

## Section on Scientific Papers

Papers Presented at the Sixtieth Annual Convention

### VARIATION IN THE SUSCEPTIBILITY OF FROGS TO OUABAIN.

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During the course of the experiments on variation in susceptibility of guinea pigs to ouabain, the results of which are presented in another paper (see JOURNAL for May, p. 558), a series of tests were run simultaneously on frogs. The method used was the "one hour" method. In the following tables the doses given are in grams per gram body weight:

AUGUST, 1911.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 38.5 to 57.5 grams.  
Temperature of water in frog tank, 26.5° to 29.5° C.  
Temperature of room, 25.5° to 28.5° C.

Dose	Weight	Results
0.0000030.....	42.0	— Beats.
0.0000031.....	40.0	— Occasional beat.
x0.0000032.....	45.5	+ Stopped. Extra contraction on stimulation.
0.0000032.....	55.0	+ Stopped. Extra contraction on stimulation.
0.0000032.....	56.5	+ Stopped. Extra contraction on stimulation.
0.0000032.....	57.5	+ Stopped. Extra contraction on stimulation.
0.0000033.....	42.5	— Non-absorption.
0.0000034.....	38.4	+ Stopped. No extra contraction on stimulation.*
0.0000034.....	44.0	+ Stopped. No extra contraction on stimulation.
0.0000036.....	45.0	+ Stopped. No extra contraction on stimulation.
0.0000039.....	40.0	+ Stopped. No extra contraction on stimulation.

M. L. D. considered to be 0.0000032.

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 30 to 62.3 grams.  
Temperature of water in frog tank, 26.5° to 29.5° C.  
Temperature of room, 25.5° to 28.5° C.

Dose	Weight	Results
0.0000036.....	40.0	— Beats.
0.0000036.....	34.0	+ Stopped.
0.0000037.....	34.0	— Slight beat in auricle.*
0.0000037.....	43.5	— Slight beat in auricle.
0.0000037.....	36.0	— Beats.
0.0000038.....	37.5	— Beats.
0.0000038.....	34.0	— Beats.
x0.0000038.....	30.0	+ Stopped. Extra contraction on stimulation.
0.0000038.....	37.5	+ Stopped. Extra contraction on stimulation.
0.0000038.....	62.3	+ Stopped. No extra contraction on stimulation.
0.0000039.....	50.5	— Beats.*
0.0000039.....	66.6	— Auricles still contracting.*
0.0000039.....	46.0	+ Stopped. No extra contraction on stimulation.
0.0000039.....	37.0	+ Stopped. No extra contraction on stimulation.
0.0000039.....	48.0	+ Stopped. No extra contraction on stimulation.
0.0000040.....	40.0	+ Stopped. No extra contraction on stimulation.

M. L. D. considered to be 0.0000038.

\*"Out of order."

*Female Bull-frogs (Rana catesbiana) from Pennsylvania.*

Weights ranged from 38.5 to 54 grams.  
 Temperature of water in frog tank, 24.5° to 26.5° C.  
 Temperature of room, 24° to 25.5° C.

Dose	Weight	Results
0.00000036.....	48.2	— Beats.
0.00000040.....	41.0	— Beats.
0.00000045.....	41.0	— Beats.
0.00000047.....	43.0	— Beats.
0.00000050.....	42.0	— Auricles still contracting.
0.00000051.....	38.5	— Auricles still contracting.
x0.00000052.....	39.6	+ Stopped. Extra contraction on stimulation.
0.00000052.....	40.0	+ Stopped. Extra contraction on stimulation.
0.00000052.....	40.5	+ Stopped. Extra contraction on stimulation.
0.00000052.....	38.5	+ Stopped. Extra contraction on stimulation.
0.00000052.....	48.5	+ Stopped. Extra contraction on stimulation.
0.00000053.....	40.5	— Non-absorption.*
0.00000053.....	48.0	+ Stopped. No extra contraction on stimulation.
0.00000053.....	54.0	+ Stopped. No extra contraction on stimulation.

M. L. D. considered to be 0.00000052.

SEPTEMBER, 1911.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 20.1 to 61.1 grams.  
 Temperature of room, 23.5° to 25.5° C.  
 Temperature of water in frog tank, 21° to 23° C.

Dose	Weight	Results
0.00000030.....	29.1	— Beats.
0.00000032.....	59.2	— Beats.
0.00000036.....	61.1	+ Contracts on stimulation.
0.00000036.....	33.6	— Beats.
0.00000036.....	35.2	— Beats.
x0.00000038.....	30.3	+ Contracts on stimulation.
0.00000038.....	20.1	+ Contracts on stimulation.
0.00000040.....	33.3	+ No contraction on stimulation.
0.00000042.....	34.2	+ No contraction on stimulation.
0.00000044.....	38.6	+ No contraction on stimulation.

M. L. D. considered to be 0.00000038.

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 61.5 to 88.7 grams.  
 Temperature of room, 23° to 25.5° C.  
 Temperature of water in tank, 21° to 23° C.

Dose	Weight	Results
0.00000025.....	88.7	— Beats.
0.00000028.....	83.	— Beats.
0.00000030.....	70.9	— Occasional beat.
x0.00000030.....	61.5	+ Contracts on stimulation.
0.00000030.....	78.0	+ Contracts on stimulation.
0.00000032.....	73.2	+ No contraction on stimulation.
0.00000032.....	61.6	+ Contracts on stimulation.
0.00000034.....	82.7	+ No contraction on stimulation.

M. L. D. considered to be 0.00000030.

\*"Out of order."

OCTOBER, 1911.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights range from 24.7 to 29.3 grams.

Temperature of room, 24.5 to 25° C.

Temperature of water in tank, 18 to 19.5° C.

Dose	Weight	Results
0.00000038.....	27.2	— Beats.
0.00000040.....	29.0	+ Contracts on stimulation.*
0.00000040.....	27.2	— Beats.
0.00000044.....	26.0	— Beats.
0.00000050.....	29.3	— Beats.
0.00000053.....	26.5	— Beats.
0.00000055.....	24.7	— Occasional beat.
x0.00000055.....	25.7	+ Contracts on stimulation.
0.00000055.....	28.3	+ Contracts on stimulation.
0.00000057.....	25.2	+ No contraction on stimulation.
0.00000057.....	25.7	+ No contraction on stimulation.

M. L. D. considered to be 0.00000055.

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 18.1 to 37.1 grams.

Temperature of room, 23.5 to 25.5° C.

Temperature of water in tank, 18° to 19.5° C.

Dose	Weight	Results
0.00000032.....	31.5	+ Contracts on stimulation.*
0.00000036.....	28.5	+ Contracts on stimulation.*
0.00000036.....	28.2	— Beats.
0.00000038.....	27.2	— Beats.
0.00000046.....	31.2	— Occasional beat.
0.00000046.....	22.2	— Beats.
0.00000048.....	20.0	— Beats.
0.00000050.....	37.1	— Beats.
0.00000053.....	26.8	— Occasional beat.
x0.00000055.....	25.0	+ Contracts on stimulation.
0.00000055.....	18.1	+ Contracts on stimulation.
0.00000057.....	26.0	+ No contraction on stimulation.

M. L. D. considered to be 0.00000055.

NOVEMBER, 1911.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 14.6 to 36.5 grams.

Temperature of room, 11.5° to 24° C.

Temperature of water in tank, 13° to 15° C.

Dose	Weight	Results
0.00000038.....	28.5	— Beats.
0.00000044.....	36.4	— Beats.
0.00000055.....	28.2	— Beats.
0.00000060.....	30.2	— Beats.
0.00000064.....	31.5	— Beats.
0.00000200.....	29.0	— Beats.
0.00000250.....	34.0	— Occasional beat.
0.00000250.....	30.2	— Beats.
0.00000270.....	27.4	— Occasional beat.
0.00000300.....	29.0	— Occasional beat.
x0.00000300.....	25.5	+ Contracts on stimulation.
0.00000300.....	14.6	+ Contracts on stimulation.
0.00000300.....	33.0	+ Contracts on stimulation.
0.00000300.....	29.0	+ No contraction on stimulation.
0.00000335.....	31.0	+ Contracts on stimulation.
0.00000350.....	36.5	+ Contracts on stimulation.
0.00000350.....	26.0	+ No contraction on stimulation.

M. L. D. considered to be 0.0000030.

\*\*"Out of order."

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 25.5 to 36.3 grams.  
 Temperature of room, 11.5° to 22° C.  
 Temperature of water in tank, 13° to 14° C.

Dose	Weight	Results
0.000002	29.5	— Beats.
0.000002	28.9	+ Contracts on stimulation.*
0.000002	27.0	— Occasional beat.
0.0000023	25.5	— Beats.
0.0000023	27.0	— Occasional beat.
0.0000023	36.3	+ Contracts on stimulation.*
x0.0000025	31.0	+ Contracts on stimulation.
0.0000025	31.3	+ Contracts on stimulation.
0.0000025	26.1	+ Contracts on stimulation.
0.0000027	30.7	+ Contracts on stimulation.
0.0000030	33.0	+ Contracts on stimulation.
0.0000034	28.3	+ No contraction on stimulation.

M. L. D. considered to be 0.0000025.

DECEMBER, 1911.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 16.36 to 27 grams.  
 Temperature of room 18° to 23° C.  
 Temperature of water in tank, 12° to 16° C.

Dose	Weight	Results
0.0000055	23.0	— Beats.
0.0000060	24.4	— Beats.
0.0000065	24.7	— Occasional beat.
0.0000070	27.0	— Auricle beats.
0.0000090	23.0	— Beats.
0.0000100	17.36	— Beats.
0.0000100	18.6	— Occasional beat.
x0.0000125	20.9	+ Contracts on stimulation.
0.0000125	24.2	+ Contracts on stimulation.
0.0000125	19.5	+ Contracts on stimulation.
0.0000150	20.2	+ No contraction on stimulation.
0.0000200	21.9	+ No contraction on stimulation.
0.0000300	18.0	+ No contraction on stimulation.

M. L. D. considered to be 0.00000125.

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 16.8 to 25.1 grams.  
 Temperature of room, 16° to 23° C.  
 Temperature of water in tank, 13° to 16° C.

Dose	Weight	Results
0.0000055	25.1	+ No contraction on stimulation.*
0.0000055	18.83	— Beats.
0.0000060	19.5	— Beats.
0.0000070	17.6	— Beats.
0.0000080	22.7	— Beats.
0.0000085	16.8	+ Contracts on stimulation.*
0.0000085	19.5	— Beats.
0.0000085	20.0	— Beats.
0.0000090	20.7	+ Contracts on stimulation.*
0.0000090	19.5	— Beats.
0.0000095	20.2	— Occasional beat.
x0.0000100	18.0	+ Contracts on stimulation.
0.0000100	20.2	+ Contracts on stimulation.
0.0000125	23.8	+ No contraction on stimulation.
0.0000150	20.2	+ No contraction on stimulation.

M. L. D. considered to be 0.000001.

\*"Out of order."

JANUARY, 1912.

*Male Leopard Frogs† (Rana pipiens) from Illinois.*

Weights ranged from 20 to 35.8 grams.

Temperature of room, 16 to 21° C.

Temperature of water in tank, 5° to 7° C.

Dose	Weight	Results
0.000025.....	22.5	— Beats.
0.000035.....	23.9	— Occasional beat.
0.00004.....	23.5	— Beats.
0.00004.....	20.0	— Beats.
0.00005.....	29.7	— Beats.
x0.00005.....	22.0	+ No contraction on stimulation.
0.00006.....	21.5	+ Contracts on stimulation.
0.00006.....	35.8	— Auricle beats.*
0.00007.....	21.0	+ Contracts on stimulation.
0.00007.....	22.7	+ Contracts on stimulation.

M. L. D. considered to be 0.00005.

*Female Leopard Frogs† (Rana pipiens) from Illinois.*

Weights ranged from 12 to 35.7 grams.

Temperature of room, 18° to 19.5° C.

Temperature of water in tank, 4.5° to 7.5° C.

Dose	Weight	Results
0.00001.....	21.1	— Beats.
0.00001.....	23.5	— Beats.
0.00001.....	22.9	— Slight beat.
0.00002.....	22.5	— Beats.
0.00003.....	18.3	— Beats.
0.00003.....	12.0	+ Contracts on stimulation.*
0.00004.....	35.7	— Auricle beats.*
x0.00004.....	22.0	+ No contraction on stimulation.
0.00004.....	19.4	+ No contraction on stimulation.
0.00004.....	19.4	+ No contraction on stimulation.
0.000045.....	19.2	+ No contraction on stimulation.
0.000045.....	23.0	— Beats.
0.00005.....	19.5	+ Contracts on stimulation.
0.000055.....	15.7	+ No contraction on stimulation.
0.00007.....	20.0	+ No contraction on stimulation.
0.00008.....	29.5	+ No contraction on stimulation.

M. L. D. considered to be 0.00004.

FEBRUARY, 1912.

*Male Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 14.2 to 25. grams.

Temperature of room, 18° to 20° C.

Temperature of water in tank, 7° to 7.5° C.

Dose	Weight	Results
0.00002.....	20.0	— Beats.
0.00003.....	19.6	— Beats.
0.00003.....	23.0	— Beats.
0.00003.....	21.1	— Beats.
0.00004.....	14.2	— Beats.
x0.00004.....	14.2	+ Contracts on stimulation.
0.00004.....	22.0	+ Contracts on stimulation.
0.00005.....	18.8	+ No contraction on stimulation.
0.00005.....	17.0	— Non-absorption.*
0.00005.....	17.2	+ Contracts on stimulation.
0.00005.....	16.39	— Beats.*
0.000055.....	19.0	+ Contracts on stimulation.
0.000055.....	20.4	+ No contraction on stimulation.
0.000055.....	22.0	+ Contracts on stimulation.
0.00006.....	21.2	+ Contracts on stimulation.
0.00006.....	25.0	+ No contraction on stimulation.
0.000065.....	16.7	+ No contraction on stimulation.
0.000070.....	21.7	+ No contraction on stimulation.
0.000080.....	21.7	— Non-absorption.*

M. L. D. considered to be 0.00004.

†Badly frozen when received.

\*“Out of order.”

*Female Leopard Frogs (Rana pipiens) from Illinois.*

Weights ranged from 14.3 to 31.5 grams.  
 Temperature of room, 18° to 20° C.  
 Temperature of water in tank, 7° to 7.5° C.

Dose	Weight	Results.
0.000002.....	22.1	— Beats.
0.000003.....	31.5	— Auricle beats.
0.000003.....	14.3	— Beats.
0.000003.....	29.4	— Occasional beat.
0.000003.....	16.2	+ No contraction on stimulation.*
x0.000004.....	20.0	+ Contracts on stimulation.
0.000004.....	21.4	+ Contracts on stimulation.
0.000005.....	23.0	+ Contracts on stimulation.
0.000005.....	20.5	+ No contraction on stimulation.
0.0000055.....	17.8	+ Auricle contracts on stimulation.
0.000006.....	20.2	+ No contraction on stimulation.

M. L. D. considered to be 0.000004.

MARCH, 1912.

*Male Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 17.3 to 31.2 grams.  
 Temperature of water in tank, 7° to 8° C.  
 Temperature of room, 18.5° to 22° C.

Dose	Weight	Results
0.000001.....	25.1	— Beats.
0.000001.....	31.2	— Beats.
0.0000012.....	30.5	— Beats.
x0.0000015.....	17.3	+ Auricle contracts on stimulation.
x0.0000015.....	29.5	+ Contracts on stimulation.
0.0000015.....	25.7	+ Contracts on stimulation.
0.0000020.....	23.8	+ No contraction on stimulation.
0.0000025.....	25.2	+ No contraction on stimulation.
0.0000030.....	21.9	+ No contraction on stimulation.

M. L. D. considered to be 0.0000015.

*Female Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 18.8 to 30.6 grams.  
 Temperature of water in tank, 7° to 14° C.  
 Temperature of room, 16.5° to 22° C.

Dose	Weight	Results
0.000001.....	18.8	— Beats.
0.0000015.....	23.2	— Beats.
0.0000015.....	29.7	+ No contraction on stimulation.*
0.0000015.....	25.5	+ No contraction on stimulation.*
0.0000015.....	25.8	— Beats.
0.0000020.....	19.2	— Beats.
0.0000020.....	23.3	— Beats.
0.0000020.....	29.2	— Occasional beats.
x0.0000025.....	27.2	+ Contracts on stimulation.
0.0000025.....	27.2	+ No contracton on stimulation.
0.0000025.....	24.0	+ Contracts on stimulation.
0.0000030.....	30.6	+ Contracts on stimulation.
0.0000035.....	24.5	+ No contraction on stimulation.
0.0000035.....	26.8	+ No contraction on stimulation.

M. L. D. considered to be 0.0000025.

\*"Out of order."

APRIL, 1912.

*Male Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 22.8 to 41 grams.

Temperature of room, 18° to 22° C.

Temperature of water in tank, 11° to 13° C.

Dose	Weight	Results
0.0000009.....	41.0	— Beats.
0.0000009.....	39.3	— Beats.
0.0000010.....	34.0	+ No contraction on stimulation.*
0.0000010.....	38.2	+ Beats.
0.0000010.....	34.0	— Beats.
0.0000012.....	24.0	+ No contraction on stimulation.*
0.0000012.....	26.0	— Occasional beat.
0.0000012.....	32.0	— Occasional beat.
0.0000015.....	22.8	— Occasional beat.
0.0000015.....	29.3	+ No contraction on stimulation.*
0.0000015.....	28.5	— Beats.
x0.0000017.....	27.0	+ No contraction on stimulation.
0.0000017.....	30.0	+ Contracts on stimulation.
0.000002.....	29.0	+ No contraction on stimulation.
0.000002.....	31.0	+ No contraction on stimulation.

M. L. D. considered to be 0.0000017.

*Female Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 25.8 to 44.5 grams.

Temperature of room, 18° to 22° C.

Temperature of water in tank, 11° to 13° C.

Dose	Weight	Results
0.0000008.....	40.0	— Beats.
0.0000009.....	39.5	— Beats.
0.0000009.....	44.5	— Auricle beats.
x0.000001.....	25.8	+ Contracts on stimulation.
0.000001.....	28.0	+ Auricle contracts on stimulation.
0.0000015.....	41.0	+ No contraction on stimulation.
0.000002.....	30.5	+ No contraction on stimulation.
0.0000025.....	30.5	+ Contracts on stimulation.
0.000003.....	33.2	+ No contraction on stimulation.

M. L. D. considered to be 0.000001.

MAY, 1912.

*Female Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 23.5 to 48.9 grams.

Temperature of room, 24° to 28.5° C.

Temperature of water in tank, 21° to 27.5° C.

Dose	Weight	Results
0.0000008.....	24.5	— Auricle beats.
0.0000009.....	48.9	— Beats.
0.0000009.....	23.7	— Beats.
0.0000010.....	30.6	— Beats.
x0.0000010.....	23.5	+ Contracts on stimulation.
0.0000010.....	30.0	+ Contracts on stimulation.
0.0000012.....	35.4	+ No contraction on stimulation.
0.0000014.....	33.5	+ No contraction on stimulation.
0.0000015.....	33.0	+ No contraction on stimulation.
0.0000020.....	28.0	+ No contraction on stimulation.

M. L. D. considered to be 0.000001.

\*“Out of order.”

JUNE, 1912.

*Male Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 12.7 to 26.1 grams.  
 Temperature of laboratory, 27° to 30° C.  
 Temperature of water in tank, 24° to 25° C.

Dose	Weight	Results
0.0000006.....	18.5	— Beats.
0.0000008.....	20.0	— Beats.
0.0000009.....	20.0	— Beats.
0.00000095.....	26.1	— Beats.
0.0000010.....	12.7	— Beats.
x0.0000010.....	25.5	+ Contracts on stimulation.
0.0000015.....	19.5	+ Contracts on stimulation.

M. L. D. considered to be 0.000001.

JULY, 1912.

*Male Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 25.5 to 48.5 grams.  
 Temperature of room, 27.5° to 30° C.  
 Temperature of water in tank, 25° to 26° C.

Dose	Weight	Results.
0.0000002.....	27.2	— Beats.
0.00000025.....	37.6	+ Contracts on stimulation.*
0.0000003.....	27.5	+ Contracts on stimulation.*
0.0000003.....	35.6	— Occasional beat.
0.00000035.....	48.5	— Beats.
0.00000035.....	25.5	— Beats.
x0.0000004.....	29.1	+ Contracts on stimulation.
0.0000004.....	26.8	+ No contraction on stimulation.
0.00000045.....	28.0	— Beats.*
0.00000045.....	26.1	+ No contraction on stimulation.
0.0000005.....	26.2	+ No contraction on stimulation.

M. L. D. considered to be 0.0000004.

*Female Leopard Frogs (Rana pipiens) from New Jersey.*

Weights ranged from 20 to 42 grams.  
 Temperature of room, 26° to 29.5° C.  
 Temperature of water in tank, 22.5° to 27.5° C.

Dose	Weight	Results.
0.0000002.....	24.5	— Beats.
0.00000025.....	24.3	— Auricle beats.
0.00000025.....	30.0	— Auricle beats.
0.00000030.....	29.5	+ Contracts on stimulation.*
0.00000030.....	38.0	— Beats.
0.00000030.....	34.5	— Beats.
x0.00000035.....	42.0	+ Contracts on stimulation.
0.00000035.....	26.0	+ Contracts on stimulation.
0.00000040.....	28.0	+ No contraction on stimulation.
0.00000060.....	20.0	+ No contraction on stimulation.
0.00000080.....	20.8	+ No contraction on stimulation.
0.0000012.....	21.1	+ No contraction on stimulation.

M. L. D. considered to be 0.00000035.

Summary of smallest amounts required to produce systolic stoppage of the heart in one hour—the amounts stated representing milligrams per gram weight of frog:

	Males Illinois	Females Illinois	Males New Jersey	Females New Jersey	Average
August, 1911.					
Lab. 25.5—28.5° C.....	0.00032	0.00038	.....	.....	0.00035.
Tank 26.5—29.5° C.					
September, 1911.					
Lab. 23.—25.5° C.....	0.00038	0.00030	.....	.....	0.00034
Tank 21—23° C.					

\*"Out of order."



October, 1911.					
Lab. 23.5—25.5° C.	0.00055	0.00055	.....	.....	0.00055
Tank 18—19.5° C.					
November, 1911.					
Lab. 11.5—24° C.	0.00300	0.00250	.....	.....	0.00275.
Tank 13.—15° C.					
December, 1911.					
Lab. 16—23° C.	0.00125	0.00100	.....	.....	0.00112.
Tank 12—16° C.					
January, 1912.					
Lab. 16—21° C.	0.00550	0.00350	.....	.....	0.00450.
Tank 4.5 to 7.5° C.					
February, 1912.					
Lab. 18—20° C.	0.00400	0.00400	.....	.....	0.00400
Tank 7—7.5° C.					
March, 1912.					
Lab. 16.5—22° C.	.....	.....	0.00150	0.00250	0.00200
Tank 7—14° C.					
April, 1912.					
Lab. 18—22° C.	.....	.....	0.00170	0.00100	0.00135
Tank 11—13° C.					
May, 1912.					
Lab. 24—28.5° C.	.....	.....	.....	0.00100	0.00100
Tank 21—27.5° C.					
June, 1912.					
Lab. 27—30° C.	.....	.....	0.00100	.....	0.00100
Tank 24—25° C.					
July, 1912.					
Lab. 26—30° C.	.....	.....	0.00040	0.00035	0.00037
Tank 22.5—27.5° C.					
Average	0.00214	0.00175	0.00115	0.00121	0.00161

The extreme range for the male Illinois frogs is 0.00032 to 0.00550 or from 85 percent below to 157 percent above the average of 0.00214. The range for the female Illinois frogs is 0.00030 to 0.00400 or from 83 percent below to 128 percent above the average of 0.00175. The range for the male New Jersey frogs is 0.00040 to 0.00170 or from 65 percent below to 48 percent above the average of 0.00115. The range for the female New Jersey frogs is 0.00035 to 0.00250 or from 71 percent below to 107 percent above the average of 0.00121. That the variation is not in accordance with the temperatures, except in a very general way, is readily seen by comparing the results for October, November, and December, and again for June and July. This does not preclude the possibility of obtaining valuable information as to the strength of preparations if each lot of frogs be "standardized" at the time of making the assay. That the variation in the susceptibility of frogs, however, is many times as great as that of guinea pigs is readily apparent by comparing these results with those set forth in another paper presented to this Section.