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## APPENDIX 1.

### OBSERVATION 1 (a).

#### *The Morphological Changes of the Ovary During Dioestrus.*

This appendix gives descriptive details of the ovaries of pigs slaughtered every three days during the dioestrous cycle. The different three-day intervals were reckoned from the beginning of oestrus. Six such intervals were recorded, the sixth interval thus falling on the 18th day of the dioestrous cycle. One Large Black and one Large White female were slaughtered at each three-day interval. Numerical particulars, such as weights and dimensions of ovaries, numbers of corpora lutea and Graafian follicles, appear in Table I of this appendix.

#### *Group I. Three days After the Beginning of Oestrus.*

##### *Large Black No. 234.*

Onset of oestrus, 21.5.44, 9 a.m.; slaughtered 24.5.44, 7.30 a.m.

Oestrus had already terminated at the time of slaughter. The corpora lutea I have a pale purplish vinaceous colour (Ridgway, 1912). All corpora stand out prominently from the ovary. The points of rupture show very clearly as bright red papillae. Vascularisation is very faint. The shape is mostly spherical but some are conically inclined. On section each corpus contains a dark red blood clot. The corpora lutea II are firm, solid bodies, creamy yellow externally and on section, but three in the left and one in the right ovary are slightly bluish-coloured on section. Only 4 Graafian follicles can be seen on the left ovary and 5 on the right ovary, all 1 mm. in diameter. These follicles are colourless.

##### *Large White No. 157.*

Onset of oestrus, 19.2.43, 6 p.m.; slaughtered 22.2.43, 4 p.m.

The colour of the corpora lutea I ranges from pale purplish vinaceous to dark red, the majority being of the latter type. The shape varies from distinctly conical to spherical. Points of rupture show clearly. Three corpora were much larger than the rest, measuring 13 to 14 mm. On section each of these latter has a dark red blood clot inclusion. The other corpora are lighter coloured on section and their central cavities contain a light red fluid. One follicle in the right ovary is cystic and had failed to rupture, diameter 15 mm. Its colour is light red. On puncture a light red fluid escapes which immediately sets to a

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jelly-like consistency, the walls collapsing completely. The corpora lutea II are firm solid bodies, distinctly creamy yellow in colour. With diameters of 4 to 5 mm., they are still very conspicuous bodies. The Graafian follicles vary in size from less than 1 mm. to 5 mm. The colour of the largest individuals is seashell pink, the smaller ones being an opaque dull white. Sizes merge gradually into each other.

### *Group 2. Six Days After the Beginning of Oestrus.*

#### *Large Black No. 176.*

Onset of oestrus, 2.7.43, 3 a.m.; slaughtered 8.7.43, 9 a.m.

The corpora lutea I vary in colour from pinkish to pale purplish vinaceous. The general shape is spherical. Blood vessels show clearly on a few only and faintly on others. Rupture points are faintly visible on two corpora only. On section a number are seen to contain a dark red blood clot but in the rest the central cavities have been closed with fibrous tissue. One corpus in the right ovary measures 16 mm. and is about double the size of the majority of corpora. A dark red blood clot is revealed in the centre on section. It is very probably cystic. The corpora lutea II still show up clearly, being 4 to 6 mm. in diameter. Their colour is creamy yellow and they are firm, solid bodies. Only scattered remnants of still older corpora can be seen. Among the follicles there is no distinct largest group, sizes ranging from below 1 mm. to 5 mm. The smallest individuals have a dull white colour and the larger ones are seashell pink.

#### *Large White No. 140.*

Onset of oestrus, 6.3.43, 9 a.m.; slaughtered 12.3.43, 9 a.m.

The corpora lutea I are pale purplish vinaceous in colour. The shape is conical to spherical. Rupture points show clearly on nearly all corpora. These bodies are distended but soft to touch. One corpus in the right ovary is distinctly larger than the rest (13 mm.), pinkish in colour and with a large papilla at the point of rupture; blood vessels are very prominent on the surface. On section, the majority contain a clear, colourless, non-viscous fluid, but some contain a red watery fluid. The cut surfaces are pale flesh pink in colour. The corpora lutea II appear as whitish bodies on the outside but on section they are reddish brown. Only very few of the Graafian follicles are of the 1 mm. class. A group measuring 4 to 6 mm. are distinctly marked off from the rest of the population. No capillaries are visible and the colour of the largest ones is seashell pink (Ridgway, 1912).

### *Group 3. Nine Days After the Beginning of Ooestrus.*

#### *Large Black No. 181.*

Onset of oestrus, 30.5.43, 3 a.m.; slaughtered 8.6.43, 8 a.m.

The corpora lutea I have a pale purplish vinaceous colour. Vascularisation is very distinct. The shape is spherical. The consistency is fairly firm. On section the central cavities are either completely filled in with fibrous tissue or else they include a dark red blood clot. No traces of the corpora lutea II can be found. This is to be expected as this gilt was killed after her first or puberty oestrus. The Graafian follicles have a seashell pink colour and their sizes increase gradually from below 1 mm. to 3 mm. Numbers cannot be determined accurately.

#### *Large White No. 159.*

Onset of oestrus, 15.3.43, 12 midnight; slaughtered 25.3.43, 8 a.m.

The corpora lutea I are mostly spherical in shape. The colour is pale purplish vinaceous. A clear network of bloodvessels appears on all surfaces of the corpora. On section a number are seen to have lost their central cavities but some still have fairly large cavities with a light red fluid inclusion. They are flabby to the touch. Points of rupture still show on a few as small raised areas. One follicle in the right ovary never ruptured; it has a thick wall and contains a yellowish liquor. The corpora lutea II show as dull white bodies externally, but on section they are pale yellow to brownish. The Graafian follicles gradually increase in size from below 1 mm. to 5 mm., but only three are of the largest size and a small minority of the smallest class. They have a seashell pink colour.

### *Group 4. Twelve Days After the Beginning of Oestrus.*

#### *Large Black No. 233.*

Onset of oestrus 8.6.44, 12 noon; slaughtered 20.6.44, 10.30 a.m.

The ovaries of this female could not be examined in the fresh state and had to be preserved in 10 per cent. formalin solution for a few days. The colour of the Graafian follicles could therefore not be recorded.

The majority of the corpora lutea I are spherically shaped. They are fairly firm bodies. Rupture points still show as small papillae. On section the colour is yellowish. Central cavities have disappeared. Three follicles in the left and two in the right ovary apparently never ruptured; their diameters range from 12 to 15 mm. All five include a colourless, jelly-like substance. The inclusion undoubtedly solidified as a result of the action of the formalin. The corpora lutea II are firm, solid bodies, yellow to brownish externally and on section. Very few of the follicles are of the 1 mm. and smaller class, the majority being 3 to 4 mm. in diameter.

*Large White No. 194.*

Onset of oestrus 1.11.43, 3 a.m.; slaughtered 13.11.43, 3 a.m.

The colour of the corpora lutea I is pale purplish vinaceous. The shape is spherical. Vascularisation is very clear. The consistency is soft. On section all follicles have a large cavity containing a clear liquor. Three follicles in the right and one in the left ovary appear to be cystic. They are 12 to 14 mm. in diameter and have central cavities of 10 mm. each, containing a clear fluid. The Graafian follicles are seashell pink in colour. More than half are 3 mm. and over in diameter and a fair percentage is just visible to the naked eye. Their actual number is difficult to determine. Capillaries show distinctly on the largest group. The corpora lutea II are yellow-coloured, firm, solid bodies, 2 to 3 mm. in diameter.

*Group 5. Fifteen Days After the Beginning of Oestrus.*

*Large Black No. 207.*

Onset of oestrus 8.8.43, 3 p.m.; slaughtered 23.8.43, 9 a.m.

The corpora lutea I are pale purplish vinaceous in colour. Capillaries show very clearly on all surfaces. The shape is spherical. The consistency is rather flabby. On section the cut surfaces are light flesh-coloured. Central cavities have disappeared in three only, the rest all have a large cavity which contains a jelly-like clear fluid. The corpora lutea II are hard bodies, deep creamy yellow externally and on section. There are no remains of older corpora. The Graafian follicles are seashell pink in colour. Faint capillaries are present on a few only. A small number are of the 1 mm. size class, the majority being 3 to 4 mm. in diameter.

*Large White No. 166.*

Onset of oestrus, 6.6.43, 3 p.m.; slaughtered 21.6.43, 3 p.m.

The corpora lutea I are of a pale purplish vinaceous colour. Capillaries appear in profusion and show up clearly. The consistency is quite firm. The shape is spherical. The colour, on section, is pinkish and all cavities have disappeared. The corpora lutea II are brownish yellow to deep yellow in colour, very firm and solid. The largest group of Graafian follicles are seashell pink in colour and capillaries show clearly on the majority. Only a small percentage is of the 1 mm. class.

*Group 6. Eighteen Days after the Beginning of Oestrus.*

*Large Black No. 166.*

Onset of oestrus 5.8.43, 9 a.m.; slaughtered 23.8.43, 9 a.m.

The colour of the corpora lutea I is creamy yellow externally and on section, all cavities having disappeared. The shape is mostly spherical. The majority still show the points of rupture as small papillae. Vascularisation is clear on a few but faint on the majority. The corpora lutea II are creamy yellow externally and on section. They are hard, solid bodies. There is present a distinctly largest group of Graafian follicles of 5 to 6 mm. diameter, the balance being 1 to 3 mm. in size. The colour is seashell pink and a clear network of capillaries appear on all the larger bodies.

*Large White No. 175.*

Onset of oestrus 29.5.43, 12 midnight; slaughtered 17.6.43, 9 a.m.

The corpora lutea I are distinctly creamy yellow in colour. They have a firm consistency and are found solid on section but a number still have small central cavities with a fluid inclusion. Evidence of older corpora cannot be seen on sectioning the ovaries. This is to be expected as this gilt was killed after her puberty oestrus. A largest group of Graafian follicles stand out clearly from the rest of the follicular population. Capillaries show faintly on their surfaces. The colour is seashell pink. None are less than 1 mm. in diameter and only a few are of this class, the majority being 3 to 5 mm.

TABLE I.  
*Summary of Data on the Ovary of the Sow During Dioestrus.*

Interval after Onset of Oestrus, Days.	Sow No.	WEIGHT OF OVARIES, GRAM.		CORPORA LUTEA I NUMBER*.			CORPORA LUTEA II NUMBER.			FOLLICLES.		Weight of Sow, lb.	Age Months.	Number of Oestrous Periods Exhibited.	Class of Animal.
		Left.	Right.	Left Ovary.	Right Ovary.	Total.	Left Ovary.	Right Ovary.	Total.	Total Both Ovaries.	Size Range mm.				
3.....	Large White 157	9.534	9.843	9	6	15	6	8	14	106	<1-5	184	7	3	Gilt.
	Large Black 234	3.463	2.711	12	5	17	7	11	18	9	All 1	263	8	1 or 2	Gilt.
6.....	Large White 140	5.494	4.878	8	6	14	5	5	10	58	1-6	234	14	5	Sow.
	Large Black 176	5.966	3.344	5	5	10	8	13	21	55	<1-5	267	10	3	Gilt.
9.....	Large White 159	7.744	7.181	10	8	18	4	7	11	117	<1-5	256	9	3	Gilt.
	Large Black 181	6.108	4.702	5	4	9	—	—	—	106	<1-3	260	9	1	Gilt.
12.....	Large White 194	9.907	6.166	9	4	13	8	6	14	149	<1-6	246	10	4	Gilt.
	Large Black 233	9.907	8.501	8	7	15	5	7	12	81	<1-6	422	13	2	Gilt.
15.....	Large White 166	9.159	6.252	8	8	13	6	8	14	84	1-6	250	10	2	Gilt.
	Large Black 207	6.643	5.728	6	4	10	9	6	15	101	<1-4	218	10	3	Gilt.
18.....	Large White 175	6.702	7.932	6	9	15	—	—	—	67	1-8	260	9	1	Gilt.
	Large Black 166	6.119	7.336	5	8	13	6	6	12	101	1-6	339	13	6	Gilt.

\* Corpora lutea I which were suspected as being cystic were discarded for the data in Appendix 1, Table III.

TABLE II.

*Weights of Ovaries at Consecutive Three-day Intervals During Dioestrus.*

Period, Days.	Pig No.	WEIGHT IN GRAMS.	
		Left Ovary.	Right Ovary.
3.....	Large Black 234.....	3.463	2.711
	Large White 188.....	3.849	3.614
6.....	Large Black 176.....	5.966	3.344
	Large White 140.....	5.494	4.878
9.....	Large Black 181.....	6.108	4.702
	Large White 159.....	7.744	7.181
12.....	Large Black 233.....	9.907	8.501
	Large White 194.....	9.907	6.166
15.....	Large Black 207.....	6.643	5.728
	Large White 166.....	9.159	6.252
18.....	Large Black 166.....	6.119	7.336
	Large White 175.....	6.702	7.932

TABLE III.

*Sizes in Millimetres of Corpora Lutea I at Consecutive Three-day Intervals During Dioestrus.*

3 Days.		6 Days.		9 Days.		12 Days.		15 Days.		18 Days.	
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.
No. 234	No. 157	No. 176	No. 140	No. 181	No. 159	No. 233	No. 194	No. 207	No. 166	No. 166	No. 175
8.0	11.0	10.0	8.0	12.5	10.0	9.0	12.0	10.0	10.5	—	—
8.0	11.0	7.0	8.0	11.0	9.0	8.0	14.0	11.0	10.0	9.0	11.0
7.5	11.0	8.5	11.0	11.0	9.5	10.0	10.0	10.5	11.0	8.0	11.0
8.0	7.0	8.0	7.0	10.0	8.5	8.0	14.0	10.5	11.5	7.0	11.0
7.0	12.0	8.0	9.0	10.0	10.5	8.0	10.0	11.0	11.0	8.0	7.0
7.0	8.0	8.0	10.0	9.0	11.0	10.0	10.0	11.0	10.0	8.5	12.0
6.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0	12.0	11.0	9.0	13.0
7.0	8.0	7.0	10.0	11.0	9.0	8.0	11.0	13.0	9.0	9.0	13.0
6.0	—	7.0	9.0	12.0	9.0	9.5	12.0	9.0	11.0	9.5	14.0
8.0	—	—	8.0	—	9.0	11.0	10.0	12.0	11.0	9.0	14.0
7.5	—	—	8.0	—	9.0	8.0	11.0	—	11.5	9.5	8.0
6.0	—	—	8.0	—	10.0	—	10.0	—	11.0	8.0	7.0
7.0	—	—	—	—	10.0	—	—	—	11.0	8.0	8.0
7.0	—	—	—	—	9.0	—	—	—	—	8.0	—
9.0	—	—	—	—	9.0	—	—	—	—	—	—
7.0	—	—	—	—	10.0	—	—	—	—	—	—
7.0	—	—	—	—	10.0	—	—	—	—	—	—
—	—	—	—	—	9.0	—	—	—	—	—	—

TABLE IV.

*Sizes in Millimetres of Corpora Lutea II at Consecutive Three-day Intervals During Dioestrus.*

3 DAYS		6 DAYS.	9 DAYS.	12 DAYS.		15 DAYS.		18 DAYS.
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.
No. 234	No. 157	No. 176	No. 159	No. 233	No. 194	No. 207	No. 166	No. 166
6.0	4.0	5.0	3.5	4.5	3.5	5.0	5.0	4.0
7.0	5.0	5.0	5.0	3.0	3.0	6.0	4.0	4.0
5.5	4.5	5.0	3.5	4.0	2.5	4.5	4.5	3.5
6.0	5.0	6.0	5.5	4.0	3.0	4.5	6.5	4.0
6.5	3.5	4.5	4.0	4.5	4.5	4.5	5.0	4.0
6.0	4.0	4.5	5.5	4.0	3.0	4.0	5.0	4.0
7.0	5.0	6.0	4.0	4.0	3.0	4.5	6.5	4.5
8.0	5.0	5.0	4.5	4.0	3.0	3.5	6.5	4.0
4.0	4.0	3.5	4.0	3.5	3.0	4.0	6.0	4.0
5.0	4.0	6.0	4.0	2.0	2.0	4.0	5.0	5.0
5.0	4.0	6.0	4.0	3.0	2.0	4.0	5.0	4.5
5.0	4.5	4.5	—	3.5	—	4.0	5.0	5.0
6.0	4.0	3.0	—	—	—	5.0	5.0	—
6.0	4.0	5.0	—	—	—	3.0	5.0	—
5.5	—	4.5	—	—	—	3.0	—	—
6.0	—	5.0	—	—	—	—	—	—
6.0	—	4.0	—	—	—	—	—	—
6.0	—	3.0	—	—	—	—	—	—
—	—	3.0	—	—	—	—	—	—
—	—	4.0	—	—	—	—	—	—
—	—	4.0	—	—	—	—	—	—

TABLE V.

*Sizes in Millimetres of the Largest Group of Graafian Follicles at Consecutive Three-day Intervals during Dioestrus.*

3 DAYS.		6 DAYS.		9 DAYS.		12 DAYS.		15 DAYS.		18 DAYS.	
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.
No. 234	No. 157	No. 176	No. 140	No. 181	No. 159	No. 233	No. 194	No. 207	No. 166	No. 166	No. 175
1.5	5.5	4.0	5.0	6.0	6.0	6.0	5.0	5.0	5.0	6.5	8.5
1.5	4.0	4.0	5.0	5.0	4.0	4.0	5.0	5.0	5.0	5.0	7.0
2.0	4.0	4.0	6.0	4.0	4.0	6.5	6.0	4.0	6.5	5.0	9.0
2.0	4.5	4.0	4.0	4.0	4.0	4.5	4.0	4.0	6.5	6.0	9.0
2.0	4.5	3.5	4.0	4.5	4.0	5.0	4.0	4.0	6.0	6.0	8.0
1.5	4.0	4.0	4.0	4.5	4.0	5.0	6.0	4.0	5.0	6.0	8.0
—	4.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	5.0	6.0	9.0
—	6.0	3.0	4.0	4.5	4.0	5.0	5.0	4.0	5.0	5.5	7.0
—	5.0	4.0	4.0	4.0	6.0	5.0	6.0	4.0	5.0	6.0	8.0
—	5.5	3.0	6.0	4.0	4.0	4.0	5.0	4.0	5.0	6.0	8.5
—	5.0	5.0	5.0	5.0	4.0	6.0	5.0	5.0	6.0	5.0	8.0
—	4.0	4.0	5.0	4.0	4.0	6.0	5.0	5.0	5.0	4.5	9.0
—	4.0	4.0	5.0	6.0	5.0	5.0	6.0	4.0	5.0	5.0	7.0
—	5.0	3.5	4.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	8.5
—	6.0	3.5	4.0	5.0	5.0	5.0	6.0	4.0	5.0	7.0	8.0
—	4.0	3.5	—	5.5	4.0	6.0	6.0	4.0	6.5	7.0	7.0
—	5.0	3.5	—	5.5	4.0	5.0	5.0	4.0	4.5	6.5	6.0
—	4.0	5.0	—	5.0	4.0	5.0	5.0	4.5	5.5	6.0	7.0
—	5.0	4.0	—	6.0	4.0	4.0	6.0	4.5	6.0	6.0	6.5
—	—	4.0	—	6.0	4.0	4.0	6.0	4.0	5.0	5.0	—
—	—	—	—	5.0	5.0	4.0	6.0	4.0	5.0	5.5	—
—	—	—	—	5.0	4.0	5.0	6.0	4.0	6.5	6.0	—
—	—	—	—	4.0	5.0	—	6.5	4.0	5.5	5.0	—
—	—	—	—	4.0	5.0	—	—	4.0	5.0	5.0	—
—	—	—	—	—	4.0	—	—	4.0	5.0	5.0	—
—	—	—	—	—	5.0	—	—	4.0	6.0	5.0	—
—	—	—	—	—	5.0	—	—	4.0	5.0	6.0	—
—	—	—	—	—	5.0	—	—	—	5.0	—	—
—	—	—	—	—	4.0	—	—	—	—	—	—
—	—	—	—	—	4.0	—	—	—	—	—	—
—	—	—	—	—	4.0	—	—	—	—	—	—
—	—	—	—	—	4.0	—	—	—	—	—	—
—	—	—	—	—	4.0	—	—	—	—	—	—

## APPENDIX 2.

## OBSERVATION 1 (b).

*The Morphological Changes of the Ovary During Oestrus.*

The morphological changes of the ovary during oestrus are described in this appendix. The animals were slaughtered at six-hour intervals, starting at the zero hour of oestrus. The number of females from each breed, killed at the different intervals, varies. More pigs were slaughtered around the expected periods of ovulation than during the early hours of oestrus. Numerical details in respect of dimensions and numbers of follicles, etc., appear in Table I of this appendix.

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### *Group 1. Zero Hour of Oestrus.*

#### *Large Blacks.*

*No. 235.*—Onset of oestrus, 4.7.44, 6 p.m., duration of one only previous oestrous period, 54 hours.

The mature Graafian follicles have a seashell pink colour. A clear network of fine capillaries appears on the surfaces of all follicles. The shape is spherical and the surfaces have a glistening appearance. The immature follicles are too small and inconspicuous for a correct count of their number. In the right ovary alone there appear 3 follicles which are greater than 2 mm. The corpora lutea I are spherical in shape and creamy yellow externally and on section. They are firm, solid bodies. Fibrous veins are revealed on section, indicating the sites of the previous central cavities. Still older corpora (C. L. II) are clearly visible, very light creamy yellow bodies, with diameters of 2 to 3 mm.

#### *Large Whites.*

*No. 17 (a).*—Onset of oestrus, 22.11.40, 9 a.m., durations of previous oestrous periods, 33, 54 hours.

The surfaces of all follicles have a glistening appearance and their colour is seashell pink. Capillaries show faintly on all. A large number of immature follicles are clearly visible but none are above 1 mm. in diameter. The corpora lutea I are conical to spherical in shape and all are ivory yellow in colour. They are hard, solid bodies. The remains of still older corpora lutea are visible, the largest one in the left ovary measuring 2 mm. The colour is brownish.

### *Group 2. Sixth Hour of Oestrus.*

#### *Large Blacks.*

*No. 195.*—Onset of oestrus, 10.8.43, 3 a.m.; slaughtered 10.8.43, 7.30 a.m.; durations of previous oestrous periods, 66, 60, 63, 36 hours.

The mature Graafian follicles are seashell pink in colour and all have a glistening appearance. The shape is spherical. The majority have a distinct network of capillaries. The immature follicles are too small to count and only a few are clearly visible to the naked eye. The corpora lutea I show prominently. Their shape is spherical. Externally, the colour is creamy yellow. They are firm, solid bodies. Two corpora in the right ovary each contains a dark red blood clot, 3 mm. in diameter; two in the left ovary show dark red streaks, indicating the previous sites of the central cavities. Only scattered yellow remnants of older corpora are visible.

#### *Large Whites.*

*No. 47.*—Onset of oestrus 5.11.40, 9 a.m.; slaughtered 5.11.40, 1.30 p.m.; durations of previous oestrous periods, 27, 33, 33, 45, 45, 54 hours.

All mature follicles glisten and their colour is seashell pink. Capillaries show very clearly. Their shape is spherical and there are no indications of imminent rupture. There are 2 follicles in each ovary varying from pink to pinkish purple in colour. On section a blood-coloured watery fluid escapes. The corpora lutea I show up prominently, their colour being creamy yellow externally and on section. Of the older corpora, numerous small, yellowish remnants are seen, up to 2 mm. in size. The immature follicles are extremely difficult to count, owing to their small size.

*No. 36.*—Onset of oestrus, 15.11.40, 6 a.m.; slaughtered 15.11.40, 10.30 a.m. No records of the durations of previous oestrous periods are available.

The mature Graafian follicles show great variation in size, diameters varying from 4 to 7 mm. The smaller follicles do not show a network of capillaries like the largest ones and are of an opaque translucency. The larger group is seashell pink in colour. The immature follicles are very small, only a few being clearly visible; all are less than 1 mm. in size. The corpora lutea I show indistinctly, being dull white externally and brownish on section.

### *Group 3. Twelfth Hour of Oestrus.*

#### *Large Blacks.*

*No. 21.*—Onset of oestrus, 17.11.40, midnight; slaughtered, 18.11.40, 10.30 a.m.; durations of previous oestrous periods, 66, 66, 54, 63 hours.

Two mature Graafian follicles in the left ovary are conically shaped whereas the others are spherical; they are also more transparent than the rest and more glistening. Two follicles are much smaller than the balance, being 4 and 7 mm. in diameter respectively, the rest being about 10 mm. In the right ovary one follicle is only 6 mm. A network of capillaries appear on all of these bodies in both ovaries. Only a few immature follicles are



visible in both ovaries, measuring up to 1 mm. in diameter. The corpora lutea I are pale yellow in colour, externally and on section. Small cavities are still present in a number, the rest are solid. Only brownish spots remain of still older corpora.

*No. 12.*—Onset of oestrus, 24.11.40, 12 midnight; slaughtered 25.11.40, 10.30 a.m.; duration of one only previous normal oestrous period is available, which lasted 60 hours.

In the left ovary there is one follicle, and in the right ovary there are four follicles, which are decidedly more transparent and glistening and their capillaries show up much clearer than the rest. Sizes range from 4 to 11 mm., the smaller individuals are opaque whereas the larger ones are seashell pinkish. A small number of immature follicles are 1.5 mm. in diameter and are clearly visible, the balance are less than 1 mm. All corpora lutea I show distinctly, but a number are buried rather deeply in the body of the ovaries. They are hard solid bodies, creamy yellow in colour.

#### *Large Whites.*

*No. 50.*—Onset of oestrus 11.10.40, 3 a.m.; slaughtered 11.10.40, 1.30 p.m.; durations of previous oestrous periods, 30, 39, 33, 51 hours.

All mature Graafian follicles, are seashell pink in colour and show a clear network of capillaries. They are turgid and spherical. They have glistening surfaces. There are numerous very small immature follicles below 1 mm. in size, the largest being 3 mm. in diameter. The corpora lutea I are clearly visible, 3 to 5 mm. in diameter and of a creamy yellow colour. They are solid and firm. On section older corpora appear as yellowish spots, 1 to 2 mm. in diameter.

*No. 32.*—Onset of oestrus 10.11.40, 9 p.m.; slaughtered 11.11.40, 7.30 a.m.; durations of previous oestrous periods, 45, 48, 57 hours.

All Graafian follicles are seashell pink in colour, glisten and a clear network of capillaries appears on all surfaces. The immature follicles are very inconspicuous, only two in the left ovary being 2 to 3 mm. in size, the balance are 1 mm. and less in diameter. The corpora lutea I stand out clearly on the ovaries, they are firm, solid bodies with a pale yellow colour. Older corpora show only as yellowish specks on sectioning the ovaries.

#### *Group 4. Eighteenth Hour of Oestrus.*

##### *Large Blacks.*

*No. 171 (b).*—Onset of oestrus, 28.1.41, 6 p.m.; slaughtered 29.1.41, 10.30 a.m.; durations of previous oestrous periods, 75, 84, 69 hours.

All mature Graafian follicles stand out prominently. Their colour is seashell pink. Capillaries are clearly visible. They are turgid and glistening and, except for two follicles, the follicular capsules are very thin. A small number of immature follicles are visible, measuring up to 1 mm. The corpora lutea I show plainly on the surfaces of the ovaries. They are firm solid bodies, creamy yellow externally and on section. Older corpora are present only as yellowish or brownish spots.

##### *Large Whites.*

*No. 21.*—Onset of oestrus, 6.3.41, 9 p.m.; slaughtered 7.3.41, 1.30 p.m.; durations of previous oestrous periods, 48, 48, 45, 60, 60, 66, 63 hours.

All mature follicles are seashell pink in colour, their walls are very thin and transparent and the network of bloodvessels is very conspicuous. On three follicles in the right ovary and on two in the left ovary, blood spots appear in the follicular walls indicating imminent rupture. One follicle in the right ovary has ruptured, the walls have collapsed and uncoagulated blood is present in the cavity, showing recent rupture. The corpora lutea of the previous ovulation are clearly visible, conical in shape, very firm in consistency and light creamy yellow in colour.

*No. 23.*—Onset of oestrus, 25.11.40, 6 p.m.; slaughtered 26.11.40, 10.30 a.m.; durations of previous oestrous periods, 84, 66, 60 hours.

All mature follicles are seashell pink in colour but a few are much less transparent than the rest. Bloodvessels show very clearly and in one follicle in the right ovary a capillary has ruptured, leaving a small blood spot. All follicles are spherical and turgid, but three in each ovary are conically shaped and more distended than the rest. All show glistening surfaces. Only a few of the immature follicles are clearly visible. The corpora lutea I still show up clearly, some are conically shaped, others are spherical. Their colour is creamy yellow, externally and on section. In the left ovary, there are 10, and in the right ovary 4, older corpora, about 3 mm. in diameter, brownish on section.

## SEX PHYSIOLOGY OF PIGS.

No. 189.—Onset of oestrus 22.9.43, 6 p.m., slaughtered 23.9.43, 10.30 a.m.; durations of previous oestrous periods, 24, 33, 39 hours. This female had just gone out of oestrus when slaughtered.

All mature Graafian follicles have ruptured. Their colour is pinkish to red. These recently formed corpora lutea stand out from the ovaries and their shape is spherical to conical. Their diameters vary from 6 to 7 mm. The immature follicles are poorly visible, only a few in the right ovary being 2 to 3 mm. in diameter, the rest are below 1 mm. The corpora of the previous ovulation (C. L. II) are clearly visible, 6 to 7 mm. in diameter, hard, solid bodies and of a deep creamy yellow colour. Still older corpora show only as yellowish to greyish specks.

### *Group 5. Twenty-fourth Hour of Oestrus.*

#### *Large Blacks.*

No. 194.—Onset of oestrus 6.6.43, 9 a.m.; slaughtered 7.6.43, 7.30 a.m.; durations of previous oestrous periods, 54, 69, 57 hours.

The mature Graafian follicles are seashell pink in colour and capillaries show very clearly in the follicular walls. One follicle is dark red in colour, a blood-stained liquid escaping on puncturing the capsule. About 22 immature follicles can be counted. They range from less than 1 mm. to 2 mm. in size. Some have a faint pinkish tinge. The corpora lutea I are spherically shaped. They are firm, solid bodies, distinctly creamy yellow externally and on section. There are 10 of these, measuring 6 to 7 mm. A further group of 14 corpora appear on the two ovaries. They have diameters of 3 to 4 mm. and are of similar colour to the corpora lutea I and are taken to be corpora lutea II.

No. 183.—Onset of oestrus on 26.7.43, 9 a.m.; slaughtered 27.7.43, 7.30 a.m.; durations of previous oestrous periods, 54, 54, 54 hours.

The mature Graafian follicles stand out very prominently from the ovaries. They are spherical in shape and the colour is pinkish. A very fine network of capillaries is present on the majority but rather indistinct on a number of them. Their surfaces have a glistening appearance. The immature follicles are too small to count. Two in the left ovary and one in the right ovary are 3 to 4 mm. in diameter, the balance being 1 mm. and less in size. The corpora lutea I are pale yellow externally and creamy yellow on section. They are very firm and solid bodies. Very faint bloodvessels can be seen on a number of them. Only scattered remains of older corpora are present in the bodies of the ovaries.

#### *Large Whites.*

No. 438.—Onset of oestrus 6.2.41, 6 a.m.; slaughtered 7.2.41, 4.30 a.m.; durations of previous oestrous periods, 45, 60, 63, 57, 72 hours.

All Graafian follicles are seashell pink in colour. Their surfaces are glistening. The shape is conical and bloodvessels show very clearly. The capsules on the majority are very thin and transparent. There are no signs of rupture of capillaries. A considerable number of immature follicles are visible, but none are over 1 mm. in diameter. The corpora lutea I are clearly visible, pale yellow externally and deeper yellow on section. They are very firm and solid bodies.

No. 57.—Onset of oestrus, 10.9.40, 6 a.m.; slaughtered 11.9.40, 4.30 a.m.; durations of previous oestrous periods, 42, 45, 45 hours.

Of the 18 mature Graafian follicles, 17 have ruptured. The unruptured one stands out well from the body of the ovary. Its follicular capsule is very thin and transparent and capillaries are plainly visible. Its colour is seashell pink. Of the ruptured follicles, 5 show signs of very recent rupture, as the blood around the points of rupture does not yet show as an organised clot. The points of rupture still show distinctly. The ruptured bodies are 5 mm. in diameter. The colour of these recently formed corpora lutea is pinkish purple. About half of these are already fairly turgid and have assumed a conical shape, protruding well from the bulk of the ovaries. The unruptured follicle is 11 mm. in diameter. The immature follicles are too small to determine their number, the majority being 1 mm. and less in diameter, the largest are 3 mm. The corpora lutea of the previous ovulation (C. L. II) are 3 to 6 mm. in diameter and stand out clearly from the ovaries. Their colour is creamy yellow externally and on section. Still older corpora are revealed on section as pale yellow remnants, 1 mm. and less in size.

No. 56.—Onset of oestrus, 11.9.40, 6 a.m.; slaughtered 12.9.40, 4.30 a.m.; durations of previous oestrous periods, 39, 66, 39 hours.

The mature Graafian follicles are very turgid and stand out about 7 mm. from the ovary and are 8 to 11 mm. in diameter. All are seashell pink in colour. The general shape is spherical. The capsules are very thin and glistening, a number having small prominences at their apices. Three follicles in the one and 4 in the other ovary show capillaries which

have ruptured, leaving small blood spots in the follicular walls. One follicle in the right ovary has ruptured, is totally collapsed with liquid blood over its surface, indicating very recent rupture. A small number of immature follicles are visible, but their total cannot be determined; they are 1 mm. and less in diameter. The corpora of the previous ovulation show up clearly. They are 4 to 6 mm. in diameter and are firm, solid bodies, pale yellow in colour. Their shape is conical. Still older corpora can be seen on section as brownish spots, about 1 mm. in diameter, a few being almost 3 mm. in diameter.

*No. 67.*—Onset of oestrus, 18.6.41, 9 a.m.; slaughtered 19.6.41, 7.30 a.m.; durations of previous oestrous periods, 45, 39, 45, 45, 51, 48, 54 hours.

All mature Graafian follicles are seashell pink in colour. A fine network of bloodvessels appears on all of these bodies. Their shape is spherical. The surfaces have a glistening appearance. In the right ovary there are three follicles which show a burst capillary each, leaving a small blood spot on the side of the follicle. Only a few of the immature follicles are visible. In the left ovary there are 5 corpora lutea I which, on section, show brownish granular matter in the cavities, which have not yet closed up. All other corpora are creamy yellow on section. Their shape is spherical to conical. Only remnants of older corpora are present, a few being almost 2 mm. in diameter.

*No. 165.*—Onset of oestrus, 24.5.43, 12 midnight; slaughtered 25.5.43, 10.30 p.m.; durations of previous oestrous periods, 33, 36, 36 hours.

One Graafian follicle has ruptured in the right ovary. It is completely collapsed with uncoagulated blood over its surface. A number of other follicles in the same ovary are red to bright red in colour, with bloodvessels showing plainly. The balance of the mature follicles are seashell pink in colour with the capillaries clearly visible against a transparent background. All follicles are very turgid and spherical in shape and indicate imminent rupture. The immature follicles are very inconspicuous, only one having a diameter of 4 mm. The creamy yellow corpora lutea I show clearly between the large mature follicles. They are firm, solid, spherically shaped bodies. Scattered dark remains of still older corpora are visible on sectioning the ovaries.

*No. 191.*—Onset of oestrus 23.9.43, 9 p.m.; slaughtered 24.9.43, 7.30 p.m.; durations of previous oestrous periods, 39, 36, 27, 33 hours.

Four mature Graafian follicles in the left and one in the right ovary have ruptured. All are still completely collapsed with uncoagulated blood over their surfaces, indicating very recent rupture. All other follicles are very transparent, spherical and their capsules very thin. In five follicles bloodvessels have broken and one follicle is blood-red in colour. Only in the right ovary there are present a few immature follicles measuring up to 4 mm., the majority being 1 mm. and less in diameter. The corpora lutea of the previous ovulation (C. L. II) are firm, solid bodies, spherical in shape and creamy yellow on section. Still older corpora show as brownish spots, a few measuring up to 3 mm. in diameter.

*No. 190.*—Onset of oestrus, 21.9.43, 3 p.m.; slaughtered 22.9.43, 1.30 p.m.; durations of previous oestrous periods, 30, 27, 24, 27 hours.

All mature Graafian follicles have already ruptured. The points of rupture are closed. Their colour ranges from red to purplish. All of the recently formed corpora lutea have assumed a spherical shape and protrude prominently from the bulk of the ovaries. Rupture must have been completed some hours previous to slaughter. In the left ovary, a deep-seated cystic body is revealed on section, 10 mm. in diameter, containing a clear, watery fluid. The immature follicles are difficult to find. About 18 are 3 to 5 mm. in diameter, the balance are less than 1 mm. They are colourless bodies. The corpora lutea II are spherical, firm, solid, deep yellow-coloured bodies, and are clearly visible. Still older corpora can be seen as brownish spots, a few being 3 mm. in diameter.

#### *Group 6. Thirtieth Hour of Oestrus.*

##### *Large Blacks.*

*No. 22.*—Onset of oestrus, 26.11.40, 9 a.m.; slaughtered 27.11.40, 1.30 p.m.; durations of previous oestrous periods, 63, 60 hours.

The mature Graafian follicles vary greatly in size, the range being 6 to 11 mm. There are only 3 in the right ovary and 9 in the left ovary. In the left ovary there are three follicles which are much more transparent and glistening than any of the others. All are seashell pink in colour, capillaries being clearly visible. A fair number of immature follicles are clearly visible, the largest being 2 mm. in diameter. The corpora lutea show very clearly on the surfaces of the ovaries. They are conical in shape and yellowish in colour. Some have brownish centres. Older corpora show only as darkish spots in the sectioned bodies of the ovaries.

*No. 17.*—Onset of oestrus, 28.11.40, 3 a.m.; slaughtered 29.11.40, 7.30 a.m.; durations of previous oestrous periods, 69, 54 hours.

## SEX PHYSIOLOGY OF PIGS.

The mature Graafian follicles stand out very prominently in both ovaries. The colour is seashell pink and the surfaces glisten. Capillaries are very clearly visible. All follicles are turgid. A number of immature follicles are distinctly visible, the two largest individuals being 2 to 3 mm. No trace of corpora lutea can be found on thorough sectioning of both ovaries. This is to be expected, as this female was slaughtered during her postweaning oestrus. No oestrus was detected since her postpartum oestrus, which occurred some three months previously.

### *Large Whites.*

No. 49.—Onset of oestrus, 15.9.40, 3 a.m.; slaughtered, 16.9.40, 7.30 a.m.; durations of previous oestrous periods, 36, 42, 54 hours.

All mature Graafian follicles have ruptured. Two in the left and four in the right ovary show signs of very recent rupture; they are completely collapsed with uncoagulated blood over their surfaces. All of these bodies are red to dark red in colour. The majority have already assumed a conical shape, some being rather turgid. Bloodvessels are not distinctly visible. The immature follicles are very indistinctly visible, only a few being 3 mm. in diameter. The corpora lutea of the previous ovulation are spherical to conical in shape and are clearly visible. Their colour is creamy yellow, both externally and on section. A few still contain central cavities, 1 x 2 mm. in size. Numerous remains of still older corpora are visible on sectioning the ovaries, a number being 3 mm. in diameter. They show as rather dark objects through the surfaces of the ovaries, being brownish on section.

No. 33.—Onset of oestrus, 13.11.40, 3 a.m.; slaughtered, 14.11.40, 7.30 a.m.; durations of previous oestrous periods, 39, 42 hours.

Sixteen out of the 17 mature Graafian follicles have ruptured. Four in the right and 2 in the left ovary show very recent rupture, being in a collapsed state, with marked bleeding. The other have already assumed a conical shape. Rupture points show very clearly. The colour is red, being darker red towards the apices. One follicle in the left ovary did not rupture. It does not appear to be normal. It is opaque. The follicular wall is tough and resists rupture when pressed hard with the forceps. No bloodvessels are visible. On being cut, a viscid mucus runs out. Immature follicles are barely visible, the largest being only 1 mm. in diameter. The corpora lutea of the previous ovulation (C. L. II) show only indistinctly, their colour being creamy yellow. Still older corpora are present only as remnants, about 1 mm. in size. They show as yellowish spots.

No. 187.—Onset of oestrus, 14.9.43, 9 a.m.; slaughtered 15.9.43, 1.30 p.m.; durations of previous oestrous periods, 60, 51, 48 hours.

The mature Graafian follicles are seashell pink in colour and a clear network of capillaries appear on all of them. None have ruptured. One follicle has small blood spots at the apex, showing rupture of bloodvessels. The immature follicles are barely visible, the majority being below 1 mm. They are not numerous. The corpora lutea I are spherically shaped. They are hard, solid bodies, deep creamy yellow externally and on section. On sectioning the ovaries, small brownish bodies of up to 2 mm. in diameter are revealed indicating still older corpora.

No. 195.—Onset of oestrus, 23.9.43, 12 noon; slaughtered 24.9.43, 4.30 p.m.; duration of previous oestrous periods, 36, 24, 33 hours.

All mature Graafian follicles have already ruptured. Only two are still in a collapsed state, showing recent rupture. The others have assumed a spherical shape and stand out clearly from the ovaries, indicating rupture of some hours previously. Only 2 immature follicles are 3 mm. in diameter, the balance being very inconspicuous. The corpora lutea II are creamy yellow, spherical, hard bodies. They show clearly on the surface. The majority still contain a brownish clot on section, about 3 mm. in diameter. Still older corpora show as brownish to yellowish bodies, 2 to 3 mm. in size.

No. 145.—Onset of oestrus, 29.9.43, 9 a.m.; slaughtered, 30.9.43, 1.30 p.m.; durations of previous oestrous periods, 39, 36, 30, 39, 48, 30 hours.

All mature Graafian follicles have already ruptured. Ovulation must have occurred some hours previous to slaughter, as they stand out well from the bodies of the ovaries, their shape being spherical to conical. A few show blood red points of rupture. The colour is mostly pale purplish vinaceous, others are pinkish, changing to red at the apices. Vascularisation is present on a number. In each ovary there are 2 opaque white follicles, 5 to 7 mm. in diameter, their follicular walls being very tough. They are probably atretic. All immature follicles are 1 mm. and less in diameter. The corpora lutea II are spherical to conical in shape, their consistency very firm and their colour creamy yellow. They are solid on section. Still older corpora show as very yellow remnants, measuring up to 2 mm.

No. 59.—Onset of oestrus, 24.6.42, 9 a.m.; slaughtered 25.6.42, 1.30 p.m.; durations of previous oestrous periods, 54, 42, 45, 48, 57 hours.

The mature Graafian follicles are all spherical in shape and have a clear network of bloodvessels on their surfaces. The colour is seashell pink. There are no signs of imminent rupture. The total number is 39. The immature follicles are too small to count and are very inconspicuous bodies. The corpora lutea I are firm, solid bodies, decidedly yellow in colour. There are only 15 of them in the two ovaries. The difference between the number of corpora lutea I and the number of mature follicles is striking. A few coloured spots indicate the presence of still older corpora.

*Group 7. Thirty-sixth Hour of Oestrus.*

*Large Blacks.*

*No. 182.*—Onset of oestrus, 12.8.43, 3 a.m.; slaughtered 13.8.43, 1.30 p.m.; durations of previous oestrous periods, 60, 69, 63, 81, 63 hours.

There are no ruptured Graafian follicles. The colour is seashell pink, they have glistening surfaces and all have a clear network of bloodvessels. The shape is spherical. The follicular walls are very thin and rupture appears to be imminent. The immature follicles are numerous but are too small to count. The corpora lutea I are very firm bodies, being pale yellow externally and deep creamy yellow on section. The majority have small cavities containing dark, granular matter.

*No. 19.*—Onset of oestrus, 22.9.40, 9 p.m.; slaughtered 24.9.40, 7.30 a.m.; durations of previous oestrous periods, 75, 66, 51 hours.

There are no ruptured mature Graafian follicles. These bodies stand out very prominently. They have glistening surfaces and a network of capillaries shows very clearly on all. One follicle has a small blood spot where a bloodvessel has ruptured at the apex. Their colour is seashell pink but one is reddish in colour. Four follicles in the left ovary and 2 in the right ovary are dark purple in colour, their diameters ranging from 3 to 5 mm. On cutting into them a dark brownish-red, viscid liquid is emitted. They are probably deranged follicles belonging to the present crop of mature follicles. The immature follicles are poorly visible and are below 1 mm. in diameter. The corpora lutea I are pale yellow in colour, conical in shape and are firm, solid bodies. Still older corpora show merely as remnants, about 1 mm. in diameter.

*Large Whites.*

*No. 183.*—Onset of oestrus, 12.8.43, 3 p.m.; slaughtered 14.8.43, 1.30 a.m.; durations of previous oestrous periods, 63, 96, 57, 54, 51, 57 hours.

One mature Graafian follicle in the left ovary and 2 in the right ovary have ruptured and their walls have collapsed completely. The presence of uncoagulated blood over their surfaces shows recent rupture. Their colour is a bright red. The contents of four other follicles are blood-stained and their colour is light red. Some follicles are much more turgid, more pointed and transparent than others. The general colour is seashell pink. Only 4 immature follicles are visible in the two ovaries, 1 mm. in diameter. One follicle in the left ovary is 5 mm. in diameter and is probably atretic. The corpora lutea of the previous ovulation (C. L. II) are creamy yellow and show as small, spherical bulges on the ovaries. Externally they are light creamy yellow and on section they have a deep creamy yellow colour. They are hard, solid bodies. Still older corpora are present as scattered remnants, brownish in colour and up to 2 mm. in diameter.

*No. 54.*—Onset of oestrus, 22.1.41, 9 p.m.; slaughtered 24.1.41, 7.30 a.m.; durations of previous oestrous periods, 54, 48, 51, 48 hours.

Seventeen out of the 18 mature follicles have ruptured. The unruptured one in the right ovary is conical in shape, glistening and has a very faint network of capillaries. The ruptured bodies occur in all stages, from complete collapse to prominent, conical and turgid states with the points of rupture showing as small, reddish, raised areas. Red clots of blood are present in the cavities of the collapsed individuals. The immature follicles are very inconspicuous objects. The corpora lutea of the previous ovulation (C. L. II) are inconspicuous and the majority had to be searched for by sectioning the ovaries. They are pale yellow externally and deeper yellow on section. Older corpora show merely as brownish to yellowish spots of matter.

*No. 121.*—Onset of oestrus, 4.1.43, 9 a.m.; slaughtered 5.1.43, 7.30 p.m.; durations of previous oestrous periods, 66, 118, 57, 63, 66, 48 hours.

The mature Graafian follicles are seashell pink in colour and are spherically shaped. Bloodvessels are very plentiful. The surfaces have a glistening appearance. The follicles do not protrude much above the surface of the ovaries. A correct count of the immature follicles is not possible owing to their extremely small sizes, but a rough estimate of the total is 35. The corpora lutea I show clearly, being creamy yellow on section. A number are dark coloured in the centre. Older corpora show as brownish or yellowish remnants, the largest being 2 mm. in diameter.

## SEX PHYSIOLOGY OF PIGS.

*No.* 185.—Onset of oestrus, 6.9.43, 3 a.m.; slaughtered 7.9.43, 1.30 p.m.; durations of previous oestrous periods, 54, 51, 51 hours.

All mature Graafian follicles are ruptured. Two of these recently formed corpora lutea are conical in shape, the others are in a state of complete collapse, indicating very recent rupture. The colour is light red. The immature follicles show very indistinctly, the majority being below 1 mm. in diameter. The corpora lutea II are spherical, hard, solid bodies, creamy yellow in colour on section. Evidences of older corpora do not exist.

*No.* 182.—Onset of oestrus, 7.9.43, 9 p.m.; slaughtered 9.9.43, 7.30 a.m.; durations of previous oestrous periods, 48, 39, 45, 36, 39 hours.

All mature Graafian follicles are ruptured. They are pinkish to light red in colour. All are conically shaped, indicating that rupture has occurred some time previous to slaughter. One follicle in the right ovary and two in the left ovary are seashell pink in colour. No bloodvessels are showing. All other immature follicles are opaque, the largest ones having diameters of 2 mm. The corpora lutea II are spherical in shape, creamy yellow externally, with a deeper yellow on section. A few show a brownish inclusion on section. Only small yellowish remnants, 1 to 2 mm. in diameter, of still older corpora can be traced.

### *Group 8. Forty-second Hour of Oestrus.*

#### *Large Blacks.*

*No.* 218.—Onset of oestrus, 17.10.43, 9 p.m. slaughtered 19.10.43, 1.30 p.m. durations of previous oestrous periods, 63, 63, 45 hours.

None of the mature Graafian follicles have ruptured. Their colour is seashell pink and their shape spherical. The follicular walls are very thin and the bloodvessels show very distinctly. All follicles are turgid and rupture may be imminent. Immature follicles are very indistinctly visible. The corpora lutea I are spherical, firm, creamy yellow bodies both externally and on section. Older corpora appear as deep yellow to brownish spots, the largest being 3 mm. in diameter.

*No.* 199.—Onset of oestrus, 27.7.43, 9 p.m.; slaughtered 29.7.43, 1.30 p.m.; durations of previous oestrous periods, 72, 60, 60 hours.

Ten out of the 11 mature Graafian follicles have ruptured. Of these the majority are in a state of collapse but a few are conical in shape. Their colour is dark red. One mature follicle in the right ovary is light red in colour and fairly distended. One follicle in the left ovary is 5 mm. in diameter and of an opaque translucency; it is probably atretic. Other immature follicles are just visible; their number cannot be determined macroscopically. The corpora lutea II are conical in shape, hard and solid, their colour being creamy yellow both externally and on section.

*No.* 211.—Onset of oestrus, 26.9.43, 3 a.m.; slaughtered 27.9.43, 7.30 p.m.; durations of previous oestrous periods, 66, 63, 54 hours.

None of the mature Graafian follicles have ruptured. Their colour is seashell pink and their walls are very thin. Capillaries show clearly. All are very distended and rupture appears to be imminent. The immature follicles are mostly 1 mm. in diameter, the rest being smaller. There appears to be between 50 and 60 in the two ovaries. The corpora lutea I are creamy yellow in colour, spherical in shape and the majority are withdrawing into the body of the ovary. On section, 3 in the left ovary contain brownish inclusions, each being about 2 mm. in diameter. Still older corpora show merely as whitish scar tissue.

*No.* 180.—Onset of oestrus, 30.9.43, 12 noon; slaughtered 2.10.43, 4.30 a.m.; durations of previous oestrous periods, 57, 54, 60, 63, 69 hours.

Fourteen out of the 16 mature Graafian follicles have ruptured. Seven of these are already conically shaped, the balance are still in a collapsed state and show signs of very recent rupture. One follicle in the right ovary is much distended and has burst bloodvessels, indicating imminent rupture. Its diameter is 10 mm. A second one in the same ovary is only 6 mm. in diameter, and does not show imminent rupture. A large number of immature follicles show as clear colourless bodies, ranging from 2 mm. to less than 1 mm. in diameter. The corpora lutea II show as creamy yellow bodies, externally and on section. They are hard, solid bodies, protruding only half of their bulk through the surfaces of the ovaries. Older corpora appear only as brownish to yellowish remnants, 1 to 2 mm. in diameter.

#### *Large Whites.*

*No.* 188.—Onset of oestrus, 24.9.43, 3 p.m.; slaughtered 26.9.43, 7.30 a.m.; durations of previous oestrous periods, 39, 39, 36, 45 hours. This gilt was still in oestrus at the time of slaughter.

All mature Graafian follicles have ruptured. All have assumed a conical shape. They are light purplish at their bases and bright red towards their apices. Bloodvessels are in evidence on some. They are pinkish coloured on section. Rupture must have occurred some hours previous to slaughter. The immature follicles are mostly less than 1 mm. in diameter, the largest being 2 mm. The corpora lutea II are creamy yellow in colour, their shape is spherical and they show well above the surfaces of the ovaries. The majority are firm, solid bodies, but 3 in the left ovary have reddish inclusions, 3 mm. in diameter; one corpus in each ovary has a cavity, 2 mm. in diameter, containing a clear fluid. Still older corpora show merely as brownish to yellowish spots, 2 to 3 mm. in diameter.

*Group 9. Forty-eighth Hour of Oestrus.*

No. 11.—Onset of oestrus, 26.11.40, 3 p.m.; slaughtered 28.11.40, 1.30 p.m.; durations of previous oestrous periods, 72, 66, 63 hours.

All mature Graafian follicles have ruptured. The majority are already conically shaped. The colour is reddish to pale purplish vinaceous. The points of rupture are red. Two recently formed corpora lutea in the right ovary are still in a rather collapsed state, indicating somewhat more recent rupture than the balance. Immature follicles are visible in both ovaries, but they are very small. In the left ovary only 2 corpora lutea II show clearly on the surface of the ovary, 8 more could be found only by thoroughly sectioning the ovary. Their colour is creamy yellow. In the right ovary no corpora lutea II can be identified as such with certainty. None are visible on the surface, and on sectioning the ovary a number of brownish to yellowish remnants are revealed, about 2 mm. in diameter. Other remains are smaller.

No. 63.—Onset of oestrus, 26.5.41, 12 noon; slaughtered 28.5.41, 10.30 a.m.; durations of previous oestrous periods, 75, 75, 72 hours.

None of the mature Graafian follicles have ruptured yet. Their colour is seashell pink and their surfaces have a decided glistening appearance. The network of bloodvessels is very clear; some capillaries appear to be rather enlarged. All are very turgid. The largest immature follicles are 3 mm. in diameter, the majority being 1 mm. and less. The corpora lutea I are conical to spherical in shape. The colour is creamy yellow. On section a few of the larger individuals show very small central cavities with no inclusions.

No. 171.—Onset of oestrus, 27.7.43, 9 p.m.; slaughtered 29.7.43, 7.30 p.m.; durations of previous oestrous periods, 93, 75, 81, 72, 72 hours.

All mature Graafian follicles have ruptured. The recently formed corpora lutea are pale purplish vinaceous in colour, their shape is conical and all are well distended. Rupture points show as small raised areas, all being closed. Central cavities on section reveal a jelly-like reddish fluid. One follicle in the left ovary is only 6 mm. in diameter, no bloodvessels showing on its walls. There are no indications of any probable rupture and it is possibly atretic. Immature follicles are mostly 1 mm. in diameter; their total cannot be determined correctly macroscopically. The corpora lutea II are very firm, solid bodies, light creamy yellow externally and deep creamy yellow on section. Orange-coloured remnants of still older corpora are found scattered throughout the sectioned ovaries.

*Large Whites.*

No. 193.—Onset of oestrus, 25.9.43, 3 p.m.; slaughtered 27.9.43; 1.30 p.m.; durations of previous oestrous periods, 36, 39, 36, 24, 45 hours.

All mature Graafian follicles are ruptured. Their colour is pale purplish vinaceous around their bases and pinkish toward their apices. Their shape is spherical to conical. Points of rupture show as small red papillae. Rupture must have occurred several hours previous to slaughter. The immature follicles are opaque white in colour and only a small number is visible macroscopically. The corpora lutea II are yellow in colour, spherical in shape, firm and solid on section. Some contain brownish granular matter, measuring up to 2 mm. in diameter. Still older corpora show as pale yellow bodies, the largest being 2 mm. in diameter.

*Group 10. Fifty-fourth Hour of Oestrus.*

*Large Blacks.*

No. 186.—Onset of oestrus 21.8.43, 9 a.m.; slaughtered 23.8.43, 1.30 p.m.; durations of previous oestrous periods, 57, 54, 66, 60, 60 hours.

## SEX PHYSIOLOGY OF PIGS.

All mature Graafian follicles are ruptured. Their colour ranges from light red to bright red. All have a conical shape and protrude well above the bodies of the ovaries. Pin-head sized rupture points show at the apices of the corpora. Immature follicles measure up to 2 mm., but their number cannot be reliably determined macroscopically. The corpora lutea II are creamy yellow in colour, spherical in shape and very firm to touch. On section they are all solid. Five and 7 still older corpora appear in the left and right ovaries respectively. Their colour is deep yellow but some are bluish.

No. 201.—Onset of oestrus, 11.9.43, 12 noon; slaughtered 13.9.43, 4.30 p.m.; durations of previous oestrous periods, 159, 63, 60, 39 hours.

No mature Graafian follicles have yet ruptured. Their shape is spherical and their colour seashell pink. Bloodvessels are not plentiful and are very faint. Four and 2 follicles in the right and left ovaries, respectively, have very thin follicular walls and some of their capillaries have ruptured, giving rise to blood spots. They indicate imminent rupture. One follicle in the left and 3 in the right ovary measure 4 mm. in diameter. They are probably atretic. Immature follicles range from less than 1 to 3 mm. in diameter. The corpora lutea I are creamy yellow externally and deeper yellow on section. They are deeply bedded in the ovaries and are much regressed, being 3 to 4 mm. in diameter.

### *Group 11. Sixtieth Hour of Oestrus.*

#### *Large Blacks.*

No. 23.—Onset of oestrus, 15.9.43, 3 a.m.; slaughtered 17.9.43, 1.30 p.m.; durations of previous oestrous periods, 72, 90, 66, 66, 63, 66, 66, 57 hours.

All mature Graafian follicles are ruptured. A number are completely collapsed and show very recent rupture, others are about half normal size, whereas still others are distinctly conical in shape, protruding well from the body of the ovary. All corpora are dark red in colour. Immature follicles are barely visible and are less than 1 mm. in diameter. Only one corpus luteum II in each ovary shows above the surface. On section they are orange yellow in colour. Still older corpora show as brownish remnants. The ovaries are very fibrous, the sow being 50 months of age.



TABLE I.  
*Summary of Data on the Ovary of Large Black and Large White Sows at Six-hour Intervals During Oestrus.*

Hours after Onset of Oestrus.	Sow No.	WEIGHT OF OVARIES IN GRAMS.		Mature Follicles.	IMMATURE FOLLICLES.		C.L. I Total No.	Weight of Sow, lb.	Age in Months.	Class.	Follicular Stage, Ruptured-U.	Duration of Previous Oestra in Hours (Excluding Post-partum and Post-weaning Oestra).
		Left.	Right.		Total No.	Size Range mm.						
0.....	235	5.111	5.195	18	36(?)	1-4	16	250	9	Gilt	All U....	51.
6.....	195	6.542	4.546	14	—	1-4	13	250	11	Gilt	All U....	36, 63, 60, 66
12.....	21	4.352	4.098	13	—	1-1	11	244	16	Sow	All U....	63, 54, 66, 66, 63
18.....	12	5.712	6.214	23	—	1-1-5	15	375	31	Sow	All U....	60
24.....	171	6.245	7.564	14	—	1-1	20	477	57	Sow	All U....	72, 72, 81, 75, 93
30.....	194	3.096	4.830	12	22(?)	1-2	10	283	8	Gilt	All U....	57, 69, 54
36.....	183	5.380	4.510	18	—	1-4	12	264	11	Gilt	All U....	54, 54, 54
42.....	22	4.964	2.271	12	—	1-2	10	237	16	Sow	All U....	51, 60, 63, 63, 66
48.....	17	2.819	2.121	10	—	1-3	0	247	17	Sow	All U....	57, 66
54.....	182	7.483	3.794	14	—	1-1	11	275	11	Gilt	All U....	63, 81, 63, 69, 60
60.....	19	4.314	3.721	11	—	1-1	19	295	15	Sow	All U....	51, 66, 75
	218	4.030	2.937	13	—	1-2	12	246	11	Gilt	All U....	45, 66, 66
	199	2.538	3.235	10	—	1-1	15	223	10	Gilt	All R....	60, 60, 72, 69
	211	5.500	5.917	14	110(?)	1-1	13	289	11	Gilt	All U....	54, 63, 66, 54
	180	3.283	4.654	16	—	1-1	15	348	13	Gilt	14 R, 2 U	69, 63, 60, 54, 57
	11	4.344	2.918	15	—	1-1	10	409	30	Sow	All R....	63, 66
	63	3.680	3.670	11	—	1-3	18	211	9	Gilt	All U....	75, 78, 78
	171	3.734	3.129	15	47(?)	1	25	324	11	Gilt	14 R, 1 U	72, 72, 81, 75, 93
	186	2.814	2.736	14	22(?)	1-2	15	288	12	Gilt	All R....	60, 60, 66, 54, 57
	201	3.702	2.770	12	—	1-2	13	296	11	Gilt	All U....	39, 60, 63, 159
	23	6.578	4.456	24	—	1	8	532	50	Sow	All R....	57, 66, 66, 63, 66, 66, 72

LARGE BLACKS.

TABLE 1—(continued).

Hours after Onset of Oestrus.	Sow No.	WEIGHT OF OVARIES IN GRAMS.		Mature Follicles.	IMMATURE FOLLICLES.		C.L.1 Total No.	Weight of Sow, lb.	Age in Months.	Class.	Follicular Stage, Ruptured—R, Unruptured—U.	Duration of Previous Oestra in Hours (Excluding Postpartum and Postweaning Oestra).
		Left.	Right.		Total No.	Size Range, mm.						
LARGE WHITES.												
0.....	17a	6.643	8.041	21	—	1-1	21	382	33	Sow	All U....	54, 33
6.....	47	5.226	4.906	15	—	1-2	17	360	13	Gilt	All U....	54, 45, 45, 33, 33, 27
	36	5.073	3.114	23	—	1	14	343	17	Gilt	All U....	—
12.....	50	5.157	4.972	16	—	1-2	21	310	12	Gilt	All U....	51, 33, 39, 30
	32	7.733	7.502	29	—	1-3	20	384	24	Sow	All U....	57, 48, 45
18.....	21	4.723	5.717	18	—	1-3	20	490	34	Sow	16 U, 2 R	45, 48, 48
	23	5.129	5.562	19	—	1-2	17	417	30	Sow	All U....	60, 66, 84
	189	4.483	3.703	14	—	1-3	16	241	9	Gilt	13 R, 1 U	39, 33, 24
24.....	438	7.297	6.429	20	—	1-1	21	570	52	Sow	All U....	72, 57, 63, 60, 45
	57	3.345	3.100	18	—	1-3	19	278	9	Gilt	17 R, 1 U	45, 45, 42
	56	3.546	4.242	20	—	1-1	19	262	10	Gilt	1 R, 19 U	39, 66, 39
	67	7.259	5.052	14	—	1-4	28	352	11	Gilt	All U....	54, 48, 51, 45, 45, 39, 45
	165	7.359	3.991	20	—	1-4	12	241	10	Gilt	1 R, 19 U	36, 36, 33
	191	5.116	3.683	15	—	1-4	14	218	9	Gilt	5 R, 10 U	33, 27, 36, 39
	190	6.180	3.880	18	—	1-5	24	272	9	Gilt	All R....	27, 24, 27, 30
30.....	49	3.914	3.724	20	—	1-3	23	369	12	Gilt	All R....	54, 42, 36
	33	5.030	5.550	17	—	1-1	17	411	25	Sow	16 R, 1 U	42, 39
	187	5.025	3.823	17	—	1-1	16	306	10	Gilt	All U....	48, 51, 60
	195	2.878	3.587	18	—	1-3	16	230	9	Gilt	All R....	33, 24, 36
	145	—	—	30	—	1-1	27	473	19	Sow	All R....	30, 48, 39, 30, 36, 39
36.....	54	3.996	3.791	18	—	1-1	20	325	11	Gilt	3 R, 20 U	57, 51, 54, 57, 63
	121	5.115	5.121	22	35(?)	1-1	16	400	15	Sow	17 R, 1 U	48, 51, 48, 54
	185	3.473	3.578	18	—	1-2	17	290	16	Sow	All U....	68, 66, 63, 57, 66
	182	3.701	3.547	21	—	1-2	19	315	11	Gilt	All R....	51, 51, 54
	188	3.849	3.614	16	—	1-2	16	402	12	Gilt	All R....	39, 36, 45, 39, 48
42.....	193	3.047	2.848	15	—	1-2	17	252	9	Gilt	All R....	45, 36, 39, 39
48.....					—	1-2	17	243	9	Gilt	All R....	45, 24, 36, 39, 36

TABLE II.  
*Sizes in Millimetres of Corpora Lutea I in Large Black Pigs at Consecutive Six-hour Intervals During the Ensuing Oestrus.*

PERIOD IN HOURS.

0	6	18	24	36	42	48	54
Sow No. 235	Sow No. 195	Sow No. 171	Sow No. 194	Sow No. 182	Sow No. 218	Sow No. 63	Sow No. 201
6.0	8.0	6.5	6.0	5.5	5.0	4.0	3.0
7.0	8.0	7.0	7.0	7.0	5.0	4.0	3.0
7.0	8.0	5.0	8.0	7.0	5.0	6.0	4.0
6.0	9.5	7.0	6.0	7.0	7.0	4.0	4.0
5.0	5.0	6.0	6.0	5.5	6.5	5.0	4.0
6.0	5.0	7.0	6.5	6.0	7.0	4.0	4.0
6.0	9.0	6.0	7.0	7.0	5.0	3.5	3.0
7.0	9.0	6.5	7.0	8.0	6.5	4.0	3.0
6.5	9.0	7.0	6.0	7.0	6.5	3.5	3.0
8.0	8.0	7.0	6.0	5.0	5.0	3.5	3.5
8.0	8.0	6.0	—	5.0	5.0	4.0	3.0
8.0	5.0	7.0	—	—	4.0	6.0	3.0
7.0	5.0	6.5	—	—	—	4.0	3.0
7.0	—	6.0	—	—	—	5.0	—
7.0	—	6.5	—	—	—	4.0	—
7.0	—	7.0	—	—	—	6.0	—
—	—	6.0	—	—	—	3.5	—
—	—	6.0	—	—	—	4.0	—
—	—	6.0	—	—	—	—	—
—	—	6.0	—	—	—	—	—

TABLE III.  
*Sizes in Millimetres of Mature Graafian Follicles in Large Black Pigs at Consecutive Six-hour Intervals During Oestrus.*

PERIOD IN HOURS.

0	6	18	24	36	42	48	54
Sow No. 235	Sow No. 195	Sow No. 171	Sow No. 194	Sow No. 182	Sow No. 218	Sow No. 63	Sow No. 201
8.5	9.0	10.0	9.0	8.0	11.0	10.0	9.0
8.0	10.0	9.0	10.0	8.0	9.0	9.0	9.0
8.0	7.5	10.0	9.0	8.0	9.0	9.0	8.0
9.0	9.0	8.0	10.0	9.0	9.0	9.0	9.0
9.0	9.5	9.0	11.0	8.0	9.5	9.0	8.0
9.0	10.0	10.0	9.0	9.0	10.0	9.0	8.0
8.0	8.0	9.0	9.0	9.0	10.0	9.0	9.0
9.0	6.0	11.0	10.0	9.0	10.0	9.5	9.0
10.0	6.0	10.0	10.0	9.0	8.0	8.5	8.0
8.0	9.0	11.0	10.0	9.0	7.5	10.0	8.0
8.5	10.0	10.0	6.0	8.0	10.0	8.5	9.0
8.0	11.0	9.5	10.0	10.0	10.0	—	8.0
7.0	9.0	10.0	—	10.0	9.0	—	—
7.0	10.0	12.0	—	10.0	9.0	—	—
8.0	—	—	—	—	—	—	—
8.0	—	—	—	—	—	—	—
9.0	—	—	—	—	—	—	—
5.0	—	—	—	—	—	—	—

**APPENDIX 3.**

## THE MORPHOLOGY OF THE OVARY DURING PREGNANCY.

This appendix presents a description of the ovary of the sow during pregnancy. One Large Black and one Large White sow were slaughtered at three-weekly intervals during pregnancy, reckoning from the date of the last service. This yielded five intervals. It was not possible to slaughter every sow at the exact termination of her interval. This applies especially to Large White No. 148 in the 15 week interval, which was slaughtered at 112 days of pregnancy instead of 105 days. It is, however, considered that the slight variations from the exact durations of pregnancy do not effect the results materially. Details in respect of sizes of corpora lutea of pregnancy and of Graafian follicles appear in tables of this appendix.

*Group 1. Sows Slaughtered After Three Weeks of Pregnancy.*

*Large Black No. 116.*—Served on 28.11.42; slaughtered on 23.12.42; pregnancy 25 days; age 18 months; weight of sow, 320 lb.; weight of ovaries, left 6.03 g., right 6.58 g.

The colour of the corpora lutea is pale purplish vinaceous. The shape is spherical. Bloodvessels are very plentiful on all corpora. On section, they are light flesh-coloured and the cavities are plugged with fibrous connective tissue. No trace of older corpora lutea can be found on sectioning the ovaries. The larger Graafian follicles are seashell pink in colour and fine capillaries appear on their surfaces. Diameters of the follicles range from less than 1 to 5 mm., those less than 1 mm. being in the minority.

*Large White No. 105.*—Served on 26.5.42; slaughtered on 17.6.42; pregnancy 22 days; age 11 months; weight of sow 260 lb.; weight of ovaries, left 6.87 g., right 6.33 g.

The corpora lutea are pale purplish vinaceous coloured. Bloodvessels are clearly in evidence. The points of rupture still show clearly on a number of corpora as small areas of scar tissue. On section these bodies are flesh-coloured and the majority show no central cavities, but a few have small cavities containing a little colourless liquor. The Graafian follicles are mostly seashell pink in colour. No capillaries are visible to the naked eye. Diameters range from about 1 mm. to 6 mm. There are no signs of older corpora lutea except a few doubtful whitish remnants, less than 1 mm. diameter.

*Group 2. Sows Slaughtered After Six Weeks of Pregnancy.*

*Large Black No. 126.*—Served on 28.7.42; slaughtered on 8.9.42; pregnancy 42 days; age 11 months; weight of sow 250 lb.; weight of ovaries, left 9.44 g., right 2.45 g.

The very exceptional condition is revealed that the right ovary of this sow carries no corpora lutea of pregnancy. On sectioning this ovary only yellowish remnants of older corpora can be found. The left ovary has 9 corpora lutea of pregnancy. The colour of the corpora is pale purplish vinaceous externally and flesh-coloured on section. Central cavities have all disappeared. The shape is spherical. No points of rupture can be seen and a network of bloodvessels is present on all corpora. The Graafian follicles range from less than 1 mm. to 5 mm. in diameter, the smallest ones being only pin point size. An approximate count of the total number of follicles is 77. They are clear colourless bodies. Migration of the embryo from left to right is very clearly shown in that 4 embryos are present in the right cornu, whereas the right ovary carries no corpora lutea.

*Large White No. 113.*—Served 11.5.42; slaughtered 23.6.42; pregnancy 43 days; age 11 months; weight of sow 226 lb.; weight of ovaries, left 3.84 g., right 7.53 g.

There are 9 corpora lutea of pregnancy in the right ovary and only one corpus in the left ovary. The colour of the corpora is pale purplish vinaceous. Bloodvessels show very clearly on each corpus. The general shape is spherical. The sectioned surfaces are pinkish flesh-coloured. Small central cavities still show in several corpora. Older corpora lutea have all disappeared. Diameters of Graafian follicles range from less than 1 mm. to 6 mm. The larger individuals are seashell pink in colour and faint capillaries are present in their walls. An approximate count shows the presence of 73 follicles.

*Group 3. Sows Slaughtered after Nine Weeks of Pregnancy.*

*Large Black No. 137.*—Served on 13.7.42; slaughtered on 14.9.42; pregnancy 63 days; age 10 months; weight of sow 265 lb.; weight of ovaries, left 8.49 g., right 6.34 g.

All corpora lutea of pregnancy are pale purplish vinaceous in colour. A clear network of bloodvessels appears on all of these bodies. The general shape is spherical. The sectioned surfaces are light flesh-coloured and all central cavities have disappeared. Only

very indistinct remains of older corpora can be traced. The Graafian follicles vary from mere pin point size to 6 mm. The largest group is seashell pink in colour, faint capillaries being present in their follicular walls. A careful count shows the presence on the two ovaries of approximately 181 follicles.

*Large White No. 154.*—Served on 30.12.42; slaughtered on 3.3.43; pregnancy 63 days; age 11 months; weight of sow 297 lb.; weight of ovaries, left 10·71 g., right 6·12 g.

The corpora lutea of pregnancy are spherically shaped and are pale purplish vinaceous-coloured bodies. Capillaries are plentiful and show clearly. Points of rupture show on several corpora as small papillae at the apices. On section the cut surfaces are light flesh-coloured and central cavities have disappeared, except for very small fissures, 1 mm. in diameter, in a few corpora. No remnants of older corpora can be traced. Diameters of Graafian follicles range from less than 1 mm. to 6 mm. The colour is seashell pink, more especially the larger individuals. The majority are above the 1 mm. size. The estimated population count is 109.

#### *Group 4. Sows Slaughtered After Twelve Weeks of Pregnancy.*

*Large Black No. 18.*—Served on 16.5.44; slaughtered on 8.8.44; pregnancy 84 days; age 61 months; weight of sow 681 lb.; weight of ovaries, left 11·23 g., right 10·10 g.

The corpora lutea of pregnancy are clearly vascularised and their colour is pale purplish vinaceous. The consistency is medium firm to touch. The shape is spherical. The sectioned walls of the corpora are light flesh-coloured and all corpora are solid. No remains of older corpora can be traced. The Graafian follicles range from 1 mm. to 5 mm. in diameter. The total count of 75 follicles is reliable. The largest follicles are faintly pinkish in colour.

*Large White No. 177.*—Served on 29.8.43; slaughtered on 22.11.43; pregnancy 85 days; age 14 months; weight of sow 484 lb.; weight of ovaries, left 12·42 g., right 7·72 g.

The corpora lutea of pregnancy have a pale purplish vinaceous colour. Bloodvessels show only very faintly. The general shape is spherical. The sectioned walls are of a very light flesh colour; no cavities are present. There are no signs of older corpora lutea. The majority of Graafian follicles are less than 1 mm. in diameter and an exact count is impossible. Three of the largest follicles have a seashell pink colour and a few capillaries are present on each of them.

#### *Group 5. Sows Slaughtered After Fifteen Weeks of Pregnancy.*

*Large Black No. 48.*—Served on 18.2.41; slaughtered on 2.6.41; pregnancy 104 days; age 14 months; weight of sow 414 lb.; weight of ovaries, left 6·80 g., right 8·96 g.

The corpora lutea of pregnancy have a pale purplish vinaceous colour. Their shape is spherical and their consistency rather soft. Bloodvessels show clearly on all corpora. On section, all central cavities are seen to have disappeared and the cut surfaces are flesh-coloured. The Graafian follicles vary in size from less than 1 mm. to 5 mm., the majority being about 2 mm. in diameter. Older corpora lutea are present as small yellowish remnants, the largest measuring 2 mm.

*Large White No. 148.*—Served on 14.12.42; slaughtered on 5.4.43; pregnancy 112 days; age 12 months; weight of sow 314 lb.; weight of ovaries, left 8·41 g., right 5·18 g.

The corpora lutea of pregnancy have a pale purplish vinaceous colour. Vascularisation is absent on the majority of corpora but shows faintly on a few only. The sectioned walls of the corpora are very light flesh-coloured. No central cavities are present. There is no trace of older corpora lutea. Diameters of the Graafian follicles range from 1 to 5 mm., the majority being 2 to 3 mm. Their colour is very light seashell pink. No bloodvessels are apparent on the follicles.

#### *Additional Sow.*

*Large White No. 66.*—This sow escaped from her pen on the night previous to farrowing. She died while farrowing and after having delivered 8 normal live piglets. A further 9 normal piglets and one mummy were removed from her after death. She probably died from injuries received while endeavouring to escape or from exhaustion in delivering such a large litter. Her particulars are nevertheless presented below, as the condition of her corpora lutea and Graafian follicles, at the particular stage of pregnancy, is of interest.

Age of sow, 40 months; weight of sow about 500 lb.; weight of ovaries, left 9·13 g., right 6·57 g.

SEX PHYSIOLOGY OF PIGS.

The corpora lutea of pregnancy are pale purplish vinaceous. The consistency is firm and the shape spherical. Vascularisation is very marked and profuse. The colour of the corpora on section is a light liver brown. The general condition of the corpora indicates that they were still functional at the time of death. There are 6 Graafian follicles in the left ovary and 4 in the right ovary with diameters of 5 to 6 mm. Although much smaller than the usual mature follicle, they resemble the mature state very closely. Their colour is seashell pink. The follicular walls are very thin and transparent and capillaries are present on all. It is not improbable that these follicles would have ovulated at postpartum oestrus.

TABLE I.

*Sizes in Millimetres of the Largest Group of Graafian Follicles in Large Black and Large White Pigs at Consecutive Three-weekly Intervals During Pregnancy.*

INTERVALS.

3 Weeks.		6 Weeks.		9 Weeks.		12 Weeks.		15-16 Weeks.		Post-partum.	
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.
Sow No. 116	Sow No. 105	Sow No. 126	Sow No. 113	Sow No. 137	Sow No. 154	Sow No. 18	Sow No. 177	Sow No. 48	Sow No. 148	Sow No. 202	Sow No. 152
4.0	5.0	6.5	7.0	5.0	6.5	5.0	4.0	3.5	5.0	5.0	3.0
4.0	5.0	4.0	7.0	4.0	5.0	5.0	5.0	4.0	4.0	5.5	4.0
4.0	4.5	6.0	7.0	4.5	5.0	5.0	4.0	3.0	5.0	5.0	3.0
4.0	5.0	6.0	5.0	7.0	6.0	5.0	5.0	3.5	4.0	5.0	4.0
5.0	4.0	5.0	6.0	5.0	6.0	4.0	4.0	3.0	5.0	5.0	4.0
5.0	4.0	5.0	6.0	5.5	6.0	4.5	3.0	2.5	4.5	6.0	3.0
5.0	5.0	5.0	6.0	6.0	6.5	4.0	3.5	2.5	4.0	4.0	6.5
4.0	4.0	4.5	7.0	5.0	6.0	4.5	5.0	2.0	4.0	4.0	7.0
4.0	5.0	5.0	7.0	4.5	4.0	4.0	5.0	5.0	5.0	4.0	5.0
4.0	5.0	4.0	5.0	6.0	6.0	5.0	5.0	3.0	3.0	5.0	6.0
4.0	5.0	5.0	6.0	5.0	4.0	4.0	4.0	3.0	3.0	5.0	4.0
4.5	4.0	6.0	5.0	6.5	4.0	3.5	5.0	3.0	4.0	5.0	4.0
4.0	4.0	4.0	6.0	5.0	5.0	3.5	5.0	2.5	3.0	5.0	5.0
5.0	5.0	5.0	6.0	5.0	5.0	3.0	5.0	2.5	2.5	5.0	4.0
4.5	5.0	4.0	6.0	4.0	5.0	3.0	5.0	3.0	2.0	5.0	4.0
4.5	4.5	4.0	5.0	5.0	5.0	3.5	5.0	2.5	2.0	5.0	3.0
4.0	4.5	4.0	6.0	4.0	5.5	5.0	6.5	2.0	3.0	5.0	—
4.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	2.0	3.0	5.0	—
—	5.0	6.0	6.0	5.0	6.0	3.5	5.0	2.0	3.0	5.0	—
—	5.0	5.0	6.0	4.0	5.0	4.0	5.0	3.0	3.0	—	—
—	4.0	5.0	5.0	—	6.0	3.0	5.0	—	—	—	—
—	4.0	5.0	5.5	—	6.0	5.0	—	—	—	—	—
—	4.0	4.0	5.0	—	5.0	4.0	—	—	—	—	—
—	4.0	4.0	5.5	—	6.0	5.0	—	—	—	—	—
—	4.0	4.0	5.0	—	6.0	4.0	—	—	—	—	—
—	5.0	—	6.0	—	4.0	4.0	—	—	—	—	—
—	4.0	—	5.0	—	4.0	4.0	—	—	—	—	—
—	5.0	—	5.0	—	4.0	4.0	—	—	—	—	—
—	5.5	—	6.0	—	—	4.0	—	—	—	—	—
—	4.0	—	6.0	—	—	4.5	—	—	—	—	—
—	5.0	—	—	—	—	—	—	—	—	—	—
—	5.0	—	—	—	—	—	—	—	—	—	—
—	4.0	—	—	—	—	—	—	—	—	—	—
—	6.0	—	—	—	—	—	—	—	—	—	—
—	5.5	—	—	—	—	—	—	—	—	—	—
—	4.0	—	—	—	—	—	—	—	—	—	—

TABLE II.

*Sizes in Millimetres of the Corpora Lutea of Pregnancy in Large Black and Large White Sows at Consecutive Three-weekly Intervals.*

INTERVALS.											
3 Weeks.		6 Weeks.		9 Weeks.		12 Weeks.		15-16 Weeks.		Post-partum.	
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.
Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.
116	105	126	113	137	154	18	177	48	148	202	152
10.0	10.0	12.0	10.0	12.0	10.0	9.0	12.0	10.0	10.0	7.0	7.0
10.0	8.0	12.0	9.0	11.5	7.0	10.0	11.0	11.0	10.0	7.0	7.0
9.0	8.0	12.0	10.5	11.0	10.0	11.0	11.0	10.0	9.0	7.0	6.0
10.0	8.0	12.0	9.0	12.0	11.0	10.0	10.0	10.5	10.0	7.0	7.0
11.0	9.0	11.5	9.0	10.5	9.0	11.0	10.0	11.5	11.0	6.5	6.0
10.0	9.0	11.5	10.0	11.0	10.0	10.0	10.0	12.0	9.0	6.5	7.0
10.0	9.0	12.5	10.0	11.5	10.0	11.0	11.0	10.0	10.5	8.0	6.0
9.0	9.5	11.0	9.5	12.5	10.0	10.0	12.0	11.0	11.0	7.0	6.0
9.0	8.5	11.5	10.0	12.0	9.5	9.5	10.0	13.0	11.0	6.0	7.0
9.0	9.5	—	10.0	9.0	10.0	11.0	10.0	12.0	11.0	—	6.0
10.0	8.0	—	—	—	9.0	10.0	9.5	11.0	9.0	—	7.0
9.0	9.0	—	—	—	10.0	11.0	10.0	10.0	8.0	—	7.0
9.0	8.0	—	—	—	10.0	10.5	11.0	8.0	10.0	—	7.0
—	10.0	—	—	—	9.0	10.5	8.0	11.0	9.0	—	7.0
—	8.0	—	—	—	10.0	11.5	11.0	—	9.0	—	7.0
—	8.0	—	—	—	10.0	11.0	10.0	—	10.0	—	7.0
—	9.0	—	—	—	9.0	—	10.0	—	10.5	—	7.0
—	7.0	—	—	—	10.0	—	10.5	—	—	—	—
—	7.0	—	—	—	10.0	—	10.5	—	—	—	—
—	7.0	—	—	—	9.5	—	—	—	—	—	—
—	9.0	—	—	—	—	—	10.0	—	—	—	—
—	—	—	—	—	—	—	8.0	—	—	—	—
—	—	—	—	—	—	—	12.0	—	—	—	—
—	—	—	—	—	—	—	11.0	—	—	—	—
—	—	—	—	—	—	—	10.0	—	—	—	—
—	—	—	—	—	—	—	10.0	—	—	—	—

#### APPENDIX 4.

##### THE MORPHOLOGY OF THE OVARY OF THE SOW AFTER TERMINATION OF POSTPARTUM OESTRUS.

The morphology of the ovary of the sow, immediately after the cessation of postpartum oestrus, is presented in this appendix. Special interest is being attached to the corpora lutea, as it was of particular importance to determine whether or not ovulation had occurred during postpartum oestrus. Details in respect of ages, weights of sows, etc., not appearing in the descriptions below, are presented in tables of this appendix. Sows were closely observed after parturition and as soon as they started to move about in their pens they were "teased" regularly at three-hourly intervals for the presence of oestrus. They were slaughtered as soon as possible after termination of oestrus, the longest intervening period being 19 hours. Six Large White and two Large Black sows were used as material. A larger number of sows of the latter breed were unfortunately not available for this study.

TABLE II.

*Sizes in Millimetres of the Corpora Lutea of Pregnancy in Large Black and Large White Sows at Consecutive Three-weekly Intervals.*

INTERVALS.											
3 Weeks.		6 Weeks.		9 Weeks.		12 Weeks.		15-16 Weeks.		Post-partum.	
Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.	Large Black.	Large White.
Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.
116	105	126	113	137	154	18	177	48	148	202	152
10.0	10.0	12.0	10.0	12.0	10.0	9.0	12.0	10.0	10.0	7.0	7.0
10.0	8.0	12.0	9.0	11.5	7.0	10.0	11.0	11.0	10.0	7.0	7.0
9.0	8.0	12.0	10.5	11.0	10.0	11.0	11.0	10.0	9.0	7.0	6.0
10.0	8.0	12.0	9.0	12.0	11.0	10.0	10.0	10.5	10.0	7.0	7.0
11.0	9.0	11.5	9.0	10.5	9.0	11.0	10.0	11.5	11.0	6.5	6.0
10.0	9.0	11.5	10.0	11.0	10.0	10.0	10.0	12.0	9.0	6.5	7.0
10.0	9.0	12.5	10.0	11.5	10.0	11.0	11.0	10.0	10.5	8.0	6.0
9.0	9.5	11.0	9.5	12.5	10.0	10.0	12.0	11.0	11.0	7.0	6.0
9.0	8.5	11.5	10.0	12.0	9.5	9.5	10.0	13.0	11.0	6.0	7.0
9.0	9.5	—	10.0	9.0	10.0	11.0	10.0	12.0	11.0	—	6.0
10.0	8.0	—	—	—	9.0	10.0	9.5	11.0	9.0	—	7.0
9.0	9.0	—	—	—	10.0	11.0	10.0	10.0	8.0	—	7.0
9.0	8.0	—	—	—	10.0	10.5	11.0	8.0	10.0	—	7.0
—	10.0	—	—	—	9.0	10.5	8.0	11.0	9.0	—	7.0
—	8.0	—	—	—	10.0	11.5	11.0	—	9.0	—	7.0
—	8.0	—	—	—	10.0	11.0	10.0	—	10.0	—	7.0
—	9.0	—	—	—	9.0	—	10.0	—	10.5	—	7.0
—	7.0	—	—	—	10.0	—	10.5	—	—	—	—
—	7.0	—	—	—	10.0	—	10.5	—	—	—	—
—	7.0	—	—	—	9.5	—	—	—	—	—	—
—	9.0	—	—	—	—	—	10.0	—	—	—	—
—	—	—	—	—	—	—	8.0	—	—	—	—
—	—	—	—	—	—	—	12.0	—	—	—	—
—	—	—	—	—	—	—	11.0	—	—	—	—
—	—	—	—	—	—	—	10.0	—	—	—	—
—	—	—	—	—	—	—	10.0	—	—	—	—

**APPENDIX 4.**

**THE MORPHOLOGY OF THE OVARY OF THE SOW AFTER TERMINATION OF POSTPARTUM OESTRUS.**

The morphology of the ovary of the sow, immediately after the cessation of postpartum oestrus, is presented in this appendix. Special interest is being attached to the corpora lutea, as it was of particular importance to determine whether or not ovulation had occurred during postpartum oestrus. Details in respect of ages, weights of sows, etc., not appearing in the descriptions below, are presented in tables of this appendix. Sows were closely observed after parturition and as soon as they started to move about in their pens they were "teased" regularly at three-hourly intervals for the presence of oestrus. They were slaughtered as soon as possible after termination of oestrus, the longest intervening period being 19 hours. Six Large White and two Large Black sows were used as material. A larger number of sows of the latter breed were unfortunately not available for this study.



## SEX PHYSIOLOGY OF PIGS.

*Large Black No. 202.*—Slaughtered 1 hour after cessation of postpartum oestrus.

The Graafian follicles are seashell pink in colour. Very fine bloodvessels can be seen on two follicles only. Their diameters range from less than 1 to 5 mm., the majority being less than 3 mm. The follicles in no way resemble those of the mature state. The corpora lutea are spherical, very firm and pale yellow bodies, being largely buried in the bulk of the ovary. Vascularisation is very faint on a few but absent on the majority. On section the corpora are shown to be solid and the colour creamy yellow. There are no indications of older corpora lutea.

*Large Black No. 214.*—Slaughtered about 4 hours after cessation of postpartum oestrus.

This sow farrowed 4 piglets. The Graafian follicles are seashell pink in colour. They have diameters ranging from less than 1 mm. to 4 mm. Four of the largest follicles show faint vascularisation in their walls. The majority are less than 2 mm. in diameter. Bloodvessels show very faintly on only 4 corpora lutea. Externally the corpora have a dull white colour but on section they are creamy yellow. They are very firm, solid bodies. Diameters vary from 7 to 9 mm.

*Large White No. 152.*—Slaughtered 16 hours after termination of oestrus.

The largest Graafian follicles have a seashell pink colour. The follicles vary from less than 1 mm. to 7 mm. in diameter. The majority are less than 1 mm. in diameter. No bloodvessels are visible and none resemble the follicle in its mature state. The corpora lutea have a dull white colour externally and no bloodvessels are present. The shape is spherical to conical. They are very hard bodies. On section they are yellowish-brown in colour and solid. Only brownish remnants of older corpora can be found.

*Large White No. 170.*—Slaughtered 16 hours after cessation of postpartum oestrus.

The Graafian follicles have diameters which range from less than 1 to 6 mm., there being no differentiated largest group. The larger individuals have a faint pinkish colour. Only four follicles show faint blood vessels. None resemble the mature state. The corpora lutea are spherical in shape and show as grayish bodies on the ovaries. There is no trace of bloodvessels on their surfaces. They are very firm bodies. On section they are distinctly yellow and are solid. No trace of older corpora lutea can be found.

*Large White No. 178.*—Slaughtered 19 hours after cessation of oestrus.

The majority of Graafian follicles are of the 2 mm. class, diameters ranging from less than 1 mm. to 4 mm. They are light pinkish to colourless bodies. The corpora lutea are very firm and faint yellow in colour. On section they are creamy yellow in colour and solid. There is no vascularisation. There are no signs of still older corpora.

*Large White No. 184.*—Slaughtered 18 hours after termination of postpartum oestrus.

The majority of Graafian follicles are less than 1 mm. in diameter, and a reliable count is not possible. The largest follicles are seashell pink in colour. Sizes merge into each other. The corpora lutea are all spherically shaped. The external colour is dull white. On section they are found to be solid and brownish-yellow in colour. The consistency is very firm. There are no remnants of older corpora.

*Large White No. 196.*—Slaughtered 16 hours after termination of postpartum oestrus.

The larger Graafian follicles are faintly pinkish in colour. The majority are 1 mm. and less in diameter and sizes range from less than 1 mm. to 4 mm. A reliable count of the population is not possible. The corpora lutea are very firm and their external colour is a dull white. On section they are found to be solid and their colour creamy yellow.

*Large White No. 198.*—Slaughtered 14 hours after termination of postpartum oestrus.

The Graafian follicles have a faint pinkish colour. The diameters range from less than 1 mm. to 6.5 mm., the majority being of the 1 to 2 mm. class. Their colour is dull white and there are no capillaries in evidence. The corpora lutea have a dull white colour externally. Their shape is spherical and they are very hard bodies. The colour on section is creamy yellow. Older corpora cannot be traced.

TABLE I.  
Summary of Particulars of Sows Slaughtered After Cessation of Postpartum Oestrus.

Sow No.	Age, Months.	PARTURITION.		Total Litter Size.	POSTPARTUM OESTRUS.						Approximate Total No. of Follicles.	Period, end of Oestrus to Slaughter, Hours.	Ovulation.
		Date.			Onset.		Cessation.		Duration, Hours.	Period, Parturition to Oestrus, Hours.			
		Date.	Hour.		Date.	Hour.	Date.	Hour.					
Large Black 202...	11	1.10.43	8 a.m...	1	2.10.43	3 p.m...	5.10.43	9 a.m...	66	31	1	None.	
Large Black 214...	11	30. 9.43	Night...	4	3.10.43	3 a.m.(?)	5.10.43	3 a.m.(?)	48(?)	51(?)	6(?)	None.	
Large White 152...	12	7. 4.43	9 p.m...	8	10. 4.43	12 noon.	11. 4.43	6 p.m...	30	63	16	None.	
Large White 170...	16	5.11.43	8 a.m...	7	8.11.43	9 a.m...	9.11.43	6 p.m...	33	73	16	None.	
Large White 178...	11	9.10.43	12 m.n...	9	11.10.43	9 a.m...	14.10.43	3 p.m...	33	33	19	None.	
Large White 184...	14	16.12.43	9 a.m...	11	19.12.43	12 noon.	22.12.43	3 p.m...	78	75	18	None.	
Large White 196...	11	6.12.43	5 a.m...	15	7.12.43	12 noon.	12.12.43	6 p.m...	114	43	16	None.	
Large White 198...	11	9.12.43	6 a.m...	3	10.12.43	12 noon.	14.12.43	6 p.m...	102	30	14	None.	

TABLE II.  
Sizes in Millimetres of Corpora Lutea in Large Black and Large White Pigs after Cessation of Postpartum Oestrus.

LARGE BLACKS.			LARGE WHITES.		
Sow No.	Sow No.	Sow No.	Sow No.	Sow No.	Sow No.
202	214	152	172	178	184
7.0	7.0	7.0	6.0	7.0	5.0
7.0	8.0	7.0	6.5	7.0	5.0
7.0	7.0	6.5	6.0	6.0	5.0
7.0	7.0	7.0	6.0	7.0	5.0
6.5	7.0	6.5	6.0	6.0	6.0
6.5	8.0	7.0	6.0	7.0	6.0
8.0	8.0	6.5	6.0	7.0	5.5
7.0	8.0	7.0	6.0	7.0	6.0
6.0	7.0	7.5	6.0	7.0	6.0
—	8.0	6.0	6.5	7.0	6.0
—	8.0	7.0	6.0	7.0	6.0
—	8.0	6.0	6.0	7.0	6.0
—	—	7.0	7.0	7.0	6.0
—	—	6.0	6.0	6.0	6.0
—	—	7.0	7.0	6.5	—
—	—	6.0	6.0	7.5	—
—	—	6.0	—	7.0	—
—	—	7.0	—	7.0	—

TABLE III.

*Sizes in Millimetres of the Largest Group of Graafian Follicles Differing by Not More Than About 2 mm.*

LARGE BLACKS.		LARGE WHITES.					
Sow No. 202	Sow No. 214	Sow No. 152	Sow No. 170	Sow No. 178	Sow No. 184	Sow No. 196	Sow No. 198
5.5	4.0	6.5	6.0	4.0	4.0	4.0	6.5
5.0	3.0	7.0	5.0	4.0	3.0	3.0	6.0
5.0	3.0	5.0	5.0	4.0	3.0	4.0	4.5
5.0	3.0	6.0	5.0	4.0	3.0	3.0	6.0
5.0	3.0	4.0	5.0	4.0	3.0	3.0	6.0
5.0	3.0	4.0	4.0	3.0	3.5	3.0	6.0
6.0	3.0	5.0	3.0	3.0	3.0	3.0	6.0
4.0	3.0	4.0	3.0	3.0	3.0	3.0	6.0
4.0	3.0	4.0	3.0	3.0	3.0	3.0	6.0
4.0	3.0	3.0	4.0	3.0	3.0	3.0	6.0
5.0	3.0	3.0	4.0	3.0	4.0	3.0	6.5
5.0	2.5	4.0	3.5	3.0	—	3.0	6.0
5.0	2.5	3.0	3.0	3.0	—	4.0	6.0
5.0	2.5	4.0	4.0	3.0	—	3.0	—
5.0	2.5	4.0	3.0	4.0	—	3.0	—
5.0	3.5	3.0	4.0	3.0	—	3.0	—
5.0	3.0	—	3.0	3.0	—	3.0	—
5.0	3.5	—	3.0	3.0	—	4.0	—
5.0	3.0	—	3.0	3.0	—	3.0	—
—	3.0	—	3.0	4.0	—	—	—
—	3.0	—	3.0	3.0	—	—	—
—	3.0	—	3.0	4.0	—	—	—
—	3.0	—	3.0	3.0	—	—	—
—	3.0	—	4.0	4.0	—	—	—
—	3.0	—	4.0	5.0	—	—	—
—	3.5	—	4.0	3.0	—	—	—
—	3.0	—	3.0	4.0	—	—	—
—	3.0	—	4.0	3.0	—	—	—
—	3.0	—	3.0	3.0	—	—	—
—	—	—	3.0	3.0	—	—	—
—	—	—	4.0	3.0	—	—	—
—	—	—	3.0	3.0	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—
—	—	—	3.0	—	—	—	—