	728	768
9	49	89	129	169	209	249	289	329	369	409	449	489	529	569	609	649	689	729	769
10	50	90	130	170	210	250	290	330	370	410	450	490	530	570	610	650	690	730	770
11	51	91	131	171	211	251	291	331	371	411	451	491	531	571	611	651	691	731	771
12	52	92	132	172	212	252	292	332	372	412	452	492	532	572	612	652	692	732	772
13	53	93	133	173	213	253	293	333	373	413	453	493	533	573	613	653	693	733	773
14	54	94	134	174	214	254	294	334	374	414	454	494	534	574	614	654	694	734	774
15	55	95	135	175	215	255	295	335	375	415	455	495	535	575	615	655	695	735	775
16	56	96	136	176	216	256	296	336	376	416	456	496	536	576	616	656	696	736	776
17	57	97	137	177	217	257	297	337	377	417	457	497	537	577	617	657	697	737	777
18	58	98	138	178	218	258	298	338	378	418	458	498	538	578	618	658	698	738	778
19	59	99	139	179	219	259	299	339	379	419	459	499	539	579	619	659	699	739	779
20	60	100	140	180	220	260	300	340	380	420	460	500	540	580	620	660	700	740	780
21	61	101	141	181	221	261	301	341	381	421	461	501	541	581	621	661	701	741	781
22	62	102	142	182	222	262	302	342	382	422	462	502	542	582	622	662	702	742	
23	63	103	143	183	223	263	303	343	383	423	463	503	543	583	623	663	703	743	
24	64	104	144	184	224	264	304	344	384	424	464	504	544	584	624	664	704	744	
25	65	105	145	185	225	265	305	345	385	425	465	505	545	585	625	665	705	745	
26	66	106	146	186	226	266	306	346	386	426	466	506	546	586	626	666	706	746	
27	67	107	147	187	227	267	307	347	387	427	467	507	547	587	627	667	707	747	
28	68	108	148	188	228	268	308	348	388	428	468	508	548	588	628	668	708	748	
29	69	109	149	189	229	269	309	349	389	429	469	509	549	589	629	669	709	749	
30	70	110	150	190	230	270	310	350	390	430	470	510	550	590	630	670	710	750	
31	71	111	151	191	231	271	311	351	391	431	471	511	551	591	631	671	711	751	
32	72	112	152	192	232	272	312	352	392	432	472	512	552	592	632	672	712	752	
33	73	113	153	193	233	273	313	353	393	433	473	513	553	593	633	673	713	753	
34	74	114	154	194	234	274	314	354	394	434	474	514	554	594	634	674	714	754	
35	75	115	155	195	235	275	315	355	395	435	475	515	555	595	635	675	715	755	
36	76	116	156	196	236	276	316	356	396	436	476	516	556	596	636	676	716	756	
37	77	117	157	197	237	277	317	357	397	437	477	517	557	597	637	677	717	757	
38	78	118	158	198	238	278	318	358	398	438	478	518	558	598	638	678	718	758	
39	79	119	159	199	239	279	319	359	399	439	479	519	559	599	639	679	719	759	
40	80	120	160	200	240	280	320	360	400	440	480	520	560	600	640	680	720	760	

In the event of the printed blank for the names of subscribers having been detached from this prospectus, subscribers can send their names and instructions entirely in manuscript; these, and the serial numbers of the plates selected, should be in full, and plainly written.

Copies of the catalogue of plates in *ANIMAL LOCOMOTION*, and subscription blanks will, upon application, be mailed free of expense to any part of the world.

# ANIMAL LOCOMOTION.

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## PROSPECTUS.

IN 1878 the author of the present work published a few Photographs under the title of "The Horse in Motion;" these were the results of some experiments in California with automatic electro-photographic apparatus, devised by him for the purpose of demonstrating the successive phases of Animal Locomotion. This subject had engaged his attention since 1872, when the first lateral photograph of a horse trotting at full speed was made by him.

The experiments were continued in 1879. Upon their termination the author became convinced that a comprehensive and systematic investigation with improved mechanical appliances, and newly-discovered chemical manipulations, would demonstrate many novel facts, not only interesting to the casual observer, but of indisputable value to the artist and to the scientist. This investigation demanded of necessity so large an outlay of money, and the subsequent publication in its present generous form assumed such imposing proportions, that all publishers not unnaturally shrank from entering the unexplored field.

In this emergency The University of Pennsylvania took the prosecution of the investigation under its auspices, and its liberal assistance has enabled the author to complete his work, which he hereby announces as ready for publication.

THE WORK WILL BE PUBLISHED EXCLUSIVELY BY SUBSCRIPTION, AT THE PRICE OF ONE HUNDRED DOLLARS FOR EACH COPY.

ONE HUNDRED PLATES OF ILLUSTRATIONS WILL CONSTITUTE A COPY OF THE WORK.

These one hundred Plates, the subscriber is entitled to select from those enumerated in the subjoined Catalogue. It is believed the description given therein of each movement will be found sufficient to enable this selection to be made with intelligent discrimination.

The 781 Plates described in the Catalogue comprise more than 20,000 figures of men, women, and children, animals and birds, all actively engaged in walking, galloping, flying, working, playing, fighting, dancing, or other actions incidental to every-day life, which illustrate motion and the play of muscles.

The figures illustrating the various movements are reproduced from the original negatives by the photo-gelatine process of printing, without any attempt having been made to improve their pictorial effect, either in outline or detail; or to conceal their imperfections.

In the Title of the work, the term "Locomotion" is stretched to its broadest capacity.

The Plates, without margin, vary in dimensions from 12 inches high by 9 inches wide, to 6 inches high by 18 inches wide.

The average area of the Plates is 108 square inches, or about 660 square centimetres; they are printed on linen steel-plate paper, of size 19 by 24 inches, and weight 100 pounds to the ream.

Subscribers desiring a greater number of Plates than the one hundred for which they subscribe, will be entitled to obtain such additions, and at the same proportionate rate of payment; *provided they make the selection at the same time that they select the Plates for their Subscription Copy.*

Subscribers for two or more Copies have the right of an independent selection of Plates for each Copy.

Subscribers for six Copies of the work,—that is, for 600 Plates,—each Plate being of a *different serial number*, will be entitled to the remaining 181 Plates without additional payment. They will thus have an impression of each one of the 781 Plates.

Each Copy of the work will be enclosed in a Portfolio.

The entire collection of 781 Plates will be enclosed in 8 Portfolios.

Upon receipt of the accompanying blank, duly filled with the necessary instructions, ~~and a remittance of twenty dollars,~~ on account of each Copy subscribed for, the work will be forwarded free of express charges to any part of the United States; ~~the remainder~~ of the subscription to be paid upon delivery.

Subscribers in foreign countries should, preferably, designate an agent in the United States to act in their behalf; or, they will be corresponded with, direct.

All remittances and correspondence to be addressed to

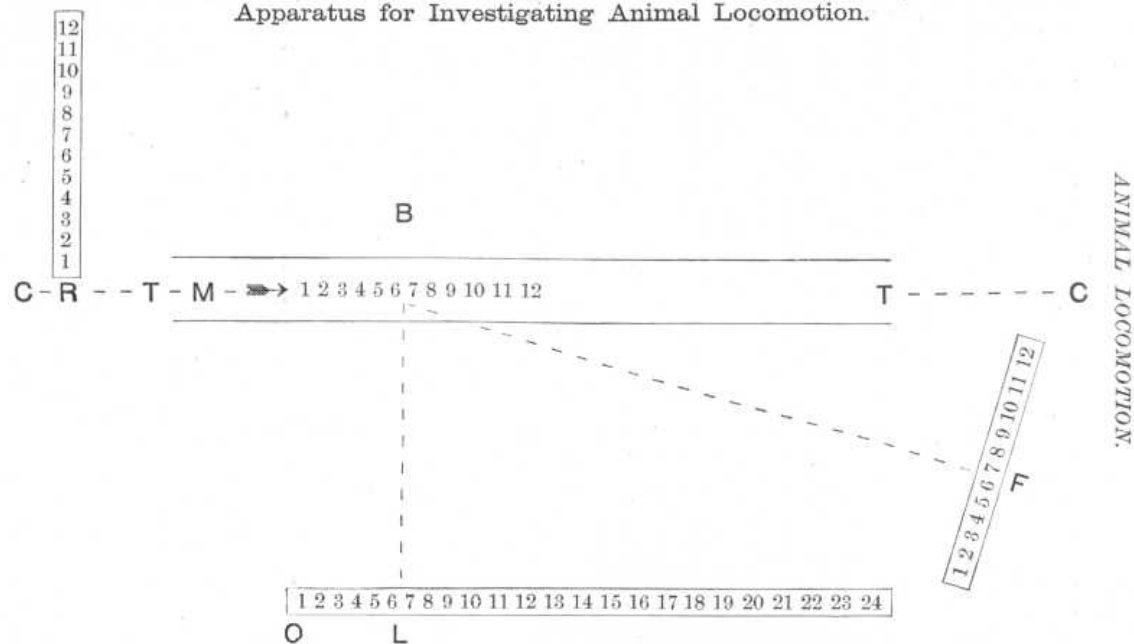
EADWEARD MUYBRIDGE,

*University of Pennsylvania,*

*Philadelphia, U.S.A.*



Diagram of the Studio at The University of Pennsylvania, and Arrangement of the 6  
Apparatus for Investigating Animal Locomotion.



STUDIO, APPARATUS, AND METHOD OF  
WORKING.

In the diagram, B is the *Lateral* background; consisting of a shed 37 metres, or about 120 feet, long, the front of which is open, and divided by vertical and horizontal threads into spaces 5 centimetres, or about 2 inches, square, and by broader threads into larger spaces 50 centimetres, or about 19½ inches, square.

At C and C, 37 metres, or about 120 feet, apart are "*fixed*" backgrounds, with vertical threads 5 centimetres, or about 2 inches, from their centres, with broader threads 30 centimetres, or about 12 inches, from their centres.

For some investigations, readily distinguishable in the plates, "*portable*" backgrounds are used, consisting of frames 3 metres wide by 4 metres high,—about 10 feet by 13 feet 4 inches,—over some of which black cloth and over others white cloth is stretched, all being divided by vertical and horizontal lines into square spaces of the same description as those of the lateral background.

These portable backgrounds are used when photographing birds and horses, and also wild animals when possible to do so.

L. A lateral battery of 24 automatic electro-photographic cameras, arranged parallel with the line of progressive motion, and usually placed therefrom about 15 metres or 49 feet.

Slow movements are usually photographed with lenses of 3 inches diameter and 15 inches equivalent focus; the centres of the lenses being 15 centimetres, or about 6 inches, apart.

Rapid movements are photographed with a *portable* battery of cameras and smaller lenses.

The centre, between lenses 6 and 7, is opposite the centre of the track T.

For illustrations comprising both "Laterals" and "Foreshortenings," cameras 1 to 12 only are used.

When "Laterals" alone are required, cameras 13 to 24 are connected with the system and used in their regular sequence.

R. A portable battery of 12 automatic electro-photographic cameras, the lenses of which are  $1\frac{1}{4}$  inches diameter and 5 inches equivalent focus; the lenses are arranged  $7\frac{1}{2}$  centimetres, or about 3 inches, from their centres. When the battery is used vertically, lens 6 is usually on the same horizontal plane as the lenses of the lateral battery.

In the diagram this battery is arranged *vertically* for a series of "Rear Foreshortenings"; the points of view being at an angle of  $90^\circ$  from the lateral battery.

F. A battery of 12 automatic electro-photographic cameras, similar to that placed at R, arranged horizontally for a series of "Front Foreshortenings"; the points of view averaging an angle of  $60^\circ$  from the lateral battery.

O. The position of the operator; the electric batteries; the chronograph for recording the intervals of time between each successive exposure; the motor for completing the successive electric circuits, and other apparatus connected with the investigation.

T T. The track parallel with the lateral battery and covered with corrugated rubber flooring.

M. The model, approaching the point number "1" on the track where the series of photographic illustrations will commence.

An estimate having been made of the interval of time which will be required, between each photographic exposure, to illustrate the complete movement, or that portion of the complete movement desired, the apparatus is ad-

justed to complete a succession of electric circuits at each required interval of time, and the motor is set in operation. When the series is to illustrate *progressive* motion; upon the arrival of the model at the point marked "1" on the track, the operator, by pressing a button, completes an electric circuit, which immediately throws into gearing a portion of the apparatus hitherto at rest. By means of suitably-arranged connections, an electric current is transmitted to each of the 3 cameras marked "1" in the various batteries, and an exposure is simultaneously made on each of the photographic plates, respectively, contained therein. At the end of the predetermined interval of time, a similar current is transmitted to each of the cameras marked "2," and another exposure made on each of the 3 next plates, and so forth until each series of exposures in each of the three batteries is completed. Assuming the operator to have exercised good judgment in regulating the speed of the apparatus, and in making the first electric contact at the proper time, and that the figures 1 to 12 represent the distance traversed by the model in executing the movement desired, the first three photographic exposures—that is, one exposure in each battery—will have been synchronously made when the model was passing the position marked "1" on the track T; the second three exposures will have been made when the model was passing the position marked "2," and so on until twelve successive exposures were simultaneously made in each of the three batteries. This perfect uniformity of time, speed, and distance, however, was not always obtained.

#### ANALYSIS OF THE PLATES.

Of the broader horizontal lines seen in the plates, the second from the ground is (excepting in special instances

easily recognized) on the same horizontal plane as the lenses of the lateral battery of cameras hereafter described.

The numbers on the background of the lateral illustrations are 15 centimetres, or about 6 inches, apart from each of their centres.

The plan adopted to facilitate analysis of the various movements may be exemplified by a reference to plate 14.

The model "8" is walking towards the right, the *quantity* of movement illustrated is two steps, or one stride. Twelve successive phases of that movement were photographed synchronously from each of the three points of view, L, R, and F in the diagram. The interval of time between each of the twelve phases was about one-eighth of a second, or according to the chronograph one hundred and twenty one-thousandth parts of a second (0.120"), the complete movement having been accomplished in about one and a half seconds.

The number of figures on the plate is 36, arranged thus:

													Laterals.
1	2	3	4	5	6	7	8	9	10	11	12		
													Rear Foreshortenings from points of view on the same vertical line, at an angle of 90° from the Laterals.
1	2	3	4	5	6	7	8	9	10	11	12		
													Front Foreshortenings from points of view on the same horizontal plane, at angles averaging 60° from the Laterals.
1	2	3	4	5	6	7	8	9	10	11	12		

A similar method of arrangement prevails in all those plates which illustrate a movement, as seen simultaneously from each of three points of view.

When the illustrations are, respectively, from one or two points of view only, a system of arrangement is adopted

which is considered the most convenient for their especial comparative examination.

The successive phases of movement are usually arranged in the plates to conform with the direction of the first phase illustrated.

If, for example, the motion of the first phase is towards the right, the arrangement of each succeeding phase is thus:  $\Rightarrow 1\ 2\ 3$ , etc. If, however, the motion of the first phase is towards the left, the arrangement of the successive phases is thus: etc.,  $3\ 2\ 1. \Leftarrow$

When two or more distinct series of illustrations are included in one plate, each separate series is distinguished by the letters A, B, C, etc.

Each series, of the plates numbered 520 to 528, inclusive, illustrates a single phase of motion, photographed synchronously from each of six points of view.

In some instances it will be found that the number of phases of motion from each of the respective points of view do not correspond, some being omitted. This arises from the loss of negatives during manipulation. The subject being, perhaps, one of interest or importance, and impossible to duplicate, it has been included in the work notwithstanding the deficiency.

Serial numbers connected with a brace indicate that one and the same series of phases is illustrated in two plates, the laterals being in one plate, and the foreshortenings in another.

Although, as before stated, the broadest interpretation has been given in this investigation to the word Locomotion, it is not assumed that a response to every possible inquiry in this inexhaustible subject will be found in this work.

## MODELS.

A few particulars in reference to some of the human models, will assist subscribers in the selection of their plates.

The greater number of those engaged in walking, running, jumping, and other athletic games are students or graduates of The University of Pennsylvania,—young men aged from eighteen to twenty-four,—each one of whom has a well-earned record in the particular feat selected for illustration.

The mechanics are experts in their particular trades, and the laborers are accustomed to the work in which they are represented as being engaged.

Unless otherwise described the arms of the models in the progressive movements are in a position naturally consistent with the movement.

Each model is distinguished by a number, and may be recognized by that number throughout the work. The male models are numbered with bold-faced type, thus: "45," and the females with light-faced type, thus: "8."

The models 52, 64, 65, and 66 are teachers in their respective professions; 60 is a well-drilled member of the State Militia; 51, a well-known instructor in art; 95, an ex-athlete, aged about sixty; 22, a mulatto and professional pugilist; 27, 28, and 29, boys aged thirteen to fifteen; 42 and 49, public acrobats; 17, 19, 21; 74 to 91, inclusive; 92 and 94 were patients of the University and Philadelphia Hospitals, selected to illustrate abnormal locomotion.

The female models were chosen from all classes of society.

Number 1, is a widow, aged thirty-five, somewhat slender and above the medium height; 3, is married, and heavily built; 4 to 13, inclusive, 15 and 19, are unmarried, of ages varying from seventeen to twenty-four; of these, 11 is

slender; the others of medium height and build; 14, 16, and 93, are married; 20, is unmarried, and weighs three hundred and forty pounds.

The endeavor has been in all instances to select models who fairly illustrate how—in a more or less graceful or perfect manner—the movements appertaining to every-day life are performed.

In the column headed "COSTUME," the state of the model with regard to apparel is represented by

- N. Nude. When any one figure is *nude*, the entire series is so classified.
- S. N. Semi-Nude. The model so designated is usually clothed with a light or transparent drapery from the waist to the knees, or to the ground: in some illustrations of the toilet it also includes more or less underclothing.
- P. C. Pelvis Cloth. A strip of cloth surrounds the lower part of the abdomen.
- T. D. Transparent Drapery. The model is attired in a flowing garment of diaphanous texture, which permits the action of the limbs to be seen, and the conformation of the folds of the drapery thereto.
- D. Draped. Fully clothed.
- B. F. Bare Feet. The costume of peasant girls with the legs below the knees, and the feet bare.

### ANIMALS AND BIRDS.

The wild animals and birds were photographed in the gardens of the Zoölogical Society, of Philadelphia, by the courtesy of its Trustees and Superintendent.

Nearly all the horses and other domesticated animals were photographed at the Gentlemen's Driving Park, and are good representatives of their various classes and movements.



## ANGLES OF VIEW.

In the classification of the illustrations into "Laterals" and "Foreshortenings," the term Lateral applies—with a few exceptions—to those figures photographed with the *lateral* battery of cameras, as described in the diagram. And the term "Foreshortenings" is applied to all the figures made from points of view at varying angles from the lateral battery, regardless of the actual position of the model.

The points of view, described as being in their relation to the laterals at the respective angles of 90 and 60 degrees, are strictly speaking not always so, but as close thereto as careful measurement and circumstances permitted. All stated angles of view, as applied to wild animals and birds, are simply approximate.

The terms "Front" or "Rear," as applied to the Foreshortenings, usually refers to the position of the model when the *first* exposure is made in the respective batteries. In the execution of some movements, the model turns completely around before the series of photographs is finished; the latter phases of motion may therefore be included in the column of "Front" views when they are actually "Rear" views. The character of the movement will of itself explain the relative successive positions of the model, and the illustrations afford ample means of determining the angular relationship to all points of view.

## MOVEMENTS AND TIME.

In the column devoted to "The *quantity* of movement," a completed action or a round movement is designated by the number "1." A "round movement" means a movement which, being completed, restores the body and limbs to the approximately relative position they occupied at its

commencement. For a horse trotting, or for a man walking, for example, it means the execution of two steps; for a horse jumping a hurdle, or for a man who, when batting, strikes a base-ball, it means the execution of the main object of the particular investigation.

The word approximate is used, because it rarely happens that the execution of regular movements by the most carefully-trained man or animal restores the body and limbs to precisely the same original relative position. When a movement is susceptible of being divided into two parts, of which the second part, with a change of the limbs, is virtually a repetition of the first part; it is not always considered necessary to include the round movement in the illustrations; but in order that the relationship which each one-half of the movement holds to the other half may be understood, five-eighths or three-fourths (designated in the column 5-8 or 3-4) of a round movement is usually illustrated. The quantity of movement given in the column is frequently only approximate to the *exact* quantity.

In the appropriate column, the interval of time between each successive exposure is stated in one-thousandth parts of a second, as recorded by a chronograph with a tuning-fork making 100 single vibrations in a second.

The duration of each interval of time between each successive exposure has been carefully examined, and when, from any obscurity in the pen-markings, or from other causes, the exact intervals of time could not be positively ascertained, an average interval of time has been computed, and attention called thereto in the column of reference notes.

It may be stated, as a matter of some interest, that from carefully-executed experiments it was proved at the University Studio that the most rapid exposures were made in periods of time varying from the one two-thousandth to the one five-thousandth of a second. With such exposures

details of black and of white drapery were obtained. The use, however, of such very brief exposures was deemed inadvisable, and for the illustrations of the movements of large animals was in practice wholly needless.

For photographs of horses at full speed an exposure of the one six-hundredth or of the one eight-hundredth of a second will usually obtain the necessary sharpness of outline and all essential details.

For slow movements an exposure of the one one-hundredth or of the one two-hundredth of a second will give all desirable results.

### REFERENCE NOTES.

1. The interval of time between each phase is an *average* of the intervals of time between all the phases, or an approximation thereto.

2. No record of intervals of time between phases.

3. Isolated phases, photographed synchronously from the various points of view.

4. Successive phases, photographed at *irregular* intervals of time synchronously from the various points of view.

5. The model has a rod attached to the hips to aid the measurement of their oscillations.

In all illustrations of this number the lenses of the lateral battery are on the same horizontal plane as the platform on which the model is walking, or, if ascending or descending, about midway between the two planes of height on which the feet are placed. The backgrounds are those described as "Portable."

6. The lenses of the lateral battery are on the same horizontal plane as the platform on which the model is walking. The backgrounds are those described as "Portable."

7. Isolated phases of motion from a single point of view.
8. A combination of 2 serials, with the same average interval of time between each successive phase.
9. One phase of this series is substituted by a corresponding phase from another series.
10. A combination of 2 serials.
11. Foreshortenings incomplete.
12. Foreshortenings irregular.
13. A double interval of time occurs between phases 2 and 3.
14. A double interval of time occurs between phases 3 and 4.
15. A double interval of time between phases 4 and 5.
16. A double interval of time between phases 5 and 6.
17. A double interval of time between phases 7 and 8.
18. A double interval of time between phases 8 and 9.
19. A double interval of time between phases 10 and 11.
20. A double interval of time, respectively, between phases 4 and 5; 9 and 10.
21. A double interval of time, respectively, between phases 5 and 6; 7 and 8.
22. A double interval of time, respectively, between phases 5 and 6; 9 and 10.
23. Five of the regular intervals of time between phases 6 and 7.
24. Five of the regular intervals of time between phases 5 and 6.

### RETROSPECTIVE.

In conclusion, it may not be irrelevant for the author to remark that a number of his early experimental photographs of animal movements, and his original Title, "The Horse in Motion," were copied, and published a few years ago, in a book which is referred to in the following para-

graph, reprinted from *Nature* (London), June 29, 1882. After the full Title of the book is quoted, the reviewer says, "The above is the somewhat long title of a large and important work issuing from the well-known Cambridge (U. S.) University Press.

"Long as is the title, the name of the principal contributor to the volume is left unrecorded there; though, indeed, even a cursory glance over its contents shows how much indebted is the whole question of the mode of motion in the horse to the elaborate series of investigations of Mr. Muybridge."

E. M.

UNIVERSITY OF PENNSYLVANIA,

*January, 1887.*

ANIMAL LOCOMOTION  
CATALOGUE

# CATALOGUE OF PLATES.

ii

ANIMAL LOCOMOTION.

Serial Number.	MOVEMENTS.	No. of Model.	Males in Bold-faced Type, Females in Light-faced Type.	Costume.	Phases of Movement Illustrated.				Quantity of Movement.	Time Intervals in One-Thousandths of a Second.	Reference Notes.	
					Laterals.	Foreshortenings at Angles from Laterals.						
						Front.		Rear.				
						90°	60°	90°				60°
1	Walking . . . . .	36	N	12	12	12	12	5-8	69	..		
2	" . . . . .	46	N	12	12	12	12	9-10	90	6		
3	" . . . . .	46	PC	12	9	12	9	3-4	69	..		
4	" . . . . .	46	N	8	8	8	8	1-2	48	..		
5	" . . . . .	46	N	8	8	8	8	5-8	83	..		
6	" . . . . .	22	N	12	12	12	12	5-8	75	..		
7	" . . . . .	29	N	12	12	12	12	3-4	54	..		
8	" . . . . .	55	PC	8	8	8	8	1-2	71	6		
9	" . . . . .	56	PC	8	8	8	8	1-2	74	6		
10	" . . . . .	26	N	6	6	6	6	1-2	88	..		
11	" . . . . .	24	N	12	12	12	12	1	83	..		
12	" . . . . .	27, 28	N	12	12	12	12	1-2	48	..		
13	" . . . . .	1	N	12	12	12	12	1	95	..		
14	right hand at chin . . . . .	8	N	12	12	12	12	1	120	..		
15	" . . . . .	2	N	10	10	10	10	5-8	103	..		
16	" . . . . .	4	N	10	10	10	10	5-8	91	..		
17	" . . . . .	6	N	12	12	12	12	3-4	94	..		
18	left hand across abdomen . . . . .	3	N	12	12	12	12	3-4	99	..		
19	commencing to turn around . . . . .	20	N	12	12	12	12	1-2	129	12		





Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
— 49	Walking and turning around rapidly, a satchel in one hand, cane in other . . . . .	43	D	12	. .	. .	12	. .	1	127	. .
— 50	“ and turning around, carrying bucket of water in left hand . . . . .	12	S N	12	12	. .	. .	12	1	172	. .
— 51	“ turning around, using sprinkling pot . .	8	N	11	11	. .	. .	11	1	211	15
— 52	“ carrying child, turning around; another child (70) holding on to dress of 93 .	93	D	12	. .	. .	. .	. .	1	182	1
— 53	“ scattering flowers and turning around .	12	S N	12	. .	12	12	. .	1	367	. .
— 54	“ two models (one flirting a fan), arm in arm, turning around . . . . .	1, 8	N	12	. .	12	12	. .	1	151	. .
— 55	“ turning around, action of aversion . . .	12	T D	11	. .	11	11	. .	1	228	13
— 56	“ “ and stooping to lift train . . . . .	12	T D	12	12	. .	. .	12	1	162	. .
— 57	“ “ around, 10-lb. basket on head . .	7	B F	12	. .	12	. .	12	1	219	. .
— 58	“ “ “ sweeping the floor . . . . .	1	N	12	. .	12	12	. .	1-2	174	. .
— 59	Starting for a run (shoes) . . . . .	37	P C	12	12	. .	. .	. .	1	93	. .
— 60	Running at a half-mile gait (shoes) . . .	37	P C	10	10	. .	. .	. .	5-8	42	. .
— 61	“ full speed (imperfect action, shoes) . .	37	P C	8	. .	. .	8	. .	1-2	36	. .
— 62	“ “ “ . . . . .	37	N	12	. .	. .	12	. .	1	41	. .
— 63	“ “ “ . . . . .	46	N	10	. .	. .	10	. .	5-8	39	1
— 64	“ “ “ . . . . .	33	N	12	. .	. .	12	. .	5-8	28	. .
— 65	“ “ “ . . . . .	33	N	8	. .	. .	8	. .	1-2	29	. .
— 66	“ “ “ . . . . .	55	N	. .	. .	7	. .	7	1-2	57	. .
— 67	“ “ “ . . . . .	47	N	8	8	. .	. .	. .	5-8	56	. .
— 68	“ “ “ . . . . .	46	N	9	9	. .	. .	. .	1-2	38	. .
— 69	“ two models . . . . .	27, 28	N	10	10	. .	. .	. .	1	62	. .
— 70	“ “ “ . . . . .	8	N	8	. .	8	. .	8	5-8	61	. .





—124	Descending incline, 20-lb. basket on head, hands raised . . . . .	8	N	12	12	. . . . .	12	11-4	124	. . .
—125	“ stairs . . . . .	36	N	12	12	. . . . .	12	7-8	92	. . .
—126	“ “ . . . . .	22	N	11	. . . . .	. . . . .	. . . . .	1	65	19
—127	“ “ . . . . .	24	N	6	6	. . . . .	6	5-8	109	. . .
—128	“ “ hands clasped . . . . .	7	N	12	12	. . . . .	. . . . .	1-2	75	1, 6
—129	“ “ . . . . .	2	N	12	. . . . .	. . . . .	12	3-4	99	. . .
—130	“ “ . . . . .	7	N	12	. . . . .	. . . . .	12	1	110	5
—131	“ “ waving hand . . . . .	6	N	12	12	. . . . .	. . . . .	1-2	159	. . .
—132	“ “ turning to look around, and waving hand . . . . .	7	N	12	12	. . . . .	. . . . .	1	221	. . .
—133	“ “ throwing handkerchief over shoulders . . . . .	13	N	11	11	. . . . .	11	1-2	101	. . .
—134	“ “ with basin in hands . . . . .	3	D	12	12	. . . . .	. . . . .	1	89	. . .
—135	“ “ and turning; lamp in right hand . . . . .	15	D	12	. . . . .	. . . . .	. . . . .	1-2	. . .	. . .
—136	“ “ full demijohn on shoulder . . . . .	39	N	12	12	. . . . .	. . . . .	1-2	68	. . .
—137	“ “ turning around . . . . .	7	N	12	11	. . . . .	. . . . .	1	174	. . .
—138	“ “ turning; pitcher in left hand . . . . .	1	N	12	12	. . . . .	12	1	178	. . .
—139	“ “ “ . . . . .	14	D	11	11	. . . . .	11	1	234	. . .
—140	“ “ looking around and waving fan . . . . .	5	D	12	12	. . . . .	. . . . .	1-2	161	. . .
—141	“ “ turning and flirting fan . . . . .	5	D	12	12	. . . . .	. . . . .	1	326	. . .
—142	“ “ dress caught . . . . .	4	D	10	10	. . . . .	. . . . .	1	396	. . .
—143	“ “ “ cup and saucer in r. hand . . . . .	8	T D	12	. . . . .	12	12	1	181	. . .
—144	“ “ “ basin in hands . . . . .	4	N	12	. . . . .	12	. . . . .	1	182	. . .
—145	“ “ “ bucket water in r. hand . . . . .	4	N	12	. . . . .	12	. . . . .	1	121	. . .
—146	“ “ “ water jar on l. shoulder . . . . .	12	S N	12	12	. . . . .	12	1	151	. . .
—147	“ “ “ “ “ r. “ . . . . .	3	N	12	. . . . .	12	. . . . .	1	163	. . .
—148	“ “ “ carrying bucket of water and broom . . . . .	4	D	11	. . . . .	11	. . . . .	1	212	16
—149	“ “ “ stooping to lift a pitcher . . . . .	8	N	12	. . . . .	12	. . . . .	1	189	. . .
—150	“ “ “ lifting pitcher, turning . . . . .	8	N	8	. . . . .	8	. . . . .	1	424	. . .

Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
151	Descend'g step-ladder, turn'g around, rock in hands	26	N	10	..	..	10	..	1	135	..
152	Jumping; running straight high jump (shoes)	37	P C	12	12	..	..	..	1	87	..
153	" " " " " " " " " "	37	P C	12	..	..	12	..	1	63	..
154	" " " " " " " " " "	26	N	12	..	..	12	..	1	125	..
155	" " " " " " " " " "	8	N	12	12	..	..	12	1	103	..
156	" " " " " " " " " "	4	D	20	..	..	..	..	1	105	..
157	" " twist " " (shoes)	37	P C	12	12	..	..	..	1	152	..
158	" " " " " " " " " "	37	P C	12	..	..	12	..	1	160	..
159	" " broad jump (shoes)	37	P C	12	12	..	..	..	1	95	..
160	" " " " " " " " " "	37	P C	8	..	..	8	..	1	161	..
161	standing high " " " " " "	40	P C	12	..	..	..	12	1	139	..
162	" " broad " " " " " "	40	P C	12	..	..	..	12	1	156	..
163	" " " " " (shoes)	37	P C	12	12	..	..	..	1	156	..
164	pole vaulting . . . . .	46	N	11	..	..	..	11	1	..	..
165	" " " " " " " " " "	46	N	..	12	..	..	12	1	..	..
166	over man's back (leap-frog)	54	N	12	12	..	..	..	1	146	..
167	" " boy's " " " " " "	28	N	10	9	..	..	..	1	109	..
168	" " " " " " " " " "	27	N	12	12	..	..	..	7-8	87	..
169	" " " " " " " " " "	29	D	18	..	..	..	..	1	107	..
170	from stone to stone across a brook . . .	12	S N	12	12	..	..	12	1	119	..
171	Stepping up on a trestle; jumping down, turning	8	N	12	..	12	12	..	1	289	..
172	" " " " " " " " " "	12	T D	12	..	12	12	..	1	290	..
173	Ascending steps and jumping off . . . . .	4	D	24	..	..	..	..	1	234	..
174	Running and jumping with skipping-rope . . . .	12	S N	12	12	..	..	12	1 1-2	104	..
175	Crossing brook on step-stones with fishing-pole and can . . . . .	12	S N	12	12	..	..	12	1 1-2	152	..

—176	Crossing brook on step-stones, with fishing-pole and basket . . . . .	7	N	10	..	10	..	10	1-2	83	..
—177	Crossing brook on step-stones, with fishing-pole and basket . . . . .	7	N	10	..	10	..	10	5-8	118	..
—178	Stepping on and over a trestle . . . . .	7	N	12	..	..	12	..	1	243	6
—179	Stepping on and over a rock, a basket on head, right hand raised . . . . .	12	S N	12	12	..	..	12	1-2	129	..
—180	Stepping on and over a chair . . . . .	7	N	12	..	..	12	..	1	242	6
—181	“ over a fence . . . . .	12	S N	12	12	..	..	12	1	169	..
—182	Crawling on hands and knees . . . . .	8	N	12	12	..	..	12	1	88	..
—183	{ Walking on hands and feet . . . . . }	8	N	12	..	..	..	..	1	106	..
—184	“ “ “ “ . . . . . }	8	N	..	12	..	..	12	1	106	..
—185	Hopping on left foot . . . . .	12	S N	8	8	8	..	..	2	141	..
—186	“ “ right foot . . . . .	82	N	12	12	..	..	12	2	81	..
—187	{ Dancing (fancy) . . . . . }	12	T D	12	..	..	..	..	1	277	..
—188	“ “ “ “ . . . . . }	12	T D	..	..	12	..	..	1	277	..
—189	“ “ “ “ . . . . . }	12	T D	..	12	..	..	..	1	277	..
—190	Dancing (nauteh) . . . . .	12	S N	12	12	12	..	12	1	192	..
—191	“ (fancy) . . . . .	12	S N	12	12	12	..	12	1	244	..
—192	“ “ “ “ . . . . .	12	T D	12	12	12	..	12	1	211	..
—193	“ “ “ “ . . . . .	12	T D	12	12	..	12	12	1	200	..
—194	“ “ “ “ . . . . .	7	T D	10	10	..	10	1	..	..	4
—195	“ waltz . . . . .	7	N	12	12	..	..	..	1-2	146	..
—196	“ two models . . . . .	1, 8	N	12	12	..	..	12	1-2	207	..
—197	“ “ “ “ . . . . .	58, 7	D	24	..	..	..	..	1	81	..
—198	Courtesying . . . . .	14	D	11	11	..	11	11	1	246	..
—199	“ fan in right hand . . . . .	5	D	12	..	12	..	12	1	211	..
—200	“ kissing hand and turning around . . . . .	7	B F	10	10	..	10	1	1	220	..
—201	Taking 12-lb. basket from head, putting it on the ground . . . . .	1	N	12	12	..	12	1	158	..	..
—202	Dropping and lifting handkerchief . . . . .	7	N	11	..	11	..	1	223	13	..

Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
203	Bending over a trestle with water-jar . . . . .	8	N	12	12	..	..	12	1	350	..
204	Stooping to pick up ball . . . . .	6	N	12	12	..	..	..	1	167	..
205	Carrying and stooping with vase . . . . .	12	T D	12	..	12	12	..	1	273	1
206	Carrying water-jar on head, turning and placing it on the ground . . . . .	8	T D	12	12	..	..	12	1	220	..
207	Stooping and lifting train . . . . .	93	D	12	..	..	..	..	1	204	..
208	Dropping a fan and stooping to lift it . . . . .	93	D	12	..	..	..	..	1	155	..
209	Stooping and lifting a handkerchief . . . . .	5	D	12	12	..	..	..	1	345	..
210	" " " dress; a fan in left hand . . . . .	4	D	12	..	..	12	..	1	218	..
211	" " " hand'chief; parasol in l. hand . . . . .	14	D	12	..	..	..	..	1	237	..
212	Dropping broom and lifting bucket of water . . . . .	4	D	11	..	11	..	11	1	272	17
213	Lifting and emptying basket . . . . .	1	N	12	12	..	..	12	1	232	..
214	" child (70) from the ground, turning around . . . . .	12	S N	12	12	..	..	12	1	311	..
215	Placing child (70) on the ground, child running off . . . . .	12	S N	12	12	..	..	12	1	290	..
216	Bending to fill water-jar; placing jar on head . . . . .	8	T D	12	12	..	..	12	1	376	..
217	Stooping, lifting, and carrying 30-lb. basket . . . . .	7	B F	12	..	12	..	12	1	200	..
218	" and lifting full demijohn to shoulder . . . . .	39	N	12	12	..	..	..	1	237	..
219	" " " broom and sweeping . . . . .	7	N	12	..	..	..	10	1	325	1
220	" " " handkerchief and turning . . . . .	2	N	12	..	..	12	..	1	173	..
221	" " " 12-lb. basket to head . . . . .	1	N	12	12	..	..	12	1	245	..
222	" " " water-jar to head and turning . . . . .	7	N	12	..	..	12	..	1	273	1
223	" " " basin, wiping it, and turning . . . . .	8	N	8	..	8	..	8	1	359	..
224	" " " water-jar to head . . . . .	4	N	12	..	..	12	..	1	263	10
225	Removing water-jar from shoulder to the ground . . . . .	4	N	12	..	..	12	..	1	532	1.10
226	Removing water-jar from shoulder to the ground and turning . . . . .	6	N	12	12	..	..	..	1	498	..

— 227	Lifting cloth from the ground, placing it around shoulders, and turning . . . . .	4	N	12	..	12	..	12	1	368	..
— 228	Turning and lifting water-jar from the ground . .	6	N	12	12	..	..	..	1	297	..
— 229	Placing basket on the ground and turning . . . .	1	T D	12	12	..	..	12	1	328	..
— 230	Lifting 30-lb. basket from ground to head, turning	7	B F	12	..	12	..	12	1	282	..
— 231	Stooping to arrange train and turning . . . . .	5	D	12	..	..	12	..	3-4	165	..
— 232	“ “ lift “ “ “ . . . . .	12	S N	12	12	..	..	12	1	196	..
— 233	Lifting shawl, putting around shoulders, turning .	8	T D	12	12	..	..	12	1	271	..
— 234	Lifting and emptying basin of water and turning	7	B F	12	..	12	..	12	1	469	..
— 235	Turning and removing water-jar from shoulder to the ground . . . . .	7	N	12	..	..	12	..	1	273	1
— 236	Placing chair and sitting down . . . . .	31	N	12	12	..	..	..	1	183	..
— 237	Sitting down on chair and opening fan . . . . .	7	N	12	..	..	12	..	1	281	..
— 238	Sitting on chair, crossing legs, drinking from teacup	8	N	12	..	12	..	12	1	270	..
— 239	Two models; one standing, the other sitting, crossing legs . . . . .	10, 11	N	8	8	..	..	8	1	330	..
— 240	Sitting and flirting a fan . . . . .	5	D	9	..	..	9	..	1	492	..
— 241	Placing chair, sitting and reading . . . . .	5	D	12	12	..	..	..	1	307	1
— 242	“ “ “ “ flirting a fan . . . . .	12	T D	12	..	..	..	..	1	364	..
— 243	“ “ and sitting, parasol in left hand . . . .	3	D	12	..	..	12	..	9-10	296	..
— 244	Sitting, crossing legs, filling goblet from pitcher .	8	N	8	..	8	..	8	1	384	..
— 245	Two models, turning around, sitting on the ground	10, 11	N	12	12	..	..	12	1	350	..
— 246	Placing chair, sitting and flirting a fan . . . .	12	T D	10	10	..	..	10	1	241	14
— 247	Sitting down, placing feet on chair . . . . .	8	N	9	12	..	..	12	1	291	..
— 248	Sitting down on the ground . . . . .	12	S N	12	12	..	..	12	1	232	..
— 249	Rising from chair . . . . .	31	N	10	10	..	..	..	1	92	..
— 250	“ “ “ stooping and lifting hand'chief .	5	D	12	12	..	..	..	1	312	..
— 251	Kneeling on left knee, basket in l. hand, and rising	8	N	12	..	12	..	12	1	286	..
— 252	“ “ right knee and scrubbing the floor . . .	8	N	12	..	12	..	12	1	334	..
— 253	“ elbows on chair, hands clasped . . . . .	12	T D	12	..	12	12	..	1	364	1
— 254	“ “ “ “ “ . . . . .	8	N	12	..	11	..	11	1	291	11





281	Base-ball; catching and throwing . . . . .	30	N	9	9	.	.	.	1	157	.
282	" " " " . . . . .	30	N	10	.	.	10	.	3-4	150	.
283	" " " " . . . . .	30	N	12	12	.	.	.	3-4	77	.
284	" " " " . . . . .	30	N	12	.	.	12	.	1	201	.
285	" " " " . . . . .	30	N	12	.	.	12	.	1	170	.
286	" throwing . . . . .	25	N	12	.	.	12	.	1	105	.
287	" running and picking up ball . . . . .	26	N	11	.	.	11	.	1	75	.
288	" error . . . . .	30	N	10	.	.	10	.	1	108	16
289	Cricket; round arm bowling . . . . .	69	N	.	.	12	.	12	1	.	2
290	" over " " . . . . .	69	N	.	.	12	.	12	1	.	2
291	" batting; drive . . . . .	69	N	.	.	12	.	12	1	.	2
292	" " back cut . . . . .	69	N	.	.	12	.	12	1	.	2
293	" " " " . . . . .	69	N	.	.	12	.	12	1	.	2
294	Lawn tennis; serving . . . . .	25	N	10	.	.	10	.	1	101	21
295	" " . . . . .	15	D	8	.	8	.	8	3-4	210	.
296	" " . . . . .	15	D	8	.	8	.	8	1	152	.
297	" " . . . . .	15	D	8	.	8	.	8	1	170	.
298	" " . . . . .	15	D	7	.	7	.	7	1	168	.
299	Playing with a ball . . . . .	15	D	24	.	.	.	.	.	.	7
300	Foot-ball; drop kick . . . . .	63	N	12	.	10	.	8	1	238	11
301	" punt . . . . .	63	N	12	.	11	.	11	1	141	11
302	Picking up a ball and throwing it . . . . .	39	N	12	12	.	.	.	1	146	.
303	" " " " " " . . . . .	8	N	12	.	12	.	10	1	178	11
304	" " " " " " . . . . .	7	N	10	.	10	.	10	1	310	.
305	" " " " " " . . . . .	12	T D	12	12	.	.	12	1	213	.
306	" " " " " " . . . . .	7	T D	12	.	12	.	12	1	320	.
307	Throwing an iron disk . . . . .	30	N	12	.	.	12	.	1	184	.
308	" the hammer . . . . .	39	N	11	.	.	11	.	1	249	.
309	" " " " . . . . .	35	N	8	.	.	8	.	1	117	.
310	Putting the shot . . . . .	68	N	12	.	12	.	12	1	.	2
311	Heaving 75-lb. rock . . . . .	22	N	12	.	.	.	.	1	111	.

Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
312	Heaving a 75-lb. rock . . . . .	39	N	12	12	.	.	.	1	390	.
313	" 20-lb. " . . . . .	46	N	10	.	.	10	.	1	145	.
314	" " " . . . . .	46	N	10	10	.	.	.	1	160	.
315	" " " . . . . .	35	N	12	12	.	.	.	1	104	.
316	" " " . . . . .	35	N	12	.	.	12	.	1	96	.
317	" 75-lb. " . . . . .	52	P C	12	12	.	.	12	1	489	.
318	Lifting " " . . . . .	42	P C	12	12	.	.	.	1	119	.
319	Heaving " " . . . . .	42	P C	12	12	.	.	.	1	132	.
320	Lifting 50-lb. dumb-bell . . . . .	52	P C	12	12	.	.	.	1	325	.
321	A, lifting 50-lb. dumb-bell; B, posing . . . . .	42	P C	24	.	.	.	.	1	.	4
322	Lifting and letting down two 50-lb. dumb-bells . . . . .	42	P C	12	12	.	.	.	1	398	.
323	" " " " " " " . . . . .	42	P C	12	.	.	12	.	1	488	.
324	Curling 50-lb. dumb-bell, model $\frac{3}{4}$ length . . . . .	42	P C	10	10	.	.	.	1	308	.
325	Lifting and holding two 50-lb. dumb-bells . . . . .	39	N	12	12	.	.	.	1	356	.
326	Lifting 50-lb. dumb-bell at arm's length . . . . .	30	N	12	.	.	12	.	1	233	.
327	Rowing . . . . .	68	N	12	.	12	12	.	1	.	2
328	" . . . . .	68	N	12	.	12	12	.	1	.	2
329	Boxing; (shoes) . . . . .	52, 53	P C	12	.	.	12	.	1	167	.
330	" cross-counter (shoes) . . . . .	52, 53	P C	12	.	.	12	.	1	98	.
331	" stop for cross-buttocks (shoes) . . . . .	52, 53	P C	10	.	.	10	.	1	176	.
332	" cross-buttocks (shoes) . . . . .	52, 53	P C	12	.	.	12	.	1	163	.
333	" 53 knocking 52 down (shoes) . . . . .	52, 53	P C	12	.	.	12	.	1	96	.
334	" with gloves (shoes) . . . . .	52, 53	P C	12	.	.	12	.	1	188	.
335	" " " " . . . . .	52, 53	P C	12	.	.	12	.	1	115	.
336	{ " open hand " . . . . .	64, 65	P C	12	.	.	.	.	1	.	2
337	{ " " " " . . . . . }	64, 65	P C	.	.	9	.	9	1	.	2, 11

338	{ Boxing; open hand (shoes) . . . . . }	64, 65	P C	12	. . . . .	. . . . .	. . . . .	1	217	. .
339	{ " " " " . . . . . }	64, 65	P C	. .	. . . . .	9	. . . . .	1	217	11
340	{ " " " " . . . . . }	64, 65	P C	12	. . . . .	. . . . .	. . . . .	1	162	. .
341	{ " " " " . . . . . }	64, 65	P C	. .	. . . . .	8	. . . . .	1	162	11
342	{ " " " " . . . . . }	64, 65	P C	8	. . . . .	. . . . .	. . . . .	1	. . . . .	. .
343	Striking a blow (left hand) . . . . .	22	N	12	. . . . .	. . . . .	. . . . .	1	124	. .
344	" " (right hand) . . . . .	22	N	12	. . . . .	. . . . .	. . . . .	1	112	. .
345	{ Wrestling; lock . . . . . }	46, 68	N	12	. . . . .	. . . . .	. . . . .	1	. . . . .	2
346	{ " " " " . . . . . }	46, 68	N	. .	. . . . .	12	12	1	. . . . .	2
347	{ " " Græco-Roman . . . . . }	46, 68	N	12	. . . . .	. . . . .	. . . . .	1	. . . . .	2
348	{ " " " " . . . . . }	46, 68	N	. .	. . . . .	12	12	1	. . . . .	2
349	{ Fencing . . . . . }	66, 67	P C	12	. . . . .	. . . . .	. . . . .	1	. . . . .	4
350	{ " " " " . . . . . }	66, 67	P C	. .	. . . . .	12	. . . . .	1	. . . . .	4, 11
351	"Fix" and "unfix bayonets" . . . . .	60	P C	11	. . . . .	11	. . . . .	1	. . . . .	4
352	"Shoulder," "order," and "carry arms" . . . . .	60	P C	11	. . . . .	11	. . . . .	1	. . . . .	4
353	"Support arms" and "arms port" . . . . .	60	P C	9	. . . . .	9	. . . . .	1	. . . . .	4
354	"Carry arms," "parade rest," and "trail arms" . . . . .	60	P C	11	. . . . .	11	. . . . .	1	. . . . .	4
355	On guard, walking and turning around . . . . .	60	P C	12	. . . . .	12	. . . . .	1	161	. .
356	Kneeling, firing and rising . . . . .	60	P C	8	. . . . .	7	. . . . .	6	1	287
357	Lying prone and firing . . . . .	60	P C	8	. . . . .	8	. . . . .	8	1	316
358	Lying on back and firing . . . . .	60	P C	8	. . . . .	8	. . . . .	8	1	319
359	Charging bayonet . . . . .	60	P C	12	. . . . .	12	. . . . .	12	1	92
360	Throwing a spear . . . . .	42	P C	12	. . . . .	. . . . .	12	. . . . .	1	136
361	" " " " . . . . .	42	P C	12	12	. . . . .	. . . . .	1	136	. .
362	Back somersault . . . . .	33	N	14	14	. . . . .	. . . . .	1	182	1, 8
363	Running somersault . . . . .	34	N	12	. . . . .	. . . . .	12	. . . . .	1	100
364	Hand-spring over man's back . . . . .	29	N	12	12	. . . . .	. . . . .	1	151	. .
365	Head-spring, a flying pigeon interfering . . . . .	42	P C	12	12	. . . . .	. . . . .	1	85	. .
366	Running, hitch and kick . . . . .	37	P C	12	12	. . . . .	. . . . .	1	107	. .
367	Kicking a hat . . . . .	13	N	12	12	. . . . .	. . . . .	12	1	169
368	Acrobat descending stairs on hands . . . . .	42	P C	10	. . . . .	. . . . .	10	. . . . .	1	405

Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
— 369	{ First ballet action . . . . . }	46	N	12	..	..	..	..	1	239	
— 370	{ “ “ “ “ “ “ “ “ }	46	N	..	12	..	..	12	1	289	
— 371	Acrobat, vertical “press up” . . . . .	42	P C	12	12	..	..	..	1	383	
— 372	“ horizontal “press up” . . . . .	42	P C	12	12	..	..	..	1	475	
— 373	“ “press up” from chair . . . . .	42	P C	8	..	..	8	..	1	363	
— 374	{ Blacksmiths, two models, hammering on anvil }	59, 61	P C	12	..	..	..	..	1	133	
— 375	{ “ “ “ “ “ “ “ “ }	59, 61	P C	..	..	12	..	12	1	133	
— 376	Blacksmith, hammering on anvil, two hands . . .	44	N	12	..	..	12	..	3-4	123	
— 377	Blacksmiths, two models, hammering on anvil . .	44, 45	N	12	..	..	12	..	1-2	122	
— 378	Blacksmith, hammering on anvil, two hands . . .	61	P C	10	..	10	..	10	1	135	1, 22
— 379	Carpenter, planing a board . . . . .	59	P C	12	..	12	..	12	1	126	
— 380	“ sawing “ . . . . .	59	P C	8	..	8	..	8	1	93	
— 381	Mason, laying a brick . . . . .	48	P C	8	..	8	..	8	1	211	
— 382	Lifting a log on end . . . . .	39	N	10	..	10	..	10	1	226	
— 383	Lifting a log on shoulder . . . . .	39	N	12	..	12	..	12	1	254	
— 384	Heaving a log from shoulder . . . . .	39	N	9	9	..	..	..	1	140	
— 385	Farmer, using a pick . . . . .	41	N	12	12	..	..	..	1	198	
— 386	Miner, “ “ . . . . .	57	D	24	..	..	..	..	1	139	
— 387	Farmer, using a long-handled shovel . . . . .	41	N	12	..	12	12	..	1	334	
— 388	“ “ spade . . . . .	41	N	12	..	12	12	..	1	353	
— 389	“ scattering seed . . . . .	41	N	12	..	..	12	..	1	98	
— 390	“ mowing grass . . . . .	41	N	12	..	..	12	..	3-4	138	
— 391	“ “ “ “ “ “ “ “ . . . . .	41	N	12	12	..	..	..	3-4	125	
— 392	Dragging a garden roller . . . . .	39	N	12	..	..	12	..	1-2	67	
— 393	Pushing “ “ . . . . .	39	N	12	..	..	12	..	1-2	73	
— 394	Turning a crank handle . . . . .	47	N	12	..	..	12	..	1	186	

— 395	Turning a crank handle . . . . .	47	N	12	12	. . . . .	1	200	. . .	
— 396	Pounding with a mallet . . . . .	39	N	9	9	. . . . .	1	260	. . .	
— 397	Lifting 75-lb. stone on shoulder . . . . .	47	N	. .	12	. . . . .	1	364	1	
— 398	Lifting bucket of water to empty it . . . . .	41	N	12	12	. . . . .	1	198	. . .	
— 399	Emptying bucket of water . . . . .	39	N	12	. . . . .	12	1	209	. . .	
— 400	“ “ “ “ . . . . .	41	N	12	. . . . .	12	1	202	. . .	
— 401	“ “ “ “ . . . . .	2	N	12	. . . . .	12	1	222	. . .	
— 402	“ basin “ “ . . . . .	8	N	12	. . . . .	12	1	301	. . .	
— 403	“ bucket “ “ . . . . .	4	D	24	. . . . .	. . . . .	1	118	. . .	
— 404	“ “ “ “ . . . . .	4	D	12	. . . . .	12	1	212	. . .	
— 405	Carrying hod of bricks up a ladder . . . . .	59	P C	8	. . . . .	8	1-2	172	. . .	
— 406	{ Two models, 8 pouring bucket of water over 1 }	1, 8	N	12	. . . . .	. . . . .	1	285	. . .	
— 407	{ “ “ 8 “ “ “ “ 1 }	1, 8	N	. .	. . . . .	12 12	1	285	. . .	
— 408	Two “ 1 “ “ “ “ “ 8 .	1, 8	N	9	9	. . . . .	9	1	437	. . .
— 409	Pouring basin of water over head . . . . .	8	N	12	. . . . .	12 12	1	244	. . .	
— 410	Stepping out of bath-tub, sitting down, wiping feet . . . . .	8	N	12	12	. . . . .	12	1	335	. . .
— 411	Lifting a towel while sitting, and wiping feet . . . . .	7	N	11	. . . . .	11	1	298	. . .	
— 412	Washing, wiping face, and turning . . . . .	8	N	9	. . . . .	9	1	443	. . .	
— 413	Pouring water in basin and washing face . . . . .	8	N	8	. . . . .	8	1	546	. . .	
— 414	Wiping body with towel . . . . .	8	N	12	. . . . .	12 12	1	213	. . .	
— 415	Toilet; preparing to put on clothing . . . . .	7	N	10	. . . . .	. . . . .	10	1	188	. . .
— 416	“ putting on dress . . . . .	13	N	12	12	. . . . .	12	3-4	241	. . .
— 417	“ sitting and putting on stockings . . . . .	1	S N	12	12	. . . . .	12	1	344	. . .
— 418	“ “ “ “ “ “ . . . . .	8	N	12	. . . . .	12 12	1	455	. . .	
— 419	“ stooping, throwing wrap around shoulders . . . . .	9	N	12	12	. . . . .	12	1	297	. . .
— 420	“ rising from chair, and putting on clothing . . . . .	12	S N	12	12	. . . . .	12	1	238	. . .
— 421	“ throwing handkerchief around shoulders . . . . .	12	S N	12	12	. . . . .	12	1	215	. . .
— 422	“ putting on shoes, and rising from chair . . . . .	3	D	9	9	. . . . .	. . . . .	1	495	. . .
— 423	“ “ boots, “ “ “ “ . . . . .	12	S N	12	12	. . . . .	12	1	285	. . .
— 424	“ rising from chair, and putting on shawl . . . . .	3	D	12	12	. . . . .	. . . . .	1	217	. . .

Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
425	Toilet; putting on dress and turning around . . .	7	N	8	..	..	..	8	1	322	..
426	" brushing her hair and walking off . . .	7	N	12	..	12	..	12	1	343	..
427	{ " two models, 1 disrobing 8 . . . . . }	1, 8	N	12	..	..	..	..	1	307	..
428	{ " " " 1 " " 8 . . . . . }	1, 8	N	..	12	..	..	12	1	307	..
429	" " " 1 " " 8 . . . . .	1, 8	N	6	8	..	..	8	1	470	..
430	" taking off clothing . . . . .	13	N	12	12	..	..	12	1	274	..
431	" " " " . . . . .	1	N	12	12	..	..	12	1	270	..
432	Washing clothes at tub . . . . .	8	N	12	12	..	..	12	1	235	..
433	Wringing clothes . . . . .	1	N	12	..	12	12	..	1	199	..
434	Hanging clothes on line . . . . .	8	N	12	12	..	..	12	1	244	..
435	Ironing clothes . . . . .	8	N	12	..	12	12	..	1	295	..
436	Making up a bed . . . . .	8	N	12	..	12	..	12	1	312	..
437	Setting down bucket and preparing to sweep . .	3	D	12	12	..	..	..	1	208	..
438	" " " " " scrub . . . . .	3	D	12	12	..	..	..	1	318	1
439	Spreading a rug on the floor . . . . .	8	N	12	..	12	12	..	1	339	..
440	Stooping, and rinsing tumbler . . . . .	4	N	10	..	10	..	10	1	252	..
441	Carrying vase and placing it on table . . . . .	8	N	12	..	12	..	12	1	221	..
442	Stooping, and rolling a stone on the ground . . .	7	N	12	..	12	..	12	1	164	..
443	Drinking from a goblet while standing . . . . .	8	N	8	..	8	..	8	1	264	..
444	Two models shaking hands and kissing each other	1, 8	N	8	..	8	8	..	1	154	..
445	Two models, 8 drinking from water-jar on the shoulder of 1 . . . . .	1, 8	N	12	..	12	12	..	1	350	..
446	Filling pitcher on the ground from water-jar . . .	7	N	11	..	11	..	11	1	300	..
447	Two models, 9 taking water-jar from shoulder of 10	9, 10	N	12	..	12	12	..	1	260	..
448	Two models, 11 descending stairs with goblet meets 10 with bouquet . . . . .	10, 11	N	11	..	11	..	..	1	229	..

449	Feeding a dog . . . . .	8	N	12	. .	12	. .	12	1	222	. .
450	Two models, 8 brings cup of tea, 1 takes cup and drinks . . . . .	1, 8	N	12	. .	. .	. .	. .	1	321	. .
451	Two models, 8 brings cup of tea, 1 takes cup and drinks . . . . .	1, 8	N	. .	12	. .	. .	12	1	321	. .
452	Two models, 8 kneels, drinks from water-jar in hands of 1, and both walk off . . . . .	1, 8	N	12	. .	. .	. .	. .	1	410	. .
453	Two models, 8 kneels, drinks from water-jar in hands of 1, and both walk off . . . . .	1, 8	N	. .	. .	12	12	. .	1	410	. .
454	Taking 12-lb. basket from head and placing it on the ground . . . . .	7	B F	10	. .	10	. .	10	1	211	20
455	Throwing self on heap of hay . . . . .	7	B F	9	. .	9	. .	9	1	230	. .
456	Raking hay . . . . .	7	D	12	. .	12	. .	12	1	215	. .
457	Stepping on chair, and reaching up . . . . .	3	D	12	12	. .	. .	. .	1	263	. .
458	Lifting handfuls of hay, turning, throwing it down	7	B F	10	. .	10	. .	10	1	212	. .
459	Stepping on chair, reaching up, and descending . .	1	T D	12	12	. .	. .	12	1	365	. .
460	Carrying jar on shoulder and basket in hand, and placing them on the ground . . . . .	7	B F	12	. .	12	. .	12	3-4	274	. .
461	Opening a parasol, and turning around . . . . .	12	T D	12	. .	12	12	. .	1	151	. .
462	Pouring libation on ground, drinking from goblet.	12	T D	12	. .	12	12	. .	1	332	. .
463	Reaching up, stooping, and turning around . . . .	7	T D	12	. .	12	. .	12	1	. .	2
464	Two models, 16 chasing 4 with a broom . . . . .	4, 16	D	16	. .	. .	. .	. .	1	81	. .
465	{ Two " child, 70 N, bringing bouquet to 12 }	70, 12	S N	12	. .	. .	. .	. .	1	291	. .
466	{ " " " 70 N, " " " 12 }	70, 12	S N	. .	12	. .	. .	12	1	291	. .
467	Child, walking . . . . .	7 <sup>2</sup>	N	12	. .	. .	12	. .	1	67	. .
468	" " " " " " " " " " " " " " " " " "	7 <sup>1</sup>	N	12	12	. .	. .	. .	1	85	. .
469	" running . . . . .	70	N	12	. .	. .	. .	. .	2	97	. .
470	" 70 N, running after a man . . . . .	5 <sup>1</sup>	D	12	. .	. .	. .	. .	1	57	1
471	" crawling on hands and knees . . . . .	70	N	12	12	. .	. .	12	2	169	. .
472	" " up-stairs . . . . .	70	N	12	. .	. .	. .	12	1	206	. .
473	" walking up-stairs . . . . .	70	N	12	. .	. .	12	. .	1	161	. .



Serial No.	MOVEMENTS.	Model.	Costume.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
					Front.		Rear.				
					90°	60°	90°	60°			
— 474	Child, walking up-stairs, kneeling, reaching for vase	70	N	12	..	..	..	12	1	348	..
— 475	“ getting up on chair . . . . .	70	N	8	..	..	8	8	1	260	23
— 476	“ sitting down on the ground . . . . .	72	N	12	..	..	12	..	1	105	..
— 477	“ stooping, lifting a goblet, and drinking . . .	70	N	8	8	..	..	8	1	335	..
— 478	“ sprinkling water over some flowers . . . .	70	N	8	8	..	..	8	1	..	4
— 479	“ getting up from the ground . . . . .	72	N	12	12	..	..	..	1	119	..
— 480	“ walking and crawling up-stairs . . . . .	70	N	12	..	..	..	12	1	208	..
— 481	“ lifting a doll, turning, and walking off . . .	70	D	12	..	..	..	..	1	182	1
— 482	A, walking; B, ascend'g stairs; C, ascend'g incline	7	N	36	..	..	..	..	..	..	2
— 483	A, lifting basket; B, running, waving handkerchief	3	D	20	..	..	..	..	..	..	2
— 484	A, sweeping; B, dusting a room . . . . .	3	D	20	..	..	..	..	..	..	2
— 485	Two models; A 10, standing and filling a goblet; B 11, drinking while lying on the ground . . .	10, 11	N	12	12	..	..	12	..	..	2
— 486	A, lawn tennis; B, ascending a step; C, descending a step; D, ascending a ladder . . . . .	102	N	44	..	..	..	..	..	..	2
— 487	A, ascending a step; B, lifting a handkerchief from the ground; C, walking; D, running . . . . .	1	D	28	2	2	2	2	..	..	2, 3
— 488	A, lawn tennis; B, dumb-bells; C, walking on hands; D, ascending stairs . . . . .	96	N	48	..	..	..	..	..	..	2
— 489	A, ascending incline; B, ascending incline with 50-lb. dumb-bell; C, descending incline; D, de- scending incline with 50-lb. dumb-bell . . . .	95	N	44	..	..	..	..	..	..	2
— 490	A, sitting down; B, sitting down; C, sprinkling water; D, stooping for cup and drinking . . . .	95	N	48	..	..	..	..	..	..	2
— 491	A, hammering at anvil; B, hammering at anvil; C, using hatchet; D, sawing a board . . . . .	95	N	40	..	..	..	..	..	..	2





ABNORMAL MOVEMENTS.

537	Single amputation of leg; hopping with crutches .	82	N	12	12	..	..	12	1	121	..
538	Double amputation of thighs; boy; A, moving forward; B, getting on chair; C, down from chair .	94	N	36	..	..	..	..	1	..	2
539	Infantile paralysis; child, walking on hands and feet	92	N	12	..	..	..	..	1	..	2
540	A, bow-legs; boy; B, spinal caries; girl, walking .	90, 91	N	24	..	..	..	..	1	..	2
541	Multiple cerebro-spinal sclerosis (choreic); walking	21	N	11	..	11	..	11	1	222	18
542	" " " walking . . . . .	17	S N	12	..	..	12	..	1	115	..
543	Spastic gait (hysterical); walking . . . . .	19	S N	12	..	..	12	..	1	157	..
544	Artificially-induced convulsions; A, B, C, while lying . . . . .	1	N	36	..	..	..	..	..	150	1
545	Artificially-induced convulsions; A, B, while sitting . . . . .	1	N	24	..	..	..	..	..	180	1
546	Locomotor ataxia; walking . . . . .	87	N	12	..	..	12	..	7-8	117	6
547	Hemiplegia; walking with crutch . . . . .	81	N	12	..	..	12	..	1-2	227	..
548	Lateral sclerosis; A, B, walking . . . . .	86	N	24	12	..	11	..	3-4	124	1, 6
549	Epilepsy; walking . . . . .	79	N	12	..	..	12	..	3-4	90	1
550	Locomotor ataxia; walking; A, arms down; B, arms up . . . . .	84	N	20	..	..	20	..	1	164	1
551	Epilepsy; walking . . . . .	78	N	12	12	..	..	..	2	214	..
552	Hemiplegia; walking with cane . . . . .	76	N	12	12	..	..	..	1	128	..
553	After traumatism of head; walking . . . . .	75	N	10	..	..	10	..	5-8	122	..
554	Locomotor ataxia; walking . . . . .	83	N	11	..	..	11	..	9-10	118	..
555	Muscular atrophy of legs; adult; A, B, walking .	89	N	24	..	..	..	..	1	124	1
556	Local chorea; A, B, while lying . . . . .	74	N	22	..	..	..	..	..	52	1
557	" " A, B, C, while standing . . . . .	74	N	36	..	..	..	..	..	48	1
558	Paraplegia; partial; walking . . . . .	80	N	12	..	..	12	..	11-2	87	..
559	Disseminated sclerosis; walking with cane . . .	88	N	12	12	..	..	12	7-8	..	2
560	Locomotor ataxia; walking . . . . .	85	S N	12	..	..	12	..	1	108	6
561	Hydrocephalus; walking . . . . .	77	N	12	12	..	..	..	1	213	..
562	Lateral curvature of spine; walking . . . . .	89	N	12	..	..	12	..	3-4	62	..



587	Walking; sulky; sorrel mare	Nellie Rose	12	12	1-2	54
588	" " bay horse	Reuben	12		5-8	32
589	Ambling (single foot); bareback; white horse	Clinton	12		1	52
590	Ambling (single foot); bareback; rider, 106, nude; white horse	Clinton	12		1	55
591	Racking (pacing); saddle; brown horse	Pronto	20		1	26
592	" " " " " "	"	12	12	1	51
593	" " " " " "	"	12	12	1	59
594	" " sulky; " " " "	"	12	12	1 1-2	74
595	" " " " " "	"	12	12	1 1-2	76
596	Trotting; free; light-gray horse	Eagle	12	12	3-4	45
597	" bareback; dark-gray Belgian horse	Hansel	20		3-4	35
598	" saddle; bay horse	Daisy	20		1	2
599	" bareback; dark-gray Belgian horse	Dusel		12	1-2	56
600	" " " " " "	"		12	1-2	52
601	" saddle; brown mare	Beauty	12	12	1	52
602	" bareback; rider, 43, nude; light-gray horse	Smith	12	12	3-4	43
603	" saddle; rider, 43, nude; light-gray horse	Smith	10	10	3-4	45 16
604	" saddle; white horse	Elberon		12	1	46 1
605	" sulky; bay horse	Reuben	12		1-2	51
606	" " " " " "	"	12		1-2	34
607	" " mare	Lizzie M.	24		5-8	17
608	" " sorrel mare	Flode Holden	24		5-8	23
609	" " bay mare	Lizzie M.	24		5-8	19
610	" " gray mare	Katydid	12	12	1 1-2	70
611	" " " " " "	"	12	12	1 1-4	52
612	" " bay horse	Dercum	12	12	3-4	47
613	" " sorrel mare	Nellie Rose		12	7-8	47
614	" " breaking to gallop; sorrel mare	Flode Holden	24			21

Serial No.	ANIMALS AND MOVEMENTS.		Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
				Front.		Rear.				
				90°	60°	90°	60°			
HORSES.										
615	Canter; bareback; dark-gray Belgian horse	Hansel	20	.	.	.	.	1	36	.
616	" saddle; bay horse	Daisy	24	.	.	.	.	1	.	2
617	" bareback; rider, 106, nude; white horse	Clinton	12	.	.	.	.	1	56	.
618	" saddle; brown horse	Middleton	12	12	.	.	.	1 1-4	67	.
619	" " " "	"	12	.	.	12	.	1 1-4	74	.
620	" " thoroughbred bay mare	Annie G.	12	.	.	12	.	1	49	.
621	" " " "	"	12	12	.	.	.	1	56	.
622	" " rider, 43, nude; gray horse	Smith	12	.	.	12	.	1	55	.
623	" bareback; rider, 43, nude; gray horse	"	12	.	.	12	.	1	51	.
624	Gallop; saddle; bay horse	Daisy	12	.	.	.	.	11-12	.	2
625	" thoroughbred bay horse	Bouquet	22	.	.	.	.	1	22	.
626	" " mare	Annie G.	16	.	.	.	.	1	31	.
627	" " " "	"	20	.	.	.	.	1	23	.
628	" bay horse	Daisy	20	.	.	.	.	3-4	.	2
629	" bareback; Belgian draught horse	Hansel	.	.	12	12	.	1 1-4	95	.
630	" saddle; gray mare	Pandora	.	.	12	12	.	1	42	.
631	" " thoroughbred bay horse	Bouquet	12	12	.	.	.	7-8	44	.
632	" " " "	"	12	12	.	.	.	3-4	33	.
633	" " " "	"	12	.	.	12	.	7-8	37	.
634	" " gray horse	Dan	.	.	8	8	.	1	64	.
635	" " mare	Pandora	.	.	12	12	.	1	42	.
636	Jumping a hurdle; saddle; preparing for the leap; bay horse	Daisy	20	.	.	.	.	.	.	2, 15
637	Jumping a hurdle; saddle; clearing, landing and recovering; bay horse	Daisy	20	.	.	.	.	.	.	2
638	Jumping a hurdle; saddle; bay horse	"	20	.	.	.	.	.	.	2

639	Jumping a hurdle; saddle; bay horse . . . . .	Daisy . . . . .	20					1		2
640	" " " " " " " " " " " "	" " " " " " " " " " " "	20					1		2
641	Jumping a hurdle; saddle; knocking over hurdle and landing; rider 105; gray mare . . . . .	Pandora . . . . .	12							64
642	Jumping a hurdle; saddle; rider, 105, nude; gray mare . . . . .	Pandora . . . . .	20					1		60
643	Jumping a hurdle; bareback; clearing and land- ing; rider, 105, nude; gray mare . . . . .	Pandora . . . . .	12							60
644	Jumping a hurdle; saddle; clearing and landing; knocking over hurdle; rider 105; gray mare . . . . .	Pandora . . . . .				8		8		149
645	Jumping a hurdle; saddle; clearing and landing; rider 105; gray mare . . . . .	Pandora . . . . .				8		8		155
646	Jumping a hurdle; saddle; rider, 105, nude; gray mare . . . . .	Pandora . . . . .				12		12	1	122
647	Jumping a hurdle; bareback; rider, 105, nude; gray mare . . . . .	Pandora . . . . .				12		12	1	120
648	Jumping over three horses; A, B; chestnut horse	Hornet . . . . .	24							2
649	A, Hornet, rocking; B, Eagle, rolling barrel, etc.	. . . . .	18							2
650	Walking with a bucket in mouth; light-gray horse . . . . .	Eagle . . . . .	12							73
651	A, bell ringing; B, teeter board; C, military drill	. . . . .	12							4
652	A, B, C, D, E, horses rearing, etc. . . . .	. . . . .	30							4
653	Walking; saddle; lame, right front foot; horse	Buckskin . . . . .	12				12		1	116
654	" " " " " " " " " " " "	" " " " " " " " " " " "	12	12					1	104
655	Walking; saddle; spavin, right hind leg; horse	Gazelle . . . . .	12				12		1	99
656	Walking; free; ossification of cartilage, right front foot; horse . . . . .	Bob . . . . .	12	12					1	101
657	Rolling a box; pony . . . . .	Lotta . . . . .	12						1	2



Serial No.	ANIMALS AND MOVEMENTS.		Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
				Front.		Rear.				
				90°	60°	90°	60°			
658	Mule; A, kicking; B, kicking . . . . .	Ruth . . . .	16	.	.	.	.	.	{ A, 62 B, 65	1
659	" A, B, bucking and kicking . . . . .	Ruth . . . .	16	.	.	.	.	.	{ A, 91 B, 90	1
660	" miscellaneous performances . . . . .	Denver . . . .	26	.	.	.	.	.	.	4
661	" A, B, a refractory animal . . . . .	Ruth . . . .	24	.	.	.	.	.	.	2
662	" A, B, " " . . . . .	Denver . . . .	24	.	.	.	.	.	.	2
663	" A, B, " " . . . . .	" . . . .	24	.	.	.	.	.	.	2
664	" various performances; at a table, etc. . . . .	" . . . .	30	.	.	.	.	.	.	4
665	Ass; walking; bareback; a boy riding . . . . .	Jennie . . . .	12	.	.	.	.	1	94	.
666	" " saddle; a girl riding . . . . .	Zoo . . . .	20	.	.	.	.	1-2	36	.
667	" " " a boy " . . . . .	" . . . .	12	.	.	12	.	1	82	.
668	" ambling; irregular; saddle; a boy riding . . . . .	" . . . .	8	.	.	8	.	1	87	.
669	Ox; walking . . . . .	.	16	.	.	.	.	1-2	48	.
670	" " " " . . . . .	.	12	12	.	.	.	3-4	123	.
671	" " " " . . . . .	.	12	.	.	12	.	5-8	115	.
672	" trotting . . . . .	.	16	.	.	.	.	1	56	.
673	Sow; walking . . . . .	.	12	12	.	.	.	1	77	.
674	" " " " . . . . .	.	12	.	.	12	.	5-8	67	.
675	" trotting . . . . .	.	16	.	.	.	.	1	31	.
676	Goat; walking . . . . .	.	16	.	.	.	.	1-2	43	.
677	" " in sulky . . . . .	.	12	12	.	.	.	3-4	51	.
678	" trotting, in sulky . . . . .	.	12	12	.	.	.	1	44	.
679	" galloping . . . . .	.	24	.	.	.	.	1 1-4	29	.
680	Orex; galloping . . . . .	.	10	.	.	.	.	1-2	.	.
681	Virginia deer; (no antlers;) buck; walking, startled to a gallop . . . . .	.	12	.	.	12	.	.	59	.

[illegible]



737	Bactrian camel; walking	16					1-2	57	
738	" " racking	16					3-4	37	
739	" " galloping	20					1	29	
740	" " (young), galloping	20					1	32	
741	" " A, walking; B, racking				24		{	A, 91	
								B, 58	
742	" " A, racking; B, galloping				24		{	A, 183	
								B, 39	
743	Guanaco; galloping	12							2
744	Raccoon; walking; change to galloping	24						32	
745	" " and turning around	20						32	
746	Capybara; walking		9				1-2		2
747	Baboon; walking on all-fours	16					1	45	1
748	" " " "	24					1 1-2	42	
749	" climbing a pole	12					3-4	41	1
750	Sloth; walking suspended on a horizontal pole	12					3-4		2
751	Kangaroo; walking on all-fours; change to jumping	11							2
752	" jumping	12					1	69	
753	" " "	12					1	64	
754	" " "		12				1	66	
BIRDS AND MOVEMENTS.									
W— 755	Pigeon; flying	12	12				1 3-4	19	
756	" " "	12	12				2	21	
757	" " "	12			12		1 1-2	20	
W— 758	Cockatoo; flying	24					2	28	
759	" " "	24					2	17	
760	" " "			20			1 1-2	16	
761	" " "			16			1 1-2	24	
762	" " "			12			3	75	
763	Red-tailed hawk; flying	24					2 1-2	19	

Serial No.	BIRDS AND MOVEMENTS.	Laterals.	Foreshortenings.				Quantity.	Time.	Notes.
			Front.		Rear.				
			90°	60°	90°	60°			
764	Fish hawk; flying . . . . .	10	10				2	58	
765	Vulture; flying . . . . .	24					1 1-4	19	
766	" " . . . . .	24					2 1-4	34	
767	" " . . . . .	12		12			1 1-4	40	
768	" " . . . . .	12			12		1 1-4	40	
769	American eagle; flying . . . . .	10	10				1	40	
770	" " " near the ground . . . . .	24					2	21	
771	" " " " " . . . . .			24			1 1-2	19	
772	Ostrich; walking . . . . .	12			12		1	91	
773	" running . . . . .	12			12		3-4	52	
774	Adjutant; walking . . . . .	12					5-8		2
775	" flying run . . . . .	10					1-2		2
776	Storks; swans, etc., A, B, C . . . . .	18							2
777	" etc., A, B, C, D. . . . .	24							2
778	" " A, B, C . . . . .	15							2
779	" swans, etc. . . . .	12							7
780	" " " . . . . .	12							7
781	Chickens; scared by torpedo . . . . .			12		12			2