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Inheritance in the Female Line of Size of Litter in Poland China Sows

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The values of C_b show us that the class of "Good" handwriters is most and that of "Bad" handwriters least divergent from the general population. The other four classes have values of C_b sensibly equal and equal to .14. The "Good" handwriters have .18 and the "Bad" .09, and the question is whether these are significantly different from .14, or from each other. The probable error of the difference is about .03. It would therefore be reasonable to assume that "Good" and "Bad" handwriters do differ from each other, though it is less easy to assert marked difference from the community at large. On the whole it seems reasonable to suggest that in distribution of intelligence the "Good" handwriters are less like a random sample of the general girl population than "Bad" handwriters. In other words heterogeneity of intelligence is more marked in the class "Good" than in the class "Bad."

As I have said, the illustration is one of numerical method only and not of interest in itself. The special purpose of the present note is the suggestion of a coefficient which may be of value in the many cases in which we wish to compare the deviation of local samples of a population from the proportions exhibited by a general population.

XI. Inheritance in the Female Line of Size of Litter in Poland China Sows.

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From the data of the American Poland China Record, the authors determined the inheritance of the size of litters from mother to daughter, using 6145 litters farrowed in 1902. The methods were those commonly employed in statistical studies of heredity.

The tabulation of the sizes of litters from mothers and daughters and the determination of the coefficient of correlation (r) shows that there is an actual correlation between the size of litters of two successive generations, and the authors feel justified in concluding that size of litter is a character transmitted from mother to daughter. The coefficient of correlation for the five years is small (.06) but it is appreciable and consequently it would appear proved that by judicious selection of sows from large litters, the average for the breed may be increased.

Correlation in size of Litter of Poland China Sows between Mother (M) and Daughter (D). American Poland China Record.

Age of Daughters	Number of Cases	Mean M	Mean D	σ_M	σ_D	r	P. E. of r
1 Year ...	2010	7.908	6.6451	2.0764	1.7582	.1088	$\pm .0149$
2 Years ...	2047	7.6927	7.5598	1.9818	1.9415	.0885	$\pm .0148$
3 Years ...	1157	7.5809	7.8799	1.9615	2.0693	.0883	$\pm .0197$
4 Years ...	606	7.6304	8.2821	1.9856	2.0661	.0379	$\pm .0274$
5 Years ...	325	7.6738	8.4031	2.1001	2.1571	.0032	$\pm .0375$
1—5 Years	6145	7.7349	7.4391	2.0202	2.0312	.0601	$\pm .0086$

The decrease from .1088 to practically zero (.0032) from the first to the fifth year does not necessarily mean that the inheritance of fecundity is lost as a sow grows older, but probably indicates that inheritance from the dam gradually plays relatively less and less of a part in the determination, while other factors, notably nutrition, play more. The correlation tables are given over page. This work is being followed with an investigation of the inheritance of size of litter through the male line and from the ancestors in the female line.

CORRELATION TABLES OF SIZE OF LITTERS OF SOWS WITH SIZE OF LITTERS IN WHICH DAMS WERE FARROWED. AMERICAN POLAND CHINA RECORD.—LITTERS OF 1902.

TABLE I. Yearling Sows.
Size of Litters of Yearling Sows.

Size of Litters in which Dams were Farrowed.		1	2	3	4	5	6	7	8	9	10	11	12	13	Totals
	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	2	2	1	1	—	—	1	—	—	—	7
	3	—	4	2	1	2	3	4	2	2	1	—	—	—	21
	4	—	—	3	5	22	20	10	4	6	—	—	—	—	70
	5	—	1	4	15	26	28	24	15	5	6	1	—	—	125
	6	—	1	3	21	34	65	81	43	18	7	2	—	—	275
	7	1	4	4	27	47	89	89	62	31	12	2	—	—	368
	8	1	1	10	31	65	67	81	61	34	12	3	1	1	368
	9	—	1	5	21	53	76	87	67	35	14	10	1	1	371
	10	1	1	4	14	16	38	48	36	23	6	6	—	—	193
	11	—	2	2	8	20	21	22	22	13	7	4	—	—	121
	12	—	1	1	4	7	15	12	8	4	1	2	1	—	56
	13	—	—	3	2	4	6	1	5	—	1	—	—	1	23
	14	—	—	—	—	1	2	3	2	1	1	—	—	—	10
	15	—	—	—	—	—	—	—	—	—	1	—	—	—	1
	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	17	—	—	—	1	—	—	—	—	—	—	—	—	—	1
Totals		3	16	41	152	299	431	463	327	172	70	30	3	3	2010

TABLE II. Two-Year-Old Sows.
Size of Litters of Two-Year-Old Sows.

Size of Litters in which Dams were Farrowed.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Totals
	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	1	—	—	1	2	—	1	—	—	—	—	—	5
	3	—	—	—	2	4	2	2	4	6	2	—	—	1	—	—	23
	4	—	—	3	4	3	10	14	10	12	2	3	1	1	1	—	64
	5	—	—	3	6	10	33	34	36	27	6	6	2	—	—	1	164
	6	1	2	7	15	26	52	70	68	36	27	8	4	1	—	—	317
	7	—	2	5	10	25	71	86	84	59	32	12	2	2	1	—	391
	8	—	7	4	15	36	55	95	78	64	32	11	6	4	1	—	408
	9	1	2	2	8	20	36	61	65	70	33	20	4	1	1	—	324
	10	—	—	1	5	14	30	33	45	23	14	15	6	1	—	—	187
	11	—	2	1	2	7	4	21	21	15	13	7	2	—	—	1	96
	12	—	—	2	1	4	10	9	9	2	4	3	1	—	—	—	45
	13	—	—	—	—	1	3	2	3	4	1	1	—	—	—	—	15
	14	—	—	—	—	—	—	3	1	1	1	1	—	1	—	—	8
Totals		2	15	28	69	150	306	431	426	319	168	87	28	12	4	2	2047

TABLE III. Three-Year-Old Sows.
Size of Litters of Three-Year-Old Sows.

Size of Litters in which Dams were Farrowed.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Totals
	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	1	1	1	1	—	—	—	—	—	—	—	—	—	4
	3	—	1	—	1	2	1	2	4	5	—	—	1	—	—	—	—	1	18
	4	—	1	—	—	2	3	6	9	7	6	2	—	1	—	—	—	—	37
	5	—	1	1	5	11	17	15	22	16	4	3	3	1	—	—	—	—	99
	6	1	1	3	5	14	27	37	29	35	14	12	3	—	—	—	—	—	181
	7	1	—	2	9	19	25	50	48	31	34	12	4	2	—	—	—	—	237
	8	1	—	5	3	13	31	40	47	35	22	18	2	3	—	1	1	—	222
	9	—	—	—	3	8	17	33	30	31	24	8	2	3	2	—	—	—	161
	10	1	—	3	—	6	11	16	25	24	17	4	—	1	1	1	—	—	110
	11	—	—	—	4	5	5	14	13	12	6	4	3	1	—	—	—	—	67
	12	—	—	1	—	—	2	3	1	2	4	5	—	—	—	—	—	—	18
	13	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
	14	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	16	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals		4	4	15	30	80	141	217	230	200	131	68	18	12	3	2	1	1	1157

TABLE IV. *Four-Year-Old Sows.*
Size of Litters of Four-Year-Old Sows.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Totals
1	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	2
2	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	2
3	—	—	1	—	1	—	1	2	1	3	—	—	—	—	—	9
4	—	—	—	1	—	2	5	5	4	3	2	2	—	—	—	24
5	—	—	—	2	3	5	6	11	8	7	2	—	—	1	—	45
6	—	—	—	2	6	7	13	18	8	17	3	2	1	1	—	78
7	—	1	—	2	6	13	22	24	32	16	4	2	—	1	—	123
8	—	—	1	3	5	10	15	23	26	24	6	6	1	1	1	122
9	—	1	1	3	8	9	18	18	15	20	10	1	2	3	—	109
10	—	—	—	1	4	5	5	10	8	11	3	—	—	1	—	48
11	—	—	—	2	2	5	1	5	6	1	5	2	1	—	—	30
12	—	—	—	—	1	2	—	1	2	3	1	—	—	—	—	10
13	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	2
14	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	2
Totals	—	2	3	16	36	60	87	118	111	107	36	16	5	8	1	606

TABLE V. *Five-Year-Old Sows.*
Size of Litters of Five-Year-Old Sows.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Totals
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
3	—	—	—	—	1	—	—	1	2	—	—	—	—	—	—	4
4	—	—	—	—	—	2	1	2	3	2	—	—	—	—	1	11
5	—	—	—	—	1	3	3	6	6	4	2	2	—	—	—	27
6	—	1	1	1	4	8	4	10	6	8	7	1	1	2	—	54
7	—	—	—	1	1	8	12	10	13	11	6	1	3	—	—	66
8	—	—	—	2	3	3	11	14	10	4	3	3	—	—	—	53
9	—	2	—	2	4	3	8	11	12	6	4	2	—	—	—	54
10	—	—	—	1	—	4	3	5	4	3	3	2	1	1	—	27
11	—	—	—	—	—	1	3	2	2	4	1	—	—	—	—	13
12	—	—	—	—	—	—	1	2	1	—	—	—	1	—	—	5
13	—	—	—	—	1	—	1	1	1	1	2	—	1	—	—	8
14	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	2
Totals	—	3	1	7	15	32	48	64	61	43	28	12	7	3	1	325

TABLE VI. *All Litters 1902.*
Size of Litters of Sows One to Five Years Old.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Totals
1	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	2
2	—	—	—	3	2	2	3	3	2	3	—	1	—	—	—	—	—	19
3	—	5	3	4	10	6	9	13	6	—	—	1	1	—	—	—	1	75
4	—	1	6	10	27	37	36	30	32	13	7	3	2	1	1	—	—	206
5	—	2	8	28	51	86	82	90	62	27	14	7	1	1	1	—	—	460
6	2	5	14	44	84	159	205	168	103	73	32	10	3	3	—	—	—	905
7	2	7	11	49	98	206	259	228	166	105	36	9	7	2	—	—	—	1185
8	2	8	20	54	122	166	242	223	169	94	41	18	9	2	2	1	—	1173
9	1	6	8	37	93	141	207	191	163	97	52	10	7	6	—	—	—	1019
10	2	1	8	21	40	88	105	121	82	51	31	8	3	3	1	—	—	565
11	—	4	3	16	34	36	61	63	48	31	21	7	2	—	1	—	—	327
12	—	1	4	5	12	29	25	21	11	12	11	2	1	—	—	—	—	134
13	—	—	3	2	6	11	5	9	5	3	3	—	2	—	—	—	—	49
14	—	—	—	—	1	3	7	3	4	3	1	—	1	—	—	—	—	23
15	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1
16	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
17	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Totals	9	40	88	274	580	970	1246	1165	863	519	249	77	39	18	6	1	1	6145