Notes on Hereditary Statistics, Measurement and Population

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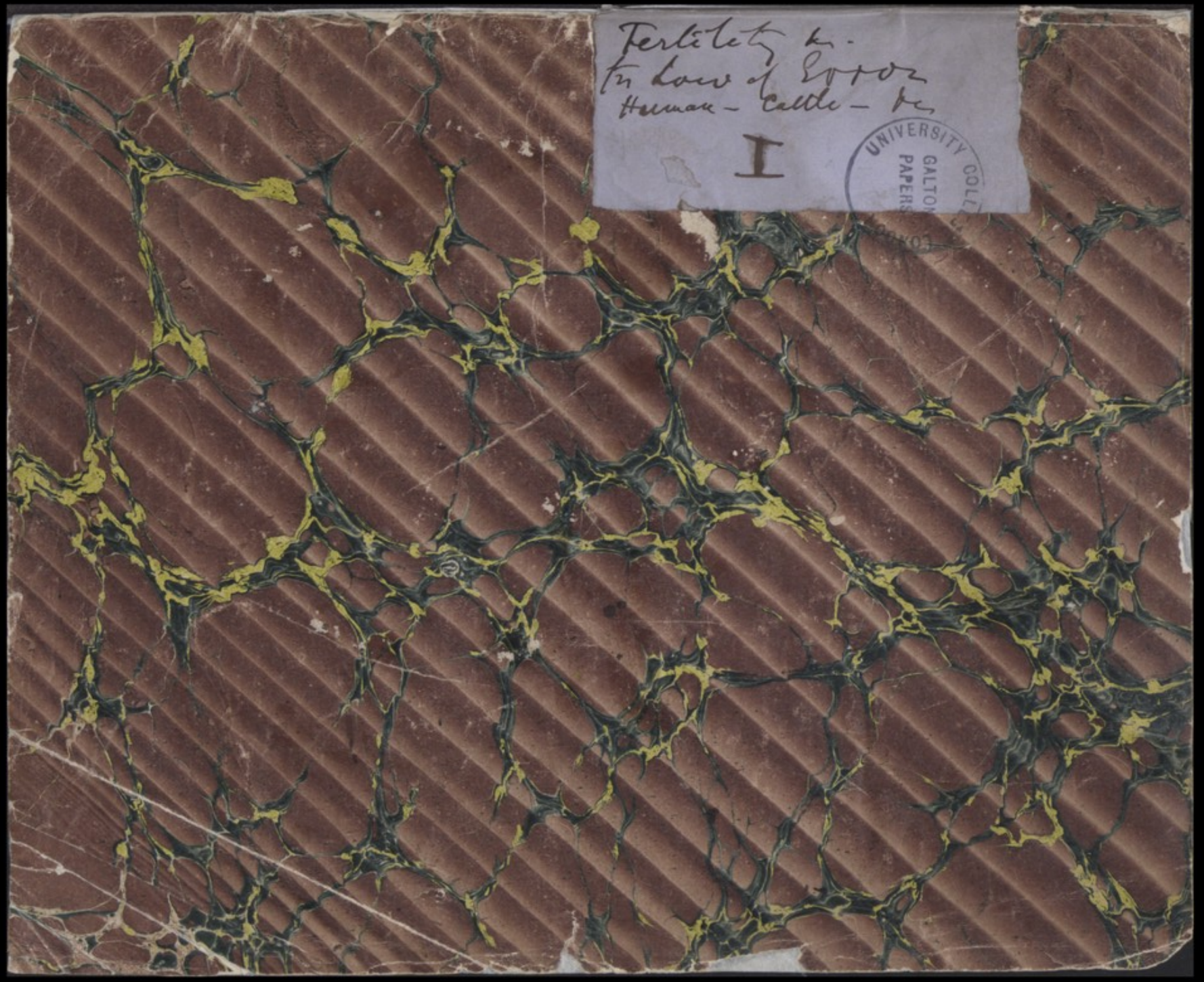

Fertility &c.
In Love of Labor
Human - Cattle - &c
I
UNIVERSITY COLL
GALTON
PAPERS

La couveuse Lion Bull: Acad Med Nov 27/93

largely in use at Nice, is an incubator in which children are put who are born prematurely & are kept at a high temp:

Quæres (1) What publications give a trustworthy account of the success of such treatment?

(2) Is the practice of artificially hastening delivery common, as alleged to be, in France?

(3) If so, what is the ascertained effect on the health of the mother?

Where, otherwise than in Reed 1877 or thereabouts, can I find a list of births, each due to a single night of cohabitation, combined with the no. of days after the cessation of the menstruation, when the cohabitation took place.

Francis Galton
42 Rutland Gate S.W.
May 30/94

Barnes Obstet: Operations

The previously recommended (see below) elastic cath: over night. next morn: accelerating measures (Churchill) 1876.

Parvin. Science & art of Obstetrics
Edinburgh 1887
p. 603 "Krause's method 1855 of elast cath between membranes of the ovum and the uterine wall is certain & in general recommended" — "described in detail" — He quotes Barnes on the moral reasons involved

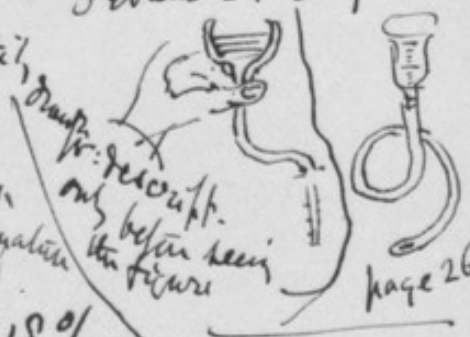
Budin Clinique Obstetricale

Paris — (O. Doin . 8. R. Odeon 1889)

References Tarnier et Budin Traité de l'art des accouchements p. 254
II. chap 22 — also Albertineau ... des nouveau-nés by Tarnier, Chantreuil et Budin — also Berthod, la couveuse et le Gavage à la maternité de Paris 1887

246. the first couveuse installed at la maternité [Paris] was in 1880
it is old fashioned now at date now. Tarnier greatly improved
the pattern in 1883 — Excellent results published by Auvard.
there is a squabble about priority of the idea, sometimes of
the same kind have previously been used at Leipsig
& at Moscow — 259 refers to Tristram Shandy,

263 If the children can't suck they must be fed by
pouring milk into mouth from spoon. — or by 'gavage'
which is injecting milk into the stomach as first suggested
by D. Marchant in 1851 & practised from 1860 onwards.
a small sort of funnel stomach pump is used by M. Tarnier, which
acts merely by gravity (not by a piston) 3 ounces every hour
for a weak child is a reasonable quantity



page 264

267 when mother's pelvis is small
it is the German plan to make a Cæsarean
operation — in France to provoke premature
delivery. Which is best is much discussed.

268. mortality of mother by Cæs: Fr = 18%
by premature = 100%
is it not

"nothing is more easy than to provoke premature
confinement"

the children fate with couveuse and gavage is
at 6 months. 22% are saved
7 38%
8 89%
8½ 95%

according to la Torre du developt.
du fœtus chez les femmes à
bassin vicié Paris 1887 p. 130

Farnier Art. des Accouchements
Paris (Lauverevgas) 1882

p. 176 a section on "de la fécondation artificielle".

First attempt in animals was by Spallanzani (1780) — It was in a bitch & successful — 16 months after Pierre Rossi of Pisa repeated the experiment, also with success. Hunter first advised it for the human species in a case where the man had hypospadias, this also was successful. Then the matter dropped until recently.

Dr. Girault of Paris from 1837 onwards tried it on 40 subjects; 12 times successfully — usually done to 4 days after cessation of menses or a few days before. Sometimes she made as many as 10 injections — Afterwards 10 months usually the women got tired of it after 3. (description follows)

Marion Sims of New York has tried

(turn over)

used it on 6 women & succeeded once
Accounts follow of apparatus by
Rorbaud – Courty – Prof. Pajot –

p 179 "Whatever process is employed
it seems to us useful that the ~~extremity~~ end
of the Canula or the sound should
be pushed beyond the internal
orifice of the col" [ie of the os tincæ see before.]

Same book
Size of Spermatozoa & drawings thereof
magnified 750 times whence it
appears that those of the pig, bull,
sheep, horse, hare, ~~rat~~ and man
are all of the same size. As regards
the rat the head is the same size but
the body is some 4 times as long.

Continued

Tapeworm (continued)

166 The number of S/t:Z is very variable depending on the individual & on the conditions — their entire absence in some men of good constitution and great vigour is not rare.

When left to themselves it is rare that the S/t Z retain their movements beyond 24 hours. In the female dogs they live much longer Bischoff, Prévost & Dumas have found them in the bitch 7 to 8 days after coït. In the cow they have been found 6 days In the human female D:S. N Percy & Alex Gord have found them 8 days after last coït in a woman who submitted to the experiment. Godart examining the sperm of an executed man found them living 62 hours after decapitation

(And more information is given

Liquors slightly alcaline increase their vitality — do the menstrual flux. Acids or alcoholics paralyse them.

F. 6r 1

Reid, duration of Pregnancy. Lancet 150 Vol 2 77.

(Memoires Acad Royale des Sciences 1817 tom II pt I.)

Tessier & Earl Spencer proved by extensive statistical tables that a definite period of gestation for animals, is totally opposed to facts. Tessier analyses ~~1000 cows~~ 2136 animals ~~and mares~~. Lord Spencer in Journal Agricultural Society - ? - when) 764 cows. most trustworthy. Dr Collins read a paper on this before the Royal Dublin Society - The male parent has influence.

No of 1st	began	Catamenia ~~ended~~	coitus date?	~~confinement~~ ~~date~~	remarks.
1			July 27 only	·	

Montgomery Signs of Pregnancy Longman 1856

Authority	No. of case	Catamenia days before coitus	Catamenia ended	Coitus dated	Parturition date of	days from coitus	Remarks
Reid	1			July 27 only	April 30	276	
	2	4 to 6	March 14	March 18 & 20	Dec 20	274	
	3	0	Dec 13	Dec 13	Sep 13	274	
	4	2	Nov 6	Nov 18	Aug 20	275	
	5	5	Nov 7	Nov 12	Aug 12	273	
	6	23	Jan 10	Feb 2	Oct 31	271	
	7		~~Nov 15~~	Nov 15	Aug 16	274	
	8		~~June 15~~	~~July 1~~ Oct 18	~~April 5~~ July 19	278/271	
	9	17	June 15	July 1	April 5	278	
	10			Aug 5	April 25	263	
	11	2	Aug 4	Aug 6	May 13	280	
	12	2	Aug 9	Aug 11	May 2	264	
	13			Oct 29	July 30	274	
	14	11	Nov 7	Nov 18	Aug 21	276	
	15		~~Oct 8~~	Oct 8	July 9	274	
	16			April 6	Jan 7	276	
	17	3	Aug 15	Aug 18	May 25	280	
	18	5	July 17	July 22	April 15	266	
	19	1	Jan 9	Jan 10	Oct 2	265	
	20		[illegible]	Feb 11	Nov 3	266	
	21	0	May 14	May 14	Feb 10	272	
	22			Feb 28	Nov 30	275	
	23			Feb 9	Nov 6	271	
	24	7	Mar 5	Mar 12	Dec 24	287	This is perfectly well authenticated – a long story is given.
	25	5 to 7	Sept 10	Sep 15, 16, 17	July 5	292 or 293	This also. child quite like its father

These are all collected by Reid & he affirms their perfect trustworthiness

Authority	No of Case	Catamenia began	Catamenia ended	Coitus date of	Parturition date of	days since coitus	Remarks
Dr Lockwood		apparently 2 days before catamenia		May 31 or later	Mar 1	274	Husband arrived home May 31. Catamenia expected June 2 but did not come.
Dr Montgomery p. 500 2nd edition Montgomery p. 500 not quoted by Reid since his article		Oct 18		Nov 10	Aug 17	280	"
				Aug 4–8 (marked Aug 6)	May 14	279–284	
						260	
Dr Reid						264	"
						276	
						270	
Dr Lockwood American Journal see 1844						292	
						296	
						284	"
Am Jour Med Sc. Ap 1842						272	
Anderson versus Whitaker						283	
Desormeaux						at least 287	a mad woman in asylum by good care of calendar month = 14 days
Dr Dewees Philadelphia						286	9 months & 13 days
Dr Beatty Dub. Med Jour						291	
Mr Skey caesarian op						293	

Don't quote Montgomery further on, because his 2nd edition contains 56 cases.

These seem all in Montgomery's 2nd edition

From Montgomery's table 2nd Edition
Signs of Pregnancy Longman 1856

Table in p 566 includes 56 cases 1 week known 253 days known which contain the cases extracted by Reid from other authors (the dates so far as they exist from their) but not the 25 collected by Reid himself. (see also p 568)

The interval between date of coition & parturition was

242 1, 258 2, ~~270~~, 263 1, 265 1, 267 4, 268 1, 269 2, 272 1, 273 2,

274 2, 275 2, (? exact day) 276 1, 277 2, 278 2, (? 279 5, 280 6, 281 1,

283 2, 284 1, 285 1, 286 1, 287 3, 288 1, 290 1, 291 2, 292 2, 293 2,

(1 ½ weeks) 297 2, 302 1

p. 568

Putting Reid's & Montgomery cases together

(interval between coition & parturition)

Period	Dr. Reid	Dr. Montgomery	Total	per Cent	age of woman calculated ½
35th week		1	1	1.24	
36th		—	—	0.00	1
37		2	2	2.48	
38	4	2	6	7.40	~~38~~
39	5	10	15	18.50	31
40	14	22	36	44.45	30
41	1	9	10	12.34	
42	1	8	9	11.11	
43		2	2	2.48	
	25	56	81	100.—	

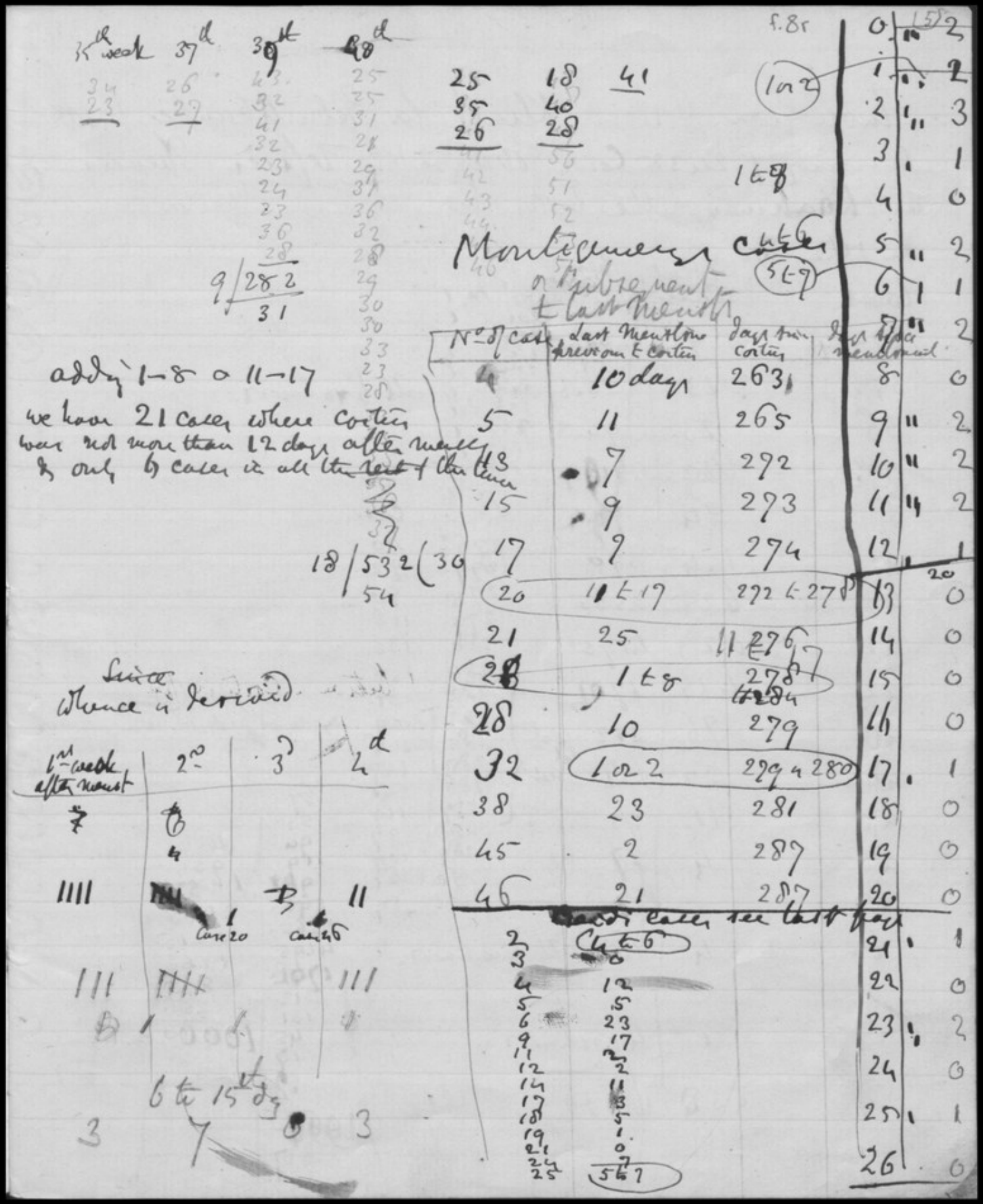


Table from Hecker Klinik der Geburtskunde I. 108
Summary of 2438 Cases observed by Tessier Spencer
and Krahmer the latter being twice as numerous as
the other two

Week	Total Cases	Per 1000
27–34	9	3.7
35	13	5.3
36	23	9.4
37	20	8.2
38	24	9.8
39	144	59.0
40	625	256.5
41	1023	419.5
42	415	170.2
43	76	31.2
44	32	13.1
45	11	4.5
46	4	1.7
47	5	2.1
48	4	1.6
⋮		
51	1	4 Krahmer
	2438	10000
	36	

Days	Cases
181	1
205	1
214	1
219	1
223	1
227	1
232	1
235	1
237	1
239	3
276	90
277	92
278	90
279	118
280	130
281	158
282	131
283	159
284	168
285	147
286	141
287	119
288	97
289	109
290	84
291	54

all Krahmer

most probable term

37		
53.		
94.	486	
119	959	
992	1455	
590.	2455	
2565.	2215	
4195	1266	
1702.	805	
312	256	
131	10000	
45		
19		
2		
4		
10000		
2		

From Monthly Journal of Medical Science July 1853 71/55

F.95

Dates of delivery calculated from last day of Catamenia

weeks	days	Med. Chi Trans. XIII p 340 Merriman	Report of Obst: pract of Univ. Coll: Murphy	Lancet 1850 Vol. ii. Reid	per 10.000	Total Fig
37th	from 252 to 259	3	12	23	486	38
38	260 – 265	13	14	48	959	75
39	269 – 273	14	27	81	1558	122
40	274 – 280	33	28	131	2455	192
41	281 – 287	22	39	112	2215	173
42	288 – 294	15	21	63	1266	99
43	295 – 301	10	25	28	805	63
44	312 – 326	4	2	14	256	20
upwards					9724	
~~number of cases~~		114	168	500		782 total

more Reid's cases are given in detail in the Lancet but this way of combining them seems most suitable & exactly fair to the collection

Period of Gestation in Cows p. 57

weeks		Lord Spencer	Tessier	Total Fig
37	? as to this see Hecker and above I think.	12	6	18
38		4	8	12
39		21	51	72
40	as above	124	166	288
41		392	202	594
42		175	105	280
43		16	27	43
44		7	7	14
upwards		751	572	1323

Rule the ~~respective~~ chances of impregnation by one act on the r^{th} & the n^{th} night ~~after~~ before bedding: is as $\frac{r}{400}$ & $\frac{n}{400}$

It follows from Johnston table - on the reasonable supposition that there was nothing in these cases to make the coition more likely to take place in one part of the 'inter-menses' than another, that a single act of coition is four times as likely to impregnate up to the 11th day after the menses than during all the rest of the period - allow 5 days that is from 12th to 23 inclusive, or the other half of the month.

12th to 20th inclusive 9 days only but M( ) runs from 11th to 17th also N. 2 from 4 to 6

28

$1+2+\ldots+28 = S$

$28+27+\ldots+1 = S$

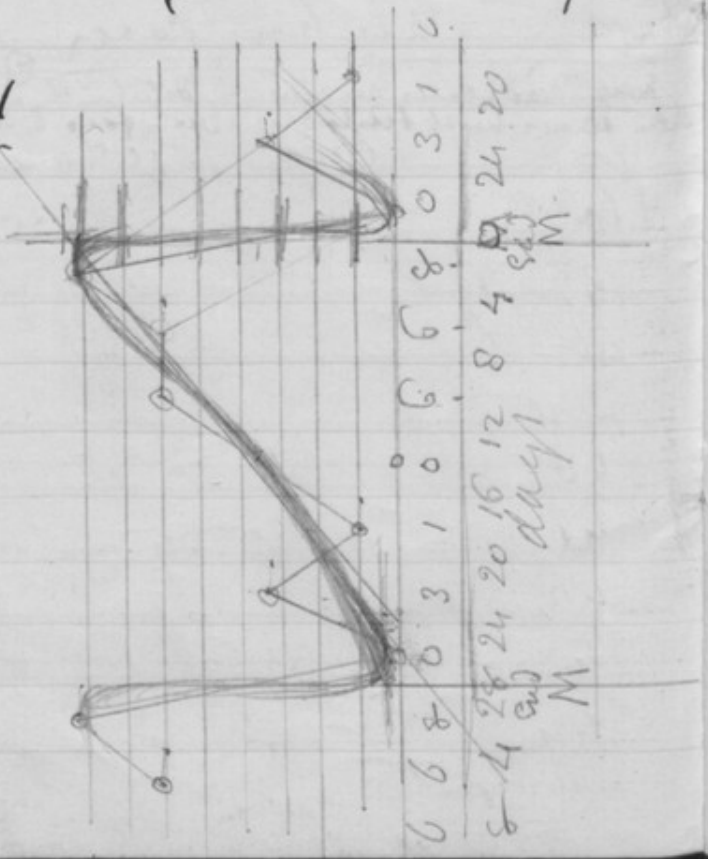
$28 \times 29 = 2S$

$S = \frac{14 \times 29}{2}$

$\frac{14}{116}$

$\frac{29}{406}$

Say 400

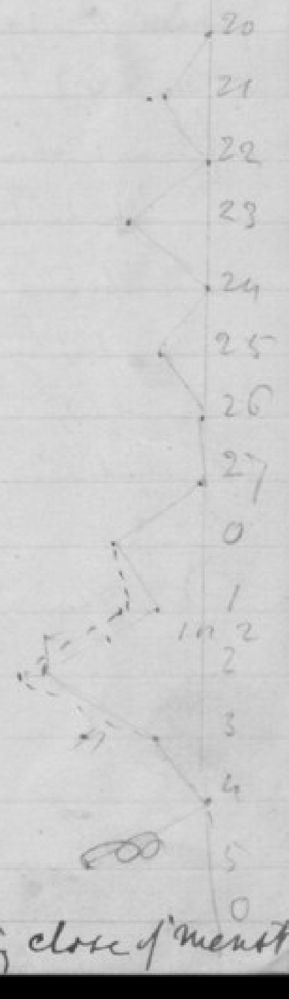


M Montgomery   R Reid – No of case in brackets (9

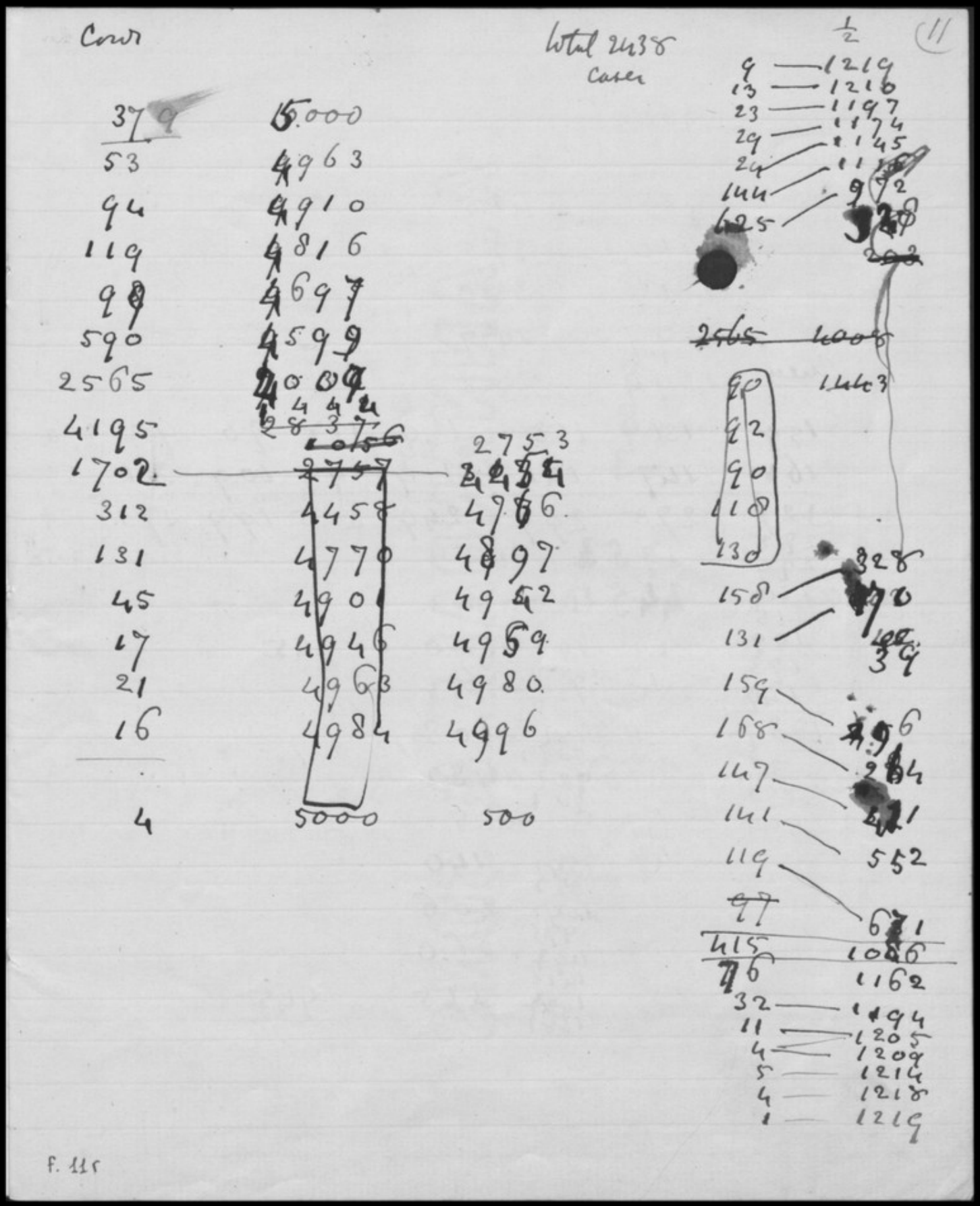
F.10r

Group	Coitus days since last mensh	Number of cases		Cases
7	0	2		(R3) 274 (R21) 272
	1 (also)	1		(R19) 265
	2	4	8	(M45) 287 (R4) 275 (R11) 280 (R12) 264
4	3	1		(R17) 280
	4	0	4	
	5	3		(R2) 274 ([illegible] 4th), (R5) 273 (R18) 266
3	6	~~1~~	6	R(25) 292 or 293.
	7	2		(M13) 272 (R24) 287
	8			
6	9	2		(M15) 273 (M17) 274
	10	2	6	(M4) 263 (M28) 279
	11	2		(M5) 265 (R14) 276
0	12			~~(M13~~
	13		0 added	
	14			
	15			
1	16			
	17	1	1	(R9) 278
0	18			
	19			
	20			
3	21	1	3	(M46) 287
	22			
	23	2		(M38) 281 (Rh) 271
1	24			
	25	1	1	(M21) 276 +1 between 1 & 2, +1 between 11 & 17
	26, 27	0		

25 Cases of which 4 fifths are in the 11 days succeeding close of menstr.



37	5000		
3	4963	42.5	5
94	4910	37.5	4
119	4816	33.0	3.3
98	4697	29.7	2 9
590	4598	26.8	6 5
2565	4008	20.3	14 4
	1443	5.9	Mean
~~4195~~			
4105	2752	11.8	13.4
1702	1050	25.2	6.3
312	4766	31.5	4.1
131	4897	36.6	3.4
45	4942	40.0	2.0
17	4959	42.0	3,5
21	4980	45.5	7.5
16	4996	53.0	
4	5000		
8			


Cour
Total 2438
cases
½
11
F. 11r

Neue

159	131	158	130	118	90	92	90
168	147	141	119	97	109	81	59
327	278	299	249	215	199	173	149

Jag 150

327
278
299
249
215
199
173
149
1889
Jag 150 — 56
1890
945

159 } 290
131 }
158 } 288
130 }
118 } 208
90 }
92 } 182
90 }

159 } 140
81 }
109 } 206
97 }
119 } 260
141 }
147 } 315
168 }

945

9	1219
13	1210
23	1197
29	1174
24	1145
144	1121
625	977
158	352
131	194
159	63
168	298
147	264
141	552
119	671
415	1086
76	1162
32	1194
11	1205
4	1209
5	1214
4	1218
1	1219

41st week

mean, between 283 & 284 th day
a nearer the latter
therefore th 284th day
or middle of 41st week
may fairly be accepted

total cases 2438

Hecker & Babl. p. 7 Leipzig 1867
First appearance of menses in 1348 cases

in 11th year	by 1 person
12	12
13	45
14	107
15	200
16	235
17	210
18	202
19	163
20	114
21	35
22	14
23	7
24	3

Extracted from Verh. Jahrg. 1883. Verhandl. der Gesellschaft für Geburtshülfe Berlin vol 7. 1883.

Puerperium	164 cases
27th day	2
28	1
29	8
30	61
31	47
32	25
33	17
34	1
35	1

mean 31.3

	Sheele Tebrin	1052 Krahmer	Total
145	—	2	2
146	2	3	5
147	15	11	26
148	36	14	50
149	87	38	125
150	142	44	186
151	175	31	206
152	183	18	201
153	176	7	183
154	60	3	63
155	24	1	25
156	7	—	7
157	5	—	5
158	—	—	—
159	—	1	1
166	—	1	1
168	—	1	1
169	—	1	1
171	—	1	1

mean 1 Tebrin 151. 4/24
" " Krahmer 150. 1/4
total 151.3

In these tables that follow only well grown calves are counted and all of L. Spencer before the 242 day are eliminated because he showed on that day, he then saw a full grown calf of a younger age.

day	Fessier	Spencer	Krahmer	Total
183			1	1
206			1	1
214			1	1
219			1	1
223			1	1
227			1	1
232			1	1
235			1	1
237			1	1
238	—	—	—	—
239			3	3

day	Tessin	Spencer	Knabmer	Total	
240	1	—	2	3	} 3
241	—	—	—	—	
242		1	1	2	} 3
243	—	—	1	1	
244	1	—	1	2	} 4
245	—	2	—	2	
246	—	2	1	3	} 5
247	1	—	1	2	
248	—	1	6	7	} 8
249	—	—	1	1	
250	—	1	4	5	} 7
251	—	—	2	2	
252	—	2	1	3	} 7
253	1	1	2	4	
254	—	1	1	2	} 5
255	—	2	1	3	
256	—	—	3	3	} 8
257	1	2	2	5	
258	3	3	1	7	} 12
259	1	1	3	5	
260	1	—	3	4	} 8
261	2	—	2	4	
262	1	1	1	3	16

day	Jeffries	Spencer	Krahmer	Total
263	1	2	—	3
264	—	—	3	3
265	—	—	—	—
266	3	1	3	7
267	1	—	10	11
268	2	2	3	7
269	1	2	3	6
270	12	5	7	24
271	7	6	17	30
272	18	3	13	34
273	10	3	19	32
274	18	5	31	54
275	12	5	34	51
276	20	15	55	90
277	33	14	45	92
278	27	18	45	90
279	29	32	57	118
280	27	35	68	130
281	38	39	81	158
282	29	47	55	131
283	22	54	83	159
284	32	66	70	168
285	22	74	51	147
286	35	60	46	141

day	Jeffreis	Spencer	Krahmer	Total
287	24	52	43	119 } 260
288	23	42	32	97 } 206
289	19	45	45	109
290	19	23	19	61 } 120
291	14	31	14	59
292	12	16	8	36 } 65
293	9	10	10	29
294	9	8	7	24 } 45
295	8	7	6	21
296	3	6	8	17 } 28
297	3	2	6	11
298	6	—	2	8 } 16
299	4	1	3	8
300	1	—	5	6 } 11
301	2	—	3	5
302	1	—	5	6 } 10
303	—	—	4	4
304	1	1	2	4 } 4
305	—	1	1	2
306	2	3	5	10 } 13
307	1	1	1	3
308	—	—	3	3 } 9
309	1	—	5	6
310	—	—	2	2

f. 15r

Day	Tepries	Spencer	Krahmer	Total
311	—	—	—	—
312	—	—	1	1
313	—	1	1	2
317	—	—	1	1
318	—	—	1	1
321	1	—	1	2
323	—	—	1	1
324	—	—	1	1
325	—	—	1	1
326	—	—	2	2
332	—	—	1	1
333	—	—	1	1
334	—	—	1	1
335	—	—	1	1
356	—	—	1	1
Means	282.2	283.0	282.0	283

(Jeftrei) Hoppes mares

week	
41	1
42	–
43	1
44	–
45	2
46	3
47	16
48	68
49	64
50	62
51	27
52	16
53	8
54	2
55	2
56	3
57	1
58	–
59	1
	277

Day since coitus	Women need assistance	Maintenance exclusive of need	Total	Day	Need	Members	Total
242		1	1	281	—	1 (1)	2
258		2	2	282	—	—	—
259		—	—	283	—	2	2
260		—	—	284	—	1	1
261		—	—	285	—	1	1
262		—	—	286	—	1	1
263	1	1	2	287	1	3	4
264	1	—	1	288	—	1	1
265	2	1	3	289	—	—	—
266	—	—	—	290	—	1	1
267	1	4	5	291	—	2	2
268	—	1	1	292 (1)	—	1	2
269	—	2	2	293	—	2	2
270	1	—	1	294 and above		3	3
271	1	—	1				
272	1	1	2	Total	25	54	81
273	1	2	3				
274	5	2	7				
275	2	2	4				
276	2 + 1	1	4				
277	2	2	5				
278	1	2	3				
279	—	4	4				
280	2	7	9				

f. 16v

Since last menstruation - when Cederschöld counted from the beginning 84 days had been added this date, at the mean duration of menses

Day	Reid	Merriam	Cederschöld	Total	Day	Reid	Merr:	Cederschöld	total
248	—	—	3	3	271	12	2	1	15
249	-	—	3	3	272	13	2	2	17
250	—	—	2	2	273	16	3	5	24
251	—	—	1	1	274	21	4	3	28
252	4	—	1	5	275	20	2	10	32
253	1	—	1	2	276	16	4	4	24
254	3	—	1	4	277	16	8	3	27
254	1	1	1	3	278	22	3	9	34
256	2	1	—	3	279	21	3	5	29
257	4	—	1	5	280	15	9	4	28
258	4	—	—	4	281	15	5	3	26
259	4	1	1	6	282	25	2	6	33
260	6	—	—	6	283	14	6	8	28
261	5	—	3	8	284	15	1	4	20
262	3	2	—	5	285	14	4	3	21
263	9	2	2	13	286	15	3	6	24
264	10	4	2	16	287	11	1	3	15
265	5	1	2	8	288	17	5	6	28
266	10	4	2	16	289	8	2	5	15
267	9	1	5	15	290	9	2	3	14
268	13	1	3	17	291	14	—	1	15
269	5	4	3	12	292	6	4	2	12
270	13	1	3	17	293	3	2	1	6

f. 17v

(Veit)

	Reid	Merrin	Cadesh	Total	
294	6	—	2	8	
295	2	1	1	4	
296	5	2	1	8	He enters into the
297	8	2	—	10	question how far
298	6	4	—	10	the 28 dy or other dy
299	1	—	—	1	type of menstruation may
300	2	—	—	2	affect gestation — not
301	4	1	—	5	much reference.
302	1	—	1	2	
303	1	1	—	2	
304	2	—	1	3	
305	1	1	—	2	
306	—	2	—	2	
307	1	—	—	1	
308	2	—	—	2	
309	—	—	—	—	
310	1	—	—	1	
311	1	—	—	1	
312	—	—	—	—	
313	—	—	—	—	
314	1	—	—	1	
315	2	—	—	2	
316	1	—	—	1	Total cases 757.
Mean	278.5	280	296	278.5	

II Cows — Ld Spencer having been advanced 3 days

	Cases observed 2468	Proportion per 1000		Rank of Scaled precision		2291 cases ignoring outsiders proportion per 1000	Scale of precision
left them ~~before~~ 244 days	95	39	500				48.90
66-7	24	10	461	28			43.40
68-9	18	7	451	26	2		38.10
70-1	51	21	444	25	1		32.80
72-3	80	32	423	22.5	2.5		27.50
74-5	127	51	391	19.5	3		22.20
76-7	220	89	340	15.3	4.2		16.90
78-9	244	99	251	10.5	4.8		11.60
80-1	334	135	152	6.3	4.2		6.30
82-3	353	143	017 / 126	5.0	5.7 / 5.1		0.75 1.00 / 4.50 5.30
84-5	269	109	235	10.0	5		9.75 10.60
86-7	216	88	323	14.5	4.5		15.00 15.90
88-9	166	67	390	19.5	5.0		20.25 21.20
90-1	84	34	424	22.6	3.1		25.50 26.50
92-3	52	21	445	25.2	2.6		30.75 31.80
94-5	32	13	458	27.5	2.3		36. 37.10
96-7	21	9	467	29	1.5		42.40
made them 97 days	82	33	500				47.70
							53.00

95
82
177
2468
2291 cases between 266 & 297 days (inclusive)

F. 18 v

Cows (summed simply) I (II is the following page) 27

264-265	4	2 -	500				
266-267	18	8 -	498	46		43.5	497
268-269	13	6 -	490	37	6.0	38.5	492
270-271	54	23	484	34	3.0	33.5	483
272-273	66	29	461	28	6.0	28.5	453
274-275	109	47	432	24	4.0	23.5	435
276-277	182	79	385	19	5.0	18.5	377
278-279	208	90	306	13.5	5.5	13.5	302
280-281	288	125	216	9	4.5	8.5	210
282-283	290	126	{ 91 / 935	3.7 / 1.4	5.3 / 5.31 / 1.56	3.5 / 1.5 36,5	87 / 37
284-285	315	136	271	7	5.5	6.5 5.	159
286-287	260	113 -	284	12.5		11.5	266
288-289	206	89	373	18.	5.5	16.5	351
290-291	120	52	425	23	5	21.5	409
292-293	65	28	453	26.5	3.5	26.5	453
294-295	45	19 +	472	30	3.5	31.5	473
296-297	28	12	484	34	4	36.5	489
298-299	16	7	491	38	4	41.5	496
300-301	11	5	496	42	4	46.5	498
302-303	10	4	500		18/35 (4.7	51.5	499
	2308	1000 / 611					

18/35 (4.7
72
130
126

7/36,5
5,2

try 5

f. 19r

		Observed (+43)	Calculated 2		
	Mean 268	10	5		
68		8	11		
	30			33	$+\frac{3}{30} = +9$. percent
70		22	22		
72		35	39		
	90			102	$+\frac{12}{102} = +12.11$
74		55	63		
76		97	90		
	204			201	$-\frac{3}{201} = 1.5$.
78		107	111		
80		146	131		
	300			292	$-\frac{8}{300} = 2.7$
82		154	161		
84		117	112		
	213			206	$+\frac{3}{216} = 3.0$
86		94	94		
88		73	68		
	116			111	$+\frac{1}{111} = 1.$
90		37	43		
92		23	25		
	37			37	0 $\quad$ 0
94		14	12		
	Mean 295 days	9	6		
		4	3		
		90	1		

$82 : k :: 2291 : 1000$

$k = 2291 \overline{)82000} \; (36$
$\quad\quad 6873$
$\quad\quad 14276$

$2291 \overline{)98000} \; (43$
$\quad 9164$
$\quad 6360$

268
296
28

∴ during the middle month (28 days) the law of error holds very well beyond it on either side it does not

$84 : 126 :: 13 : x$

$\frac{13}{348}$
$\frac{126}{1008} \; (2$

$84 \mid 35 \; (2$
$\quad 13$
$\quad 105$
$\quad 35$

$21 : 35 :: 13 : x$

$21 \overline{)455} \; (22$
$\quad 22$
$\quad 35$

654
1786
2440

F. 19v

See back page
Table II Cont.

		Proportion per 1000			Rank in Scale of precision by Eye roughly	allowing diff of 5.30 between grades revised		
								1
less than 266 days	95	ignoring all less than 266 or more than 297				48.90	499	2
266-7	24	10	500			43.40	497	5
68-9	18	8	490		37	38.10	492	19
70	51	22	482		33	32.80	481	22
72	80	35	460		27.7	27.50	459	39
74	127	55	425		22.7	22.20	420	63
76	220	97	370		17.8	16.90	359	90
78	244	107	274		11.8	11.60	267	111
80	334	146	167		6.6	6.30	156	131
				021	0.8	1.00	025	~~025~~
82	383	154	~~021~~	133	5.5	5.30	136	161
84	269	117	~~133~~	250	10.6	10.60	248	112
86	216	94	~~250~~	344	16.0	15.90	342	94
88	166	73	~~344~~	417	22.0	21.20	410	68
90	84	37	~~417~~	454	26.6	26.50	453	43
92	52	23	~~454~~	477	31.0	31.80	478	25
94-5	32	14	~~477~~	491	37.5	37.10	490	12
296-7	21	9	~~491~~	500	~~37.5~~	42.40	496	6
more than 297 days	82	ignoring all more than 297				47.70	499	3
						53.00		1
Total cases	2468	2291						

1010
6

2 3

35 : 15 = 33 : x
15
165
33
35) 495 (14
35
145

Cover weeks – dependent tail end of curve f. 20v
of 2nd quality

week	no of cases from card kard of this week	per 1000	per 1000									
27–34	4	4	4	500							500	4
35	13	5	5	496	42			42	42	496	9	
36	23	9	9	491	37.5	4.5		36	35	5	487	20
37	29	12	12	482	33.2	4.3		30	29.0	467	54	
38	24	10	10	470	29.8	4.4		24	22.5	413	69	
39	144	59	59	460	27.8	3.0		18	16.0	344	114	
40	625	257	257					12	9.5	225	150	
41	1023	419	419					6	3.0	075	162	
42	415	170	170	441	24.5			6	3.5	087	149	
43	96	31	31	442	30	5.5		12	10.5	236	115	
44	32	13	13	489	36	6.0		18	23	427	96	
45	11	4	4	493	39	3.0		24	29.5	469	42	
46	4	2	2	495	41	3		30	36.0	489	20	
47	5	2	2	497	45	4		36	42.5	497	8	
48	4	2	2	499	49	4		42	49	499	2	
						41.7						
						4.2						
51	1	1	1	500		very fair(?) round				500	1	
		1000	1000								1000	

42
49
91 (5.7)
80
120

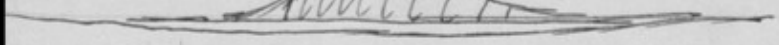
96
112

14 91 (6.5)
84
170
120

1
an Laboor

242-3	3			
44-5	4	7	20	12
46-7	5			
48-9	8	13		
60-1	7			22
52-3	7	14	27	
54-5	5			
56-7	8	13		25
58-9	12			
60-1	8	20		
62-3	6		29	17
64-5	3	9		
66-7				

This is the general idea of the curve – above line a curve of error below line an antinomian curve not symetrical



298-9	16			
300-1	11	27		
302-3	10		43	37
4-5	6	16		
6-7	13			28
8-9	9	21	26	
10-1	2			
12-3	3	5		
14-5	-	1		
16-7	1		4	
18-9	1	3		
20-1	2			
22-3	1			
24-5	2	3	5	
26-7	2			
28-9	-	2		
30-1	-			
32-3	2	2	4	
34-5	2			
36-7	-	2		
38-9	-	-		
40-1	-	-		
42-3	-	-		
344-5	-	-		
346-7	-	-		

Families per 1000

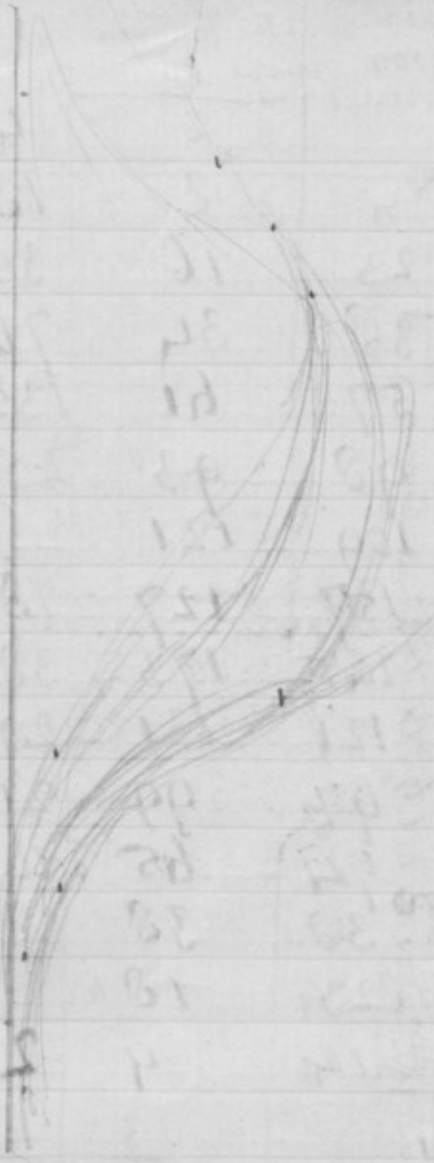
week

38	10	500	11	500			
39	59	490	61	489	37	13.9	
	257	431	267	428	23.1	16.5	
	419	174	434	161	6.6	17.4	
		282		273	11.8		
	170	452	177	450	26.	14.2	
	31	483	32	482	33	7	
44	13	496	14	496	42	9	
45	4	500	4	500			

Clear work do

963 1990

242 – 249	20
250 – 257	27
258 – 265	29
266 – 273	
274 – 281	
282 – 289	
290 – 297	
298 – 305	43.
306 – 313	26
314 – 321	4
322 – 329	5
330 – 337	4
338 – 345	1
346 – 353	.
354 – 361	1



	actual observ.	per 1000 observed	Calculated per 1000 above 1			Differences	
266-7	24		2	4		4	+4
8-9	18	8	8	18			
270-1	51	23	16	35		53	−16
2-3	80	36	34	76			
4-5	127	57	61	135		211	+4
6-7	220	98	93	207			
8-9	244	109	121	268		475	+11
280-1	334	157	127	282			
2-3	323	145	173	384		666	+8
4-5	264	121	131	291			
6-7	216	97	99	219		510	+25
8-9	166	74	65	144			
290-1	84	38	38	84		228	−22
2-3	52	23	18	40			
4-5	32	14	9	20		60	−24
6-7	21	9	3	7			
8-9				2		9	+9
						2216	

Calculated Observed

48.5	499	1			
42.5	497	2	3		
36.5	489	8		8	
30.5	473	16	24	23	31
24.5	439	34		36	
18.5	378	61	95	57	93
12.5	285	93	214	98	207
6.5	164	121		109	
0.5	37	127	300	157	302
5.5	136	173		145	
11.5	267	131	236	121	218
17.5	366	99		97	131
23.5	431	65	103	74	112
29.5	469	38		38	
35.5	487	18	27	23	37
41.5	496	9		14	
47.5	499	3			
		1			
		1000			
		8			

248 260
304 266
552 526
-24

36 - 36 } 53
26 -9 23

14 14 } 26
12 12

2 2 } 4
2 2 } 6
2 4
3 5 5

Day	Tessier	Spencer (advanced 3 days)	Krahmer	Total		Day	Tessier	Spencer (advanced 3 days)	Krahmer	Total	
above 239	–	[illegible]	9	9	13	242	1	–	1	2	4
239	–	1	3	4		3	1	1	–	2	
240	1	–	2	3	3	4	–	–	3	3	
1	–	–	–	–		5	–	2	–	2	5
2	–	2	1	3		6	3	2	3	8	
3	–	2	1	3	6	7	1	5	10	16	24
4	1	–	1	2		8	2	6	3	11	29
5	–	1	–	1	3	9	1	3	3	7	18
6	–	–	1	1		270	12	3	7	22	
7	1	1	1	3	4	1	7	5	17	29	51
8	–	–	6	6		2	18	5	13	36	
9	–	2	1	3	9	3	10	15	19	44	80
250	–	1	4	5	8	4	18	14	31	63	
1	–	1	2	3		5	12	18	34	64	127
2	–	2	1	3	6	6	20	32	55	107	
3	1	–	2	3		7	33	35	45	113	220
4	–	2	1	3	7	8	27	39	45	111	
5	–	3	1	4		9	29	47	57	133	244
6	–	1	3	4	7	280	27	54	68	149	
7	1	–	2	3		1	38	66	81	185	334
8	3	–	1	4	9	2	29	74	55	158	323
9	1	1	3	5		3	22	60	83	165	
260	1	2	3	6	10	4	32	52	70	154	269
1	2	–	2	4		5	22	42	51	115	
					85					1699	610

On the ~~probability~~ change of conception ~~in respect to~~ during the different days of the inter menstrual period

The disciples of Malthus advocate ~~some~~ ~~degree of~~ connubial restraint as a ~~means of~~ checking ~~the~~ to large families, but I have never seen any attempt to measure the effect that might be expected to result from ~~any~~ ~~such~~ ~~either generally~~ at particular periods. ~~[illegible]~~ restraint. ~~Now~~ It appears to me, ~~that~~ certain statistics, well known & often quoted by obstetrical writers for other purposes, ~~contain~~ are capable ~~[illegible] which, [illegible] with unexpected precision~~ ~~are able to afford a direct answer to this particular question~~. The statistics ~~in question~~ which I shall refer are few in number but they speak in ~~results are~~ clear & emphatic language & therefore well deserve consideration by the disciples of Malthus.

over /

It however occurred to me, when examining statistics bearing upon a subject in which I am interested — the comparative fertility of different races of mankind — to collect certain statistics.

f. 10 (Lancet 1858)

I refer to the cases collected by Reid, & by Montgomery, from their own observations respecting supplemented by those which the first named author chiefly gathered from various medical periodicals, of impregnation following a single cohabitation. These are all to be found ~~collected~~ p. 566 ? in ~~the 2nd Edition~~ of Montgomery's work ~~Signs of Pregnancy 1856~~ in two tables ~~the first~~ (note) * The cases collected by Reid from periodicals are evidently included in Montgomery's first table, ~~as shown by a comparison~~ being easily identified by their dates, they must not be counted ~~for the statis~~ twice over. These cases are 80 in number, ~~and~~ and in 24 of them we have the following full particulars — day of cohabitation

[Interlinear insertion above "Montgomery": Signs of Pregnancy 2nd Ed: 1856]

3

day of cessation of last menstrual period and
day of child birth, while 5 other cases are ~~abs~~ given
in which ~~the period of~~ cohabitation extended ~~from~~ through
various periods between 2 days & a week. These
there are 29 cases. ~~In all but~~ ~~the~~ data ~~upon~~ which to argue. Now it
may safely be assumed, that the day of cohabitation
~~had nothing to do with~~ was equally likely to have
occured at any ~~to shock~~ ~~period~~ day in the inter-menstrual
epoch, because the ~~cases~~ instances were ~~casual~~ single, those of
a husband ~~returning home~~ passing a day at home
in the interval of two journeys. ~~and the like~~. Consequently
if the ~~probability~~ chance of impregnation was the same
for any ~~period~~ day in the inter-menstrual epoch the 29 cases could be distributed
pretty equal throughout the ~~inter-menstrual epoch~~ whole of it.
the chance was unequal the cases would ~~accumulate~~ be found in
which if otherwise, ~~they~~ /.

excess of the average at one period over
deficiency at another. The following
table shows what ~~was~~ ~~actually~~ occurred.
The first column gives the actual observation
in the record I have ~~added~~ interpolated the 5 if
as fairly could where
cases ~~where~~ ~~it struck~~ the exact day was not
fixed with precision In the third column
I have taken 7 days means & in the fourth
I have made a trifling adjustment among
the figures to bring them into a perfectly
regular series. The fifth column is, as
I take it, the a very close representation of the
truth as it would appear if we had ~~more~~
believed ~~a longer~~ more numerous data

(Table)

F. 1F

The results are unmistakeable, 2~~7~~3 cases or nearly ~~4/5ths~~ ~~of~~ of the pregnancies are the results of cohabitation during some part or other of the first 12 days after the cessation of the menses and only ~~7~~6 or about one ~~fifth~~ [illegible] result from cohabitation during ~~all the rest~~ the remaining 12 days [average interval?] of the term. say ~~during the next~~ succeeding 12 days ~~This is a very important fact to the mathematician. if we~~

I have discussed these curious statistics from another point of view, with confirmatory results. Thus, I found the range of uncertainty of the date of ~~parturition~~ childbirth to be wider when we take the day of cohabitation as our ~~the~~ starting point than ~~if~~ when we reckon from the day of cessation of the menses. Showing that the act of conception is more closely connected with the ~~former~~ latter, than with the former. ~~It~~ It can only take place during the [illegible] days, more or less, when the ovum is passing down the fallopian tube, while successful insemination may

The conclusion This might have been theoretically anticipated on à priori grounds, because [illegible]

(Bischoff see Duncan on Fecundity 2nd ed. p. 114)

occur at any time (as ~~clearly pointed out~~ strongly insisted on both by Veit and Duncan) the spermatozoa remaining alive until ~~the~~ the next ovum is extruded ~~but~~ As a matter of fact, the ~~above~~ statistics I have adduced shew that though the spermatozoa may remain active until ~~the~~ the next oft-ovulation [~~period~~] of this their chances are ~~strongly~~ five to six against them.

~~Lastly~~, I do not see much error in assuming that what is true for cohabitation during 1 day would be also true for ~~periods of~~ longer periods and consequently that ~~a wife restraint~~ connubial ~~restraint~~ intercourse during the ~~last~~ last half ~~course~~ of the ~~last~~ inter menstrual period ~~subsequent to the 12th day~~, would be only about one sixth as ~~conducive~~ likely to be followed by impregnation as if the intercourse had been wholly unrestrained. This is a great fact for Malthusians & I commend it to their attention.

f. 1h

I

x I understand on good authority that the greater tendency to dissipation during the earlier part of the intermenstrual epoch is well known to many women abroad and that ~~it is acted on~~ they act upon their knowledge ~~accordingly~~, x I am told, that in Geneva the fertility ~~population~~ of the upper classes has been materially checked by their sort of restraint ~~in~~. Nevertheless ~~But~~, as I ~~said before~~ began by stating, I have never heard of ~~been~~ any attempt to measure the effect of restraint by dissecting statistically statistics, although ~~the statistics~~ data available for the purpose were continually in the hands of writers on cognate subjects — ~~Thus~~ Their application of them in this way has been curiously missed by Duncan - Fecundity p. 439-40.

8

f. 41r

I would conclude by expressing some ~~aston~~ surprise that ~~the~~ available statistics are not more numerous. It is notorious, that on certain occasions as ~~tot~~ ^on^ the few holidays ~~of~~ English life, at statute fairs where maid-servants collect to be hired and at the occasional feasts of certain religious sects a great deal of ~~sexual~~ ^illicit^ intercourse takes place, followed ~~by~~ occasionally by pregnancy. These ^cases^ would be excellent ~~cases~~ for statistical, ^perhaps^ and perhaps ~~this~~ ^present^ short contribution may be the means of attracting some ~~of~~ such facts to the columns of your Journal.

f. 1iv

Date of cohab.
No. (Days) subsequent
to cessation of
M. at which
the cohab. took place

Nº of days that had elapsed since cessation of rules, when the cohabitation took place.	I. Nº of Pregnancies (Reid and Montgomery)	II. ditto, after interpolating those in which the precise date was wanting	III. 2 days' Means	IV. ditto with lifting adjustments & make the Series regular.
0	2	2		
1	2	3	5	5
2	3	3		
3	1	2	5	5
4	1	1		
5	2	2	3	3
6	1	1		
7	2	2	3	3
8	1	1		
9	2	2	2	3
10	2	2		
11	2	2	4	2
12	1	1		
13	1	1	1	2
14	1	1		
15	1	1	1	1
16	1	1		
17	1	1	1	1
18	1	1		
19	1	1	1	1
20	1	1		
21	1	1	1	1
22	1	1		
23	2	2	2	1
24	1	1		
25	1	1	1	1
26	1	1		
27	1	1	1	1
~~28~~				

16

29

Day	Tessier	Spencer advanced 3 days	Krahmer	Total
286	35	45	46	126
7	24	23	43	216 90
8	23	31	32	86
9	19	16	45	166 80
290	19	10	19	48
1	14	8	14	84 36
2	12	7	8	27
3	9	6	10	52 25
4	9	2	7	18
5	8	1	6	32 14
6	3	1	8	12
7	3	-	6	21 9
8	6	1	2	8
9	4	1	3	15 7
300	1	-	5	6
1	2	1	3	12 6
2	1	1	5	7
3	-	3	4	14 7
4	1	1	2	4
5	-	-	1	5 1
6	2	-	5	7
7	1	-	1	9 2
8	-	-	3	3
9	1	-	5	9 6
				635 5 12

Day	Tessier	Spencer advanced 3 days	Krahmer	Total
310	-	1	2	3
1	-	-	-	3 -
2	-	-	1	1
3	-	-	1	2 1
4	-	-	-	-
5	-	-	-	0 -
6	-	-	-	-
7	-	-	1	1 1
8	-	-	1	1
9	-	-	-	1 -
320	-	-	-	-
1	1	-	1	2 2
2	-	-	-	-
3	-	-	1	1 1
4	-	-	1	1
5	-	-	1	2 1
6	-	-	2	2
7	-	-	-	2 -
8	-	-	-	-
9	-	-	-	0 -
330	-	-	-	-
above 330 (the last being 356)	-	-	5	5 5
				2438
				315
				1099
				85
				2438

Days	Calcn		Numbers according to law of error
above 240	13	+6	9 above
240-1	3		3
2-3	6	9	4
4-5	3	13	6
6-7	4	7	6
8-9	9		7
250-1	8	17	7
2-3	6		8
4-5	7	13	8
6-7	7	16	7
8-9	9		7
260-1	10		6
2-3	4	14	6
4-5	5	9	4
6-7	24	29	3
8-9	18	28	3
270-1	51	43	2
2-3	80	92	1
4-5	127	152	3 below
6-7	220	215	total 100
8-9	244	273	
280-1	334	288	
2-3	323	288	
4-5	269	293	

intervals 3 of Quetelet's scale.

	27	40	4
	24	44	2
	21	41	3
	18	37	3 4
	15	34	4 3
	12	28	6
	9	22	6
	6	15	7
	3	8	7 8
	3		
	21		
	15		
	49		
	79		
	126		
	219		
	243		
	334		
	322		
	268		

5.3 below Quetelet

2	2000	494	6	13
5	3636	490	4	9
11	3333	482	8	18
22	3000	471	11	25
39	2668	452	19	43
63	2133	411	41	92
90	1600	344	67	152
101	1066	250	94	215
131	533	128	122	273
			128	288
50			1125	

Error known

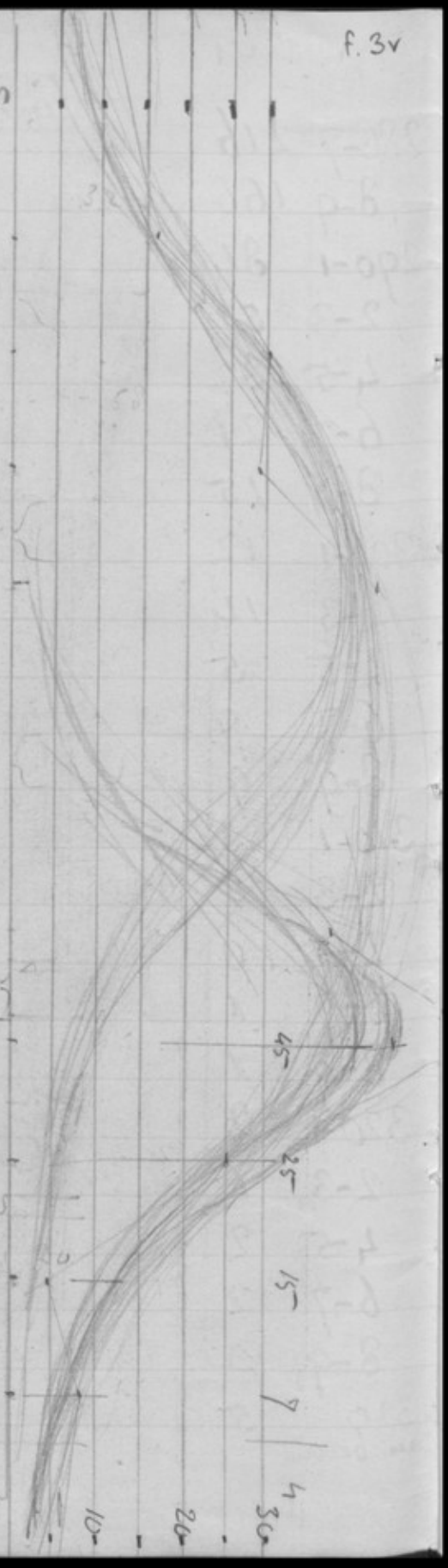
2250

Days	Cases	Number according to law of Error about 2								
286-7	216	215	1	3	214		94	210		
8-9	166	852	1	3	164		68	160	136	
290-1	84	92	2	4	80		43	78	86	
2-3	52	43	2	5	50		25	45	52	
4-5	32	25	2	4	30		12	25	26	
6-7	21	18	2 (104)	5	4	12 104	8	13	13	
8-9	15	36 4 9	2	5	13	6 11	8	7		
300-1	12	136	3	5	17	2 7	68 8	4		
2-3	14	26 3 6 5	3	5	2	5	8	6		
4-5	5	2 4 5	4	5	2		7			
6-7	9	14 2 4 5	4	5	3	118	7			
8-9	9	2 4 5	4	4	3	104 222	6			
310-1	3	12 2 4 5	4	5	3	2438 2216 remainder	6			
2-3	2	2 4 4	3	4	3		6			
4-5	0	2 1 2 3	3	3	4		5			
6-7	1	1 2 3	2	3	5		5			
8-9	1	2 2 3	2	3	4		4			
320-1	2	4 3	2	3	5		4			
2-3	1	3 2	2	2	5		3			
4-5	2	2 3	2	2	5		3			
6-7	2	4 1 2	1	1	5		2			
8-9	0	0 1 1	1	1			1			
330 and below	5	5 4 5	2	4			6			

intervals 2 1 Quartile

6 5 4
3 7

	Cases observed	Calculated diff. of Quadrat. scale	Unaccounted for by previous numbers	
above 240	16		16	16
240 – 3	9		9	
4 – 7	7		7	16
8 – 51	17		17	
252 – 5	13		13	30
6 – 9	16	1	16	
260 – 4	14	1	13	20
4 – 7	29	4 2	27	
8 1	49	53	16	43
27 2 – 5	207	211	(-4)	
6 – 9	464	475	(-11)	-3
280 – 4	657	666	(-9)	
4 – 7	485	510	(-25)	34
8 – 1	250	228	12	
29 2 – 5	84	60	24	36
6 – 9	36		31	5
300 – 4	26	9	23	54
4 – 7	14		13	
8 – 1	12		12	25
312 – 5	2		2	5
6 – 9	2		2	4
320 – 4	3		3	
4 – 7	4		4	7
below 327	5		5	5



F. 45

[illegible] scale [illegible] days prop [illegible]

12 : 42 : 10.5 : x

405/1200(0.28
810
150
105
400

12/420(3.5
36
60

mean period 281.5 days

a prob[illegible] error = [illegible] days
3.5 days

408/1200(0.29
810
3900

Rabbit Day	Observed no of cases	Per cent	Quetelet scale of frequency		av diff = 13 grms		
27	2	1	50		54	50	1
28	1	1	49	37 + ?	41	49	3
29	8	5	48	33	28	46	12
30	61	37	43	23 ½	15	34	29
31	47	29	{ 6	2 ½	2	5 }	29
			{ 23	10	11	24 }	
32	25	15	38	18 ½	24	44	20
33	17	10	48	33	37	49	5
34	1	1	49	37 + ?	50	50	
35	1	1	50		63		
	163	100					100

Clearly 5 - 37 - 29 - 15 cannot be a simple variate because the mean must be nearer 37 than 29 yet the fall from 37 to 5 exceeds largely that from 29 to 19

Sheep

I take Tessier alone Krahmer being less numerous (only 177) & requiring some modification to fit in with Tessier – Note the numerous late births of Krahmer

Days	Tessier observed	per 100 observed		No. in Scale of precision		~~revised~~ tentative	revised		Calculated per 100
145	—								
146	2	—							
147	15	2	50					50	1
8	36	4	48	33	8½	36	35	49	4
9	87	10	44	24½	9	27	26	45	9
150	142	15	34	15½	9½	18	17	36	17
1	175	19	19	8	8½	9	{8 1	19} 21	21
2	183	20	20	8½	11	9	10	24	22
3	176	19	39	19½	9½	18	19	38	14
4	60	7	46	28	9	27	28	46	8
5	24	3	49	37		36	37	49	3
6	7	1	50	7/65 = 9.3, say 9				50	1
7	5	0–1							100
8	–	–							
9	–	–							
160	–	–							
1	–	–							
	912 (5)	100 (4)							100

(= 151.11 day

$1 : 9.3 :: x : 10.5$

$x = 93/105(1.10$

93 / 120 / 93 / 27

a mean period 151 + 1/9 days, or prob. error = 1.10 day

Women from Reid alone

Date	SO2 Cases obs.	per 1000	Harlow						
25 2-3	5	18	2						
4-5	4	8	1	3	50			50	3
6-7	6	12	1						
8-9	8	16	2	3	47	30	30 1/4	47	3
260-1	11	22	2			5 1/2			
2-3	12	24	2	4	44	24 1/2	25	44	5
4-5	15	30	3			4 1/2			
6-7	19	37	4	7	40	20	19 3/4	39	7
8-9	18	36	3			5 1/2			
270-1	25	50	5	8	33	14 1/2	14 1/2	32	10
2-3	29	57	6			4			
4-5	41	82	8	14	25	10 1/2	9 1/4	22	12
6-7	32	64	6			6			
8-9	43	86	8	14	11	4 1/2	4	10	13
					3	1 1/4	1 1/4	3	
280-1	33	66	6			5 3/4			
2-3	39	77	8	14	17	7	6 1/2	16	13
4-5	29	57	6			5			
6-7	26	52	5	11	28	12	11 3/4	27	11
8-9	25	50	5			6 1/2			
290-1	25	50	5	10	38	18 1/2	17	36	9
2-3	9	18	2			3 1/2			
4-5	8	16	2	4	42	22	22 1/4	42	6
6-7	13	26	3			6			
8-9	7	14	1	4	46	28	27 1/2	46	4
	482		96			2			

f. 7r

per 100

carried over 482

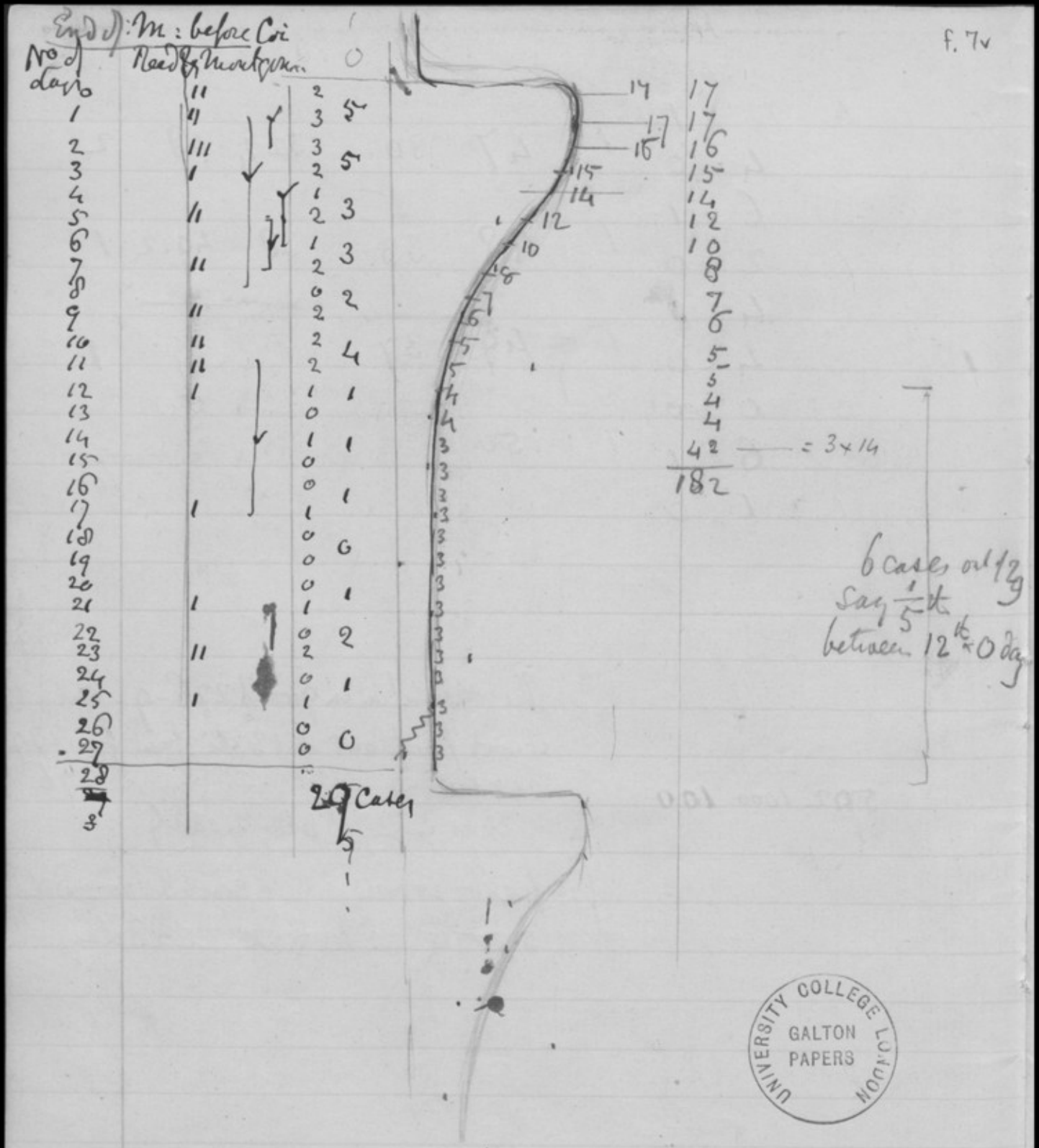
290-1	6	12	1
2-3	2	4	0
4-5	3	6	1
6-7	1	2	0
8-9	2	4	[illegible]
300-1	2	4	0
2-3	0	0	0
4-5	3	6	1
6-7	1	1	0
8-9		39	102
310-1			
2-3			
4-5			
6-7			
	502	1000	100

1	47	30	$32\frac{3}{4}$	48	2
1	48	33	38	49.2	1
1	49	37	~~$43\frac{1}{4}$~~	~~49.6~~	1
1	50			50	
					100

The mean line in growth 276-9 but it is $\frac{3}{13}$ parts out of 13 ~~distant~~ distant from 279
and 10 — — — — — — 276
That is 278 very nearly

For prob. Error   prob. Error = 8 days

$5\frac{1}{4} : 4$ days $:: 10\frac{1}{2} : x \quad x = 8$ days



Cases of 1 Coin — days since last M

Regd

Coin occurred Days since End of Mens A	Part. occurred days since Coin B	Total + 4 days average duration of Mens C		Montgomery A	B	C	Total D			Since beginning		Since Coin	
4+6	274	279	283	10	263	273	277						
0	274	274	278	11	265	276	280						
2	275	277	281	7	272	279	283	260-3				1	1
5	273	278	282	9	273	282	286	4-7	III	4	IIII	4	
23	271	294	298	7	274	281	285	8-1	II	2	I	1	
17	278	295	299	25	296	301	305	272-5	I	1	III	8	
2	280	282	286	10	279	289	293	6-9	III	3	IIII	4	
2	264	266	270	1 in 2	279-280	284	285	280-3	IIII	5	IIII	4	
11	276	287	291	23	281	304	309	4-7	IIII	5	III	3	
3	280	283	287	2	287	289	293	8-1	I	1		-	
5	266	271	275	21	287	308	312	292-5	II	2	I	1	
1	265	266	270					6-9	IIII	4			
0	272	272	276					300-3	I	1			
7	287	294	298					4-7	I	1			
5-7	292 in 3	297	301					8-1	I	1			
								312-5	I	1			
								6-9		0			
								320-3		6			
										26		26	

Carried on next page but one

Women 1 Coi Montgomery and Reid.

		Reid's and Myuto	others	Total	Per 100			
24	0-3		I	1	1			
	4-7			–	–			
	8-1			–	–			
	252-5			–	–			
	6-9		II	2	2	50		
26	0-3	I	I	2	3	47	30	5½
	4-7	IIII	IIII	9	11	44	24½	10
	8-1	II	III	5	6	33	14½	2½
27	2-5	IIII	IIII II	17	21	27	12	10
	6-9	IIII	IIII IIII	14	18	6 / 12	2 / 5	7 / 6
28	0-3	II	IIII IIII	11	14	26	11	6
	4-7		IIII I	6	8	34	16	5
	8-11	I	IIII	5	6	40	21	5
29	2-5	I	IIII	5	6	46	28	7
	6-9		II	2	3	49	37	9
30	0-3		I	1	1	50	16	167 / 6.3/4 about
	4-7			80	100			
	8-1							
31	2-5							
	6-9							
32	0-3							
	4-7							
	8-1							
33	2-5							

27th on 27th day

The numbers are too irregular (from the paucity of cases) to detect by law of Error

refer to last page but one

	Days since end of last M (Column C 1 last page but one) Read	Marks	Total	Revised by eye	Read	M	Days since end of Coi	Revised by eye
260-3						1	1	1
4-7	II 1		2	1	III	1	4	3
8-1	I 22		1	2	I		6	4
292-5	II 2	I	3	3	IIII	III	8	6 = 27[th] day since last M
6-9	III 3	II	5	4½	II	II	4	4
280-3	II 5-2	III	5	4½	280 (4 days since last M)		4	4
4-7	I 5 1		1	2			3	2
8-1	1 2	II	2	2			—	1
292-5	III 9		3	2	I		1	1
6-9	I 4		1	3				
300-3	1	I	1	1				
4-7		I	1	1				
8-1		I	1	1				
312-5	1							
6-9								
			26	26			26	26

(5 or 6 days)

Hence end of last M. 280 days
Coi that did it 275 or 276
Coi that did it on average 5 or 6 days after the end of M.

First appearance of M in 1348 Cairo

Year		per 1000	per 100				
11	1	1					
12	12	9	1	50			
13	45	33	3	49	37		36
14	107	80	8	46	28	9	29.5
15	200	148	15	38	18½	9½	19
16	235	174	17	23	10	8½	10.5
17	210	156	16	10	2	8	2
				6	4	6	6.5
18	202	150	15	25	11	5	15
19	163	121	12	39	18	6	23.5
20	114	85	8	45	26	8	32
21	35	26	3	48	33	7	40.5
22	14	10	1	49			
23	7	5	1	50			
24	3	2					
	1348	10000	100				
	11	5					

This is quite wrong.

28
33
8|61
8.6 say 8.5 & begin at 2

Evidently the lower end tails off much more slowly. This is observable in all the statistics in this book.

$t = 231$ $P = 0.998\,9124 = 0.999$

$t = 220$ $P = 0.998\,1371 = 0.998$ very nearly

Kramp's Table Prob: of Error

Therefore take grades t in number of 20 interval beginning with $t = 20$

$t =$ 20 60 100 140 220 131 153 175 197 219 231

222

381 239 110 46 2

2227 6034 8427 9523 9987

1113 3017 4213 4761 4990

2×1904 1196 548 229 10

381
239
110
46
2
222
999

23
55
120
190
222
190
120
55
23
1 cause
2 causes
1 grade apart
both equal

10 229 548 1196 3808 1196 548 229 10

10 239 787 1973 5552 6200 5552 1973 787 239 10

3 causes
1 grade apart
rest equal

per 1000 1 22 69 200 416 200 69 22 1

22
69
199
200
499

1 1 1
29 22 23
92 69 55
265 200 120
554 416 380
265 200 120
92 69 55
29 22 23
1 1 1
1328 1000 738

This curve 1 23 55 120 190 222 190 120 55 23 1

1 4 6 4 1
1 4 6 4 1
1 5 10 10 5 1

4 3

Curve of Error	Ditto 2 sets of Causes means separated by 1 grade	Ditto ditto separated by 2 grades	ditto – – 3 grades
1	1	1	
23	16	20	
55	50	56	
120	116	123	
190	199	189	
222	236	222	
190	199	189	
120	116	123	
55	50	56	
23	16	20	
1	1	1	
1000	1000	1000	1000
1	$\frac{1}{2}$	1	1
23	17	17	22
55	57	50	59
120	117	123	130
190	198	194	185
222	233	230	206
190	198	194	185
120	117 (revised)	123	130
55	57	50	59
23	17	17	22
1	$\frac{1}{2}$	1	1

1 23 55 120 190 222 190

1 23 55 120 190 222

1 24 78 175 310 412 412

12 mit 11 | 12

12/132

~~1 28 124 250 425 425~~

1 30 92 212 360 423

reduced (per 1000) ½ 17 51 117 198 233

1 23 55 120 190 222 190 120 55

1 23 55 120 190 222 190 120 55

1 23 56 143 245 342 380 342 245

13 mit 11

13
13
143

1 23 55 120 190 222 190 120 55 23 1

1 23 55 120 190 222 190 120 55 23 1

1 23 55 121 213 277 310 310 277 213 121 55 23 1

14 mit 11

7 mit ½

1 1
22 33
59 90
130 198
185 283
206 313
185 283
130 198
59 90
22 33
1 1
1000 1523

4 6

½ ½
17
51
117
198
233
360
423
360
212
92
30
1
1000

5

1 1
17
50
123
194
230
194
123
50
17
1
1000

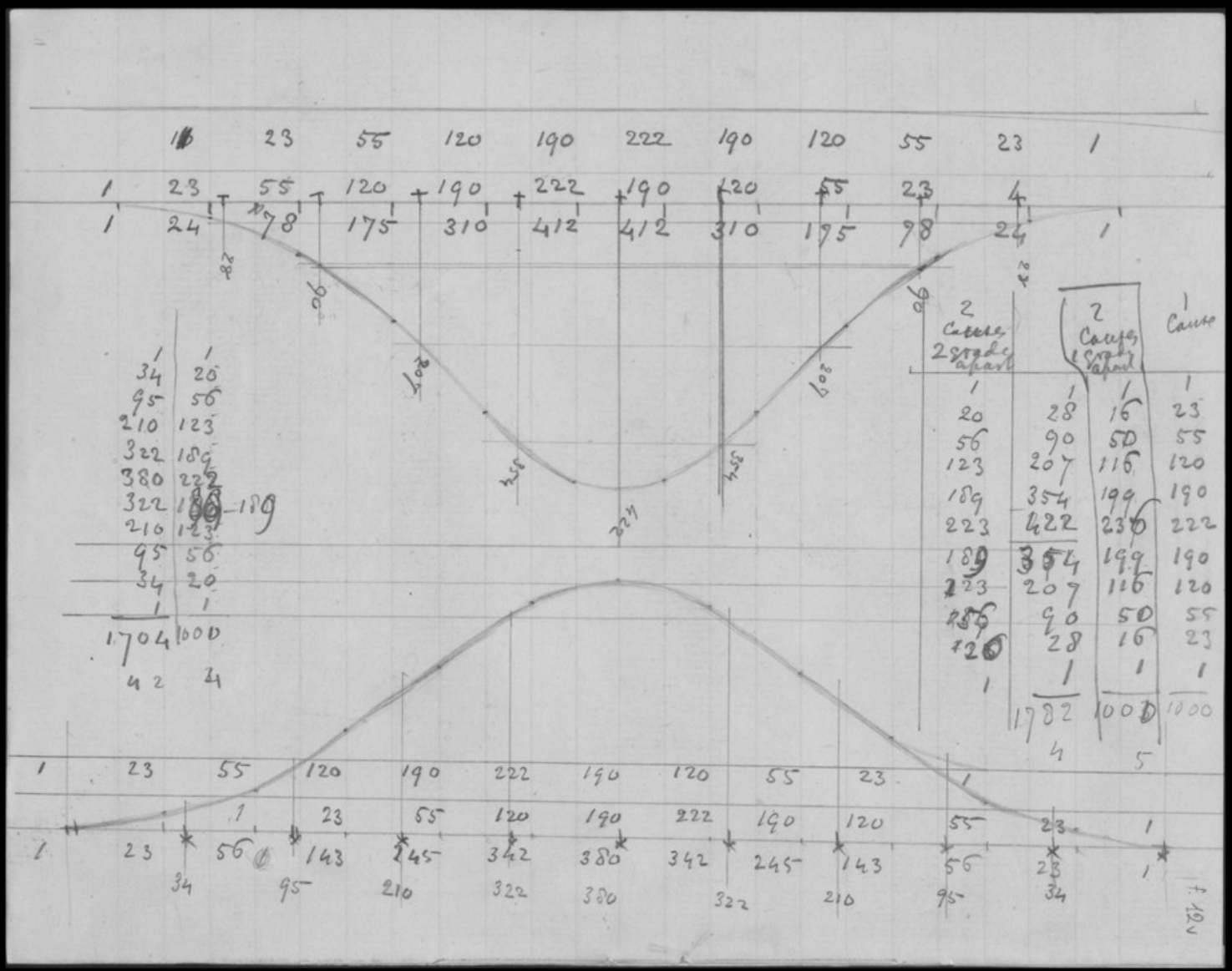
3

Neue Serie

1
2/8
1/24
259
425
837

1
30
92
212
360
423
360
212
92
30
1
1853

1 1
23 28
58 83
143 202
245 320
380
320
202
83
28
1
1648

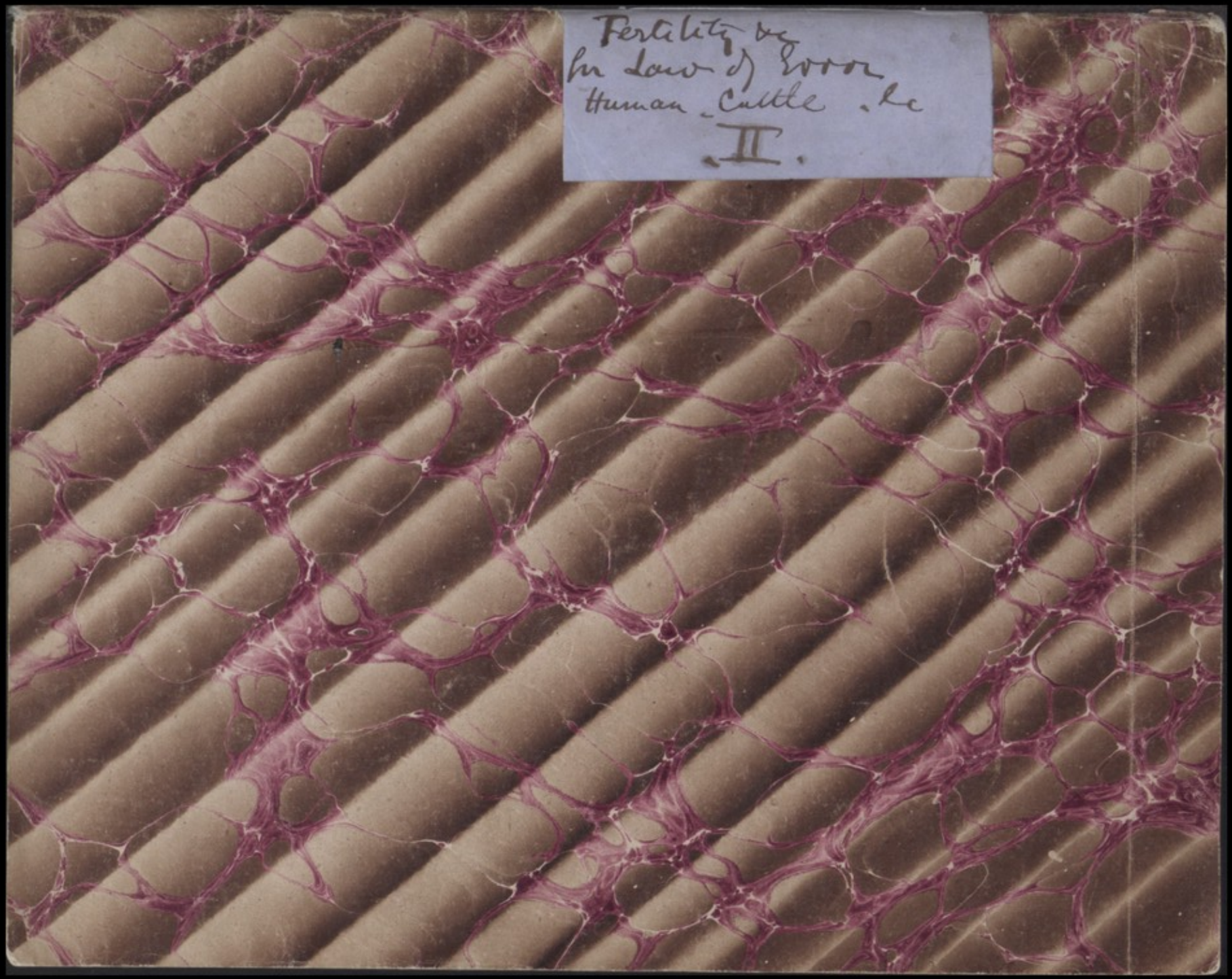

2 Cases 2 grades apart
2 Cases 1 grade apart
1 Case
f. 12v

233 $8/\frac{232}{29} =$

64
3
192
256

215
220

208
224
240


Fertility &c
in Law of Force
Human Cattle &c
II.

F 1r

REPORTER'S

NOTE BOOK.

October
6 Nov 7
1895

1d.

100 Pages

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RULED.

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10 Suffolk Sheep soc:
11 } English Cart horse soc
12 }
13 } — General stud book
14 — Hackney Stud book
15 — French Herd book
16
17
18 Notes on Colds F Smith Vet: Phys:
19 Addresses of Societies & Pubns
20 Books at R. Agricult. S.
21
22 Mr Sedgwick Librarian
23 M.H. Hayes — Koch notes from
24 addressen (see 33)
25 Nathusius
26 Koch again
27 Krämer as quoted. College
28 Stud books
29 Asses
30 Poitou mules Togetherness their measures
31 Stud book commenced
32 "

33. Hayes Points of horse
34 measures of Horses
to 38 of race horses
39. Pedigree at Stud (Hayes) Soc
40 Hackney Soc's horses
41 Gadow References
43 Racing Illustr:
44 Lectures
5
6

N° 3

f. 2

Dining Room
Small 1 pendant
Large 2 (one of each of mantle)
2 switches (1 for each) on Dining door

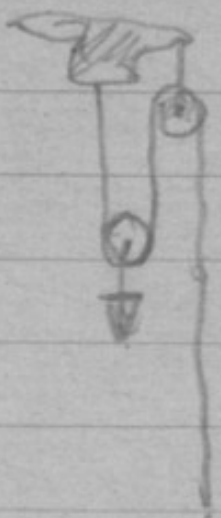
Hall 1 front door.
Hall lantern 1 } switch
Under stairs 1 } under stairs

Bath 2 light one to each
fitted mantel 1 switch by door

Landing 2 switches
1 bracket pendant on front of drawing room doors
1 bracket 4 plugs in drawing room
1 at each corner of large room
1 & mantel of small room

Bed room
2 1 in each side with the wardrobe
1 plug behind bed at bottom
switch by door

My Sleeping room
1 Cockl
Switch by door



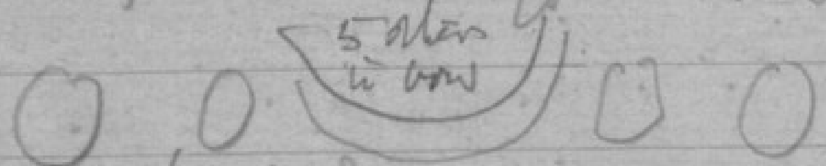
Landing
1 Bracket – Switch below

Veterinary Capt F Smith FRCVS
Prof. Army Veter. School
Aldershot

Mrs McKendrick FRI

The Croft
Little Heath
Charlton
SE

~~Knightsbridge~~ Barracks
fronting Park Officers Quarters



Hill
white
prickly
going thin
through
black lower
face

Londonderry
black & white
ears
partly like a
zebra, partly
a tattooed N. Zealander

Raglan Somerset
abominably
dirty
all below eyebrows

Fountain in broad shallow pit near
Grosvenor Gate with boy washing a
dolphin. A black eye splotching under either eye
& on one eyelid — Dolphin head & fins
mouth & eye sockets black
dirty . . . the boy really has hold
of the dolphin's mane

/cy

f. 6r

Light over door
Switch just inside

Little room 1 pendant
Switch to both plugs just inside

Hall windows 1 lamp
Switch do

Outside Din^g Door
4 switches outside & box of
1 to Hall lamp cut off & central switch

Dining top of passage
3 in middle & door just [illegible] middle of table.
2 side plugs
back Dining
1 light
} gas remains

Drawing Room
4 switches outside
large candelabra above
naked lamps
[illegible] 1 2 or all

British Museum

Horses — 'Hackneys' Stud Book Soc's
see Norwich
'Hackney Improvement Soc'
see G. Britain & Ireland
'Shire Horse
see English Cart Horse Soc

thoroughbred Horses — The Stud Book
[PP 2489 z] [London 8vo]

Cattle — The Herd Book ?
not in library Cat

Sheep — The Flock Book not in Cat.

Stud Books & pedigree books
Other animals
Wd height & length any one other measure as suitably be appreciated ?
or usefully descriptive ?' – other animals too

J. R. Holliday

Size now 4½ or 5 mm across
Persistency – ducts too are transplanted
Condition of union of ridges
Method serves for scars generally

Mrs Gardiner
– Changelings

F

Grafts — what is the influence after some time, of the environment — and conversely.

Small grafts of hair, from various breeds & colors of dogs in one another, recording the texture & color, but tracing both.

1 Newfoundland, retriever shaggy - long, curly
2 Scotch terrier rough harsh abundant
3 Bull dog, hunter, turnspit smooth short - sparse, terrier
4 Spaniel curly, short curls light
5 Angora like hair spaniel long delicate

Moles & Nevi

Tabication - skin from the back, or to the place of nose - (texture of skin)

Having on to a hair-less place

Men constitutional influences in increased growth of hair - women with excited ovaries

Taliotrichi – hair of different animals, as dog or cat or man

To secure uniformity of size, cut with outliner a sharpened cylinder like a punch, & direct out, the hair being first shaved off.

Wensleydale Flock Book 1895

Extract from Scale of Points p xv

Head broad behind ears
Neck moderate length
Shoulder broad & oblique
Chest deep and wide
Loins broad
Tail broad
Fore legs well set apart

Why not publish the above measures of the Prize winners?

The total no of points is 31
Thus: Face dark. Ears dark. well set on. Head broad and flat behind ears. Neck moderate length strong & well set on to the shoulders, and to on. In this quotation there are 5 points mentioned of which two at least are measurable

Suffolk Sheep Society
Flock Book 1895

Scale of Points	Total Marks	Total No.	Total Measurable
Head	25	9	2
Neck	5	2	1
Shoulder	5	2	1 or 2
Chest	5	2	2
Back & Loin	20	9	2 or 3
Legs and feet	20	9	0 or 2
Belly	5	1	0
Fleece	10	5	3
Skin	5	3	0
	100	44	11 to 15

Head
Face long. Ears well set on length —— 2
Neck moderate length —— 1
Shoulder broad oblique —— 1 or 2
Chest deep & wide —— 2
Back & loin Long tail broad rather long 2 or 3
Legs & feet Straight - Fine legs set well apart 0 or 2
Belly 0
Fleece moderately short, close, fine fibre. 3
Skin. 2 0

f. 11

English Cart Horse Society
Stud book 1st Vol 1880 contains
prefaces. p XIV on the horse 60
years ago "such a sketch can of course but
very imperfectly convey to the mind of
the reader"
Head large in all its dimensions
Forehead & face wide
Side view of jaws & muzzle remarkable for depth
Ears small
Eyes somewhat small & not prominent
Nostrils & mouth large
Neck long & remarkable for its depth
Shoulders upright low & thick at the withers
Fore arm long
Knee broad
Fore & hind canons short & thick, frequently
measuring upwards of 12 inches in circumference
Pastern bones very short & upright
Feet large

continued

Continued Cart horse bogeam &c

Hind legs considerably bent, the hocks
bey thrown backward & the feet forward
Breast wide
Back long narrow
Croup bent at a considerable angle
about 62 points noticed in all of which
the 27 above are measurable

p xxvii Essay on breeding by
W. N. Trotter Lax, no measure
lxiii d- by Frederick Street
with letter from James Howard & references
Farmer's Club Journal Dec 1871 "Breeding;
Facts & Principles" contributed by himself & others

In the list of Horses in the book each is
entered (Shire Horse) Albert Brown Foaled 1855
in successive lines
thus - but
Owner
Breeder
Sire
Dam
Dam's breeder
Dam's sire

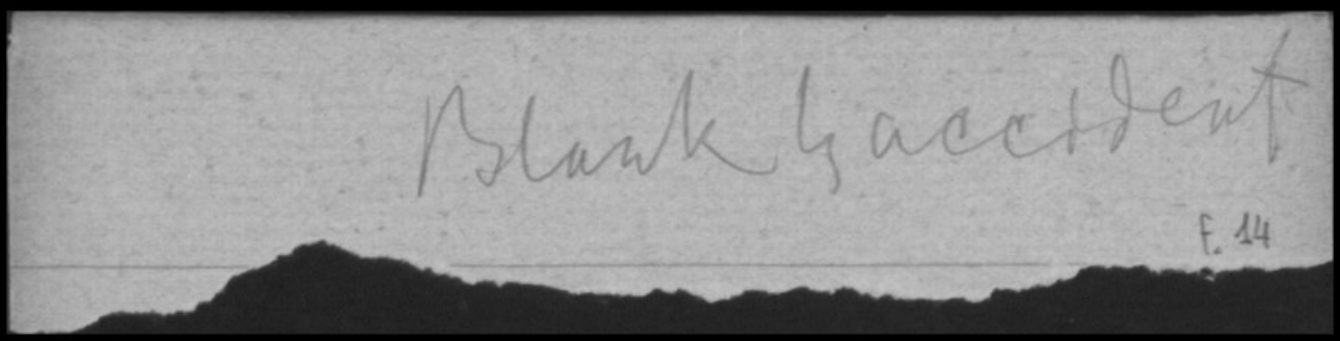
but now there is a change (continued)

in vol IX 1886 The colors
are given Bay or Chestnut, white face,

1372 Member of the Shire Horse Soc.
the address of the Society is
11. Chandos St. Cavendish Square W
(X)

General Stud Book
vol XVII 1893
List of Brood mares & their produce
fills 815 pages - about 6 to a page all told
is more than 4890 to about 5000
The General Index to this vol fills
90 pages 3 columns to a page & have 53 names
to a column 4770 x 3 = 14310 Total names
The colors are above given as in a racing card
The mares produce perhaps 5 foals each, altogether
the term has of course not been reached by most in the
book, they being still breeders

Continued (5)


Blank Accident
F. 14

1938 Obituary of Stallions

Under 10 hands	10 to 14	15 to 20	20 to 24	25 & above
11	11	18	16	11
7 / 7	12 / 19	14 / 33	7 / 40	7 / 47

Hackney Stud Book Vol XII, 1895.

(Its office in London is 12 Hanover Square)

It is arranged much on the English Cart Horse book but in some few cases gives height thus "black, 15.3 hands"

" dark chestnut, white face, white hind legs 15. 1½ hands

f. 16

French Herd Book
Quotes Colours – nothing more

Manual of Veterinary physiology
by Veter Capt. F Smith FRCVS
Baillière & Co 1895

539. In the legs of the foal the mch (the length from) the knee & the hock to the ground are nearly their full length

540 Table of lengths of bones in foal & in adult (? are these averages?)

541. Growth in height between 2 & 3 (4 years) ?: average ½ inch; between 3 & 4 ⅓ inch between 4 & 5, also ⅓ inch

57

f. 17

Numbers ~~of family~~ ~~males~~ where | 0 | 1 | 2
of sons in same family
of daus

No of families in which the so
~~No of individuals~~

~~Index~~ Heading
No of families in which the No of ~~whose~~ sons ~~are~~ as in Index Heading
~~of each~~
sons & daus ~~together~~ sons & daus

Numbers

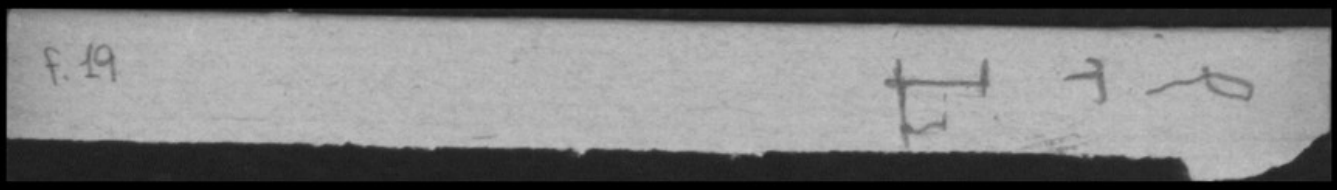
No of families in which the ~~figures~~ in the top lines expressed the No of ~~it~~ ~~as~~ in heading ~~of that of the~~
Sons
daus
both sons and daus ~~together~~

16

Table of 205 families shewing the number of cases in which the No of Sons & Daus & of Sons and Daus combined corresponds with the figures in the left hand

Figures	0	1	2	Total
Each of 205 families has in succession				
the figure in the left hand line represents the number of each (thus				
of Sons	25			205
of daus	25			205
of both sons and daus	0			205

That table is to be read thus out of 205 families there are 25 in which the No. of Sons is 0, in — it is 1 in — it is 2, the Similar for the Daughters


f. 19

Smith. Vet: Physiol.

540 Boussingault on increase of foal in weight quoted by Colin (? Colin - Physiologie Comparée

541 Torey weight of calves increase quoted { Colin

541 Percivall dress at a table, which is considered v. imperfect or rate at which some horses of his regiment grew - Lectures on Form & Action

many horses grow much more than $\frac{2}{3}$ rds between 3 & 5 years of age

---

Capt. F. Smith Veter: Physiol: (Increased shape) (p 540)

Foal of	Foal 6 weeks	Adult	Growth
	inches	inches	
Scapula	8 1/4	15	1.8
Humerus	8	12	1.5
Radius and Ulna	12	18	1.3
Knee Joint	3 x 3	3½ x 3½	1.2
Metacarpal	8 3/4	9½	1.1
Sufraginus	3	3½	1.2
Femur	10½	17	1.6
Tibia	9½	13½	1.4
Calcis & Metatarsus bone	5	6	1.1
Metatarsal	10	11	1.1

Future height of foal may be ascertained by measuring the fore limb from the fetlock to the elbow & multiplying it by two.

12 Hanover Square

Royal Agricultural Soc of England (Ernest Clarke sec)

Shorthorn Soc. of G. Brit & Ireland (E.T. Powell sec)

Smithfield Cattle Club

11. Chandos St. Cavendish Square

Shire horse Soc (J. Sloughgrove sec)

Hackney horse Soc: H.F. Euren sec

Hunters improvement Soc A.B. Charlton sec

~~Cart Horse Parade Soc~~ H.F. Euren sec

Norfolk House Norfolk St. Strand, Chamber of Agriculture
Sec: H.H. Raw

Publications

General Stud Book (every 4 years) (Weatherby)

Horning News (Friday) 172 Strand WC

Journal of Bath & West Eng'l Soc for Encouraging of Agriculture &c. (Annually) L. Stanford

Journ R. Agricult Soc (Quarterly) J. Murray

Land Agents Record (weekly) 22 Furnival St. EC

Sussex Herd book Yearly 191 Fleet St.
~~Parcard~~

Continued

Veterinarian (monthly) Longmans & Co
Veterinary Journal, Baillière & Co

John Thornton 7 Princes St
Sec'y English Jersey Cattle
Herd book

Royal Commission on Horse Breeding
L. Herbert Taylor
6 St George's St

Werner Rinderzucht
Berlin 1892 (P Parey)
p. 133 refers to
S. Low on the domesticated
animals & Stephens book of
the farm.
(Sir J Lawes writes to)

2

Moll & Gayot 1883
Paris Firmin Didot

Zoötechnie take care to mention whether the animal has been mutilated. "Cours pratique" in with a chain

See Alexis Lemoigne
in Recueil de Medecine
veterinaire, 1877 p 489,

E. Dubourssel le Cheval p. 67

Goubot a Barrier
The exterior of the Horse
translated by Harger 1892
Lippincott Co. 10 Henrietta St
Covent Garden

see p 392 the slope of (2)

(continued)

Bieler
Directeur de l'Institut agricole
de Lausanne à Lausanne

George Fleming CB LLD.
FRCVS
Higher Lerch
Combe Martin – S. Devon

He translated The Comparative
Anatomy of the Domesticated
Animals by A. Chauveau MD LLD
1891. (Churchill)
and was Principal Veterinary Surgeon
of the British Army

Chauveau is Member d Inst.: (acd. Sc)
& Inspecteur Gen.l d Vet.: Schools à Paris
& Prof.: Museum Nat Hist.: Paris

Mathematics

K. Landwirthschaftliche Hochschule

N.K. Invalidenstraße 42 Thiel

Kuratorium

write to him

write to Dr. Billings
Surgeon U.S. Army
War Dept.
Surg. Gen'l. Office
Washington, D.C.

Nathusius Abbildungen von Schweine Schädeln zu den Vorstudien für Geschichte und Zucht der Hausthiere von. Hermann von Nathusius

Berlin Wiegandt und Hempel 1864

Tafel II 9 skulls of 28 different sorts of pigs measured / reduced ½

axis between Snout a Foramen Magnum = 100 m/m

the real value lies between 366 m/m & 212

Extreme ranges. The N°s in that used in paper to describe the different measures (19 in total N° 1

2	110 – 78	11	82 – 68
3	112 – 88	12	56 – 48
4	115 – 94	13	22 – 18
5	116 – 91	14	70 – 41
6	65 – 48	15	48 – 28
7	28 – 17	16	28 – 23
8	35 – 20	17	16 – 4
9	20 – 15	18	15 – 7
10	32 – 25	19	29 – 10

It goes on to measurement N° 37 (N° 5)

5 wild boar males from different parts of Germany. (The others are different breeds of domestic pigs except 2 Indian ones)

Reference No						
2		104	109	110	108	106
4	see below for what are	111	112	115	114	112
11		71	70	72	71	70
17		10	7	4	6	12
22		21	20	20	20	23

2 = Horiz. Achse zwischen Schnautze u Mitte des Occipital Klamms

4 Achse zwischen Nasenspitze u mitte der Occipital Klamms

11 Längenachse zwischen Gaumen-Ausschnitt und Schnautzen Spitze

17 Geringste Breite zwischen den Scheitelleisten

22 Größte Breite der Occipital Schuppe, an der Sehne gemessen

(20)

S. Kräner an excellent small book — "Ueber Körpermessungen am Rindvieh mit besonderer Rücksicht auf deren Anwendung in der Schweiz. Ix Sonderabdruck der "Landwth Thierzucht" Bunzlau. I. Schl. Nr 249-252. 1886 das Messverfahren sowie die zu messenden Theile des Thierkörpers ausführlich beschrieben.

Also Körner "Ueber Körpermessungen am Rindvieh — — beim Schweizer Fleckvieh (spotted cattle)

A chief requisite in measuring is rest of the animal

Clement Stephenson
F. R. C. V. S.
Sandyford Villa
Newcastle-on-Tyne
Chief Vet Inspector for
Northumberland

Board of Agriculture
Major T. G. Craigie is the state vet
have some influence – re breeding

See or Principal (write to)
R. Veterinary College
Camden Town

R. Agricult Coll
Cirencester

Colonial agricult College
(for gentlemen students)
Hollesley Bay. Suffolk

(from the Measurements above)

11. Bemerkt muss als Ausgangspunkt jenen am oberen äusseren Ende der Vorderarmbeines (Radius) befindlichen kleinen, deutlich fühlbaren Bandhöcker, den sogenannten Biéler'schen Punkt - - "

"Band" = band ribbon ligament
"höcker" = a protuberance

Shetland Pony Stud book
George Bruce
35 Market ~~Street~~ Hall
Aberdeen

Brookfield Stud
St Albans Road
Finchley
Mr W. Burdett-Coutts MP.

Live Stock Journal & Almanac
Vinton & Co Ludgate Circus
Contains numerous addresses
of Breeders

Catalogue of Awards
R. Agricult Society
1879 at Kilburn.
On this year they gave prizes
for Ayrs. Among the
Chief breeders are
Lord Arthur Cecil of Orchardmains
Innerleithen NB.
Edward Peake of Greencroft
Darlington Co Durham
Charles Leslie Sutherland of
Combe Croydon Surrey
at Windsor 1879

Lords A & L Cecil of Orchardmains
Tunbridge Kent.
Charles L Sutherland of Down Hall
Farnborough Kent

Horses after Zebras mules
& Mule breeding by
B. Tegetmeyer FZS
and C L Sutherland FZS
late of War Office.

163 Measurements of a Porton Jack

Height 14 hands 1"	greatest girth (at 6)
Forearm	Girth behind shoulder
Knee	Length of Head
Below knee	Length of Ear
Hock	Ears tip to tip across
below hock	

9th In Porton there is a purely local occupation & breeding mules on a large scale little known elsewhere in France

102 The number of ateliers, or mule-breeding Establishments is nearly 200, the majority in the Deux-Sevres (The breeders are very narrow & dismissed)

Continued

From Official statistics 50.000 mares were employed in Portugal for mule breeding purposes 38.000 for producing mules & the remainy 12.000 for substitute horses & one of the most remunerative occupations though little is known of it outside its own immediate district

---

Stud book 1893 the last they are published some 4 years

	1892
Colts born in year	1517
Fillies	1523
Barren	1206
Slipped foal	258

The number of breeders is about 1400. the nos in above are half as many again as before 1889

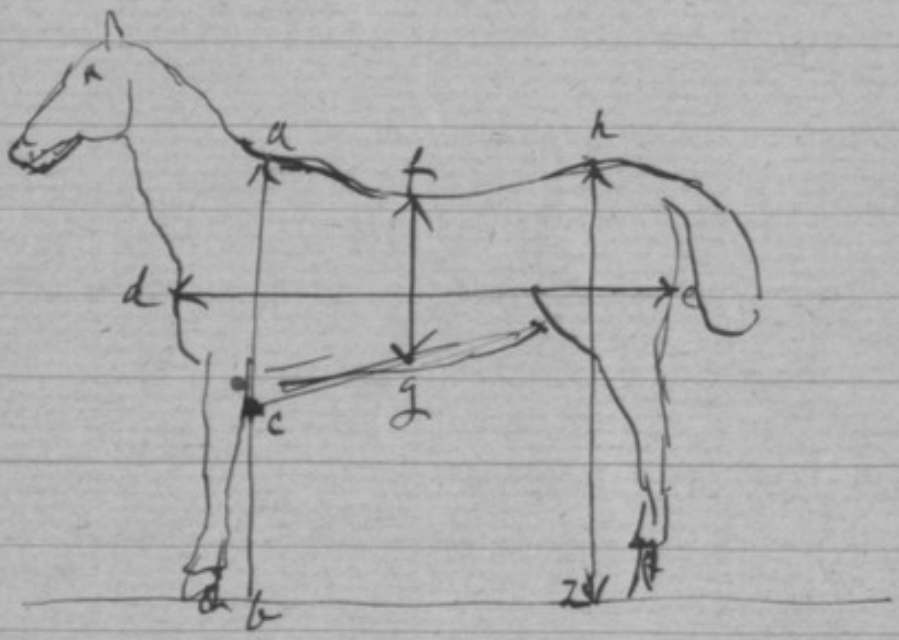
From Stud book / 1893
the years of best foaled & produce up to date only are quoted here – Starting from beginning – viz the mare "Abandoned

	No. of foals
1886	2
84	6
76	2
80	8
67	3
85	3
78	2
80	5
82	4
83	5
78	3
75	2
85	5
83	2
85	3
79	4
76	3

1876	8
84	5
76	5
72	1
79	8
82	4
75	3
84	4
84	2
88	2
80	3

F. 32

Points of the Horse
Capt^n M. H. Hayes Thacker 1893 34
77 Reproductions of Photographs Small 4^to



? in photographing cats

	ab	ac	de	fg	hz	
Ormonde frontispiece	12.6	6.9	12.2	5.0	12.6	D. of Portland
62. St Simon	10.5	4.5	10.6	4.3	11.3	do do.
78 Stefatide	10.5	4.9	11.3	4.2	10.5	Irish Hunter
157 Shire mare Chas	12.4	6.4	14.3	5.8	12.3	Shire mare
159 Skittles	9.7	4.5	10.4	4.0	9.9	Pony mare
160 Pony mare	10.2	4.7	11.3	4.1	10.4	" very low in front
180 Arab pony	9.5	4.4	9.4	3.7	9.7	"Magistrate"
184. Arab	10.5	4.6	10.0	4.5	10.8	heavy crested
188 Arab pony	8.9	4.3	9.0	3.5	9.0	"He Brat"
190 English cob	8.6	4.4	9.3	3.8	8.5	pony
192 Kathiawar mare	9.7	4.6	10.7	3.9	10.0	—
194 Romance	10.6	4.7	10.5	4.3	10.7	Australian
200 Unthoroughbred Horse	10.5	5.0	10.5	4.7	11.0	

f. 34

Oct 28 measured more carefully from prints bought at ~~Simpsons~~ Spooner 379. Strand near Exeter Hall – measured in mms

	withers ab	depth of chest ac	length rather diag d'e'	height of croup hz
Shotover (1840 CR)	59.4	29.6	64.0	59.0
	59.5	29.5	63.8	58.9
1	59.2	29.5	64.0	58.9
	59.5	29.5	63.8	58.9
	59.5	29.5	63.7	59.1
means	59.4	29.5	63.9	59.0
	100	49.6	107	99
indices approx calling ab = bound	60	29.75	64.20	59.4

	withers ab	Chest ac	diagonal length d'd'	Croup hz
Shotover 1841 CR	48.4	24.1	49.8	47.0
	48.3	24.2	50.0	47.2
2	48.0	24.1	50.5	47.5
	48.3	24.1	49.8	47.1
	47.8	24.3	49.7	47.3
	48.1	24.2	50.0	47.2
	100	50.4	104	98
indices approx calling ab = bound	60	30.2	62.4	59.4

35

Shotover Continued

Taking length as unit

	ab	ac	de	hz
1.	59.4	29.5	63.9	59.0
	92.9	46.2	100	92.4
2	48.1	24.2	50.0	47.2
	96.2	48.4	100	94.4

Take depth of chest as unit

		ac	de	hz
	59.4	29.5	63.9	59.0
1	201	100	217	200
$\times \frac{60}{201} = .299$	60.3	29.9	64.9	59.8
2	48.1	24.2	50.0	47.2
halve	199	100	207	195
$\times \frac{60}{199} = .302$	60.1	30.2	62.5	58.9
Diffce in inches	0.2	0.3	2.4	0.7

Hence the greatest risk of Error is in length - hence not standing square.

26

	withers ab	chest- ac	length de	croup hz
Broxton	66.8	30.3	68.2	67.0
1839. C.R.	66.0	30.5	68.1	67.7
	66.2	30.4	68.2	67.7
(3)	66.8	30.6	68.2	67.8
	66.6	30.5	68.2	68.0
	66.5	30.5	68.2	67.6
Donovan	64.5	30.5	64.0	64.3
	64.6	30.5	64.0	64.1
	64.9	30.6	64.0	63.9
(4)	65.0	30.7	64.3	64.0
	65.0	30.7	64.0	64.0
	64.8	30.6	64.1	64.1

	written ab	check ac	length de	crank fz
Orme 1838 (5)	65.0	29.2	64.7	63.0
	65.0	29.5	64.8	63.0
	65.0	29.5	65.0	63.1
	65.0	29.5	64.8	63.5
	65.0	29.4	64.8	63.5
	65.0	29.4	64.8	63.2

The first marked 6 was too diagonal to use

Bend 02 (6)	65.0	29.5	67.6	64.5
	64.8	29.5	67.7	64.3
	65.5	30.2	67.8	64.5
	too high a write			
	65.0	30.0	67.9	64.2
	65.0	30.0	67.7	64.5
	65.1	29.8	67.7	64.4

La photographie hippique
French taken in Horse photographs
in Hannay's Office Toft Ct

Frank Haes 28 Bassett Rd N. Kensington
used 4 phot: horses & other animals
Hotel at Lecture below

Gambier Bolton

N. Photo. Soc
Mr Spiller in Chair Jan 9/94
Capt Hayes first Lecture read
Mr. S. said he had photo'd at R. Military
Repository small success - Allended
by a thrill loud whistle - Also
umbrella had duly opened.

Hackney Horse Socy
Book of Phot first 2 or 3 ago — Sends a man Charles Reid Wishaw NB to photograph champion Stallion & mare £10/£10 & expence only 2 horses but in many attitudes (say 6) out of which selection is made.

Capt Hayes bad rep in Newmarket apparently

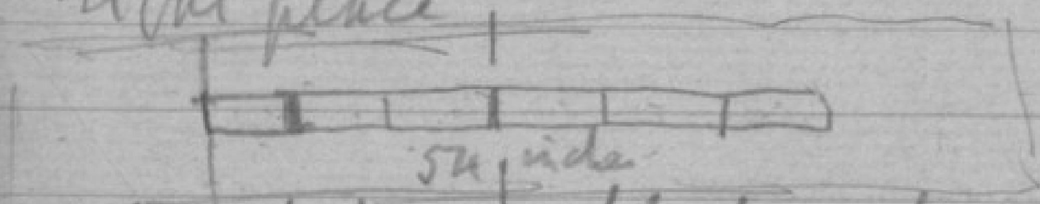
American Hackney Stud book has many photographs

The Hackney Soc are pure bred all about them is known pedigrees can be traced back some 200 years Every year 600 or 700 Stallions & 2000 mares.
with their certificate Horses imported in american duty free (5)

f. 40

Plenty of photos by ~~amateurs~~ & professionals each year in a year at recently the horse show but Mr Read photos them at their homes when he has plenty of time & horses not excited.

? take snap photo while horse is slowly walked along the track & when he reaches the right place



~~whitish brick~~ ~~black mortar~~
or black " white mortar pointed

f. 41r

Given me by [illegible] at R. Soc soirée

H. Gadow.
Cambridge.

Herrn
Director der
Koenigl. Reitschule
Hannover.

An den Herrn Director
des Koenigl. Gestuets
zu Trakehnen. Ost Preussen
Prussia.

Anschuetz.

Lissa

Prussia. Posen

Momentphotographien
von Pferden und Kindern.

f.41v

f. 42

Impreg: Art Billings dict first part publ: 1885

42

Racing Illustrated

No	Date		Withers	Chest	Croup	Length
1	5	Melanion	66.5	30.7	66.9	71.1
	10	Glencairn a hunter	87.0	41.3	84.0	92.0
	(11	Curzon, too foreshortened)				
	(13	Remainder, do)				
	15	Irish Wake & Gay Boy do)				
	16	Postscript x Foal - too much grass				
2						
	22		102.0	47.5	101.2	97.6
	25	Illuminate x foal too foresh'd				
	29	Aortion	104.8	47.7	107.0	108.5

Racing Illustrated continued

No.	Page	Weight	Head	Crest	Length
2	30	Camelot —	fore feet	hidden	½ length
		Port Mahon —	"		
3	37	Throttle —	last	forehorse	
	39	Grey Leg			
		81.2	38.0	80.0	80.5
	41	Le Var			
		102.0	47.3	99.2	101.2
	43	Son of a Gun		too forest.	
	45	Foxtail		ditto	
4	57	Hurlaks			
		93.5	43.2	95.7	95.8
	59	Radenbury		too forest.	
	62	The Lombard			
		109.0	51.0	105.0	107.5

Measure all the premaxillae
& describe them carefully
test thereby accuracy of measurers

Counter

List of measures that can be taken

1 trustworthily

2 Such as give a good general idea
of the shape of the animal & especially
the principal points

3 That can be taken quickly & easily

4 That are equally applicable to all
& other vertebrates

Brick path adjacent, bad focus
wall good } 71

wall very good } 76

Brick wall to a house & a figure
some 30 feet in front all excellent
in our photo: but dont bear leaf – could
be used however. See too pavement } 70

XX wall excellent XX 87

x Clear hard pavement shows horseshoes
in the Stables – Palace House } { (shelling work behind railings 103, 104) } 97 XX

Small Scale ~~Ground~~ & kike pavement 109, 111, 120

Hard grooms 175

Small ~~[illegible]~~ sharp 65 mm long 62 high
width 37 mm (would do for smallest size) XX 203

Select (87, 97, 203)

E 47

96

Continued.

p. 376 Arthrogonimeta

Letter is Lemoignes
He has a paper
Italian Giorn. — veterin. —
Naples 1865 the same is
in French on in last page

Mr. Sedgwick

Librarian
R. Agricult. Soc
13 Hanover Square
W.

Prof Adam Sedgwick of Zool Cambridge
writes to

M H Hayes
Points of the horse
Thacker & Co 1893

A. Koch Encyk d. Thier-
Heilkunde und Thierzucht
about a dozen large 8vo vols
the VI[th] vol: is (Moritz Perles) 1889 Wien
& Berlin
Messmethoden 1401 vol VI
Hitherto measurements chiefly of
Cattle Krämer of Zurich has printed
an excellent little work on it - Also
Nörner (a Swiss)
Instruments used all described in the Encyc
(as well as the above persons) are the Rollbandmass
Messtock and the Tasterzirkel (calipers)
(Kluftermass in the text)
The point Capt F. Smith a Scot at
the end of the radius is here called Bierlay's
point - He has used it largely.
This is a useful article for the literature
on stock subjects

F. Galton
42. Rutland Gate
London
S.W.

Nov 1896.

Art of Description

Words. Variety of substantives, richness of references.

H. Harris's way of indicating a point in a landscape

word-painting not quite what is meant, not bright enough

Senses to be appealed to — other than sight — as "one

"skimmed an iron coast and angry waves, You seemed

to see them rise & fall (movement)" And (sound) rock thwarted under

bellowing caves, Beneath the windy wall"

(sound) (feeling)

But better perhaps to begin with views only.

First a classifying word, as tree, house, carriage, ... then

distinctive features.

Strange words & adjectives awaken up the attention, then

the slang words of shortness "words for teeth

Emotion blocks the detailed description

Imagine a person describing what he is seeing to a

blind man, as in Tennyson's 'Harold'. no hurry, no faults

of recollection to be feared.

Collection of aspects of nature, for reference.

Vocal distinctness of ordinary speech, a deaf man knows it

Lotos Eaters . p. 147 "Like a tale of little
meaning though the words are strong" a
"like the tale of an idiot: full of sound & fury signifying nothing.

Brief account in Tennyson's dream of fair women '52

E Clarke Sec R Agric Soc, 13 Hanover Square W.

X A R Wallace LLD DCL Corfe View, Parkstone, Dorset X

X Sir M. Foster M D, Q^rs Shelford, Cambridge X

X Sir J. Hooker KCSI The Camp. Sunningdale. X

X Prof J Cossar Ewart M D FRS The University, Edinburgh X
The Bungalow, Penicuik, Midlothian

Collins

Merrifield

Norwell Masters ERS, Mount Avenue Ealing W

Sir T Lawes — X Dec 12

Mrs Romanes — X

Lubbock — X

Prof Newton

Gilbert

Fred: Ducane Godman, 10 Chandos St. Cavendish Square X
and South Lodge Horsham

E. J. Lowe, Shirenewton Hall, Chepstow, Monmouthshire. X
Dec 12

Adam Sedgwick, Trin Coll, Cambridge X

Blandford

Sir Everett

J Millais Bart. Littleton House, Shepperton X

F. W Burbidge

Thiselton Dyer — X

ask Heape Salvin Walsingham
Bateson R. Lankester Matlers Godman

F. 3r

Prof. Weldon × 30A Wimpole St W ×

Prof. Meldola × 6. Brunswick Square W ×

F. Darwin × Wychfield. Huntingdon Rd. Camb ×

S.H. Burbury. 17. Upper Phillimore Gardens Kensington W ×

Prof Poulton × Wykeham House, Banbury Rd. Oxford ×

Prof Macalister MD. Torrisdale, Cambridge ×

Prof Ray Lankester 3 Bradmore Road Oxford ×

K. Pearson × 7. Well Rd. Hampstead NW ×

Prof St George Mivart 11 Duke St. St James SW

W. Bateson × Norwich House Cambridge ×

P.L. Sclater 3 Hanover Square W ×

Ld. Walsingham × Merton Hall Thetford Norfolk ×

~~Prof Ewart MD. The University Edinburgh~~ see opposite page

Osbert Salvin Hawksfold, Fernhurst, Haslemere ×

Sir J. Murray ? address ×

~~F.D. Godman 7. Carlos Place W.~~

W. Heape × Heyroun Chaucer Rd. Camb: ×

G.C. Bourne × 36 Banbury Rd. Oxford ×

Lloyd Morgan × University Coll: Bristol ×

Clue for collecting and discussing data that bear on the Continuance or on the Change of Racial Characters.

Clue on Breed & Races. of Plants & Animals.

Statistical inquiries into Race & Heredity

Collection & discussion of statistical data bearing on Race & Heredity

---

Snake-rats Darwin Voles
S.J. Salter Journ. Linn: Soc: Vol VI. 1862 p. 71
— Field Sept. 8th & 15th. 1860.

Subjects for experimental inquiry Dec 1/96 f. 45 4

Amount of Regression towards average of children

2 Fraternal differences about average of children

Kinship – closeness of relationship in various degrees of,

Fertility inheritance of

1 " of closely interbred, & effects

" of widely differed – hybrids

" intermediate points

" Ancestors which maximum occurs.

Variations

Sports – frequency & amount – degree of hereditary stability

Preferences in breed: transmission

Atavism

Inheritance of acquired faculties, disease – lost instincts

natural & acquired knowledge

Telegony, facts of

Inherited disease &c, its appearance at progressively

earlier ages

Correlation of useless with useful characters

Determinate measures of effects of selection

Tests of Darwinism & other theories.

Graft-hybridism

Mrs Romanes write
to Leonard Hill Univers. Coll
knows all about R's papers.

Zool. Gardens – also Botan.

R. Agricultural Soc & others ie Stud Hackney &c

Private persons

What has become of the French Darwinian Instn

Mrs Romanes

mice Guineapigs rabbits dogs fowls (incubators)
ducks fish insects & moths

ducks fish insects & moths

Farm &c Lord Armstrong

Lundy Island | Walney off Lancashire Coast

Godman | Caldy Island

Bass Rock

Inch Keith

Pedigree stock; Systematic photography of single animals
Heritability of small variations, of large ones (new characters, effects)
Statistics of frequency in regard to some few definite characters

Programme f. 61 6

Heredity
Quantitative measure of kinships
atavisms
Prepotencies
Telegony (mice white x wild)

Variation
fraternal
Shorter Habitat /

Hybridism

Fertility
causes of annual variation – malformation
interbred stock – max fert. point of, abortions

Acquired faculties
Early acquirement of – inheritance of
I.

Tests of theories

Jan 14/97

Question To which experts would you yourself wish to refer, or have made, on the supposition —

a that an experimental station existed, suitable for plants and small animals of all sorts

b that a system of cooperation had been established between leading breeders &c, and the Ctee, for undertaking such simple experts as were recommended by the Ctee.

Names from List of FRS

F. Allman	Sir J. Gilbert	Pitt Rivers	Prof Warrington
Duke of Argyll	~~Sir J Gilbert~~	Poulton ✓	Weldon ✓
L^d Armstrong	Godwin-Austen	L^d Rayleigh	
Bateson ✓	Grant Duff	L^d Rosebery	
Prof. Orpen	Günther	L^d Salisbury	
R^t Hon Chamberlain	Prof Hickson	Salomon ✓	
Earl Crawford	Sir J Hooker ✓	Sclater ✓	
Dallinger	R. Lankester	Scott (Kew)	
Fr: Darwin ✓	Sir J. Lister ✓	A Sedgewick ✓	
Duke of Devonshire	Ed: J. Lowe	Dav^d Sharp	
Earl Dneie	Sir J Lubbock ✓	Sorby	
Thist: Dyer ✓	Mc Lachlan	Stracey	
Sir John Evans	Markelyne	Symons	
D. Cosmo Gwyn ✓	Moseley ✓	Prof Traill	
Sir W. Flower	Prof. Miall	Venn	
M Foster ✓	Muore ✓	Vines	
Frankland ✓	Newton	Wallace	
R^t Hon Sir E Fry	Sir A Noble	L^d Walsingham ✓	
F. Galton ✓	Oliver	Marsh: Ward	

19 15 19

Mr E Millais Littleton House Shepperton

May 3/97

Selection in rearing	1	men t 4 t 12	5 wd be a good [illegible] to be killed
" in mating	2	people like T.
The [illegible] melanism		
the Black & tan	3	plenty of these abroad	Kennel Club Gazette
kept in registered? in the [illegible]		
No bred per annum	4	(say 150)	[illegible]
value of each	5	5 a 6
Ideal in view / points of excellence	6	
See record book, what more cd be got out of it?	7	not more
what more cd be done	8	very difficult
" Inheritance	8'	
" Correlation	9	

[illegible]

f. 8v

That the Chairman & Mr Heale[illegible] be deputed by the Cttee to confer with breeders of animals regarding [illegible] and to ascertain whether any of those gentlemen would be disposed to engage in them, & to communicate the results to the Cttee

[illegible] [illegible] in conference with the Chairman be deputed to confer

Balance	771	Spt in 1896	
Paid back NSW	200	Jan	141
Jan 1896	533	whole of Feb	61
up to Feb 12 mdg	214	[illegible] for cures	160
Feb 12 in 83 rest of month 207	add for consols 20		352
	1738	pay out 2000	
Sale of Consols 1000	1120		2352
	2858	Balance	506
overplus	~~500~~		2858

352 [illegible] 2

may be 83 on Feb 12th
[illegible] by end of Feb + 207

result pay 2000 on Feb 12th
~~and~~ first selling 1000 consols.

That H and the Chairman be deputed to confer with breeders of animals regarding such ~~such experiments as they might be disposed~~ they to undertake. x

(x to report to the C[ommitt]ee

Butler
Arthur Hetts [?] of
G. Adams Esq
Wadley Manor
Farringdon
Berks

breeds sheep & cows (for milk
and does seeds for Sutton
Wd require some payment

he wd do anything for Ld
Wantage his landlord in part

Adam Sedgwick L^d-Walsingham Heafe

? as t getting up a report on points that are considered, at home & abroad, t want effectual verification

Must have a distinctly practical side in order to enlist good will of breeders & of public
A clear programme is wanted

Work that is appropriate to a Coll.
Suggestions, criticism, support, influence &
ascertainment of public feeling,

Work for an exper. farm under Supervision
Continuous - careful records -
Small stock animals - Library

Heafe's written proposal Jan 7/97:- "My suggestion is"
"that I sh^d be associated each with one for the
purpose of conferring with breeders -
a as to problems which they are desirous of having solved
b as to a scheme or schemes of recording data bearing
upon those problems which they will be willing to supply"
"besides this it will be very desirable to be prepared with a
series of problems the importance of solving which should
be urged upon breeders as opportunity offers and their aid
obtained whenever possible."

Statistics of Heredity and Variation

f. 11r

Chiefly from Darwin (an: Plants - Domestication)

	page
Hered Coeffts (average Resemblce)	12
Statistics of XIII Reversion & Atavism - pure & crossed breeds (s.v. breeds)	13
XIV Strength of character preponderancy sexual limitation	14
XV, XVI On Crossing - Causes that interfere with free crossing Sports - relating to blend, which arise suddenly appear in the individual	15
XVI, XVII Fertility. Sexual preference, mutual sterility	
XVII Good effects of crossing & evil from close interbreeding	
XIX Hybridism	
XXIV use & disuse; acquired faculties & inheritance	

Darwin Plants an: Domestic:

Animals. Dogs, Cats, Horses, Asses, pigs, cattle, sheep, goats, rabbits, pigeons, fowls, duck, goose, peacock, turkey, guinea fowl, Canary bird, gold fish, hive bees, silk worm, (? also ants)

Insects

fish Stuckebooks

Plants (omitted at present)

Subjects of exp: returns of pedigree stock, interest say Editor of "Racer" & societies
mice. a purish breed (Weissmann) – bonds
guinea pigs
rabbits
fowls
(? ants & bees for fraternal twins different nests & hives. for var.?)

Coeffts of heredity

f. 125 12

, (F) ~~its~~ scheme of percent distribution ; I, II

F means some particular measureable faculty in a given popn
~~(F) I (F) II~~ ~~its~~ schemes of percentage-distribution of F at times I, II,
Then if the conditions of heredity fertility selection &c be fully known (F) II is determinable from (F) I.

The simpler & more useful form of the problem is where I & II are successive generations & where selection acts no more strictly than in man or horses. the desiderata being to obtain the coeffts of the parento-filial and of the fraternal relation in equally fertile families. Similarly as a next step, to discuss III & find the grpar-gr filial, ~~the~~ grand-filio-fraternal, the grunde-gr. nephew, and the cousinly coeffts

Breeders; but they would be reluctant to tell
the nos of gens to do this w. measure fixed resp of breed.

try rabbits on an island where there were none before

wants numerical work

Reversion to lost Characters in pure breeds

4-5 W.d be more correct in plants if gardeners did not pull up the "rogues" — By a little selection for a few generations, most cultivated plants could probably be brought back to their wild forms 2 instances given. of parsnip & of Scotch Kail.

5-6 In animals that have run wild — curious & small evidence the assertion rests that they become feral. Hooker has strongly said so about plants.

9. Reversion may show after an almost indefinite no. of generations

7 Reversion to characters derived from an ancient cross

8. Sapphire blue pointer 1/16 — Breeders think bad gen^ns are reared in (see p65) breed out a strain, but no rule can be laid down. It depends on a diff^ce of prepotency & actual diff^ce & conditions of life.

9. Is^{eq} powerful with hybrids [but see b last line]

10-13 [In bad propagation - i.e. not by seeds]

13. Crossing as a direct cause of Reversion.
Pigeons &c &c — 17 L^d Morton's mare. 21 half caste men

23. Reversion to one or other of the parent forms; not blends.
Naudin says a hybrid is a living mosaic work.

24 Reversion said rarely to occur in non cultivated plants, though frequent with others (cultivated products are unstable)
with crossed breeds there tends to a reversion of long lost characters as well as those of either parent form

25. Latent characters
Sexual in fluctuating sep. 26 castrated animals acquire female instincts

28 flat fishes left side is usually the blind but some are "wrong fishes" Gasterosteus & many others. Characters of one parent often latent in childhood. -

35 Germ incessantly urged by what Quatrefages calls "tourbillon vital".

36. The wonderful contents of the germ (fine passage)

Test statistics

Distribution of

statistics of

Fixedness of character

37. Breeders think a long established character is the more stable true only in one sex. [see 45] Some new varieties are very stable
38 as white × yellow hyacinths – the tortoiseshell cyes. ancon × manchamp sheep × Niata cattle all modern breeds yet stable.
39 Stability and prepotency differ (see trumpeters 4 lines below this) × silk fowl

40 Prepotency (see Prosper Lucas II 110–)
the ball "Favorite" × black greyhound. 41 a cape ram – 2 races
1 French merinos. many cat. Porter prepotent over fantail
Trumpeters a race at least 130 years old. breeds quite true, yet in crossing has very feeble potency. Silk fowls similarly.
43 Plants nevertheless jackal over dog – ass over horse.
44 disavowed of common rules – their great diversity proves them false
47 Great intricacy of subject of prepotency. varies in strength × in different animals – sexual limitation – secondary sex characters – reputed to blend, a perhaps telegony.

47.– Inheritance as limited by sex (Prosp Lucas II, 137–165)
Lambert horns projection – deficient fingers – color – hæmorrhagic – cattle, boars, fowls

51 " at corresponding periods of life
Embryo × adult characters – same looking eggs may produce
52 very different fowls – different looking eggs often produce like adults
53 many cases – medical cases – Paget thinks they occur earlier in children than in the parents.

59 Latent characters ready to be evolved under certain but mostly unknown conditions – any cause that disturbs the organisation seems sufficient, totally crossing
60. Prepotency plays an important part in determining the rate at which one race can be modified or wholly absorbed through repeated crosses with another.
Chase. The male is more variable than the female
Transmission and development are distinct powers – and occasionally seem antagonistic

Sh[2] - to verified

Excellent case of measure - counting hairs.

important to verify

Crossing

Free
63 Crossing gives uniformity to a race — keeping apart
Causes differences to arise. Vigour, occasionally
crossed offspring. When ratios of black & white are
equal as when differed sufficiently indiscriminate marriage,
64 equal fertility and 1 in 30 annually to die and to be born.
(White Goat: in man p. 46)
64. Rats are ½ domestic, some Snake rats escaped in Zoo: a few
a long time after the keeper frequently caught at first
cross bred but in time the new characters disappeared
65 length of time to absorb another breed 6 or 8 generations (Keep 9)
No of fibres of wool to a sq: inch as test of effect of a trade cross
after 20 generations one cross with a 5500 reached only 27.000, the
perfect merino being 40,000 to 48,000

69 On certain characters not blending
(Black & white — in mice — common turtle doves — Game fowls
in grey). angora rabbits (wh: blk, brr: x fawn). Turnspit dogs
and ancon sheep — usually with tailless & hornless animals
70 Dorking fowls when crossed rarely have often 4 toes on one foot, 5 on the
other. — Plants many cases
72. all cases of new future are such as have been known to
appear suddenly in individuals — (These are sports)

73 Modification by crossing (strains)
Greyhound with a strain of bulldog, pointers with fox hounds
sheep all except Southdown — numerous other cases
74 of true breeds out crosses. Breeders old & incorrect
views about purity of blood — In first generation the result
75 seem disastrous but with patience & weeding out a new
breed is made — But some first generations form breeds
76 at once — Himalayan rabbit from 2 other good breeds.
& many other animals & plants
crossing is not the only cause of variability; witness
bud-variation

Fertility. Sexual prefer°. Mutual Sterility

78. Few precise obs^ns on fertility of mongrels during many generations
79. Crossing prevented by great diff^ce in size – pencil & horses
80 mutual dislike, different habits -- various cases of all
more evidence re fertility in plants
81 Increased fertility from Domestication & Cultivation
91 The direct (Insane cats) Selection of the most fertile has increased fertility
but not with cats ferrets dogs &c

92. Good effects of cross^g & evil of interbreeding
the first is immediate & conspicuous
93 close interbreeding (= sib breeding), its general evils as in
loss of size, of constitutional vigour, of fertility & sometimes malformation
manifest evil usually not for 2 3, in some 4 6 gens – may be checked
by yearly differently (Sebright Carr)
94 It is a great law of nature that all profit from occasional
cross and that long interbreeding is injurious
95. Opinions quoted and again in 96
Hermaphrodite animals & plants never self fertilise
96–102. Much evidence. 100. with all highly bred animals
there is difficulty in getting them to procreate quickly and
all suffer from delicacy of constitution

To talk about R agr Soc Jan 19/97 17

Pedigree stock - encourage fuller acct of measures, vertical, at shows.
(see p 11) Heape's proposal.
? paper in R Agr Journ. & correspondence
? bring it before their Council? They might establish ask Mr Clarke to attend our next Cttee [a form?] [be] or office.

So much done - so costly - co-op needed. scientific direction needed - Sc men cant get the needed data.

F H Collins' paper Nature April 17/90 p 557

Original lots 25 males — 25 females f. 17v
A – Z a – z

Say 225 + 25 spare = 250 hutches
breed a [redacted] nominal 225 for a real 200 -

a bain Marie with labelled gallipots
that is zinc labels (on their contents
with punched figures)

allowing for deaths
Say 2[redacted] = [redacted] offspring
200 × 12 = 2400

Measurements living
dead

(in I) FF FM No. in the male fraternity MF No. in the female fraternity / No. in the frat.

♂ ♀ ♂ ♂ ♀ ♀ ♂ ♀
Labels of form (182, 213, N + 412, 323, s) L (or l)
499 Even nos 2 4 ··· 998 males; odd 500 females

Cap letters Males in order in family; Italics, females.

? for different generations use differently colored, or differentiated labels in Greek letters

? 2 letters instead of 3 figs thus (NM GC, RH kl; L) = 152
which allows 625 males / females } parents
625 : offspring. & keep Nos for the hutches only.

I st. regular breeding

& clearly numbered with label to observer what is in it and to keep a log

Each Hutch – arranged for breeding but capable of turning into 2 compartments for rearing the young

put in it one male and one female (children of the original ♂ and ♀) (I)

when female has bred, kill & preserve the male

When offspring old enough to take care of themselves

(a) kill & preserve their mother

(b) separate the sexes of the young & put them in a clean rearing hutch (using the old label to ensure cleanse the old one & arrange it for rearing to be used in its turn

When offspring are adult –

~~(a) put one male together with the other males similarly taken from the other hutches~~

~~(b) ditto female~~

kill all males but one (a.f. short, good) & preserve them

" " females " " "

~~But surviving~~ Still keep these two survivors separate –

When many hutches are then gone through take out one male from one hutch & one female from another & put them into a clean hutch (breeding) (with a new label) & cleanse the old one & (these say ~~20~~ clean hutches) and rearrange as a breeding hutch, to serve in its turn & to start another generation (II)

Similarly ad infinitum.

f. 19 19

Mouse Chambers Encyc p 334

'not squeaking, but singing, musically & rhythmically, in a high key, with a thin & very light but not displeasing quality – something like a weak voiced canary-bird'. This is printed with the quotation marks.

4 or 5 young at a birth – breeding all the year round

are occasionally cannibals

Harvest mouse very small. Wood mouse common in Europe – an abundant pest. – & others

a French Doct^r

Time of gestation 25 days young are naked & blind at birth & suck for 15 days – Young mice are very ~~apt~~ soon ready to breed.

Brockhaus Lex. – The female breeds in one summer 5 or 6 times, 4–6 young, which in 14 days can take care of themselves

Homes without hands Wood 603–605

mice building in a flower pot, empty bottle

Besides names on Circular as members of Ctte
I send it C. Ewart, Morgan Lloyd, E B Lowe, Mrs Rayner,
Collins, Wallace, Dyer, Lankester, Mrs Lowes.

Prefer to Ctte Dyer, Ewart, E J Lowe

afterwards wrote to Lowe, Morgan, Mrs Rayner
(? Collins) (? Lankester) (? Mitchell) (? Wallace)
& send names to Harrison

female Subject ✓	1 mother,	2 mean sisters,	3 mat: gr mother,	4 mean mat aunts
male subject ✓	Father,	mean brothers,	pat gr mother,	pat mean aunts

f. 21r

Barbary mouse easily got
& Egyptian variegated Fieldrat } is in the Gardens
(which is not var.)
both belong to Arvicanthis
(Isomys)

White {~~[illegible]~~ mice
{common

Japanese mice {~~[illegible]~~
mostly piebald {common mice

Guinea pigs
Russian - Long haired
introduction recent
Common - short haired
brown
these are difficult to get uncrossed

---

f. 21v

Arthur Cayley
Simple in life
Retiring in disposition
Gigantic mathematical capacity
& performance.

March 2/97 Suggested title of an Expert:

On the gradual increase in purity of breed, according as the parents in each successive generation are —

1. Highly selected but of different families,
or 2. Highly selected and closely interbred.

f. 23r

Retrograde Selection

(Gardeners Chronicle
41 Wellington St. Strand
my paper appeared in: } May 15/1897)

M. Masters writes & refers to a forthcoming
leader next week recommending
sweet peas & garden peas
dwarf beans & runner beans & others

Sweet Pea grows wild in Sicily & S. Italy
for reference

Thiselton Dyer had written May 7
giving a "tentative list"
Dwarf Antirrhinum
China Aster
Dianthus Heddewigii [D. chinensis]
Centaurea Cyanus (minor vars)
Lobelia Erinus
Nasturtium Tom Thumb
Candy tuft

Babington
Shortest variety of Parsnip Buckman in 5 years
ago Burbidge (Propagation) p. 558
? due to growing in pots [illegible]

Bradlys
Rivers Sawbridgeworth

A E F. 23v

Airy Hubert MD Stoke House Woodbury, Suffolk
Amman Dr Otto
Appleton's Science Monthly
Armstrong
Balfour
Bell Duncan
Bateson
Prof Binet 29 rue Madame Paris
Bourne
M. Edmond Bordage 57 rue Cuvier Paris
Bowditch
Brooks
Prof. W. K Brooks (Appleton Sc. Mon.)
Bullard C. Harvard
Burbury
G G Butler Ewart Park, Wooler, North

Cattell
Miss Agnes M. Clerke 68 Redcliffe Square SW
Collins
Coste F. H. Perry

Darwin F. L and Wm. George (4)
Hamilton Dickson
Davenport C B
Dr T. Dixey
Du Cane

Carughem (Guido) 42 Piazza Poli Rome

Ellis Havelock Carbis Water Lelant Cornwall
Edgeworth
Erle W
Ford
Foster Carey
Galton Erasmus
Galton Sir D.
Griffith, Selworthy Harrow
Hatton
Heape
Capt. E. Mills
Herschell Sir Wm
Körösi
Hawthorn USA
Lee Miss Alice
Mrs Lethbridge ?

Merrifield F
Macalister D
A. S. Mackenzie Pittsfield
Berkshire County Mass. U.S.A
Minot
Mitchell Sir E
Lloyd Morgan 16 Canynge Road Clifton Bristol
Mevius D. W. Mevius Groningen
Lehrer der Mathematik am Gymnasium
Nature
Osborn
16 19

Tichener

Pearson, K

Prof Thomson Indeam Oxford

Toynard

Poulton

Vaisigny

Vernon

Richet

de Vries

Dr Riders St Johns Coll: Camb

Prof: Sculpture Yale University

Welby Lady

Sergi Univ: 42 Piazza Poli Rome

Welton

Shepard WF 2 Temple Gardens EC

Wesselman Prof

Wheaton Dr

Windle Dr

Stedman adress

Vet Lab T. Smith

H. Spencer

Yule 4 Curlingford Rd Hampstead NW

Statistical

Mrs Symonds

1 Portland Villas East Heath Road Hampstead NW

Work in view June 1897

Purity of breed = $\frac{\text{mean of frat: deviations}}{\text{mean of frat: values}}$; self fert.

Occurrence of wildness or tameness

Lengths of gestation

Work out collaterals. (a) theory (b) test it.

Defects due to interbreeding

Get Bassett registers up to date

Omitted at get, address wanted f. 25br

Barbury, 5 H. 17 Upper Phillimore Gardens Kens

Lee Alice

Cattell

Minot

Osborn

Sedgwick

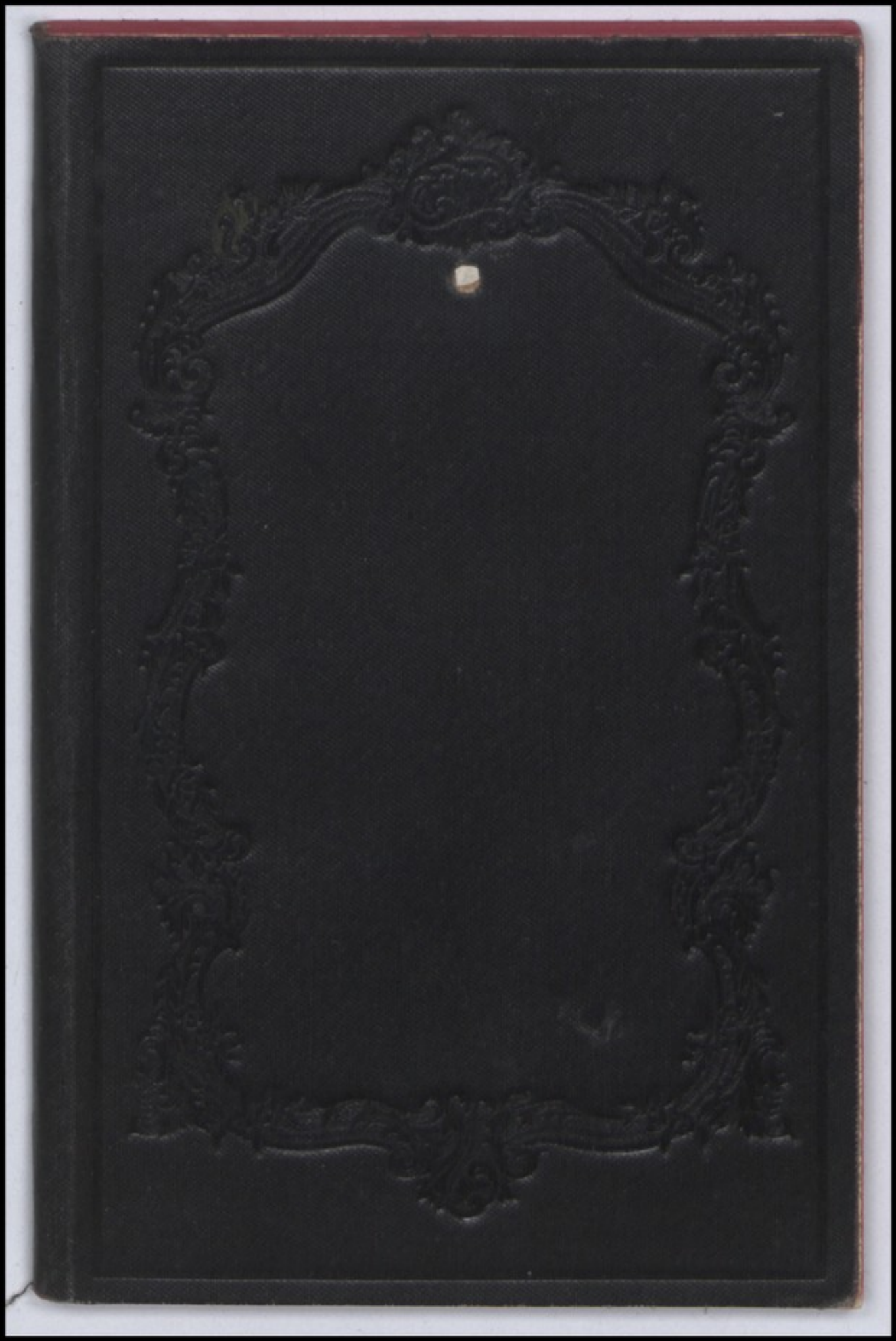
H. Spencer

Titchener

Venus 3 V. Peters Tess Camb

de Vries

The men who worked a crater



drx
35 — Clermont Ferr July 28/97

Francis Galton

Collimator + reflector, 5 rod levs for graduation on rod
Lead Plot for measuring vertical dimensions

To improve the descriptive part of stud books
by inserting that which fulfils following conditions —
1. Of interest to the owner of the animal
2. " " owners of stud animals generally & stallions
3. Of use from a scientific view,

Marks for efficiency of racing, of horses & greyhounds be for prize achievements. This is altogether beyond my powers to discuss otherwise than in a general way, namely that a winner of one or more first class races should be marked say 10, a winner of large number of a larger group of good but second class races should be marked say 8. Similarly for a still larger group of third class races to be marked 6 (marks all to be accumulative) a single mark to be added or subtracted according to the judgement of the assessor, guided by circumstances. This is the merest outline which specialists will have to discuss at length for it is complicated with questions of age & sex. Still it might be done, and a number assigned to each horse by definite rules. for performances up to date. It would be compendious and approximately accurate way of expressing a fact that any one knowing the rules
(Speed of trotters & pacers in America — This is largely but not wholly given

f. 2v

colour }
angles } given by translucencies with bars in front (like 'charms' with pictures)
& st. of limbs }

Stud Books
Variety of stock
No of animals registered
Money spent on breeding animals
" plant
Badness of facts given
Inadequacy for inquiries intended
What is known of heredity my own views
Reasonable desiderata — conditions to be fulfilled } owners breeders & amateurs scientific men
Suggestions measures
Photos
outlines best - pictures (watch chain views) measure &c
colors "

Sliding mirror collimator

log 26 = 1.4150 ½ = 0.7075 = 5.099 (log 5.1)

AD is treated as EB=FA. AD = 60 inches say DF = 24 inches say

EB = FA = $\sqrt{3600 - 576}$ = $\sqrt{3024}$ log 3024 = (3.4806) ½ = 1.7403 = antilog = 54.99

If not DF = 12 inches

EB = $\sqrt{3600 - 144}$ = $\sqrt{3456}$ log 3456 = 3.5386 ½ = 1.7693

Error of an inches plane = 1.21 inch antilog = 58.79 = 60" - 1.21

$\frac{1.21}{6000}$ log $\frac{2.0820}{3.7782}$ = 2.3046 .02201 = 2 per cent about

but the boring is not a plane, but a [ ] fig with rounded ends, whence real error is less.

Chalk marks on horse — head very difficult, don't see how.

f. 3v

Relative richness of pedigree & other peculiarities of record horses in say 1896 whose racing trotter are 2.30 2.15 2.00 & higher

Is there a record kept of no of times each stallion has served & of proportion of failures (barren or miscarriage)

819 1011 1285 x 14 15 =
4 5 6 7
x = 0
2 3

Letters July 21 and 22/1897 from
A J Meston, Allen Farm, Pittsfield, Mass: U.S.A.

1845 Lady Suffolk 2m. 29½ sec ¼(¼/¼)¼
1859 Flora Temple 2. 19¾
1884 Jay Eye See 2. 10 & Maud S. 2. 8¾
This record remained unbeaten for 6 years Then, on a new (oval) course
1891 (Sunol)? 2. 8¼ this track was not satisfactory
1892 "Bicycle" wheels with pneumatic tyre came into use & is now universal. Some believe the new Sulky & track 5 sec' faster
Nancy Hanks 2.04
1893 Alix 2.03¾ w.h. is now the Record
There are also ½ mile tracks, twice round for a mile, most trotters go 4 to 10 seconds faster on the mile track than on ½ mile
There are also all kinds of [illegible] tracks — No distinction as to these in the stud books. There are 3 judges 2 time keepers Race records & trial records. The * is in the Year Books
(4) The trotting records & pedigrees of every horse of 2.30 or less are published & can be relied on and appear in Vols 8–12 of Wallace's Year Book. In vol 8 part 2 a complete record from 1845 to 1892 inclusive Trotters are given alphabetically with color, sex, year of birth, sire, dam, sire of dam & generally grandam & her sire Also the "Great Table" in which all the sires are alphabetic with data as before, the dams of all the 2.30 trotters he has raised, & all these from her down. Similarly as to his sons. Also a table of non 2.30 horses whose dams have produced 2.30. Also table of Great Brood mares. In Vols 9–12 similar yearly information for years 1893–6
(5) To get at all the sires & grandsires & grandams of 500 brood mares is probably impossible, but by making a selection from breeders catalogues this might be done for the trained foals who have given records. He has a large collection of catalogues &c & selects 6 or 7 of the oldest established stock farms & sends me, which would be trustworthy. But it is seldom all foals are trained. If the first turns out very well, the sons & sisters

? an to wold asiatic horses

(7) are utilized as stallions & brood mares, as spec, as soon as can be & stallions, soon the owners dont know what becomes of all their foals mares are sent from a distance & then taken home, perhaps hundreds of miles. The foals too may die young. Still an approx: estimate of nos that lived & 5 years might be made. The catalogues he could look are owned by men likely & help if asked — Electioneer is quoted Pres Jourdan - Leland Stanford University — Palo Alto California could probably get all about Electioneer if not

8) about Trotting & Pacing ? in & Brit: Hindoo horses
9) Color — can be relied on. difficulties in regard & foals brown
10) and bay shd be bracketed He has written in Xtian Ad of Chicago horseman in transmission of color under a nom de plume
Has written Sec: Amer Trotting Register Assoc" two prices of vols.
Asks about Romaine's work & who will take it up.

2nd letter supplementary & the first & written on the next day.
Blank forms for Registration adopted in 1879
Standard trotter 2.30 or faster standard pacer 2.25 or faster (1891)
the "stud book" ~~in Vols~~ since 1879 is Vol 4-12 About 90 000 & 100 000 registered. Stallions are numbered & indexed alphabetically
My inquiries should deal only with horses aged 5 & over. Probably not above 50 000 & 60,000 of these Vol 3 contains alphabetically data (including color) of all standard trotters 1845 & close of 1892 (7494 of them) Standard pacers up & same date 1309. Vols 9-12 contain the annual additions of same year on same principle in 1896 there were 1056 new stand: trotters & 947 new pacers. Restatement in brief about getting full information of all the issue. unless inquiry is limited to certain famous progenitors.

(a 2)

Letter of July 21/97 page 1

"The test of an American trotter is his ability & trot a mile "to harness" at speed. "To harness" is a technical expression meaning that the horse shall be harnessed to a two-wheeled vehicle and be driven by a man weighing

at least 150 lbs or if less enough weight shall be added to make the vehicle carry, with the driver, 150 lbs. This vehicle is known as a sulky"

On Oct 13 1845 the gr. m Lady Suffolk ~~trotted~~ .... a mile in ~~2:29~~ 2:29½ ; this is the first recorded instance of a horse trotting a mile in less than 2½ minutes . Only 2 occasions was Lady Suffolk's record beaten until 1859 (14 years later) when the bay mare Flora Temple did the mile in 2:19½

Tylor Early Hist of Mankind

279 Quotes from Sir Stamford Raffles that in Sumatra "the Battas hold intermarriage in the same tribe to be a heinous crime, and that they punish the delinquents after their ordinary manner, by eating them up alive and eating them grilled or raw with salt and pepper" [Thorough!]

Forbidden marriage within 7th degree — any relationship — in same tribe to be a bar

(Hallam says)
Gregory I. China India Siberia
Australia America N & S
acquired knowledge of N.

—

Our supposed fanatic would then insist on the fact that an improvement in the breed of men in quality & number is the crying want. The cruelty of the ~~struggle~~ for existence would be eliminated, ~~the blind force~~ of the progress / evolution would be furthered. Horses are bred in the number that is wanted, their breed is improved & the almost without any slaughtering of the unfit the blind ~~action~~ & blundering action / natural selection ~~is~~ being superseded by the intelligent skill / human selection. ~~A civilized human being is a costly creature~~ & rear

How to do it the fanatic might propose &

accomplish the end in view, I dont propose
to say, in declaring myself I am assumed to have a clear
field & might make monstrous propositions
of many kinds. What I shall endeavour
to shew is that natural customs have
already been existed, unblamed, in various civilized countries
which would make numerous probable less
absurd or repugnant, than they would be
to persons whose ideas on the matter
were limited by the manner & customs
of the day in the country in which he happened
to have been brought up. More I shall
mention are such as would be applicable

to the assumed case of a population passionately desirous of improving its race and making it its religion to do so, that is to say a paramount motive of conduct enforced by public opinion if not by laws that punished ~~breach of~~ what was felt bad ~~tabulary~~ to the state and honored whatever tended to its good.

Man is by nature a polygamous animal who has become monogamous through considerations of expediency which has gradually led to become expressed by the establishment of a custom of monogamy which ultimately became enforced by law.

Supposing a break down of any existing
social system there is nothing in the ordinary nature
of the male that is repugnant to polygamy,
but contrariwise. There may be some
race difference between men in this respect,
but it is extremely difficult here to separate
what is due to nature and to nurture, reflecting
what is due to nature and to nurture, reflecting
The effect of ~~celibacy~~ Religion (in the widest sense of the word)
on the male in restricting
~~a promiscuous~~ marriage is very great; ~~as the~~
~~the case when~~ m. The The great spread of
the custom of celibacy, when it was enjoined
by the Church as a merit, is a conspicuous
instance of this. Alexandrian monks.

f. 6 11

At the present moment ⅓ of the male inhabitants of Thibet are said to be celibates living in monasteries

Anns Simm

Their civilisation may not be thought a high one but that does not affect the argument in the least which is that the human nature of men is of such a character ~~that~~ that under the influence of religion or custom or other motive, they are content to forego marriage & to lead ~~a~~ long years or even a whole life of celibacy. Nay it ~~is~~ is there nothing in all the more ~~ap~~ convincing ~~appropriate~~ to take from that low civilisations that are of a vigorous & somewhat brutal ~~men~~ race such as the Zulu's, whose celibacy ~~is ordered~~ was compelled and accepted with little murmur during their long initial stage of soldiering.

f. 7 12

The ~~effect~~ of religion and of custom in restricting the marriage of women is ~~too~~ well known to be worth describing. illustrating ~~by~~ ~~examples~~ ~~one~~ ~~with~~ ~~[illegible]~~ namely that French girls if not married ~~at an early age~~ before their early youth was passed ~~were~~ have been sent as a matter of course to a convent. and appear to have accepted their lot uncomplainingly. ~~They were married~~ and ~~are to a great degree~~ ~~after the according to the choice of their parents, and in a very secondary degree according to their own. Again women rarely marry much below their social rank~~

Both in men & women the sexual feelings are ~~capable of being~~ easily metamorphosed into religious aspirations. The ~~double aspect of the~~ alternative psychological expression of the same physiological ~~state~~ excitation is notoriously ~~double~~, and forms one of the few features that are common to all religions. It is everywhere recognised among them from the highest to the lowest, that temporary or, better, total celibacy, ~~if [illegible] more or less~~ especially when combined with ~~some~~ starvation, &c, is favorable conducive to religious ecstasy & visions.

The general conclusion thus far is that a national aspiration to unite as to be a living religion is capable of exerting great ~~influence of~~ restraining influence on the marriage & consequently marriage relations and on the number of children of a population.

The attitude of a women towards marriage differs greatly from that of the male. To her it is regarded eminently as an honorable & secure state; ~~lastly~~ to ~~the~~ maternity with while the man is mostly ~~disgusted~~ by passion. Where custom universally applauds marriage, the woman usually accepts it with little demur. I have myself witnessed on amusing instances of the arrival in Africa who had been sent out by a ~~missionary~~ religious society as bride to a missionary whom she had never seen. Such cases are common. ~~The marriage~~ Abundant instances exist of the custom in nations of all grades of civilization in which the girl is married under arrangements made by her parents and by herself. In no inconsiderable part of the world the girl never even sees her future husband.

Religion even at the present day in England exercises ~~the a great~~ one & marked effect on the time of marriage, namely that they rarely ~~not~~ take place in Lent. In catholic families the husband does not approach his wife during that season. ~~He does~~

A period of ~~abstinence~~ separation on physiological grounds, more rigorously commanded in Leo: Dont is still observed by the modern Jews. In the highest Hebrew families the fact of the female being impure is ~~made~~ conspicuous in the household. She may not to examble

If the foregoing be borne in mind the significance of the following fact will be understood. ~~In each month~~ ....

~~on~~

There are recurrent periods in every life whose beginnings and ends are notified to the household in all Jewish families, from the lowest to the highest, by ~~outward performance~~ acts which their religion makes compulsory. Nightwatches are the modern equivalents of the far stricter & more public ones ordained in .

Reckoning from the close of these periods, I find on ~~data to~~ an analysis of the data furnished by Read & by Montgomery, that the fertility during the first four days is five times as great as in any four days after the first fortnight. The ~~cases in which~~ data are indeed but few consisting of no more than 24 cases at the outside, of which the preferably of only 24 are markedly defined ~~ones~~, still the curve of fertility thus afforded by them is so conspicuous in itself and so marked in its character, that I cannot but trust it. The inferences are obvious.

and again, that the fertility during the first 2 weeks of each four of the month is equal to that of the whole of the remaining 3 weeks

Isolation of human race - present exceptional - sobered by mystery behind & before - sense of duty & fear to an unknown. Hyperion - dignity of independent action

Duties

(1) Introduction of intelligent agency into a system of blind & ruthless law   social duties

Quite possible some who may accept this, will afterward discover they had always practised so

(2) Furtherance of evolution - energy. work to same end as before but minimise misery and waste (Nat Sele superseded by Intg humane slaughter)

(3) Solidarity - influence race at any cost.   man a sport why not a sport from man to something higher. an animal that may see & feel much what we cannot - spiritual sense.

How to do it — aphorisms or canons

A belief that the human race is ~~isolated and detached~~ ~~and~~ isolated ,, to work out its ends in its own way and standing or falling by the result , is more fitted to brace the mind ,, than ~~the~~ the ~~sentiment~~ sense of dependence and the character
On a higher power ,, ~~which shapes our ends, rough hew them as we will~~ It gives the Freedom ~~has many dangers but it~~ (conduces to the parent of strenous effort) and in the present case cannot lead to that irreverent ~~self satisfied~~ attitude of mind which

Supposing Econom: difficulties threatening existence of nation
Discontent with bases of present civiliz:
with its creed [do not account for blindly] wasted life in S+ & Sx: ~~wasted germ~~
wasted germs – (explain amount of waste & art fert)

making for solidarity & isolation necessary — ~~The~~ creed — work not wasted, makes for solidarity & isolation ... duty of ... – Man's part to act intelligently (Hypocrisy ~~waste~~ ... more than beasts) Le Chie the further Evolution ~~dignity~~ without waste – mystery better & beyond ... nothing blind makes, but with sensity

work to do ~~[illegible]~~ — Solidarity of race
~~To improve it at any cost~~

(1) As in beleaguered town, pers: indep. must be restricted

4 Conditions / Canons
(2) Canon Finality of custom nonsense
(3) " Any custom ever contentedly followed cannot be repug:
(4) Establishment of customs – they become axiomatic

Suppose then subject to canons, entire volte face, & freest hand
Then many ways of more & life throughout.
Can't talk about them. the volte face not having been made
Certainly some laws bearing on fertility have got to be enacted:

Improve race Mor: int: & phys, and touch future gen?

Divide the race into four classes equal in number, so arranged
~~graded~~ in respect
~~either~~ to morals to intellect or to physical forces
which by the way, run on the whole pretty closely
together. An average representation of the
lowest or fourth class is a ~~quarter~~ a fool and a weakling
as compared to one of the highest a first class ~~quarter~~. The
It is possible that those of the first class if all
the rest ~~were~~ of the nation were suddenly clean away
might be competent to maintain a state on principles
of altruism, ~~Representative government would be~~
~~worked by them~~ or but as to the ~~two~~ fourth class
~~it is scarcely~~ if they had it all their own way, national
degradation ~~would~~ would obviously be the result. And modern
civilisation leads to lower the stock to the ~~that~~
~~subject~~ If the race, then comes more ~~chiefly~~ from ~~the lowest classes~~
~~from the fourth is say from the third~~ below the average than from above it
We are ~~constantly~~ burdened with ineffectuals

Is then the problem of the improvement of the human
race an insoluble one, must we turn it down in
despair and gloomily look forward to the time when
~~a~~ higher civilisation shall in its turn perish &
be succeeded by a lower but a healthier one..?

with ~~the detail ... of such men as those~~ their names of the other
speakers

42 Rutland Gate. London SW. Oct 20/95

My dear Edward Wheler.

Can you help with your advice in the following matter?—

I wish to advocate in the way most likely to succeed, the insertion of certain few measurements of each pedigree animal in the various stud &c books; that is in the case of race-horses, cast horses, cattle, sheep, dogs and it may be, pigs and other domestic animals as well.

The utility of this for scientific inquiries into heredity, would be very great, and I think you may provisionally accept this for certain, without my now troubling you with details.

On the other hand, the conditions of these measurements being cheerfully & accurately supplied, depends wholly on their utility and interest to the owners of stock, and what I wish to learn from you & from those whom you may talk to about it, is how far that which I will sketch out, strikes you as sufficient for the purpose. Later on, I will ask you more about the particular measurements to be asked for, and about the best method of bringing forward what I mean to say.

My contention is that a statement of such measures as would express height, length of body, length of neck, length of legs &c (I will go a little more into detail further on) would be of real value and much interest — (1) The owner of the female, in selecting an appropriate male, would thereby find the trouble of choosing him distinctly lessened. (2) A fair comparison of different stock or breeds, so far as those measures are concerned, would become for the first time practicable. (3) The changes in the size and proportions of stock as the years go by, would be definitely known. (4) They would be equal guide to judges. ~~an appendage to these measures~~ I will shortly give illustrations of the advantages that measurements would have yielded, ~~had they~~ in the above respects.

Quære can other arguments be used?

As regards the possibility of taking accurate measurements in horses, I have already been in correspondence with Veterinary Capt.n F. Smith the author of a well known book, latterly Professor of the Army Vet: school, Aldershot, and now at Woolwich. There seems to be no difficulty, only embarrassment of choice.

Cattle & Sheep

Horse
Back
Sheath
Back ribs
Girth
Length of thigh
Shoat cannon bone
Bone

Girth
Length

Strength of neck
Width of back bone
Back ribs

(1)
W. Housman Esq
℅ W. Horrocks
7 Princes St
Hanover Sq

(2)
W. Graham Esq
Eden Grove
Penrith

Recd 1st Live Stock Journal
Roy. British Agriculturalist

Illustrations.

In the Lonsley dale Flock Book 1895 a list of points (numbers & the Italics are mine) is given, to guide the Judges in their awards. They run there — (1) Face dark (2) Ears dark and well set on. Head (3) broad and flat behind ears. Neck (4) moderate length, (5) strong, and (6) well set on to the shoulders, &c. In this quotation, 8 points are mentioned, of which (in Italics) two at least are measurable. In the complete list there are 31 points of which the following 21, or most of them, might be reduced to measurement and printed with the descriptions of at least the prize animals. Head broad. Neck moderate length. Shoulder, broad and oblique. Chest deep and wide. Loin broad. Tail broad. Fore legs well set apart.

In the "English Cart Horse Society Stud book" vol 1. 1880, there is an attempt to describe what that kind of horse was like, 60 years ago. It speaks of the interest of such a knowledge and regrets the imperfection of the sketch. There are about (it is impossible to be quite exact) 62 points mentioned in all, of which the following 27 are measurable but of which only one (marked with an asterisk *) is given in definite figures. It was with a sudden sense of relief that after more than a page of vagueness, but those precise figures were reached. They were like a piece of rock to the foot when walking over boggy land. The 27 measurable points are these. Head large in all its dimensions. Forehead and face wide. Side view of jaws and muzzle remarkable for depth. Ears small. Eyes somewhat small and not prominent. Nostrils and mouth large. Neck long & remarkable for its depth. Shoulders upright, low, and thick at the withers. Fore arm long. Knee broad. Fore and hind canons short and thick, frequently measuring *upwards of 12 inches in circumference. Pastern bones very short and upright. Feet large. Hind legs considerably bent, the hocks being thrown backwards and the knees forwards. Breast wide. Back long and narrow. Croup bent at a considerable angle.

The above is a brief outline of my argument. I want to know (1) how to strengthen it. (2) Whether you can put me in way of anybody who could help me. (3) What publication would be the best for me to write in — I should of course write fully & go into the details of the heredity, &c, utility. (4) any blunders I have made above.

It is I think premature to take much pains about selecting the best measurements. the fewer the better for my purposes, so long as they are not less than three.

Affectly yours Francis Galton

Kindly let me have this letter back, some time. If you like first to send it on to any capable friend to an opinion, pray do so.

Questions as to the
Points in borrer that
might be most usefully
measured —
Ed: Wheler's comments

f. 9v

Oct 20th 1895

SWANSFIELD HOUSE,
ALNWICK.

Dear Uncle Frank,

Your letter has just come at an unfortunate time a Dance off and to Wales this afternoon for 10 days. I therefore ~~can't~~ will talk it with me & consult one or two friends about it. The measurement of mind is no new idea, as is shown in Stonehenge's book on the Dog. I quote from the first page I open at, "Deerhound" - "The girth should be at least 2 inches greater than his height - often an inch or two more"

"A good Corn should measure 25 or 26 inches". + finally exact measurement are given of a certain dog called "Bran". Ht. - Nose to tail - Tail - height - length of head - Circum: of head - arm - girth of chest - girth at Loin - round thigh - round lower thigh Hock - Knee -

At the same time I do not think reference is made to measts by practical men, owing to the difficulty of exactness especially by men not specially trained to the purpose.

I have just tried on my mare, with the groom - each measuring separately.

Between Eyes -	Self	8½
	Man	6½

Differences owing to points of measurem

Between fore legs under chest 6 in: & 11 inches

Difference owing to position of legs -

Length of neck.	ft.	in.		ft.	in.
Self.	2.	7.	&	3.	3
Man.	2.	6	&	3.	2½

Difference owing to position of head.

1st Elevated. 2nd Of floor feeding.

Of course these are extreme cases as illustrations of unskilful work - but how can real accuracy be obtained, & how in 50 years' time will it be known exactly how these measurements were obtained.

3. Even the common measure quoted by (as of the "bone" of a horse's leg, which of course includes the back sinew, is difficult to get within ½ an inch, but ½ an inch is a good deal to the eye.

As the whole argument of the question rests, I presume, not on its practicability

difficulty to f. 4v

Please let me Know how these ~~are~~ to be
met. My Edition of Stonehenge is dated
1882. I wonder if he returns his measure
ments in later Editions.

The Subject is a most interesting
one, & I will gladly do anything I
can, & if you want to try practically
on Stock, there is every opportunity
of doing so here at any time. Horses
Cows, Sheep Dogs etc etc. Highly bred animals.

If you want the papers back
before my return home, please drop
a line to me at Wern. Tremadoc
R.S.O.
If not I will keep North Wales
it till my return, & will consult our
Farm Bailiff (a well Known judge of Stock)
& others here & elsewhere.

Yours affectly in haste

F. J. Wheler

Alnwick Nov. 2. 1895

- Measurement of Animals -

Replyto questions-

No. I. This is difficult to answer without knowing more fully the arguments to be adopted in more detail. Possibly it may be argued that certain measurementshave a direct influence on the intellect of an animal,such as a heavy head generally denotes an obstinate disposition, & a weak head an absence of intelligence. Again more directly the size of a horses' leg bone indicates his strength, the length of thigh compared with that of the cannon bone indicates his speed, & his size of girth directly affects his wind. The length of his back ribs, & the size of his sheath & strength of his dock appear undoubtedly to indicate his strength of constitution. In cattle & sheep measurements relating to flesh producing qualities are paramount. The girth, length width of hook bones,&length of back ribs,as proportioned to their weight,seem important. The strength & arch of the neck indicate strength of constitution. In dogs to the points of the horse are to be added width of head for intelligence,(though this also applies to horses) & length of nose for scenting power,in some cases; also length of jaw for punishing power in other breeds.

No. 2. The only likely persons I can think of are - W. Housman. Esc. (I have not got his address but a letter sent to W. Thornton 7 Princes St. Hanover Sc. would be forwarded. Thornton is the well-known Shorthorn Auctioneer. Housman writes largely on breeds of animals & understands what he writes about. Another likely man is W. Granam. Esc. Eden Grove Penrith. He keeps well bred things of all sorts.

No. 3. I should suggest the "Live Stock Journal" as the best agricultural publication for your purpose. The "North British Agriculturalist" is also good. Of course papers such as the "Field" or even a magazine such as the "Nineteenth Century"are of higher class & are circulated among a more general class of reader, but this is not, I imagine, the class of readers you want. E. G. W.