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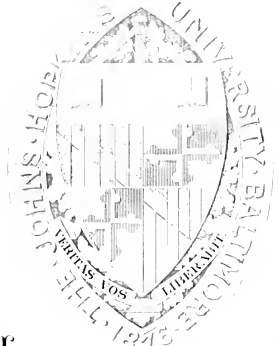

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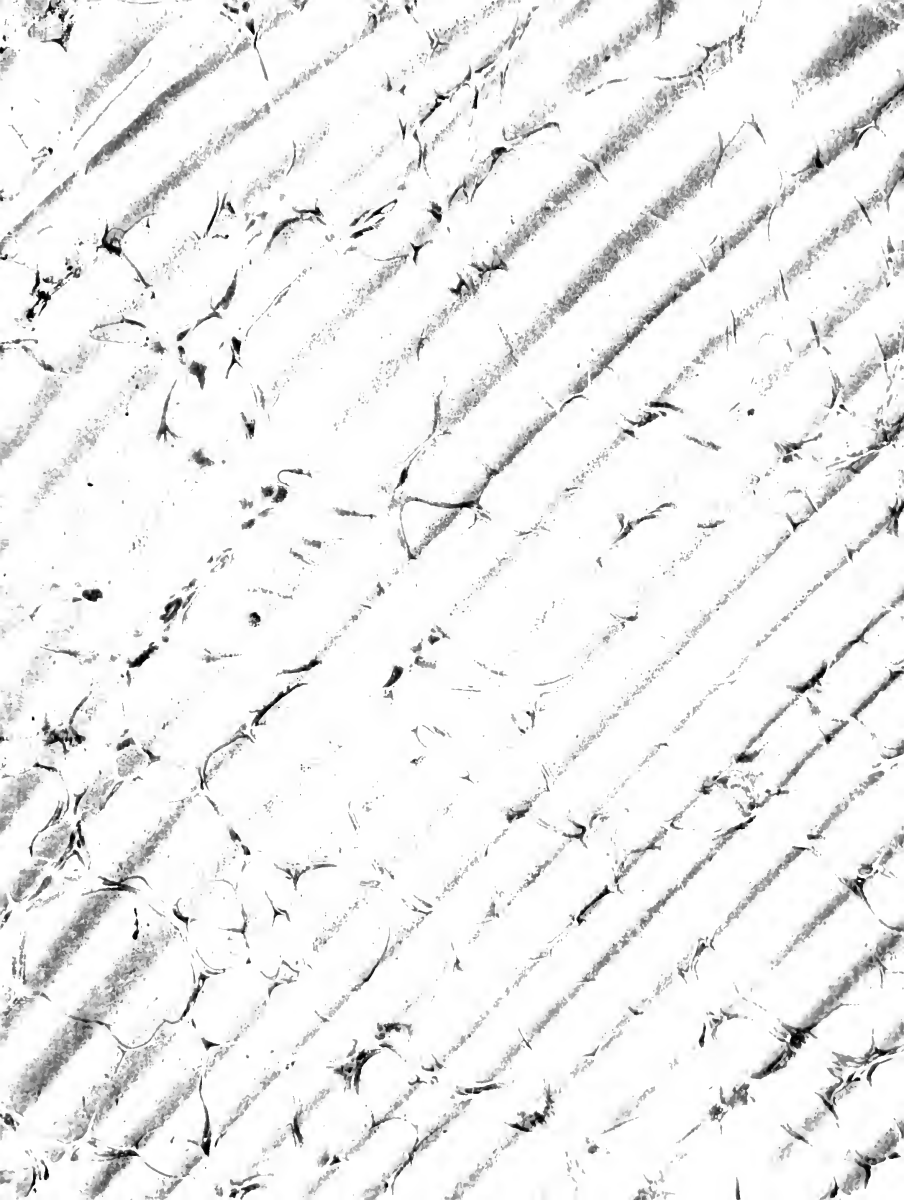

THE RELATION BETWEEN BRAIN WEIGHT AND THE TIME REQUIRED FOR HABIT FORMATION IN THE ALBINO RAT.

A DISSERTATION

SUBMITTED TO THE BOARD OF UNIVERSITY STUDIES OF

THE JOHNS HOPKINS UNIVERSITY

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DOCTOR OF PHILOSOPHY

BY

GARDNER CHENEY BASSETT.

ACKNOWLEDGMENTS.

Before entering upon the body of this presentation I desire to express my obligations to those without whose co-operation my experiments would have been of less value.

Above all am I indebted to Professor John B. Watson, Director of the Johns Hopkins Psychological Laboratory, who has kept himself informed of the progress of my experimentation and who has been ready at all times with helpful suggestions and encouragement.

To Dr. Henry H. Donaldson I owe much: for suggesting the experiment; for placing the facilities and material of the Wistar Institute at my disposal; for much helpful advice as to the evaluation of my results.

To Dr. Shinkishi Hatai for preparing the anatomical data referring to the rats used in my experiments.

To Dr. Helen I. King for keeping her sequences of inbreeding moving so perfectly that, at any time, I was able to procure inbred rats of the desired age.

Gardner Cheney Basset.

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I. INTRODUCTION.

A few years ago experimental inbreeding of the albino rat, Mus norvegicus albinus, was started at the Wistar Institute of Anatomy and Biology in order to determine the anatomical consequences of such procedure upon successive generations of progeny. Among other results obtained was a distinct and progressive decrease in actual and relative brain weight (relative, that is, in reference to body length) for four generations of close inbreeding. From the fourth to the tenth generations the relative brain weight remained, on the average, constant at six and one half percent less than that of the average normal rat.

When, early in October, 1911, Dr. Donaldson suggested to Professor Watson that the deterioration in brain weight might be accompanied by a similar deterioration in the ability to form habits a new line of investigation in comparative psychology was opened up. The problem was offered to the writer and gladly accepted.

In regard to the question as to whether inbreeding, per se, has deteriorating effects upon progeny it is unsafe to be arbitrary, and authoritative testimony must await the results of further investigations. We know, upon the authority of historians, that the Incas of Peru for many generations married their oldest sisters and were, until their extinction by the Spaniards, physically and mentally superior to their subjects. Breeders of domestic animals frequently resort to inbreeding in order to perfect desirable qualities in the strain. It may be, as many claim, that inbreeding is deteriorating only in cases where an hereditary taint, appearing in the com-

mon ancestor, is strengthened in the progeny of a consanguineous union. Of the rats used in the experiments hereinafter described it is not postulated that the lesser ability to form habits is necessarily due to inbreeding; but the rats used for purposes of inbreeding produced a strain having a lesser relative brain weight, which rats, for convenience, I shall hereafter refer to as the Inbred strain. The object, then, of the following experiments is to compare the habit-forming ability of the inbred strain with lesser brain weights with the ability of a normal control series.

Owing to the fact that experimental work on the brain weight problem has not before been attempted there is no history and little literature to be presented. Donaldson[1] reproduces tables from Manouvrier[2] showing the brain weights of eminent men to be, on the average, greater than those of average Parisians. It is not necessarily true that the specific individual with greater brain weight is more intelligent or will contribute more to the world's arts and sciences than the specific individual of lesser brain weight. But, if the tables of Manouvrier are to be believed, individuals of greater brain weight are more likely to be more intelligent and to do the world greater service.

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[1]Donaldson, The Growth of the Brain, London and New York, 1909, pp. 128 ff.

[2]Manouvrier, Sur l'interpretation de la quantité dans l'Encéphale, &c., Paris, 1885.

The results of the experiments hereinafter described agree closely with Manouvrier's tables. Tables of distribution of brain weights of the inbred strain and normal con-

trol series overlap; but the normal series, having a greater brain weight average, show greater ability in habit formation.

All the experiments here described were carried out at the Psychological Laboratory of the Johns Hopkins University.

II. METHODS.

All the inbred rats used in this investigation were bred at the Wistar Institute by Dr. Helen D. King. Two strains were used, referred to in this paper as strains A and B. The original parents of each strain were picked at random, a male and female from each of two unrelated litters. The A male was mated to his sister, A female, and the B male to his sister. Their respective litters constituted generation 1A and 1B. From this point inbreeding was carried on by selecting from the litter the healthiest appearing rats and mating brother to sister within the same litter, this constituting the closest possible inbreeding. At about thirty days of age the young rats were taken from their mother and those to be used by the writer were shipped to the Johns Hopkins University. There were no fatalities en route, and all arrived apparently in good condition. The system of numbering individual rats as appears in the tables is as follows: the first number refers to the generation of inbreeding, the letter to the strain (A or B) and the last number identifies the individual. For example 7A90♀ is analyzed as follows: 7th generation inbred, A strain, individual 90, female.

It seemed advisable to secure normal control mating strains from different laboratories in order to avoid any possibility of inbreeding. Control strain H is from the Johns Hopkins Laboratory, W from the stock rats of the Wistar Institute, C from Columbia University, B a litter bought from a Baltimore dealer, and E a large male given to me by Dr. Herbert M. Evans of the Johns Hopkins Medical School. Care was taken in mating the control series to avoid any approach to

inbreeding. As in the case of inbred rats the young were taken from the mother at the age of thirty days. The system of numbering individual normal rats as appears in the tables is as follows: the first letter, S, signifies that it is a standard or normal control rat, the letters within the parenthesis give the pedigree and the figures give the individual number. For example, S(C/EB)70♂ is analyzed as follows: standard or normal control series, C father, E maternal grandfather, B maternal grandmother, individual 70, male.

When taken from the mother the males were kept in cages separate from the females. In order to keep conditions constant neither males nor females were allowed to mate. As solitude may affect behavior, from three to five rats were kept in each cage. The cages were sufficiently large (24"x15" x15") to permit this. Cages were frequently disinfected with a preparation, Creso Dip, the principal ingredient of which is carbolic acid. A layer of clean chips and shavings was kept on the floor. The food, from date of weaning, consisted of bread soaked in milk (no water), and, twice a week, grain and sunflower seeds. Temperature was kept as uniformly as possible at 70°F. In order to facilitate this a small gas heater was installed and it proved very efficient during the coldest days of winter. As the animal laboratory is located in the basement the temperature, during the summer, rarely rose above our norm.

At the age of sixty days the rats intended for experimental purposes were placed on a short allowance of feeding time (thirty minutes) in order to prepare them for experimentation. The experiments were begun uniformly at the age of seventy days. Care was taken in each experiment to use the same number of males and females in the control series as in the inbred; this was necessary because, as in man, the relat-

ive brain weight of the female is greater than that of the male. Experiments upon individual rats were conducted as nearly as possible at the same time of day, thus forming feeding rhythms.

There are three methods of estimating perfection in experiments relating to the behavior of animals: the number of errors, the distance traversed and the time required. In any case it is hard to form a judgment as to what constitutes an error and especially so in a comparative study of this kind where it is possible for the personal prejudice of the experimenter to enter. At the time this investigation was begun there was no adequate means for measuring the distance traversed. This left the time consumed as the only criterion of perfection. However, time is the criterion used by most investigators in the animal field. Hicks[1], in summing up the experimental results of several investigators concludes, that "time is the best single criterion, inasmuch as it represents all phases of the process of learning, and since it will yield the most comparable results at the hands of different investigators." In timing the rats a very accurate Swiss split-second stop-watch was used. Under ideal conditions, perhaps, the animal should be presented to the problem by one person, timed by another, while the experimenter himself should merely record results. But timing very soon becomes automatic; when the rat is crossing the starting line it is almost impossible to inhibit the impulse to press the button.

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[1]Hicks, The Relative Values of the Different Curves of Learning, Jl. of An. Beh., vol. I, pp. 138 ff.

At the conclusion of the experiments all the rats

used were shipped to the Wistar Institute, where Dr. Shinkishi Hatai ascertained the body length and weight, brain and cord weight, and the percentage of water in brain and cord. From the figures supplied by him I was enabled to draw up the anatomical data and to formulate the relations between relative brain weight and habit formation.

III. EXPERIMENT 1: THE MAZE.

The apparatus used in this experiment was the Watson Maze (Plate I). This maze is circular in form, five feet in diameter, with entrances from outer runways to the next inner at alternate ends of a quadrant arc. The partitions are of aluminum and rise to a height of five inches above the floor of the maze. A heavy wire screen resting on top serves the purpose of preventing the rats from climbing over the partitions, and also allows the experimenter to observe all movements within. The perfect course of the animal running is, from the entrance, E, through runway entrances 1, 2, 3, 4, 5, 6 and 7 to F (food). Each side of runway entrances 2 to 6 inclusive lead into cul-de-sacs.

The object of the experiment was to have each rat learn to reach the centre, F, in the least possible time, the starting time being taken when the animal crossed runway entrance 1, and the finishing time when he crossed entrance 7.

In preparation, each animal, beginning at the age of sixty-five days, was fed alone in the centre, F, for ten minutes daily for five consecutive days. During this period the centre was barred from the rest of the maze at entrance 6. At the age of seventy days the experiment began. Eleven males and ten females from the inbred strain were used and, as control, an equal number of males and females from the normal series. Of the inbred rats, fourteen were from the 6th generation and seven from the 7th. The stimulus used was the food to which they had become accustomed, bread soaked in milk.

Each rat was required to run from E to F five times each day. At the end of the fifth trial it was allowed to feed

in P for five minutes, but permitted no more food until the completion of the next day's experiment. Each rat was used daily until it had learned the course perfectly, the criterion of perfection being five perfect trials for each of three successive days. A perfect trial consisted in running the course within six seconds, a period so short that it was practically impossible for the rat to make a detectable error and reach the centre within that time. Those rats failing to learn within one hundred days (500 trials) were no longer used for experimentation. Those rats learning the maze were, at the conclusion of the experiment, fed for sixty days in a runway twenty-five feet long with a feeding box at the far end. At the end of this period they were tested for retention and relearning.

The results of the experiment for the inbred rats are given in tables Ia, Ib, and Ic; for the normal control series in tables IIa, IIb, and IIc. These tables give only the averages of the five daily trials of individual rats. The shortest period of learning for an inbred rat was twelve days; for a normal control, ten days. Two inbred rats and one normal failed to learn the maze at all. This paper does not pretend to take up individual differences, but certain of the normal control series showed peculiarities of behavior similar to those of the inbred series. These peculiarities, for the most part, consisted in disorientation and persistent errors. Strain B of the control series exhibited these peculiarities to such an extent and were so slow in learning (the control rat failing to learn at all was from this strain) that the investigator suspected this strain to be of lesser relative brain weight; and, when the returns were received from the Wistar Institute, this was indeed found to be the case.

Tables Ia and IIa show, respectively, the daily average time in seconds of the inbred and normal control series during the process of formation of the maze habit. After the standard set for perfection (five perfect trials of six seconds or less each, for each of three consecutive days) had been reached, the average time of the three perfect days was carried on for the succeeding days in red ink. For example, in Table Ia, the time record of rat 6B103♂ is recorded thus: day 10, 5.12 seconds; day 11, 4.92 seconds; day 12, 5.04 seconds. The average of these three perfect days, 5.03 seconds, is carried forward in red ink. It is necessary to preserve these figures in order to compute the total daily averages based upon which the curves of learning are constructed.

Table IIb, the daily averages of the control series, is especially significant showing, as it does, the erratic behavior of the B strain. By the end of the twenty-fourth day all the normal group had formed the perfect maze habit with the exception of five rats from the B strain; nor did any of these five become perfect until a week later when two dropped out. One B rat persisted in the same error, passing entrance 2 into the cul-de-sac at the right, with occasional other errors and did not learn the problem in the hundred days allowed.

Tables Ib and IIb show what I have termed the absolute retention of, respectively, the inbred and normal control series. Absolute retention is measured by the time required to complete the <u>first</u> trial of the relearning series after the sixty days' rest; the stronger the retention, the less the time. These tables show the absolute retention of the normal control series to be much stronger than that of the inbred.

Tables Ic and IIc show, respectively, the daily av-

erage time in seconds of the inbred and normal control series during the process of relearning. The two inbred and one control rat failing to learn the maze were not, of course, tested for relearning. Of those inbreds so tested, two had failed to relearn within fifty days, in consequence of which it was thought useless to carry them further. All the control series had relearned at the end of twenty-two days.

Tables Id and IId show, respectively, the anatomical data of the inbred and normal control rats used in the maze experiments, based upon figures sent by the Wistar Institute. These tables will be treated fully in the comparative summaries.

For greater convenience in making a comparative study I have placed together in Table III a summary consisting of the daily averages of all the inbred and all the control rats. From this table, too, are constructed the comparative curves of learning. The table shows that two of the inbred and one of the normal rats failed to learn the maze habit. The inbreds required, on the average, 36.62 days to learn; the normals but 24.67. The absolute retention of the inbreds was, on the average, 81.558 seconds; of the normals, 59.640 seconds. Two of the inbreds failed to relearn; all the normals had relearned at the end of twenty-two days. The inbreds required, on the average, 12.68 days to relearn; the normals but 5.75.

In all these criteria of ability the rats of the normal control series are shown, on the average, to be superior to those of the inbred series.

There are two possible criteria for estimating the relative brain weight -- in reference to body length and in reference to body weight. In a healthy normal rat the differ-

ence between body weight in grams and body length in millimetres is slight. But under conditions of overfeeding or of sickness the body weight varies greatly while the body length remains constant. For this reason Dr. Donaldson has accepted body length as the sole criterion. In these tables, however, both are produced. Both body length and body weight of the inbred rats used in the maze are, on the average, a trifle greater than is the case with the normals. The average actual brain weight of the inbreds is less than that of the normals. The relative brain weight (in reference to body length) of the inbreds is 4.43% less than that of the normals. The relative brain weight (in reference to body weight) of the inbreds is 7.99% less than that of the normals. The percentage of water in brain and cord decreases with age, but in the inbreds of the maze series, although killed on the average fourteen days later than the normals, the percentage of water was greater.

The tables of comparative summaries of maze results support the hypothesis that the deterioration of brain weight in a strain of rats is accompanied by deterioration in the ability to form habits.

In Plate II is shown the curve of learning (below) and of relearning (above) of the inbred rats compared with those of the normal control. The inbred curve is shown by the solid line, that of the control by the broken line. The ordinates give the average time in seconds, and the abscissae the number of the day in which such time was made. The time required by both inbreds and normals for the first four days was so long that it is represented here by figures rather than by the curve. For the first few days the descent in both cases is very rapid, and from the twentieth day the normal curve

lies entirely below the six second mark. The inbred curve never reaches a flattened appearance but shows great irregularities, particularly on the forty-fifth, sixty-first, eighty-second, ninetieth and ninety-second days. The inbred curve of relearning is more similar to that of the control, but it must be borne in mind that the two inbreds and one normal failing to learn are not represented here. From the twenty-second day the normal control curve is perfectly flat at 5.3 seconds, all the animals having relearned. Two of the inbreds failing to relearn, their curve of relearning remains slightly irregular and above that of the normals.

In Plate III may be seen the distribution curves of learning and relearning of both the inbred and control series for the maze experiment. The time is given in days -- in groups of five for learning, in groups of two for relearning. As may readily be seen, the advantage from the standpoint of time (days required to learn and relearn) lies wholly in favor of the normal control series.

The question arises as to whether the later generations of inbred rats differ from the earlier in the ability to form habits; that is, is deterioration in this ability progressive, even if, as earlier stated, deterioration in relative brain weight after the 4th generation is not. Of the inbred rats used in the maze, fourteen were from the 6th generation and seven from the 7th generation. In Table IV is shown a comparative summary consisting of the daily averages of all the 6th and all the 7th generations. From this table, too, are constructed the curves of learning of the 6th and 7th generation inbreds. The table shows that two of the 7th generation failed to learn the maze; all the 6th generation had learned it at the end of eighty-three days. The 6th generation re-

quired, on the average, 32.93 days to learn; the 7th generation, 44.00. The absolute retention of the 6th generation was, on the average, 65.443 seconds; of the 7th generation, 126.680 seconds. Two of the 6th generation failed to relearn; all the 7th generation had relearned at the end of fourteen days. The 6th generation required, on the average, 14.14 days to relearn; the 7th generation but 8.60.

In these criteria of ability, the 6th generation excelled in learning and absolute retention; the 7th in relearning. It must be remembered, however, that two rats of the 7th generation, having failed to learn, were not tested for relearning. On the whole, the ability of the 7th generation inbreds in learning the maze appears to be somewhat inferior to that of the 6th.

The body length and body weight of the 6th generation average greater than those of the 7th. The average actual brain weight of the 6th generation is greater than that of the 7th. The relative brain weight (in reference to body length) of the 6th generation is .91% less than that of the 7th generation. The relative brain weight (in reference to body weight) of the 6th generation is 1.50% less than that of the 7th generation. The relative brain weight of the inbred rats used in the maze has not deteriorated from one generation to another; however, the number of rats considered in each generation is but few, and all from the 7th generation are females having greater relative brain weights than males. The percentage of water in brain and cord is within .03% of the same figure in the two generations.

In Plate IV is shown the curve of learning (below) and of relearning (above) of the 6th and 7th generations of inbred rats. The 6th generation curve is shown by the broken

line; that of the 7th generation by the solid line. The ordinates give the time in seconds, and the abscissae the number of the day in which such time was made. From the twenty-second day in the curve of learning the 6th generation curve is below the second mark, and from the eighty-third day is flat at 5.158 seconds. The 7th generation learning curve is very irregular throughout its length and never approaches the appearance of learning. The 7th generation relearning curve, however, is slightly better than the 6th, being flat from the 14th day at 5.656 seconds; but the two rats that failed to learn are not represented in this curve.

The similarity in behavior of the rats of the control series containing B blood to that of the inbreds has already been mentioned. Table V presents a summary consisting of the daily averages of the nine control rats containing B blood and the twelve control rats lacking it. Eight of the rats containing B are 1/2 C and 1/2 B; the other is 1/2 C, 1/4 F and 1/4 B. Most of the rats lacking B blood contain C, which makes void the possibility that C is a factor in the lack of ability in the strain containing B. In order to compare the behavior of control rats having F and those lacking it with the inbreds, cross references may be made from Table V to the inbred averages of Table III The control rats having B blood shall be referred to as B rats; those lacking B blood as (-B) normals.

The tables show that two of the inbreds and one of the B failed to learn the maze; the (-B) normals had all learned at the end of the twenty-fifth day. The inbreds required, on the average, 36.624 days to learn; the B 35.67 ; and the (-B) but 16.42. The absolute retention of the inbreds was, on the average, 81.558 seconds; of the B, 72.475 seconds; and

of the (-B), but 51.083 seconds. Two of the inbreds failed to relearn; all the B had relearned at the end of the twenty-second day; while all the (-B) had relearned at the end of the eighth day. The inbreds required, on the average, 12.68 days to relearn; the B, 8.94 days; the (-B), but 4.09 days.

In these criteria of ability the inbreds did the least well; the B rats were, in each instance, not far from their record; the (-B) were much superior to either.

Both body length and body weight were greatest in the inbreds, next in the B, and least in the (-B). Actual brain weight was least in the inbreds, much greater in the B, and slightly greater in the (-B) than in the B. The relative brain weight (in reference to body length) of the inbreds was 5.46% less than that of the (-B); that of the B was 2.53% less than that of the (-B). The relative brain weight (in reference to body weight) of the inbreds was 10.02% less than that of the (-B); that of the B was 5.15% less than that of the (-B). As might be expected from the behavior and the hypothesis, the average relative brain weight of the B strain lies between that of the inbreds and of the (-B).

The results here obtained reinforce the former conclusion that deterioration of brain weight in a strain of rats is accompanied to a similar degree by deterioration in the ability to form habits.

In Plate V is shown the curve of learning (below) and of relearning (above) of the inbred and B rats compared with those of the (-B). The inbred curve is represented by the solid line, the B by the heavy broken, and the (-B) by the lighter broken line. The ordinates give the average time in seconds, and the abscissae the number of the day in which such time was made. From the twentieth day the (-B) curve is

flat at 4.9 seconds. Neither the inbred nor the B curves flatten entirely, although the B curve is more regular than that of the inbreds. The curve of relearning (without the two inbreds and one B that failed to learn) of all three nearly coincides. But here the inbred remains slightly above, and the (-B) slightly below the curve of the B.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
6A71♂	287.60	33.60	13.96	11.84	9.12
6A72♂	570.20	19.52	15.72	11.52	7.60
6A73♂	524.12	34.92	15.32	12.52	10.28
6B70♂	853.16	86.08	90.68	66.68	58.32
6B71♂	940.96	120.76	81.56	32.80	30.44
6B72♂	553.84	97.48	65.36	41.12	31.76
6B73♂	217.40	53.12	72.96	67.12	35.72
6B101♂	375.24	105.04	105.56	83.40	64.76
6B102♂	453.16	158.92	464.44	55.20	91.12
6B103♂	173.24	57.24	52.72	45.84	14.00
6B104♂	661.60	43.76	14.72	7.32	11.40
6B76♀	1556.44	77.20	48.40	39.28	32.36
6B77♀	280.60	118.20	58.40	31.00	16.16
6B108♀	132.36	20.96	20.16	18.64	7.16
7A25♀	451.04	151.24	31.68	20.40	14.04
7A26♀	761.84	260.76	127.36	73.04	27.36
7A55♀	151.64	29.80	24.56	90.56	18.80
7A56♀	1451.24	369.20	92.00	97.48	38.28
7A57♀	467.56	15.56	10.52	9.28	8.20
7A89♀	155.96	45.44	8.56	5.92	4.68
7A90♀	145.76	20.68	16.72	7.68	5.36
Average	531.665	91.404	68.160	39.459	25.568

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
6A71♂	7.76	11.84	8.32	8.80	7.44
6A72♂	10.88	11.96	10.28	8.92	6.92
6A73♂	23.44	13.72	10.72	12.00	10.84
6B70♂	26.88	12.72	9.32	6.40	6.96
6B71♂	15.04	15.20	8.24	6.88	10.28
6B72♂	14.80	13.36	9.44	8.92	6.52
6B73♂	21.04	18.44	11.92	10.44	10.20
6B101♂	105.44	54.48	17.12	17.08	11.56
6B102♂	32.64	27.48	18.92	14.92	13.28
6B103♂	8.76	7.96	6.76	6.76	5.12
6B104♂	7.64	4.84	8.16	4.68	4.56
6B76♀	17.92	14.16	14.44	17.60	19.32
6B77♀	10.80	9.32	8.56	7.84	16.64
6B108♀	39.36	13.72	6.84	15.56	7.40
7A25♀	8.84	7.84	7.64	8.64	7.04
7A26♀	20.40	14.04	15.04	9.24	8.04
7A55♀	8.56	7.52	6.52	5.36	5.88
7A56♀	20.00	17.84	15.00	15.52	19.68
7A57♀	5.80	5.12	6.12	5.40	5.76
7A89♀	5.36	5.04	16.60	4.48	10.12
7A90♀	8.96	5.28	16.32	8.44	6.40
Average	20.015	13.899	11.061	9.709	9.522

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
6A71♂	8.36	8.92	6.88	6.76	6.80
6A72♂	7.12	8.32	7.32	7.56	7.48
6A73♂	8.72	8.76	9.60	9.60	8.76
6B70♂	7.52	7.04	5.04	6.72	5.76
6B71♂	5.76	5.36	5.24	7.92	6.80
6B72♂	7.28	6.64	6.00	6.52	6.44
6B73♂	11.80	8.32	7.96	9.76	7.48
6B101♂	13.28	16.56	14.44	10.24	12.32
6B102♂	12.00	6.92	7.96	7.32	6.28
6B103♂	4.92	5.04			
6B104♂	9.72	5.08	6.32	5.00	4.76
6B76♀	44.60	10.20	12.16	15.40	11.08
6B77♀	8.32	12.12	36.68	8.68	6.04
6B108♀	6.60	4.84	4.92	4.60	
7A25♀	7.80	6.20	6.88	6.92	6.36
7A26♀	13.76	7.96	8.56	9.72	7.96
7A55♀	5.88	4.80	4.76	4.68	
7A56♀	12.92	13.20	9.08	7.44	12.08
7A57♀	8.12	6.52	5.88	6.36	4.84
7A89♀	5.16	6.60	7.00	5.04	4.80
7A90♀	4.92	5.28	5.16	6.32	6.40
Average	10.217	7.937	8.708	7.600	7.000

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
6A71♂	6.64	6.04	5.52	6.56	6.48
6A72♂	7.08	6.04	6.16	6.04	5.52
6A73♂	7.96	7.00	7.68	7.88	9.20
6B70♂	5.44	6.08	5.88	6.92	7.00
6B71♂	5.24	4.92	4.88	5.92	6.44
6B72♂	8.84	5.48	10.32	7.96	5.40
6B73♂	5.84	7.48	5.64	5.60	6.08
6B101♂	10.12	8.88	9.96	7.56	7.60
6B102♂	6.28	6.88	6.00	6.48	5.76
6B103♂					
6B104♂	5.00	4.52			
6B76♀	10.28	10.96	6.32	7.40	6.32
6B77♀	6.20	9.56	5.96	6.36	7.52
6B108♀					
7A25♀	5.96	6.96	5.92	7.96	7.48
7A26♀	6.88	9.52	8.56	9.08	12.88
7A55♀					
7A56♀	7.84	8.20	7.68	9.36	6.16
7A57♀	4.64	4.68			
7A89♀	4.68				
7A90♀	5.72	5.68	7.04	6.36	4.88
Average	6.439	6.585	6.305	6.492	6.458

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25
6A71♂	7.44	8.28	6.52	6.76	8.84
6A72♂	6.24	7.04	5.12	6.88	6.04
6A73♂	8.72	6.68	9.00	6.80	6.96
6B70♂	5.28	5.08	4.56		
6B71♂	6.00	5.24	5.72	5.88	4.92
6B72♂	7.56	5.12	5.52	4.96	5.48
6B73♂	5.08	4.80	5.72	4.72	5.36
6B101♂	9.20	6.16	9.44	6.72	8.44
6B102♂	7.52	6.56	6.32	5.68	6.12
6B103♂					
6B104♂					
6B76♀	5.24	5.44	5.12	5.00	
6B77♀	5.00	5.40	4.96	5.12	7.16
6B108♀					
7A25♀	9.96	5.68	6.20	6.20	5.64
7A26♀	7.84	6.60	8.88	10.16	8.96
7A55♀					
7A56♀	8.64	8.88	8.64	7.16	13.32
7A57♀					
7A89♀					
7A90♀	5.00	4.88			
Average	6.362	5.749	5.978	5.753	6.848

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 26	Day 27	Day 28	Day 29	Day 30
6A71♂	7.96	8.04	5.88	6.52	5.60
6A72♂	6.12	6.76	5.20	6.16	5.28
6A73♂	6.80	7.00	6.36	6.40	6.96
6B70♂					
6B71♂	4.88	4.92			
6B72♂	4.88	5.32	5.20	5.16	4.96
6B73♂	5.36	4.88	4.80	5.52	5.32
6B101♂	6.48	7.92	6.64	6.64	7.64
6B102♂	6.16	5.56	5.60	5.12	6.12
6B103♂					
6B104♂					
6B76♀					
6B77♀	5.08	4.88	5.04		
6B108♀					
7A25♀	5.88	6.88	6.52	9.40	6.28
7A26♀	7.64	7.72	6.52	11.00	7.72
7A55♀					
7A56♀	9.20	35.88	10.40	18.32	9.88
7A57♀					
7A89♀					
7A90♀					
Average	5.734	7.130	5.669	6.387	5.697

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 31	Day 32	Day 33	Day 34	Day 35
6A71♂	6.04	6.32	7.04	6.44	5.28
6A72♂	6.04	6.40	6.20	5.92	6.68
6A73♂	6.76	9.36	7.24	9.60	6.36
6B70♂					
6B71♂					
6B72♂					
6B73♂	4.68	4.76	4.60		
6B101♂	5.84	7.48	8.08	7.44	8.36
6B102♂	5.36	5.36	5.40		
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀	6.08	6.32	6.04	12.12	5.52
7A26♀	6.00	6.92	6.48	7.52	6.40
7A55♀					
7A56♀	7.28	7.96	9.68	9.68	12.72
7A57♀					
7A89♀					
7A90♀					
Average	5.384	5.708	5.702	6.084	5.731

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 36	Day 37	Day 38	Day 39	Day 40
6A71♂	5.48	5.48			
6A72♂	7.04	6.56	5.84	5.68	5.76
6A73♂	6.64	7.48	6.60	6.24	5.88
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	6.72	6.88	6.32	7.28	6.44
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀	6.12	5.32	5.64	5.36	
7A26♀	8.36	6.28	6.64	7.00	14.92
7A55♀					
7A56♀	8.00	7.96	9.88	10.32	9.92
7A57♀					
7A89♀					
7A90♀					
Average	5.590	5.476	5.494	5.540	5.848

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 41	Day 42	Day 43	Day 44	Day 45
6A71♂					
6A72♂					
6A73♂	7.24	8.28	6.68	6.52	7.08
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	7.36	12.68	7.88	6.16	8.40
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	10.00	8.52	7.92	9.04	172.12
7A55♀					
7A56♀	8.20	10.40	10.12	8.68	9.32
7A57♀					
7A89♀					
7A90♀					
Average	5.640	5.978	5.631	5.526	13.456

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 46	Day 47	Day 48	Day 49	Day 50
6A71♂					
6A72♂					
6A73♂	7.84	6.96	7.76	7.68	7.08
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	6.28	5.68	6.32	6.88	7.36
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	32.80	9.64	11.72	11.80	9.96
7A55♀					
7A56♀	8.84	47.48	27.20	7.96	12.60
7A57♀					
7A89♀					
7A90♀					
Average	6.734	7.400	6.602	5.713	5.840

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 51	Day 52	Day 53	Day 54	Day 55
6A71♂					
6A72♂					
6A73♂	6.40	8.60	6.64	5.88	11.40
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	12.60	6.68	5.60	6.56	6.68
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	8.08	7.12	7.64	7.44	7.36
7A55♀					
7A56♀	10.00	7.92	6.88	8.20	8.76
7A57♀					
7A89♀					
7A90♀					
Average	5.844	5.522	5.353	5.416	5.707

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 56	Day 57	Day 58	Day 59	Day 60
6A71♂					
6A72♂					
6A73♂	7.44	7.00	6.24	6.48	7.04
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	6.28	7.04	7.00	5.48	5.36
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	6.88	9.52	7.40	7.20	8.76
7A55♀					
7A56♀	18.16	9.24	8.32	13.24	34.72
7A57♀					
7A89♀					
7A90♀					
Average	5.924	5.640	5.458	5.621	6.740

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 61	Day 62	Day 63	Day 64	Day 65
6A71♂					
6A72♂					
6A73♂	8.12	8.68	7.92	6.32	6.48
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	5.56				
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	7.36	12.24	8.60	7.48	7.24
7A55♀					
7A56♀	68.60	23.24	22.08	9.00	14.56
7A57♀					
7A89♀					
7A90♀					
Average	8.347	6.442	6.177	5.425	5.686

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 66	Day 67	Day 68	Day 69	Day 70
5A71♂					
6A72♂					
6A73♂	6.32	7.24	6.16	7.56	5.88
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	8.60	8.04	8.32	8.88	8.48
7A55♀					
7A56♀	17.44	11.84	8.68	14.68	7.84
7A57♀					
7A89♀					
7A90♀					
Average	5.880	5.630	5.442	5.821	5.396

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 71	Day 72	Day 73	Day 74	Day 75
6A71♂					
6A72♂					
6A73♂	5.76	6.12	6.24	5.76	6.52
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	6.04	7.32	8.64	9.04	11.04
7A55♀					
7A56♀	8.88	15.92	8.60	11.40	15.80
7A57♀					
7A89♀					
7A90♀					
Average	5.419	5.737	5.457	5.587	5.922

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 76	Day 77	Day 78	Day 79	Day 80
6A71♂					
6A72♂					
6A73♂	7.04	6.20	6.48	7.32	5.92
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	11.16	8.56	9.76	7.60	7.48
7A55♀					
7A56♀	10.08	15.88	14.80	12.12	9.56
7A57♀					
7A89♀					
7A90♀					
Average	5.686	5.798	5.817	5.627	5.432

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 81	Day 82	Day 83	Day 84	Day 85
6A71♂					
6A72♂					
6A73♂	5.72	5.64			
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	7.44	41.80	7.36	8.80	27.88
7A55♀					
7A56♀	23.72	15.48	8.72	10.56	8.56
7A57♀					
7A89♀					
7A90♀					
Average	6.095	7.335	5.379	5.535	6.345

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 86	Day 87	Day 88	Day 89	Day 90
6A71♂					
6A72♂					
6A73♂					
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	11.08	7.76	12.44	9.88	41.20
7A55♀					
7A56♀	7.44	7.00	7.44	7.08	15.00
7A57♀					
7A89♀					
7A90♀					
Average	5.495	5.316	5.560	5.421	7.290

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 91	Day 92	Day 93	Day 94	Day 95
6A71♂					
6A72♂					
6A73♂					
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	17.76	36.88	24.08	20.20	12.68
7A55♀					
7A56♀	7.76	13.56	9.32	9.16	7.12
7A57♀					
7A89♀					
7A90♀					
Average	5.829	7.015	6.204	6.011	5.556

Table Ia. Maze Learning by Inbred Rats.

Rat #	Day 96	Day 97	Day 98	Day 99	Day 100
6A71♂					
6A72♂					
6A73♂					
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	19.80	16.24	23.20	22.48	21.92
7A55♀					
7A56♀	7.08	5.84	6.28	6.08	6.32
7A57♀					
7A89♀					
7A90♀					
Average	5.893	5.893	5.893	5.893	5.893

Table Ia. Maze Learning by Inbred Rats.

Rat	Failed to learn.	Days required to learn.
6A71♂		37
6A72♂		40
6A73♂		82
6B70♂		23
6B71♂		27
6B72♂		30
6B73♂		33
6B101♂		61
6B102♂		33
6B103♂		12
6B104♂		17
6B76♀		24
6B77♀		28
6B108♀		14
7A25♀		39
7A26♀	1	100+
7A55♀		14
7A56♀	1	100+
7A57♀		17
7A89♀		16
7A90♀		22
Total	2	Average 36.61+

Table Ia. Maze Learning by Inbred Rats.

Rat #	First trial after 60 days' rest.
6A71♂	70.20
6A72♂	77.00
6A73♂	13.00
6B70♂	38.20
6B71♂	86.00
6B72♂	36.40
6B73♂	19.20
6B101♂	164.60
6B102♂	41.60
6B103♂	109.20
6B104♂	94.60
6B76♀	68.80
6B77♀	36.60
6B108♀	120.80
7A25♀	383.60
7A26♀	------
7A55♀	89.20
7A56♀	------
7A57♀	21.40
7A89♀	51.60
7A90♀	87.60
Average	81.558

Table Ib. Absolute Retention of Inbred Rats.

Maze.

Rat	Day 1	Day 2	Day 3	Day 4	Day 5
6A71♂	20.16	7.72	9.00	8.44	7.56
6A72♂	20.64	6.48	5.56		
6A73♂	7.80	9.24	6.32	8.56	8.48
6B70♂	22.20	12.76	17.92	13.32	10.36
6B71♂	34.32	10.24	7.40	8.84	6.08
6B72♂	13.12	5.72	6.00	4.88	
6B73♂	9.20	4.96			
6B101♂	52.68	10.12	23.96	14.40	21.52
6B102♂	38.80	9.80	12.12	17.80	11.96
6B103♂	118.08	23.32	20.32	9.12	9.72
6B104♂	25.76	5.60	6.00	5.72	5.52
6B76♀	29.12	19.12	11.52	5.12	
6B77♀	15.20	11.36	5.84	10.24	6.56
6B108♀	39.04	8.56	17.68	10.16	6.40
7A25♀	89.40	8.04	7.32	8.40	13.96
7A26♀	-----	-----	-----	-----	-----
7A55♀	42.20	50.36	8.04	14.60	5.60
7A56♀	-----	-----	-----	-----	-----
7A57♀	11.40	8.48	9.68	21.28	9.32
7A89♀	32.44	10.24	5.40		
7A90♀	51.32	9.64	8.28	5.84	
Average	35.415	12.208	10.069	9.560	8.069

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
6A71♂	6.72	6.36	10.44	6.96	6.64
6A72♂					
6A73♂	16.56	9.04	10.92	10.20	13.72
6B70♂	5.88	6.12	5.12		
6B71♂	7.36	8.56	5.76	5.72	5.36
6B72♂					
6B73♂					
6B101♂	10.00	17.80	8.24	9.44	7.48
6B102♂	19.68	11.68	6.84	7.12	6.48
6B103♂	5.92	5.36			
6B104♂	5.24	4.84			
6B76♀					
6B77♀	8.80	7.12	5.84	5.24	
6B108♀	7.76	6.56	5.04		
7A25♀	7.12	9.76	7.12	7.20	6.88
7A26♀	-----	-----	-----	-----	-----
7A55♀	6.56	13.68	10.64	7.32	7.48
7A56♀	-----	-----	-----	-----	-----
7A57♀	6.40	6.88	8.28	7.16	14.08
7A89♀					
7A90♀					
Average	7.672	7.659	6.642	6.232	6.604

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
6A71♂	6.32	8.12	7.92	6.04	6.00
6A72♂					
6A73♂	14.76	11.72	8.72	9.28	7.84
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂	5.96				
6B102♂	7.76	7.48	8.32	6.48	6.60
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀	5.80				
7A26♀	-----	-----	-----	-----	-----
7A55♀	5.64				
7A56♀	-----	-----	-----	-----	-----
7A57♀	8.84	5.92	10.20	5.60	
7A89♀					
7A90♀					
Average	6.200	5.966	6.067	5.660	5.587

Table Ic. Maze Relearning by Inbred Rats.

Rat	Day 16	Day 17	Day 18	Day 19	Day 20
6A71♂	6.16	6.72	7.00	9.56	8.28
6A72♂					
6A73♂	9.84	8.88	9.48	12.92	8.36
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂	6.32	6.40	5.72	6.36	6.28
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6F108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	5.634	5.669	5.680	6.029	5.718

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25
6A71♂	15.24	7.28	7.32	8.36	6.60
6A72♂					
6A73♂	7.72	11.44	10.80	14.36	11.48
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂	6.20	6.40	7.20	6.72	5.84
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	6.046	5.834	5.844	6.061	5.771

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 26	Day 27	Day 28	Day 29	Day 30
6A71♂	10.60	7.64	9.16	9.06	7.88
6A72♂					
6A73♂	15.00	9.04	11.64	10.36	11.08
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	6.166	5.697	5.914	5.842	5.817

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 31	Day 32	Day 33	Day 34	Day 35
6A71♂	10.64	9.08	6.72	8.04	6.84
6A72♂					
6A73♂	9.92	11.56	8.88	11.48	14.44
6D70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	5.901	5.905	5.640	5.846	5.939

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 36	Day 37	Day 38	Day 39	Day 40
6A71♂	8.00	7.24	8.16	8.96	8.36
6A72♂					
6A73♂	12.92	14.36	12.44	9.04	8.88
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	5.920	5.956	5.903	5.766	5.726

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 41	Day 42	Day 43	Day 44	Day 45
6A71♂	7.40	10.56	8.36	10.12	9.68
6A72♂					
6A73♂	8.52	9.00	9.88	7.48	10.12
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	5.657	5.848	5.779	5.745	5.861

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Day 46	Day 47	Day 48	Day 49	Day 50
6A71♂	11.88	8.52	9.64	10.08	8.04
6A72♂					
6A73♂	11.16	10.40	11.28	7.84	8.64
6B70♂					
6B71♂					
6B72♂					
6B73♂					
6B101♂					
6B102♂					
6B103♂					
6B104♂					
6B76♀					
6B77♀					
6B108♀					
7A25♀					
7A26♀	-----	-----	-----	-----	-----
7A55♀					
7A56♀	-----	-----	-----	-----	-----
7A57♀					
7A89♀					
7A90♀					
Average	6.032	5.815	5.920	5.762	5.697

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Failed to relearn.	Days required to relearn.
6A71♂	1	50+
6A72♂		3
6A73♂	1	50+
6B70♂		8
6B71♂		10
6B72♂		4
6B73♂		2
6B101♂		11
6B102♂		25
6B103♂		7
6B104♂		7
6B76♀		4
6B77♀		9
6B108♀		8
7A25♀		11
7A26♀		--
7A55♀		11
7A56♀		--
7A57♀		14
7A89♀		3
7A90♀		4
Total	2	:Average 12.68+

Table Ic. Maze Relearning by Inbred Rats.

Rat #	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
6A71♂	199.	203.7	1.7413	.5590	78.27
6A72♂	207.	218.6	1.7829	.5737	78.60
6A73♂	205.	153.0	1.7113	.5916	78.78
6B70♂	202.	204.0	1.7737	.5331	78.64
6B71♂	203.	193.2	1.7773	.5223	78.46
6B72♂	198.	191.2	1.7572	.5081	78.71
6B73♂	204.	215.4	1.7611	.5478	78.96
6B101♂	210.	220.3	1.7855	.5892	78.21
6B102♂	200.	193.5	1.7646	.5454	78.00
6B103♂	215.	240.2	1.7626	.5500	78.21
6B104♂	208.	224.9	1.8053	.5208	78.33
6B76♀	188.	168.4	1.7804	.5380	78.59
6B77♀	177.	139.0	1.6197	.4610	78.77
6B108♀	194.	165.1	1.7098	.5033	78.32
7A25♀	195.	175.0	1.7058	.5563	78.35
7A26♀	189.	166.6	1.6559	.5227	78.38
7A55♀	181.	147.2	1.6055	.4775	78.69
7A56♀	177.	126.5	1.5189	.4883	78.78
7A57♀	176.	136.6	1.6041	.4936	78.56
7A89♀	193.	170.9	1.6565	.5304	78.31
7A90♀	182.	144.5	1.6563	.4868	78.51
Average	195.38	180.855	1.71172	.52852	78.497

Table Id. Anatomical Data of Inbred Rats.

Rat #	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
6A71♂	70.89	.87503	.85493	234.
6A72♂	71.36	.86130	.81560	234.
6A73♂	70.25	.83478	1.11850	190.
6B70♂	72.22	.87807	.86912	190.
6B71♂	72.01	.87552	.91993	190.
6B72♂	72.56	.88747	.91904	190.
6B73♂	72.65	.86289	.81760	190.
6B101♂	72.00	.85024	.81049	262.
6B102♂	70.92	.88200	.91194	178.
6B103♂	71.13	.81981	.73381	178.
6B104♂	71.39	.86793	.80271	178.
6B76♀	72.75	.94702	1.05701	175.
6B77♀	72.67	.91508	1.16525	175.
6B108♀	71.47	.88134	1.03561	178.
7A25♀	71.63	.87477	.97474	239.
7A26♀	71.55	.87614	.99394	239.
7A55♀	71.41	.88702	1.09035	165.
7A56♀	72.58	.85763	1.20071	231.
7A57♀	71.39	.91142	1.17430	165.
7A89♀	71.49	.85829	.96928	206.
7A90♀	71.86	.91005	1.14623	206.
Average	71.723	.87685	.97052	200.

Table Id. Anatomical Data of Inbred Rats.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(CW)28♂	209.56	42.64	24.04	12.48	107.24
S(CW)29♂	128.40	32.44	10.44	10.40	31.36
S(BC)62♂	288.24	76.52	48.00	8.40	7.56
S(BC)63♂	365.56	219.56	77.04	33.40	15.44
S(C/BB)70♂	509.72	79.32	41.76	16.16	21.80
S(CW)83♂	192.96	31.20	9.20	6.84	8.64
S(CB)98♂	827.52	187.96	50.16	45.00	34.00
S(CB)99♂	1125.12	596.24	120.60	48.96	22.80
S(CH)137♂	120.36	23.44	9.52	5.24	7.20
S(CH)138♂	650.32	23.36	9.00	5.76	12.48
S(CH)139♂	72.80	41.56	25.92	12.64	4.96
S(HC)23♀	526.76	101.20	30.76	50.00	19.48
S(HC)25♀	149.32	24.40	17.24	13.04	6.64
S(HW)59♀	319.24	191.88	97.92	27.28	41.84
S(HW)60♀	297.60	38.12	59.36	17.24	13.48
S(BC)64♀	266.44	43.84	37.12	37.40	35.64
S(BC)66♀	259.56	117.40	78.80	35.64	34.04
S(BC)67♀	254.52	91.56	65.88	41.00	33.36
S(BC)69♀	3730.44	277.16	277.64	149.48	62.56
S(CW)84	182.64	69.64	24.04	14.04	12.84
S(CW)85♀	128.60	16.08	16.84	5.88	4.52
Average	505.128	110.739	53.851	28.404	25.613

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
S(CW)28♂	16.12	11.16	6.24	6.48	5.56
S(CW)29♂	8.52	5.80	5.00	5.56	7.56
S(BC)62♂	7.96	7.16	6.08	5.12	37.00
S(BC)63♂	9.68	7.08	6.60	6.24	5.84
S(C/EB)70♂	11.52	7.84	7.24	8.36	6.64
S(CW)83♂	16.16	6.00	5.72	13.28	6.32
S(CD)98♂	26.32	19.72	21.08	15.08	7.76
S(CD)99♂	20.80	16.64	15.88	14.60	16.40
S(CH)137♂	6.36	4.88	5.20	5.52	7.84
S(CH)138♂	8.04	8.48	7.28	6.84	5.08
S(CH)139♂	6.04	6.16	4.52	4.44	5.20
S(HC)23♀	51.16	25.32	38.68	23.60	12.12
S(HC)25♀	7.56	8.24	5.44	8.92	4.88
S(HW)59♀	39.36	23.68	20.84	22.20	5.08
S(HW)60♀	6.12	27.68	24.52	43.64	13.32
S(BC)64♀	15.64	12.32	13.28	9.32	8.76
S(BC)66♀	27.68	9.04	12.72	9.28	11.68
S(BC)67♀	38.44	29.68	20.28	15.68	15.80
S(BC)69♀	22.80	32.92	14.04	5.80	6.80
S(CW)84♀	11.32	6.80	6.16	19.76	5.72
S(CW)85♀	7.08	4.40	5.08	8.52	6.64
Average	17.366	13.381	11.994	12.440	9.619

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
S(CW)28♂	5.04	5.24			
S(CW)29♂	5.28	4.92	5.28		
S(BC)62♂	5.20	10.16	5.36	4.72	4.68
S(BC)63♂	5.60	6.00	5.84	5.84	5.48
S(C/EB)70	6.44	5.56	16.00	8.16	6.08
S(CW)83♂	5.52	4.76	5.48	6.52	4.88
S(CB)98♂	6.88	10.68	8.32	7.20	14.36
S(CB)99♂	13.40	16.08	9.00	6.52	6.80
S(CH)137♂	5.04	4.96	4.60		
S(CH)138♂	4.56	4.72	5.28	5.36	4.56
S(CH)139♂					
S(HC)23♀	10.16	9.56	9.36	9.84	10.28
S(HC)25♀	4.56	4.72			
S(HW)59♀	11.68	8.88	8.88	9.80	7.44
S(HW)60♀	9.60	13.20	10.40	11.72	7.96
S(BC)64♀	7.00	8.12	8.32	9.72	9.44
S(BC)66♀	8.32	10.28	11.24	7.00	12.68
S(BC)67♀	12.20	12.12	8.48	9.04	8.88
S(BC)69♀	8.24	7.00	7.60	9.08	15.20
S(CW)84♀	5.16	4.84	4.60		
S(CW)85♀	8.60	6.20	5.68	4.84	4.48
Average	7.295	7.748	7.354	6.904	7.277

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
S(CW)28♂					
S(CW)29♂					
S(BC)62♂	4.64				
S(BC)63♂	5.12	5.84	7.36	6.32	5.64
S(C/EB)70♂	5.84	5.80	5.40	8.44	7.00
S(CW)83♂	6.52	6.24	5.36	4.68	4.64
S(CB)98♂	8.88	7.52	6.44	6.92	5.72
S(CE)99♂	5.84	7.16	6.32	8.16	6.44
S(CH)137♂					
S(CH)138♂	9.52	4.52	5.60	4.64	4.80
S(CH)139♂					
S(HC)23♀	6.92	7.08	5.44	6.64	5.36
S(HC)25♀					
S(HW)59♀	10.28	5.12	5.04	4.52	
S(HW)60♀	12.52	7.32	4.56	8.40	5.52
S(BC)64♀	6.48	10.72	9.48	11.88	7.12
S(BC)66♀	8.00	10.88	9.00	6.88	11.24
S(BC)67♀	8.48	11.12	7.92	6.68	7.24
S(BC)69♀	7.04	6.68	7.00	7.24	8.28
S(CW)84♀					
S(CW)85♀	4.72				
Average	6.687	6.428	5.900	6.209	5.851

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂	6.52	5.36	5.00	5.28	
S(C/ER)70♂	6.44	5.56	5.48	4.92	
S(CW)83♂	4.84				
S(CH)98♂	8.52	6.96	5.92	6.20	6.40
S(CH)99♂	6.04	7.20	6.84	7.72	5.76
S(CH)137♂					
S(CH)138♂	5.04				
S(CH)139♂					
S(HC)23♀	5.68	5.56	5.32	5.16	
S(HC)25♀					
S(HW)59♀					
S(HW)60♀	4.72	5.08	4.60		
S(BC)64♀	5.68	5.96	7.68	5.80	6.32
S(BC)66♀	8.56	11.76	10.84	12.04	9.08
S(BC)67♀	7.12	9.88	9.56	8.48	6.80
S(BC)69♀	5.20	5.60	5.24		
S(CW)84♀					
S(CW)85♀					
Average	5.630	5.816	5.710	5.675	5.420

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 26	Day 27	Day 28	Day 29	Day 30
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/TB)70♂					
S(CW)83♂					
S(CB)98♂	6.32	8.08	8.60	8.02	9.80
S(CB)99♂	7.80	7.48	6.88	5.52	5.44
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀	6.16	5.64	6.12	5.56	5.84
S(BC)66♀	7.72	7.92	7.92	9.28	7.68
S(BC)67♀	5.72	5.72	6.08	6.68	5.96
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.389	5.442	5.479	5.496	5.437

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 31	Day 32	Day 33	Day 34	Day 35
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/TB)70♂					
S(CW)83♂					
S(CB)98♂	10.72	8.72	8.16	11.40	6.56
S(CB)99♂	5.24				
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀	5.68				
S(BC)66♀	12.76	10.76	8.40	7.80	8.64
S(BC)67♀	5.84	5.52	5.84		
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.700	5.502	5.378	5.499	5.308

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 36	Day 37	Day 38	Day 39	Day 40
S(JW)38♂					
S(CW)29♂					
S(DC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(JB)98♂	6.80	5.48	5.04	5.48	
S(JB)99♂					
S(CH)137♂					
S(JH)138♂					
S(JH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	7.64	8.48	10.56	10.88	10.04
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.272	5.249	5.327	5.363	5.316

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 41	Day 42	Day 43	Day 44	Day 45
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	10.60	15.44	11.28	8.64	12.72
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.343	5.573	5.375	5.250	5.444

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 46	Day 47	Day 48	Day 49	Day 50
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/FB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	9.32	6.80	6.48	7.56	8.08
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.282	5.162	5.147	5.198	5.223

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 51	Day 52	Day 53	Day 54	Day 55
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	10.16	10.96	7.44	16.32	8.88
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.322	5.360	5.192	5.615	5.261

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 56	Day 57	Day 58	Day 59	Day 60
S(CW)28♂					
S(CW)39♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	8.40	7.20	10.92	9.40	8.80
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.286	5.181	5.358	5.286	5.257

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 61	Day 62	Day 63	Day 64	Day 65
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	11.76	23.40	19.00	9.68	9.44
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.398	5.952	5.743	5.299	5.288

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 66	Day 67	Day 68	Day 69	Day 70
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CR)98♂					
S(CR)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	10.64	10.52	7.04	10.96	8.08
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.345	5.339	5.173	5.360	5.223

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 71	Day 72	Day 73	Day 74	Day 75
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/B2)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	8.52	6.96	6.12	7.72	5.72
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.244	5.170	5.130	5.206	5.110

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 76	Day 77	Day 78	Day 79	Day 80
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	7.24	9.44	6.96	6.40	12.24
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.183	5.288	5.170	5.143	5.421

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 81	Day 82	Day 83	Day 84	Day 85
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)58♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	8.92	8.36	7.84	7.76	6.76
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.263	5.236	5.211	5.208	5.160

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 86	Day 87	Day 88	Day 89	Day 90
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/BB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	9.44	6.68	7.20	6.60	6.60
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.288	5.156	5.181	5.152	5.152

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 91	Day 92	Day 93	Day 94	Day 95
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	8.80	5.40	6.36	7.80	6.58
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.257	5.095	5.141	5.210	5.166

Table IIa. Maze Learning by Normal Rats.

Rat #	Day 96	Day 97	Day 98	Day 99	Day 100
S(CW)28♂					
S(CW)29♂	-	-	-	-	
S(BC)82♂					
S(BC)83♂					
S(C/EB)170♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	7.96	6.52	5.88	7.32	7.92
S(BC)67♀					
S(BC)69♀					
S(CW)84♀					
S(CW)85♀					
Average	5.217	5.149	5.118	5.187	5.215

Table IIa. Maze Learning by Normal Rats.

Rat	Failed to learn.	Days required to learn.
S(CW)28♂		12
S(CW)29♂		13
S(BC)62♂		16
S(BC)63♂		24
S(C/EB)70♂		24
S(CW)83♂		21
S(CB)98♂		39
S(CB)99♂		31
S(CH)137♂		13
S(CH)138♂		21
S(CH)139♂		10
S(HC)23♀		24
S(HC)25♀		12
S(HW)59♀		19
S(HW)60♀		23
S(BC)64♀		31
S(BC)66♀	1	100+
S(BC)67♀		33
S(BC)69♀		23
S(CW)84♀		13
S(CW)85♀		16
Total	1	:Average 27.67+

Table IIa. Mare Learning by Normal Rats.

Rat #	First trial after 60 days' rest.
S(CW)28♂	44.00
S(CW)29♂	23.80
S(BC)62♂	25.60
S(BC)63♂	21.20
S(C/HE)70♂	64.60
S(CW)83♂	8.80
S(CH)98♂	72.40
S(CH)99♂	108.40
S(CH)137♂	81.80
S(CH)138♂	.80
S(CH)139♂	15.80
S(HC)23♀	186.60
S(HC)25♀	107.80
S(HW)59♀	37.60
S(HW)60♀	65.00
S(LC)64♀	42.20
S(LC)66♀	------
S(DC)67♀	57.20
S(LC)69♀	188.20
S(CW)84♀	17.40
S(CW)85♀	15.20
Average	59.640

Table IIb. Absolute Retention of Normal Rats.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(CW)28♂	23.40	7.44	7.40	6.28	7.00
S(CW)29♂	9.40	5.36	11.08	5.08	
S(BC)62♂	19.84	5.56	6.32	4.88	
S(BC)63♂	12.68	5.52			
S(C/EB)70♂	20.64	8.76	7.48	6.24	12.56
S(CW)83♂	6.92	5.84	5.12		
S(CB)98♂	28.52	13.20	16.48	21.20	7.72
S(CB)99♂	122.48	139.44	22.32	11.44	7.00
S(CH)137♂	22.12	6.48	5.32		
S(CH)138♂	13.76	7.48	5.92		
S(CH)139♂	13.76	15.68	9.72	8.36	5.60
S(HC)23♀	75.00	46.12	27.00	8.20	7.64
S(HC)25♀	38.60	20.20	7.16	5.04	
S(HW)59♀	22.92	6.36	5.04		
S(HW)60♀	26.52	10.08	9.24	5.96	5.12
S(EC)64♀	15.32	11.00	7.08	7.84	7.56
S(EC)66♀	-----	-----	-----	-----	-----
S(EC)67♀	20.44	7.16	9.28	5.68	
S(EC)69♀	49.80	43.20	12.96	26.64	13.00
S(CW)84♀	15.12	5.20			
S(CW)85♀	14.04	4.96			
Average	28.574	18.752	9.530	7.996	6.548

Table IIc. Maze Relearning by Normal Rats.

Rat	Day 6	Day 7	Day 8	Day 9	Day 10
S(CW)28♂	11.48	4.96			
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/W)70♂	5.20				
S(CW)83♂					
S(CB)98♂	7.52	5.24	8.00	7.56	4.76
S(CB)99♂	11.64	7.08	5.84		
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀	13.04	6.32	5.32		
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀	7.16	6.48	6.48	6.64	6.00
S(BC)66♀	-----	-----	-----	-----	-----
S(IC)67♀					
S(BC)69♀	16.80	14.52	14.16	9.60	12.04
S(CW)84♀					
S(CW)85♀					
Average	7.076	6.064	5.922	5.670	5.630

Table IIc. Maze Relearning by Normal Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EE)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(CH)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	-----	-----	-----	-----	-----
S(BC)67♀					
S(BC)69♀	9.60	8.12	8.04	7.72	8.80
S(CW)84♀					
S(CW)85♀					
Average	5.508	5.434	5.430	5.414	5.468

Table IIc. Maze Relearning by Normal Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	-----	-----	-----	-----	-----
S(BC)67♀					
S(BC)69♀	18.84	7.92	9.24	6.52	8.24
S(CW)84♀					
S(CW)85♀					
Average	5.970	5.424	5.490	5.354	5.440

Table IIc. Maze Relearning by Normal Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25 to 30
S(CW)28♂					
S(CW)29♂					
S(BC)62♂					
S(BC)63♂					
S(C/EB)70♂					
S(CW)83♂					
S(CB)98♂					
S(CB)99♂					
S(CH)137♂					
S(CH)138♂					
S(CH)139♂					
S(HC)23♀					
S(HC)25♀					
S(HW)59♀					
S(HW)60♀					
S(BC)64♀					
S(BC)66♀	-----	-----	-----	-----	-----
S(BC)67♀					
S(BC)69♀	11.72	5.44			
S(CW)84♀					
S(CW)85♀					
Average	5.614	5.300	5.300	5.300	5.300

Table IIc. Maze Relearning by Normal Rats.

Rat #	Failed to relearn.	Days required to relearn.
S(CW)28♂		7
S(CW)29♂		4
S(BC)62♂		4
S(BC)63♂		2
S(C/EE)70♂		6
S(CW)83♂		3
S(CE)98♂		10
S(CE)99♂		8
S(CH)137♂		3
S(CH)138♂		3
S(CH)139♂		5
S(HC)23♀		8
S(HC)25♀		4
S(HW)59♀		3
S(HW)60♀		5
S(BC)64♀		10
S(BC)66♀		--
S(BC)67♀		4
S(BC)69♀		22
S(CW)84♀		2
S(CW)85♀		2
Total	0	Average 5.75

Table IIc. Maze Relearning by Normal Rats.

Rat #	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
S(CW)28♂	205.	212.3	1.6762	.5525	78.38
S(CW)29♂	205.	226.3	1.8139	.5275	78.38
S(BC)62♂	191.	183.2	1.7865	.5156	78.72
S(BC)63♂	210.	229.7	1.8426	.6067	78.17
S(C/EB)70♂	197.	196.4	1.6764	.5247	77.92
S(CW)83♂	192.	170.3	1.6221	.4969	78.23
S(CB)98♂	200.	191.7	1.7801	.5519	78.24
S(CB)99♂	206.	214.5	1.8088	.6051	78.32
S(CH)137♂	201.	196.0	1.8201	.5316	78.06
S(CH)138♂	193.	175.5	1.7724	.5290	78.18
S(CH)139♂	197.	185.7	1.8027	.5406	78.19
S(HC)23♀	177.	140.5	1.7793	.4727	78.08
S(HC)25♀	193.	179.0	1.7345	.5048	78.89
S(HW)59♀	174.	122.4	1.7335	.4965	78.76
S(HW)60♀	177.	131.0	1.7506	.5195	78.74
S(BC)64♀	184.	146.0	1.7094	.5170	78.31
S(BC)66♀	183.	141.7	1.7064	.5296	78.21
S(BC)67♀	186.	148.2	1.7345	.5407	78.06
S(BC)69♀	180.	130.2	1.6393	.4846	78.34
S(CW)84♀	180.	133.5	1.6337	.5135	78.07
S(CW)85♀	180.	145.6	1.7122	.5124	78.44
Average	191.00	171.41	1.74930	.52740	78.319

Table IId. Anatomical Data of Normal Rats.

Rat #	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
S(CW)29♂	71.62	.91522	.88375	191.
S(CW)29♂	71.87	.88483	.80155	191.
S(BC)62♂	71.63	.93534	.97516	151.
S(BC)63♂	71.69	.87743	.80218	201.
S(C/BB)70♂	71.09	.85096	.85356	197.
S(CW)83♂	70.78	.84484	.95250	180.
S(CB)98♂	70.96	.89005	.92859	225.
S(CB)99♂	71.74	.87806	.84326	225.
S(CH)137♂	70.65	.90552	.92862	168.
S(CH)138♂	71.53	.91834	1.00991	168.
S(CH)139♂	71.44	.91508	.97076	168.
S(HC)23♀	71.69	1.00525	1.26641	164.
S(HC)25♀	72.72	.89870	.96899	164.
S(HW)59♀	73.35	.99626	1.41626	175.
S(HW)60♀	71.99	.98915	1.34489	175.
S(BC)64♀	71.76	.92902	1.17062	201.
S(BC)66♀	71.09	.93246	1.20423	201.
S(BC)67♀	71.24	.93253	1.17058	201.
S(BC)69♀	72.08	.91072	1.25906	201.
S(CW)84♀	71.76	.90761	1.02375	180.
S(CW)85♀	72.31	.94900	1.17396	180.
Average	71.666	.91745	1.05479	186.

Table IId. Anatomical Data of Normal Rats.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	531.665	91.404	68.160	39.459	25.568
Nor. Avg.	505.128	110.739	53.851	28.404	25.613

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
Inb. Avg.	20.015	13.899	11.061	9.709	9.522
Nor. Avg.	17.366	13.381	11.994	12.440	9.619

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
Inb. Avg.	10.217	7.937	8.708	7.600	7.000
Nor. Avg.	7.295	7.748	7.354	6.904	7.277

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
Inb. Avg.	6.439	6.585	6.305	6.492	6.458
Nor. Avg.	6.687	6.428	5.900	6.209	5.851

Learning	Day 21	Day 22	Day 23	Day 24	Day 25
Inb. Avg.	6.362	5.749	5.978	5.753	6.248
Nor. Avg.	5.630	5.816	5.710	5.675	5.420

Learning	Day 26	Day 27	Day 28	Day 29	Day 30
Inb. Avg.	5.734	7.130	5.669	6.387	5.697
Nor. Avg.	5.389	5.442	5.479	5.496	5.437

Learning	Day 31	Day 32	Day 33	Day 34	Day 35
Inb. Avg.	5.384	5.706	5.702	6.084	5.731
Nor. Avg.	5.700	5.502	5.378	5.499	5.308

Table III. Comparative Summary of Inbred and Normal Maze Results.

Learning	Day 36	Day 37	Day 38	Day 39	Day 40
Inb. Avg.	5.590	5.476	5.494	5.540	5.848
Nor. Avg.	5.272	5.249	5.327	5.363	5.316

Learning	Day 41	Day 42	Day 43	Day 44	Day 45
Inb. Avg.	5.640	5.978	5.631	5.526	13.456
Nor. Avg.	5.343	5.573	5.375	5.250	5.444

Learning	Day 46	Day 47	Day 48	Day 49	Day 50
Inb. Avg.	6.734	7.400	6.602	5.713	5.840
Nor. Avg.	5.282	5.162	5.147	5.198	5.223

Learning	Day 51	Day 52	Day 53	Day 54	Day 55
Inb. Avg.	5.844	5.522	5.353	5.416	5.707
Nor. Avg.	5.322	5.360	5.192	5.615	5.261

Learning	Day 56	Day 57	Day 58	Day 59	Day 60
Inb. Avg.	5.924	5.640	5.458	5.621	6.740
Nor. Avg.	5.286	5.181	5.358	5.286	5.257

Learning	Day 61	Day 62	Day 63	Day 64	Day 65
Inb. Avg.	8.347	6.442	6.177	5.425	5.686
Nor. Avg.	5.398	5.952	5.743	5.299	5.288

Learning	Day 66	Day 67	Day 68	Day 69	Day 70
Inb. Avg.	5.880	5.630	5.442	5.821	5.396
Nor. Avg.	5.345	5.339	5.173	5.360	5.223

Table III. Comparative Summary of Inbred and Normal Maze Results.

Learning	Day 71	Day 72	Day 73	Day 74	Day 75
Inb. Avg.	5.419	5.737	5.457	5.587	5.928
Nor. Avg.	5.244	5.170	5.130	5.206	5.110

Learning	Day 76	Day 77	Day 78	Day 79	Day 80
Inb. Avg.	5.686	5.798	5.817	5.627	5.432
Nor. Avg.	5.183	5.288	5.170	5.143	5.421

Learning	Day 81	Day 82	Day 83	Day 84	Day 85
Inb. Avg.	6.095	7.335	5.379	5.535	6.345
Nor. Avg.	5.263	5.236	5.211	5.208	5.160

Learning	Day 86	Day 87	Day 88	Day 89	Day 90
Inb. Avg.	5.495	5.316	5.560	5.421	7.290
Nor. Avg.	5.288	5.156	5.161	5.152	5.152

Learning	Day 91	Day 92	Day 93	Day 94	Day 95
Inb. Avg.	5.829	7.015	6.204	6.011	5.556
Nor. Avg.	5.257	5.095	5.141	5.210	5.166

Learning	Day 96	Day 97	Day 98	Day 99	Day 100
Inb. Avg.	5.893	5.665	6.017	5.973	5.956
Nor. Avg.	5.217	5.149	5.118	5.187	5.215

	Failed to learn.	Days required to learn.	Absolute retention.
Inb. Avg.	2	36.62+	81.558
Nor. Avg.	1	24.67+	59.640

Table III. Comparative Summary of Inbred and Normal Maze Results.

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	35.415	12.208	10.069	9.560	8.069
Nor. Avg.	28.874	18.752	9.530	7.996	6.548

Relearning	Day 6	Day 7	Day 8	Day 9	Day 10
Inb. Avg.	7.672	7.659	6.642	6.232	6.604
Nor. Avg.	7.076	6.064	5.922	5.670	5.630

Relearning	Day 11	Day 12	Day 13	Day 14	Day 15
Inb. Avg.	6.200	5.966	6.067	5.660	5.587
Nor. Avg.	5.508	5.434	5.430	5.414	5.468

Relearning	Day 16	Day 17	Day 18	Day 19	Day 20
Inb. Avg.	5.634	5.669	5.680	6.029	5.718
Nor. Avg.	5.970	5.424	5.490	5.354	5.440

Relearning	Day 21	Day 22	Day 23	Day 24	Day 25
Inb. Avg.	6.046	5.834	5.844	6.061	5.771
Nor. Avg.	5.614	5.300			

Relearning	Day 26	Day 27	Day 28	Day 29	Day 30
Inb. Avg.	6.166	5.697	5.914	5.842	5.817
Nor. Avg.					

Relearning	Day 31	Day 32	Day 33	Day 34	Day 35
Inb. Avg.	5.991	5.998	5.640	5.846	5.937
Nor. Avg.					

Table III. Comparative Summary of Inbred and Normal Maze Results.

Relearning	Day 36	Day 37	Day 38	Day 39	Day 40
Inb. Avg.	5.920	5.956	5.903	5.766	5.726
Nor. Avg.					

Relearning	Day 41	Day 42	Day 43	Day 44	Day 45
Inb. Avg.	5.667	5.848	5.779	5.745	5.861
Nor. Avg.					

Relearning	Day 46	Day 47	Day 48	Day 49	Day 50
Inb. Avg.	6.032	5.815	5.920	5.762	5.697
Nor. Avg.					

	Failed to relearn.	Days required to relearn.
Inb. Avg.	2	12.68+
Nor. Avg.	0	5.75

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
Inb. Avg.	195.38	180.55	1.71122	.52852	78.497
Nor. Avg.	191.00	171.41	1.74930	.52740	78.319

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
Inb. Avg.	71.723	.87685	.97052	200.
Nor. Avg.	71.666	.91745	1.05479	186.

Table III. Comparative Summary of Inbred and Normal Maze Results.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
6th Avg.	541.423	73.343	79.997	37.449	30.014
7th Avg.	512.149	127.526	44.486	43.480	16.674

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
6th Avg.	24.457	16.371	10.646	10.486	9.789
7th Avg.	11.131	8.954	11.891	8.154	8.989

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
6th Avg.	11.157	8.294	9.825	7.958	7.130
7th Avg.	8.337	7.223	6.760	6.926	6.741

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
6th Avg.	6.767	6.690	6.350	6.376	6.421
7th Avg.	5.781	6.376	6.216	6.724	6.530

Learning	Day 21	Day 22	Day 23	Day 24	Day 25
6th Avg.	6.276	5.741	5.899	5.576	6.004
7th Avg.	6.536	5.764	6.136	6.107	6.736

Learning	Day 26	Day 27	Day 28	Day 29	Day 30
6th Avg.	5.604	5.716	5.455	5.441	5.466
7th Avg.	5.993	9.959	6.096	8.279	6.159

Learning	Day 31	Day 32	Day 33	Day 34	Day 35
6th Avg.	5.320	5.674	5.594	5.658	5.464
7th Avg.	5.513	5.776	5.919	6.936	6.267

Table IV. Comparative Summary of 6th and 7th Generation Inbred Line Results.

Learning	Day 36	Day 37	Day 38	Day 39	Day 40
6th Avg.	5.406	5.444	5.284	5.316	5.236
7th Avg.	5.959	5.541	5.913	5.987	7.073

Learning	Day 41	Day 42	Day 43	Day 44	Day 45
6th Avg.	5.399	5.853	5.396	5.261	5.461
7th Avg.	6.124	6.227	6.101	6.056	29.444

Learning	Day 46	Day 47	Day 48	Day 49	Day 50
6th Avg.	5.364	5.259	5.361	5.396	5.387
7th Avg.	9.473	11.684	9.084	6.347	6.747

Learning	Day 51	Day 52	Day 53	Day 54	Day 55
6th Avg.	5.713	5.447	5.230	5.244	5.647
7th Avg.	6.107	5.673	5.599	5.759	5.827

Learning	Day 56	Day 57	Day 58	Day 59	Day 60
6th Avg.	5.336	5.359	5.301	5.210	5.241
7th Avg.	7.101	6.204	5.770	6.444	9.736

Learning	Day 61	Day 62	Day 63	Day 64	Day 65
6th Avg.	5.333	5.366	5.312	5.198	5.209
7th Avg.	14.376	8.593	7.907	5.879	6.639

Learning	Day 66	Day 67	Day 68	Day 69	Day 70
6th Avg.	5.198	5.264	5.186	5.286	5.166
7th Avg.	7.244	6.364	5.953	6.890	5.856

Table IV. Comparative Summary of 6th and 7th Generation Inbred Maze Results.

Learning	Day 71	Day 72	Day 73	Day 74	Day 75
6th Avg.	5.158	5.184	5.192	5.158	5.212
7th Avg.	5.941	6.844	5.987	6.444	7.359

Learning	Day 76	Day 77	Day 78	Day 79	Day 80
6th Avg.	5.249	5.189	5.209	5.269	5.169
7th Avg.	6.559	7.016	7.033	6.341	5.959

Learning	Day 81	Day 82	Day 83	Day 84	Day 85
6th Avg.	5.155	5.149	5.158		
7th Avg.	7.976	11.707	5.821	6.290	8.730

Learning	Day 86	Day 87	Day 88	Day 89	Day 90
6th Avg.					
7th Avg.	6.170	5.633	6.364	5.947	11.553

Learning	Day 91	Day 92	Day 93	Day 94	Day 95
6th Avg.					
7th Avg.	7.170	10.730	8.296	7.719	6.353

Learning	Day 96	Day 97	Day 98	Day 99	Day 100
6th Avg.					
7th Avg.	7.364	6.679	7.736	7.604	7.559

	Failed to learn.	Days required to learn.	Absolute retention.
6th Avg.	0	32.93	65.443
7th Avg.	2	44.00+	126.680

Table IV. Comparative Summary of 6th and 7th Generation Inbred Maze Results.

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
6th Avg.	31.866	10.357	11.043	9.009	8.071
7th Avg.	45.352	17.392	7.344	11.104	8.064

Relearning	Day 6	Day 7	Day 8	Day 9	Day 10
6th Avg.	8.174	7.426	6.351	6.111	6.129
7th Avg.	6.264	8.312	7.456	6.584	7.936

Relearning	Day 11	Day 12	Day 13	Day 14	Day 15
6th Avg.	6.163	6.054	5.886	5.660	5.563
7th Avg.	6.304	5.720	6.576	5.656	

Relearning	Day 16	Day 17	Day 18	Day 19	Day 20
6th Avg.	5.628	5.674	5.689	6.163	5.740
7th Avg.					

Relearning	Day 21	Day 22	Day 23	Day 24	Day 25
6th Avg.	6.186	5.897	5.911	6.206	5.811
7th Avg.					

Relearning	Day 26	Day 27	Day 28	Day 29	Day 30
6th Avg.	6.349	5.711	6.006	5.909	5.874
7th Avg.					

Relearning	Day 31	Day 32	Day 33	Day 34	Day 35
6th Avg.	5.989	5.994	5.634	5.914	6.040
7th Avg.					

Table IV. Comparative Summary of 6th and 7th Generation Inbred Mare Results.

Relearning	Day 36	Day 37	Day 38	Day 39	Day 40
6th Avg.	6.014	6.063	5.991	5.806	5.751
7th Avg.					

Relearning	Day 41	Day 42	Day 43	Day 44	Day 45
6th Avg.	5.657	5.917	5.823	5.777	5.934
7th Avg.					

Relearning	Day 46	Day 47	Day 48	Day 49	Day 50
6th Avg.	6.166	5.871	6.014	5.800	5.711
7th Avg.					

	Failed to relearn.	Days required to relearn.
6th Avg.	2	14.14+
7th Avg.	0	8.60

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
6th Avg.	200.71	195.04	1.75234	.53881	78.49
7th Avg.	184.71	152.47	1.63286	.50794	78.51

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
6th Avg.	71.73	.87418	.91653	196.
7th Avg.	71.70	.88219	1.07851	207.

Table IV. Comparative Summary of 6th and 7th Generation Inbred Maze Results.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
Nor. B	249.458	187.729	88.511	36.160	29.689
Except B	248.380	52.997	27.857	15.085	12.557

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
Nor. B	20.093	15.822	13.066	10.276	12.964
Except B	15.320	11.550	11.223	14.063	7.110

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
Nor. B	8.142	9.544	8.907	7.476	9.289
Except B	6.652	6.393	6.190	6.475	5.768

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
Nor. B	6.702	7.822	7.067	7.467	7.040
Except B	6.675	5.382	5.025	5.265	4.959

Learning	Day 21	Day 22	Day 23	Day 24	Day 25
Nor. B	6.529	6.973	6.804	6.719	6.102
Except B	4.956	4.948	4.868	4.892	4.908

Learning	Day 26	Day 27	Day 28	Day 29	Day 30
Nor. B	6.031	6.156	6.240	6.280	6.142
Except B					

Learning	Day 31	Day 32	Day 33	Day 34	Day 35
Nor. B	6.756	6.294	6.006	6.287	5.842
Except B					

Table V. Comparative Summary of B Strain and Normals Lacking B Maze Results.

Learning	Day 36	Day 37	Day 38	Day 39	Day 40
Nor. B Except B	5.758	5.704	5.887	5.971	5.861

Learning	Day 41	Day 42	Day 43	Day 44	Day 45
Nor. B Except B	5.923	6.461	5.999	5.706	6.159

Learning	Day 46	Day 47	Day 48	Day 49	Day 50
Nor. B Except B	5.781	5.501	5.466	5.586	5.643

Learning	Day 51	Day 52	Day 53	Day 54	Day 55
Nor. B Except B	5.874	5.963	5.572	6.559	5.732

Learning	Day 56	Day 57	Day 58	Day 59	Day 60
Nor. B Except B	5.679	5.546	5.959	5.690	5.723

Learning	Day 61	Day 62	Day 63	Day 64	Day 65
Nor. B Except B	6.052	7.346	6.857	5.821	5.794

Learning	Day 66	Day 67	Day 68	Day 69	Day 70
Nor. B Except B	5.928	5.914	5.528	5.963	5.643

Table V. Comparative Summary of B Strain and Normals Lacking B Maze Results.

Learning	Day 71	Day 72	Day 73	Day 74	Day 75
Nor. B Except B	5.692	5.519	5.426	5.603	5.381

Learning	Day 76	Day 77	Day 78	Day 79	Day 80
Nor. B Except B	5.550	5.794	5.519	5.457	6.106

Learning	Day 81	Day 82	Day 83	Day 84	Day 85
Nor. B Except B	5.746	5.673	5.617	5.608	5.497

Learning	Day 86	Day 87	Day 88	Day 89	Day 90
Nor. B Except B	5.794	5.488	5.546	5.479	5.479

Learning	Day 91	Day 92	Day 93	Day 94	Day 95
Nor. B Except B	5.723	5.346	5.452	5.612	5.510

Learning	Day 96	Day 97	Day 98	Day 99	Day 100
Nor. B Except B	5.630	5.470	5.399	5.559	5.626

	Failed to learn	Days required to learn.	Absolute retention.
Nor. B	1	35.67+	72.475
Except B	0	16.42	51.083

Table V. Comparative Summary of P Strain and Normals Lacking B Maze Results.

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
Nor. B	36.215	29.230	10.930	11.180	7.990
Except B	23.480	11.767	8.597	5.873	5.587

Relearning	Day 6	Day 7	Day 8	Day 9	Day 10
Nor. B	8.075	7.200	6.970	6.340	6.240
Except B	6.410	5.307	5.223		

Relearning	Day 11	Day 12	Day 13	Day 14	Day 15
Nor. B	5.935	5.750	5.740	5.700	5.835
Except B					

Relearning	Day 16	Day 17	Day 18	Day 19	Day 20
Nor. B	7.090	5.725	5.890	5.550	5.765
Except B					

Relearning	Day 21	Day 22	Day 23	Day 24	Day 25 to 50
Nor. B	6.200	5.415			
Except B					

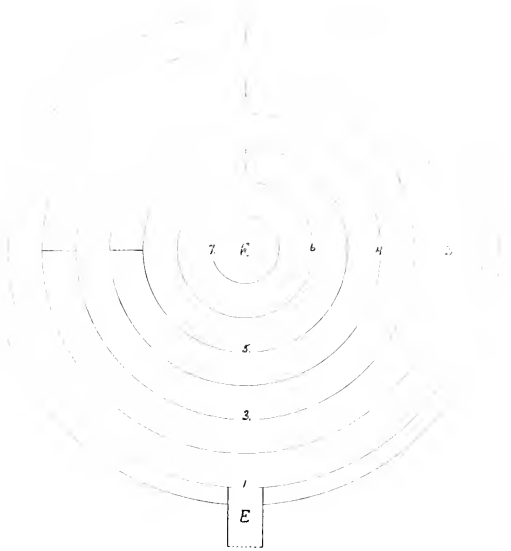
	Failed to relearn.	Days required to relearn.
Nor. B	0	8.24
Except B	0	4.08

Table V. Comparative Summary of B Strain and Normals Lacking B Maze Results.

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
Nor. B	193.00	175.73	1.75378	.54191	78.25
Except B	189.50	168.18	1.75428	.51646	78.37

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
Nor. B	71.48	.90406	1.02303	200.
Except B	71.81	.92748	1.07861	175.

Table V. Comparative Summary of B Strain and Normals Lacking B. Maze Results.



The Watson Maze.

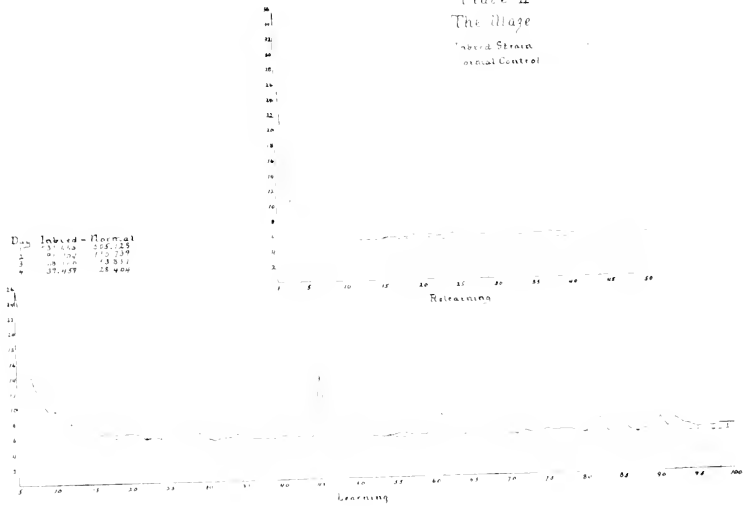
Plate I.

Plate II

The Maze

Inbred Strain

Normal Control



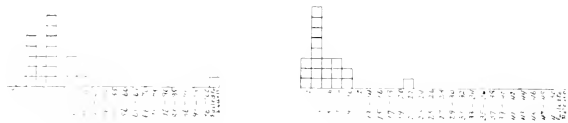


Plate III

The Maze.

Distribution of Learning and Relearning.

Plate IV
The Major

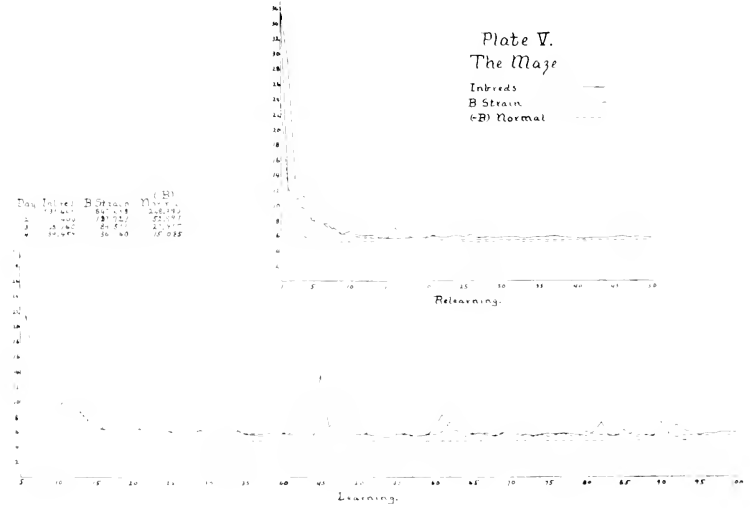


Plate V.
The Maze
Inbreds
B Strain
(-B) Normal
Relearning.
Learning.

IV. EXPERIMENT 2: THE PRELIMINARY INCLINED PLANE.

The apparatus used in this experiment (see Plate VI) was designed especially to make a problem exceptionally difficult to learn, and in this purpose it succeeded beyond expectation. The basic principle is the same as that of the apparatus used by Watson[1] in his experiments at the University of Chicago, described and illustrated in his monograph "Animal Education," page 37. But my apparatus differs from his in several respects.

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[1] Watson, Animal Education, Chicago, 1903.

Plate VI shows in detail the construction and method of operation. The food box, A, is framed of wood, 11 x 12 inches base, 11 inches in height and covered by 3/8 inch heavy wire mesh. It is fitted with a hard rubber door, d, 3/16 inch thick, 5 inches high and 4 1/4 inches wide. To the door is fastened a cord which passes over a pulley, p, and is weighted at the other end with a piece of lead, l, of sufficient weight to insure the opening of the door upon releasing the latch. B shows the device for latching and releasing the door. A short distance above the door is fastened a 3inch electrical magnet, m; directly below that is a steel wire, s.w., surmounted by a steel disk, s.d., of the same diameter as the core of the magnet. The steel wire holds the door by dropping through holes in two brass plates, G, which serve as guides, to a point, behind another brass plate which is set at the top of and behind the door, 1 1/2 mm below the top of the door.

The setscrew, s.s., placed on the wire above the lower guide prevents any further drop. When the steel wire holds the door the disk is 2mm. below the magnet; when the disk is drawn up to the magnet, 1/2mm. clearance is allowed for the door. Back of the feeding box A, is placed the inclined plane, I.P.

The inclined plane has a hard rubber base 3/8 inch thick, 6 inches long and 2 3/8 inches wide. Upon standards at the middle of the base rests the plane itself. The plane is of wood fibre and of the same dimensions as the base. The plane is weighted at the end nearest the box in order to insure its return to position after use. At the end opposite the weight, platinum electrical contacts, e.c., are placed in both base and plane. The power is provided through wires connecting with the regular electric lighting system, direct current, 115 volts. A 32 c.p. lamp is placed in the series in order to avoid any danger of short-circuiting. In order to make the contact and allow the current to pass through the magnet, thus raising the steel wire and releasing the door, it is necessary for the rat to step on the point of operation, o, which lies well out toward the end of the plane. On account of a certain amount of latency in the operation of the magnet, the rat must not only make the contacts touch, but must also inhibit further action, remaining on point o until the click of the disk meeting the magnet is heard. Over the food box and plane is placed a cage constructed of 1/2 inch heavy wire mesh, the base measurements of which are 24 x 24 inches and the height 14 inches. This allows the rat ample room to explore on all sides and above the food box. When the rat is within the entrance, e, to the cage is closed.

The preliminary inclined plane experiment was not intended so much as a decisive experiment as to test the ef-

ficiency of the apparatus. The results, however, are significant and, therefore, included here.

The object of the experiment was to have each rat learn to reach the interior of the food box from the entrance to the cage in the least possible time. The procedure of a perfectly trained rat was,to run from the entrance, e, to the point of operation, o, remaining there until the click of the disk against the magnet insured the door being open, then running through the door of the box to the food which was placed within at point f. The starting time was taken when the animal entered at e, another when the magnet clicked, and the final time when the food box was entered. The object of taking the two times was that differences in association between the inbred series and the control might be compared. But as in both series the association was practically perfect after the second day such comparison is useless.

In preparation, each animal, beginning at the age of sixty-five days, was fed alone in the food box ten minutes daily for five consecutive days. During this period the door of the food box was allowed to remain open, thus giving the rat an opportunity to become acquainted with all parts of the interior of both box and cage. At the age of seventy days the experiment began. Six males and five females from the inbred strain were used and, as control, an equal number of males and females from the normal series. All the inbred rats were from the 6th generation. The stimulus used was their regular food, bread soaked in milk.

As one of the first rats used took fourteen hours before his first accidental success, it was decided to use "cumulative" time for the first few trials. By this method each rat was allowed to work thirty minutes and then, if un-

successful, he was taken out while the door was opened, and he was then returned to feed for five minutes and used no more that day. When they began to succeed within the half hour, each rat was required to open and enter the food box five times each day. At the end of the fifth trial it was allowed to feed for five minutes, but permitted no more food until the completion of the next day's experiment. Each rat was used daily for twenty days. As a time limit had been placed, no criterion of perfect learning was established for this experiment. At the conclusion of the learning experiment the rats were fed in the runway which has already been described for sixty days. At the end of this period they were tested for retention, and were worked for five days in order to ascertain the effects of the previous training.

The results of the experiment for the inbred rats are given in tables VIa, VIb, and VIc; for the normal control series in tables VIIa, VIIb, and VIIc. These tables give only the averages of the five daily trials of individual rats. Tables VIa and VIIa show, respectively, the daily average time in seconds of the inbred and normal control series during the process of forming the inclined plane habit. The time includes both opening the door at the plane and entering the food box.

Tables VIb and VIIb show the absolute retention of the inbred and normal control series respectively. These tables show the absolute retention of the normal control series to be stronger than that of the inbred.

Tables VIc and VIIc serve only to show individual daily averages during the five days of testing for the effects of previous training. The individual anatomical data can with the above be better treated in the comparative summaries.

Table VIII presents a comparative summary consisting of the daily averages of all the inbred and all the control rats. From this table are constructed the comparative curves of learning. From the eleventh day the figures for learning time of the normal rats are less than those of the inbreds. The absolute retention of the normals is stronger than that of the inbreds. In the five trials to test the effects of previous training the time of the normals is less each day than that of the inbred rats

In these criteria of ability the rats of the normal control series are shown, on the average, to be superior to those of the inbred series. Body length of the inbred rats used in the preliminary inclined plane is, on the average, slightly greater than is the case with the normals; body weight, however, is a trifle less. The average actual brain weight of the inbreds is less than that of the normals. The relative brain weight (in reference to body length) of the inbreds is 11.61% less than that of the normals. The relative brain weight (in reference to body weight) of the inbreds is 11.65% less than that of the normals. Although killed at a later age, the percentage of water in brain and cord of the inbreds is greater than is the case with the normals.

The tables of comparative summaries of preliminary inclined plane results support the hypothesis that the deterioration of brain weight in a strain of rats is accompanied by deterioration in the ability to form habits.

In Plate VII is shown the curve of learning (left) and of relearning (right) of the inbred rats compared with those of the normal control. The inbred curve is shown by the solid line, that of the control by the broken line. The ordinates give the time in seconds, and the abscissae the number

of the day in which such time was made. Both learning curves are irregular, but on the eleventh day that of the control series passes permanently below that of the inbred. The curves of relearning show that the inbreds had failed to benefit by practice to so great an extent as the normal control.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
6B82♂	2166.68	1032.08	25.28	21.76	13.12
6B83♂	1721.36	1511.68	129.32	15.04	9.00
6B84♂	488.44	151.12	57.76	13.12	13.96
6B85♂	3022.24	7067.24	28.68	15.96	16.24
6B87♀	392.00	105.24	16.68	24.04	26.56
6B88♀	3424.56	720.40	42.72	47.52	8.44
6B89♀	3787.04	5444.32	15.64	25.92	4.92
6B50♀	4722.96	297.76	65.64	33.64	133.16
6B51♀	636.00	932.64	122.40	233.16	4.20
6A61♂	394.04	267.20	40.12	53.08	72.44
6A62♂	869.12	413.28	119.08	21.64	7.24
Average	1965.858	1631.178	60.302	45.916	28.116

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
6B82♂	5.00	3.48	3.24	4.40	6.56
6B83♂	9.80	12.72	7.76	5.00	5.24
6B84♂	5.64	15.04	4.48	17.80	6.20
6B85♂	15.68	6.40	4.80	12.36	4.92
6B87♀	10.28	8.20	18.52	5.76	9.32
6B88♀	20.48	8.12	16.08	8.48	6.04
6B89♀	5.80	6.24	9.52	10.00	4.76
6B50♀	13.44	4.56	13.32	6.04	5.48
6B51♀	3.60	66.20	4.80	5.64	8.28
6A61♂	26.08	25.52	11.48	5.44	16.76
6A62♂	4.52	6.68	6.04	104.28	4.64
Average	11.120	14.833	9.095	16.858	7.109

Table VIa. Preliminary Inclined Plane Learning

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
6B82♂	5.16	7.68	8.60	11.68	7.28
6B83♂	4.68	6.00	10.40	9.00	8.64
6B84♂	5.56	9.60	5.68	22.16	33.72
6B85♂	8.68	8.16	9.36	8.84	7.00
6B87♀	5.24	24.60	7.40	5.64	4.92
6B88♀	3.56	6.32	10.88	33.24	12.04
6B89♀	4.40	4.04	5.24	4.64	16.76
6B50♀	12.36	19.92	4.80	5.44	5.48
6B51♀	3.40	4.76	3.68	3.96	5.72
6A61♂	5.40	6.28	8.96	9.72	6.96
6A62♂	10.44	6.56	9.24	5.76	4.68
Average	6.262	9.465	7.658	10.916	10.291

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
6B82♂	10.08	5.60	4.96	5.00	4.84
6B83♂	3.12	6.16	7.36	3.68	21.44
6B84♂	8.76	6.08	6.04	7.96	29.40
6B85♂	6.28	10.92	3.36	3.56	10.12
6B87♀	3.64	3.16	3.60	11.08	7.52
6B88♀	8.28	8.04	5.96	3.68	8.28
6B89♀	3.84	4.40	3.36	4.68	5.52
6B50♀	6.88	5.48	10.60	27.20	8.44
6B51♀	6.00	4.72	4.88	17.24	3.68
6A61♂	19.60	8.24	3.28	6.36	5.48
6A62♂	4.48	8.92	7.44	8.48	8.04
Average	7.360	6.247	5.531	8.811	10.251

Table VIa. Preliminary Inclined Plane Learning

Rat #	First trial after 60 days' rest.
6B82♂	18.20
6B83♂	7.80
6B84♂	215.20
6B85♂	162.20
6B87♀	17.40
6B88♀	37.80
6B89♀	7.60
6L50♀	14.40
6B51♀	148.80
6A61♂	6.80
6A62♂	16.20
Average	59.309

Table VIb. Absolute Retention of Inbred Rats.

Preliminary Inclined Plane.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
6D82♂	7.00	5.24	4.64	6.72	6.60
6D83♂	7.96	5.56	6.16	9.92	7.84
6D84♂	74.16	7.16	4.16	3.12	2.96
6D85♂	36.92	11.12	22.84	18.08	8.64
6D87♀	11.60	6.72	6.72	10.96	17.84
6D88♀	16.44	8.92	17.20	5.40	6.08
6D89♀	6.36	4.56	2.76	3.96	3.60
6D50♀	22.60	19.60	21.92	12.32	12.76
6D51♀	34.48	18.44	13.40	8.24	8.72
6A61♂	10.12	7.56	9.28	6.16	3.80
6A62♂	39.48	14.08	17.60	4.76	7.72
Average	24.302	9.905	11.516	8.149	7.869

Table VIc. Preliminary Inclined Plane Relearning by Inbred Rats.

Rat #	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
6B82♂	194.	178.0	1.6737	.5207	77.98
6B83♂	198.	199.4	1.6951	.4771	79.01
6B84♂	200.	194.8	1.6707	.5048	78.37
6B85♂	192.	170.4	1.6110	.4846	78.00
6B87♀	189.	156.2	1.7264	.4980	78.48
6B88♀	169.	157.2	1.3144	.3753	78.67
6B89♀	187.	151.3	1.6407	.4591	78.56
6B50♀	189.	146.9	1.6710	.4777	79.00
6B51♀	189.	154.4	1.7077	.4881	78.93
6A61♂	192.	171.0	1.6109	.4947	78.69
6A62♂	180.	151.9	1.5048	.4487	78.52
Average	190.82	166.50	1.62031	.47535	78.565

Rat #	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
6B82♂	70.02	.86273	.94028	203.
6B83♂	72.21	.85611	.85010	203.
6B84♂	70.68	.83535	.85765	203.
6B85♂	70.64	.83906	.94542	203.
6B87♀	71.00	.91344	1.10525	203.
6B88♀	71.49	.69544	.83613	203.
6B89♀	71.27	.87735	1.08440	203.
6B50♀	72.30	.88413	1.13750	181.
6B51♀	72.44	.90355	1.10602	181.
6A61♂	71.96	.83901	.94205	177.
6A62♂	71.79	.83600	.99065	177.

Table VIIA. Preliminary Inclined Plane Bearing by Normal Rats.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(C)2♀	1253.32	3082.84	47.80	24.72	14.44
S(C)3♀	801.68	193.32	41.92	35.92	10.76
S(C)4♀	6664.36	74.72	36.60	17.64	5.72
S(C)5♂	471.28	412.84	37.80	23.80	28.20
S(C)6♂	5085.76	497.36	56.36	25.00	5.64
S(C)7♂	595.44	649.60	186.12	31.40	68.76
S(C)8♂	839.24	3188.76	139.88	15.40	7.48
S(C)9♀	6592.40	986.12	84.60	30.68	8.32
S(C)10♀	3422.72	25.32	21.64	19.28	19.36
S(HC)19♂	909.32	1321.00	136.24	13.32	18.84
S(HC)20♂	528.80	250.24	88.56	66.04	52.72
Average	2470.393	971.102	79.775	27.564	21.840

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
S(C)2♀	40.96	28.20	14.16	16.04	14.60
S(C)3♀	8.48	4.84	10.36	10.12	9.16
S(C)4♀	6.80	8.20	12.52	11.20	5.44
S(C)5♂	17.28	5.80	4.04	5.28	3.24
S(C)6♂	12.72	7.44	13.92	12.80	12.28
S(C)7♂	35.44	11.68	8.44	8.20	3.24
S(C)8♂	16.04	10.24	7.08	5.36	12.32
S(C)9♀	32.92	8.68	8.60	9.08	14.24
S(C)10♀	15.20	8.80	6.92	6.80	4.96
S(HC)19♂	17.64	8.28	10.72	7.64	4.80
S(HC)20♂	19.88	11.96	11.80	8.96	4.36
Average	20.305	10.375	9.869	8.971	8.058

Table VIIa. Preliminary Inclined Plane Learning by Normal Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
S(C)2♀	1.60	3.96	4.92	6.44	11.36
S(C)3♀	4.88	5.88	3.32	3.08	3.56
S(C)4♀	7.48	4.68	5.20	5.36	5.56
S(C)5♂	3.40	3.48	3.84	1.92	2.28
S(C)6♂	7.76	7.08	6.92	3.08	3.76
S(C)7♂	8.64	5.68	3.88	2.96	2.20
S(C)8♂	5.84	4.12	11.76	7.08	8.16
S(C)9♀	4.92	6.08	5.56	5.00	3.28
S(C)10♀	2.64	6.48	2.64	4.40	2.48
S(HC)19♂	5.52	4.92	4.12	5.36	4.00
S(HC)20♂	3.08	2.80	3.44	4.00	3.00
Average	5.342	5.015	5.055	4.425	4.513

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
S(C)2♀	7.08	5.28	9.76	19.96	16.16
S(C)3♀	10.40	6.20	4.36	4.72	4.92
S(C)4♀	9.32	4.36	4.40	8.44	5.76
S(C)5♂	2.44	1.84	2.56	3.20	2.28
S(C)6♂	5.16	3.00	6.20	4.72	3.88
S(C)7♂	2.16	2.28	2.44	2.64	2.12
S(C)8♂	2.92	2.68	2.40	2.36	2.52
S(C)9♀	3.20	2.60	6.76	3.28	3.68
S(C)10♀	4.16	4.44	5.04	4.20	4.64
S(HC)19♂	8.80	5.72	5.08	4.56	5.80
S(HC)20♂	2.04	2.60	7.80	5.88	7.08
Average	5.062	3.727	4.800	5.815	5.622

Table VIIa. Preliminary Inclined Plane Learning by Normal Rats.

Rat #	First trial after 60 day's rest.
S(C)2♀	6.80
S(C)3♀	17.80
S(C)4♀	31.20
S(C)5♂	12.00
S(C)6♂	81.80
S(C)7♂	34.80
S(C)8♂	15.20
S(C)9♀	8.80
S(C)10♀	331.00
S(HC)19♂	.80
S(HC)20♂	12.60
Average	49.164

Table VIIb. Absolute Retention of Normal Rats.

Preliminary Inclined Plane.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(C)2♀	4.32	4.80	3.96	2.32	4.68
S(C)3♀	12.64	5.36	2.48	2.68	13.04
S(C)4♀	3.08	2.80	3.64	5.60	6.40
S(C)5♂	5.20	2.72	1.80	2.40	1.84
S(C)6♂	16.88	5.20	6.04	5.48	4.48
S(C)7♂	12.84	3.12	2.48	2.68	3.92
S(C)8♂	9.44	4.32	6.80	5.32	4.16
S(C)9♀	12.20	8.44	6.52	7.36	5.52
S(C)10♀	96.52	13.24	21.76	3.60	19.52
S(HC)19♂	3.96	5.28	4.56	5.84	3.44
S(HC)20♂	6.04	5.20	4.52	3.60	4.16
Average	17.102	5.498	5.869	4.262	6.651

Table VIIc. Preliminary Inclined Plane Relearning by Normal Rats.

Rat #	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
S(C)2♀	179.	142.6	1.7851	.4877	77.83
S(C)3♀	187.	152.0	1.8488	.5461	78.08
S(C)4♀	179.	147.1	1.7658	.5067	78.15
S(C)5♂	185.	159.5	1.7498	.5061	77.91
S(C)6♂	197.	185.2	2.0237	.5890	78.14
S(C)7♂	192.	161.5	1.7990	.4998	78.10
S(C)8♂	206.	199.4	1.8975	.5454	77.80
S(C)9♀	183.	158.4	1.7390	.4970	77.94
S(C)10♀	193.	197.0	1.8230	.5575	78.10
S(HC)19♂	197.	198.2	1.8392	.5599	78.37
S(HC)20♂	186.	148.0	1.7432	.5129	77.38
Average	189.45	168.08	1.81946	.52819	77.982

Rat #	Water in cord	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days
S(C)2♀	71.38	.99726	1.25182	167.
S(C)3♀	71.05	.98866	1.21632	167.
S(C)4♀	71.59	.98648	1.20041	167.
S(C)5♂	71.49	.94584	1.09705	160.
S(C)6♂	71.17	1.02726	1.09271	183.
S(C)7♂	71.43	.93698	1.11393	160.
S(C)8♂	70.10	.92112	.95160	183.
S(C)9♀	71.35	.95027	1.09785	180.
S(C)10♀	71.17	.94456	.92538	180.
S(HC)19♂	71.35	.93360	.92795	164.
S(HC)20♂	70.33	.93729	1.17784	164.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	1965.858	1631.178	60.302	45.916	28.116
Nor. Avg.	2470.393	971.102	79.775	27.564	21.840

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
Inb. Avg.	11.120	14.833	9.095	16.855	7.109
Nor. Avg.	20.305	10.375	9.869	8.971	8.058

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
Inb. Avg.	6.262	9.465	7.658	10.916	10.291
Nor. Avg.	5.342	5.015	5.055	4.425	4.513

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
Inb. Avg.	7.360	6.247	5.531	8.811	10.251
Nor. Avg.	5.062	3.727	4.800	5.815	5.622

	Absolute retention.
Inb. Avg.	59.309
Nor. Avg.	49.164

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	24.302	9.905	11.516	8.149	7.869
Nor. Avg.	17.102	5.498	5.869	4.262	5.651

Table VIII. Comparative Summary of Inbred and Normal Inclined Plane (Preliminary) Results.

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
Inb. Avg.	190.82	166.50	1.62031	.47535	78.565
Nor. Avg.	189.45	168.08	1.81946	.52819	77.982

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
Inb. Avg.	71.436	.84929	.98140	194.
Nor. Avg.	71.128	.96084	1.09571	170.

Table VIII. Comparative Summary of Inbred and Normal Preliminary Inclined Plane Results.

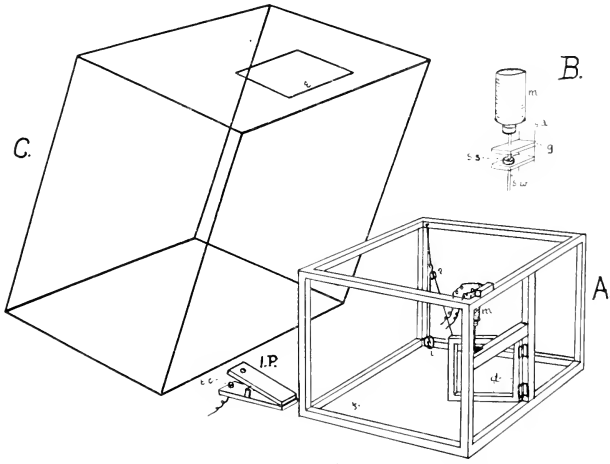

Plate VI. The Inclined Plane.

Day	Inbred	Normal
1	1965.858	2470.393
2	1631.78	971.103
3	60.302	79.775
4	45.916	27.564

Plate VII

Preliminary Inclined Plane

Inbred Strain

Normal Control

V. EXPERIMENT 3: THE INCLINED PLANE.

The apparatus used in this experiment was the same as that used in Experiment 2: the Preliminary Inclined Plane. The animals were prepared in the same way as for the previous experiment, and began work at the age of seventy days. Sixteen males and fourteen females from the inbred strain were used and, as control, an equal number of males and females from the normal series. Of the inbred rats, fifteen were from the 7th generation, fourteen from the 8th and one from the ninth. As the behavior of the single ninth generation rat was no worse than the average of the 8th her results have been included in the tables and curves of the 8th generation. The stimulus used in this experiment was bread soaked in milk.

Cumulative time was used in the earlier trials as in the previous experiment. When the rats began to succeed within the half hour, each rat was required to open and enter the food box three times each day. At the end of the third trial it was allowed to feed in the box for five minutes, but was permitted no more food until the completion of the next day's experiment. Each rat was used daily until it had learned the problem perfectly, the criterion of perfection being three perfect trials for each of three successive days. A perfect trial consisted in running from the entrance to the point of operation on the plane at the rear of the box, opening the door, running around and entering the box, all within four seconds; but, if the time consumed in opening the box after passing the entrance was more than two seconds, or, if the time consumed in entering the box after having opened the door was more than two seconds, the trial was considered a failure.

It was possible for a rat to have a perfect trial in four seconds, or a failure in a less total time. Those rats failing to learn within one hundred days (300 trials) were no longer used for experimentation. Those rats learning the inclined plane were, at the conclusion of the experiment, fed for sixty days in the runway. At the end of this period they were tested for retention and relearning.

Three of the rats formed the habit of lifting the plane at the end nearest the box and thus forming the contact, but it apparently affected neither the rapidity of each trial nor the number of days required for perfect learning. One of the normal rats placed his nose between the electrical contacts and received a shock, but beyond one squeal and a vigorous rubbing of his nose, he showed no sign of harm and had apparently forgotten the experience the next day. Some of the rats jumped to the point of operation from a distance; some placed the fore paws on the end of the plane and pressed down; and still others ran slowly around to the plane, halting an instant on the point of operation, and then continued the run around to the door. As in the maze, many of the inbred rats were subject to errors which persisted throughout the experiment.

The results of the experiments for the inbred rats are given in tables IXa, IXb, and IXc; for the normal control series in tables Xa, Xb, and Xc. These tables give only the averages of the three daily trials of individual rats. The shortest period of learning for an inbred rat was twelve days; for a normal control, nine days. Eleven inbred rats and one normal failed to learn the inclined plane problem within one hundred days. As in the maze tables, after recording the three perfect days of any one rat, the average of the time for those three days was recorded on each succeeding day in red ink.

It is necessary to preserve these figures in order to compute the total daily averages based upon which the curves of learning are constructed. The particular value of tables IX and X is that they give the data in detail from which the tables of comparative summaries are constructed.

In table XI is presented a comparative summary consisting of the daily averages of all the inbred and all the control rats used in the inclined plane experiment. From this table are constructed the comparative curves of learning. The table shows that eleven of the inbred and two of the normal rats failed to learn the inclined plane. The inbreds required, on the average, 73.70+ days to learn; the normals but 45.97+. The absolute retention of the inbreds was, on the average, 31.642 seconds; of the normals, 23.587 seconds. All the inbreds had relearned at the end of the twenty-fourth day; but all the normals had relearned at the end of the seventeenth day. The inbreds required, on the average 6.74 days to relearn; the normals but 4.68.

In all these criteria of ability the rats of the normal control series are shown, on the average, to be superior to those of the inbred series.

The body length of the inbred rats used in the inclined plane is, on the average a trifle greater than that of the normals; the body weight is slightly less. The average actual brain weight of the inbreds is less than that of the normals. The relative brain weight (in reference to body length) of the inbreds is 5.89% less than that of the normals. The relative brain weight (in reference to body weight) of the inbreds is 2.36% less than that of the normals. Although the inbred rats were killed, on the average, at a more advanced age than the normal control, the percentage of water in brain

and cord is higher.

The tables of comparative summaries of inclined plane results support the hypothesis that the deterioration of brain weight in a strain of rats is accompanied by deterioration in the ability to form habits.

In Plate VIII is shown the curve of learning (below) and of relearning (above) of the inbred rats compared with those of the normal control. The inbred curve is shown by the solid line, that of the control by the broken line. The ordinates give the average time in seconds, and the abscissae the number of the day in which such time was made. As in the other learning curves, the average time for the first four days is given in figures. The descent for the first ten days is quite rapid, with one or two lapses. From the forty-first day the normal curve lies entirely below the four second mark. The inbred curve, throughout, shows great irregularities, especially on the thirtieth day when it rises to an average of nearly twenty-eight seconds. The inbred curve of relearning is very similar to that of the normal, and from the twenty-third day coincides with it. But it must be remembered that only the best of the inbreds were used in the relearning experiment; eleven had failed to learn as against only two of the normals. The inbreds used had all relearned at the end of the twenty-fourth day; the normals at the end of the seventeenth day.

In Plate IX may be seen the distribution curves of learning of both the inbred and control series for the inclined plane experiment. The time is given in days -- in groups of five for learning, singly for relearning. As is the case with the maze experiment, it is very apparent that the advantage lies wholly in favor of the normal control series.

Of the inbred rats used in the inclined plane ex-

ment, fifteen were from the 7th generation, fourteen from the 8th and one from the 9th. In Table XII is shown a comparative summary consisting of the daily averages of all the 7th and all the 8th generations (including with the 8th the one 9th generation rat). The table shows that four of the 7th generation and seven of the 8th generation failed to learn the inclined plane. The 7th generation required, on the average, 59.60 days to learn; the 8th generation, 66.53 . The absolute retention of the 7th generation was, on the average 44.945 seconds; of the 8th generation, 13.625 seconds. All the 7th generation had relearned at the end of the twenty-fourth day; but all the 8th generation had relearned by the end of the eighth day. The 7th generation required, on the average, 8.00 days to relearn; the 8th generation but 5.00 days.

In these criteria of ability the 7th generation excelled in learning; the 8th in absolute retention and relearning. But seven of the 8th generation as against but four of the 7th had failed to learn, and for that reason not tested for relearning. There seems, on the whole but little difference, but in the learning where all were used the advantage lies with the 7th generation.

The body length and body weight of the 7th generation average greater than those of the 8th. The average actual brain weight of the 7th generation is greater than that of the 8th. The relative brain weight of the 7th generation (in reference to body length) is 6.20% less than that of the 8th generation. The relative brain weight (in reference to body weight) of the 7th generation is 13.3% less than that of the 8th. The relative brain weights of the inbred rats used in the inclined plane has not deteriorated from one generation to another, but has increased. The percentage of water in brain

and cord of the 7th generation is greater than in the 8th

In Plate X is shown the curve of learning (below) and of relearning (above) of the 7th and 8th generations of inbred rats. The 7th generation curve is shown by the broken line; that of the 8th generation by the solid line. The ordinates give the time in seconds, and the abscissae the number of the day in which such time was made. Both curves in the learning series are very irregular, but more particularly that of the 8th generation rats. Although irregular, the 7th generation curve lies below that of the 8th except in a few instances. After the first day, the relearning curves are similar and very regular, although that of the 8th generation remains below the 7th all the way. But only the best of the two generations were used, four of the 7th and seven of the 8th having been discarded on account of not having learned the inclined plane.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
7B56♂	15677.93	1205.60	139.93	50.60	30.00
7B57♂	814.73	1978.93	207.93	108.67	61.27
7B58♂	1701.53	3290.80	80.60	36.27	16.33
7B69♂	7113.87	4745.00	591.27	336.20	44.00
7B70♂	3413.33	2029.80	93.53	30.60	8.73
7B71♂	3901.20	403.60	14.07	14.07	17.07
7B72♂	8377.60	836.67	139.80	91.67	30.13
7B73♂	5334.73	757.80	33.80	7.00	6.00
7A86♂	16621.33	57.00	16.40	12.27	4.13
7A87♂	5442.67	94.40	68.27	9.13	6.73
7A88♂	3760.53	2453.47	75.33	10.13	3.73
8B36♂	1967.60	542.33	97.40	29.27	12.53
8B37♂	18014.07	111.60	20.80	8.47	10.13
8B39♂	704.80	909.20	641.20	156.20	80.13
8B10♂	9870.60	645.60	89.20	24.20	18.27
8B11♂	4953.20	2722.60	429.53	75.20	19.33
7B59♀	1117.40	1997.27	254.80	41.53	16.73
7B60♀	2279.80	1099.93	82.13	27.67	10.13
7A91♀	10499.07	171.67	20.60	20.27	4.67
7A92♀	4702.47	794.67	29.73	7.67	7.73
8B40♀	365.13	852.20	113.13	52.27	51.73
8B16♀	3861.40	1068.80	44.27	123.53	10.67
8B17♀	2045.27	124.53	48.93	29.87	14.40
8B18♀	1405.33	490.40	217.80	101.27	111.27
8B19♀	3048.00	173.87	52.00	3.73	3.93
8B114♀	2022.27	1484.60	90.40	36.40	11.80
8B115♀	1546.60	2134.27	361.13	80.13	21.67
8B116♀	2988.27	1038.13	106.60	11.13	12.33
8A36♀	2652.20	1870.47	463.33	82.07	18.40
9B130♀	801.00	445.07	386.00	79.80	33.60
Average	4673.131	1218.976	166.997	56.576	22.926

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
7B56♂	31.20	30.07	6.67	9.67	6.07
7B57♂	8.87	22.07	6.67	5.00	3.60
7B58♂	7.40	10.27	13.87	3.67	4.93
7B69♂	33.93	6.27	10.60	3.40	1.67
7B70♂	7.40	5.47	13.73	10.20	6.53
7B71♂	21.67	15.93	6.00	6.33	5.20
7B72♂	3.73	13.73	11.13	10.07	9.00
7B73♂	2.93	4.73	4.67	2.40	4.27
7A86♂	4.67	3.33	3.07	9.80	4.80
7A87♂	6.93	19.27	9.53	24.73	8.20
7A88♂	7.73	4.20	8.53	8.07	4.80
8B36♂	12.07	3.80	5.20	11.93	5.27
8B37♂	6.47	8.80	10.27	45.33	13.73
8B39♂	18.53	15.87	4.07	12.73	21.07
8B10♂	5.07	4.07	4.87	12.47	26.33
8B11♂	14.20	22.20	8.73	2.93	2.60
7B59♀	8.80	9.27	5.93	16.87	12.13
7B60♀	11.67	10.73	10.60	7.20	5.33
7A91♀	3.47	3.53	3.60	3.87	2.67
7A92♀	6.73	8.73	7.80	9.40	5.60
8B40♀	51.13	15.73	7.20	17.40	18.60
8B16♀	41.80	30.73	4.40	8.47	5.00
8B17♀	628.80	14.87	28.27	4.73	6.47
8B18♀	60.07	12.40	14.73	8.13	8.20
8B19♀	8.40	4.27	4.47	4.20	4.20
8B114♀	7.33	9.20	34.67	7.13	7.47
8B115♀	15.73	35.07	6.13	6.73	8.67
8B116♀	7.27	7.80	6.67	7.07	8.27
8A38♀	52.13	10.93	38.87	22.73	12.33
9B130♀	10.20	6.33	30.87	17.87	8.07
Average	36.878	12.422	11.061	10.751	8.136

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
7B56♂	13.47	6.80	10.13	4.33	6.67
7B57♂	14.47	6.27	7.87	7.07	8.47
7B58♂	7.87	8.87	8.87	5.93	3.73
7B69♂	3.20	2.87			
7B70♂	5.00	6.47	7.53	5.33	16.60
7B71♂	6.47	5.33	9.67	5.00	4.47
7B72♂	9.53	1.87	4.67	8.47	4.73
7B73♂	5.87	5.40	2.87	5.27	7.33
7A86♂	5.20	5.07	5.13	3.67	5.47
7A87♂	45.87	4.33	6.73	2.67	2.60
7A88♂	4.27	6.20	6.27	2.87	6.67
8B36♂	4.40	16.47	17.13	6.27	7.47
8B37♂	5.40	4.40	4.27	5.80	3.20
8B39♂	14.40	13.33	6.80	14.53	6.47
8B10♂	13.93	4.60	8.27	8.07	21.40
8B11♂	12.40	7.20	21.87	7.47	21.13
7B59♀	5.00	5.13	8.07	3.60	9.27
7B60♀	8.00	10.87	3.33	9.33	6.40
7A91♀	3.07	2.60			
7A92♀	19.33	5.80	3.73	5.73	7.40
8B40♀	5.60	7.27	15.20	5.27	6.47
8B16♀	9.27	20.53	10.73	10.20	4.67
8B17♀	8.47	5.60	19.80	5.53	10.33
8B18♀	3.67	13.20	10.73	22.73	48.07
8B19♀	6.40	3.40	17.67	3.47	3.47
8B114♀	5.27	6.07	5.47	9.13	15.13
8B115♀	10.93	10.27	9.13	9.73	12.67
8B116♀	6.47	22.07	3.47	11.47	8.27
8A38♀	8.93	16.27	8.73	10.07	15.00
9B130♀	3.13	3.73	8.93	7.93	5.53
Average	9.383	7.876	8.625	7.188	9.586

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
7B56♂	4.73	4.60	3.47	13.07	13.00
7B57♂	7.60	3.40	10.13	14.00	5.47
7B58♂	6.80	5.80	2.33	1.80	2.13
7B69♂					
7B70♂	4.40	5.00	2.93	8.07	8.40
7B71♂	19.17	4.33	5.27	5.07	5.73
7B72♂	1.87	7.80	2.60	3.87	1.80
7B73♂	5.33	4.47	5.13	8.73	5.27
7A86♂	4.80	3.33	13.67	3.47	3.00
7A87♂	2.10				
7A88♂	8.80	4.87	6.00	7.47	7.93
8B36♂	4.33	7.67	6.33	4.93	6.60
8B37♂	11.20	3.27	2.60	7.13	6.20
8B39♂	7.53	4.60	10.87	10.40	6.20
8B10♂	26.13	33.87	19.80	8.20	7.40
8B11♂	13.13	8.67	15.87	6.53	2.80
7B59♀	3.93	3.73	3.33	5.13	7.47
7B60♀	7.13	9.00	6.47	8.67	6.67
7A91♀					
7A92♀	4.67	6.40	26.13	7.67	4.53
8B40♀	10.93	4.80	3.60	8.80	4.73
8B16♀	9.47	2.47	7.33	11.53	10.53
8B17♀	7.33	3.07	3.40	4.53	4.93
8B18♀	6.00	6.27	9.07	9.40	7.67
8B19♀	8.07	4.60	9.87	5.60	15.73
8B114♀	7.60	10.87	11.20	5.60	6.20
8B115♀	11.20	7.60	2.93	4.80	9.27
8B116♀	14.40	3.07	6.13	5.73	18.67
8A38♀	34.13	66.60	6.53	82.40	5.60
9D130♀	2.53	3.67	4.67	4.87	9.33
Average	8.710	8.069	7.364	9.191	6.717

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25
7B56♂	7.67	5.93	5.47	6.60	6.40
7B57♂	2.33	3.73	4.73	10.27	5.73
7B58♂					
7B69♂					
7B70♂	4.73	5.33	4.73	9.07	6.87
7B71♂	4.67	6.27	5.67	16.67	10.07
7B72♂	4.60	5.00	8.73	4.40	7.20
7B73♂	2.67	8.07	5.87	2.13	3.47
7A86♂	14.33	4.53	4.13	3.73	4.20
7A87♂					
7A88♂	6.07	13.87	3.20	5.60	6.13
8B36♂	3.27	4.60	5.47	9.40	14.13
8B37♂	25.73	6.33	11.60	3.67	5.07
8B39♂	5.40	10.60	6.40	10.93	8.47
8B10♂	3.20	14.20	7.93	8.80	2.87
8B11♂	5.00	5.60	7.93	10.60	8.33
7B58♀	5.13	4.53	3.80	3.93	4.33
7B60♀	8.67	8.27	12.87	4.73	6.87
7A91♀					
7A92♀	12.67	7.20	4.47	5.27	10.60
8B40♀	4.20	6.27	6.67	4.07	6.33
8B16♀	10.60	4.07	28.07	3.73	9.53
8B17♀	2.67	5.80	10.00	6.60	43.93
8B18♀	11.47	8.00	5.67	11.33	5.00
8B19♀	10.13	16.20	9.73	2.67	2.33
8B114♀	4.87	5.27	10.40	3.00	8.60
8B115♀	12.13	10.00	11.13	11.27	3.67
8B116♀	7.67	3.40	3.53	2.67	7.20
8A38♀	6.27	3.27	6.20	3.60	3.20
9B130♀	8.07	4.20	3.80	9.67	9.00
Average	6.919	6.363	6.951	6.458	7.309

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 26	Day 27	Day 28	Day 29	Day 30
7B56♂	5.40	6.67	8.27	6.00	5.40
7B57♂	4.33	4.93	3.40	4.40	4.67
7B58♂					
7B69♂					
7B70♂	11.27	2.87	7.53	4.80	3.60
7B71♂	28.40	8.13	5.93	3.27	4.00
7B72♂	6.73	5.00	3.33	4.27	11.53
7B73♂	3.33	3.60	3.80	3.27	4.87
7A86♂	2.53	2.67	3.00		
7A87♂					
7A88♂	4.13	14.40	10.53	6.87	6.73
8B36♂	6.60	8.20	15.27	4.87	5.47
8B37♂	5.07	7.20	4.67	5.20	13.07
8B39♂	5.07	6.40	9.93	5.47	9.07
8B10♂	5.07	7.60	11.67	6.93	7.40
8B11♂	4.13	16.33	7.20	13.00	2.47
7B59♀	4.80	8.07	14.80	4.93	8.60
7B60♀	7.20	11.53	11.20	4.87	6.13
7A91♀					
7A92♀	4.60	6.33	5.00	3.73	4.53
8B40♀	5.33	7.80	6.93	6.47	647.20
8B16♀	4.00	4.73	3.20	10.47	4.13
8B17♀	13.80	4.33	5.47	6.20	10.13
8B18♀	5.27	9.13	11.00	11.27	27.53
8B19♀	4.07	5.20	6.20	8.60	4.47
8B114♀	2.67	2.27	6.53	3.00	5.93
8B115♀	3.07	3.07	3.13	4.53	6.27
8B116♀	3.80	9.13	5.53	5.33	3.87
8A38♀	3.40	7.07	3.87	4.80	3.93
8B120♀	5.80	4.87	11.07	7.80	10.00
Average	5.674	6.262	6.627	5.514	27.802

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 31	Day 32	Day 33	Day 34	Day 35
7B56♂	6.87	3.07	7.33	9.80	8.00
7B57♂	5.00	3.87	3.67	4.67	4.47
7B58♂					
7B69♂					
7B70♂	5.87	22.73	5.67	2.33	4.60
7B71♂	3.33	3.20	4.33	3.60	6.27
7B72♂	4.60	4.13	4.13	4.33	3.47
7B73♂	2.13	4.33	2.47	3.73	3.47
7A86♂					
7A87♂					
7A88♂	5.27	11.67	5.87	8.47	6.00
8B36♂	6.20	3.07	2.67	5.13	7.13
8B37♂	22.60	12.80	8.53	11.13	3.93
8B39♂	4.40	7.53	11.20	2.87	5.87
8B10♂	10.40	7.47	14.47	5.87	23.00
8B11♂	8.00	6.47	13.27	14.33	7.87
7B59♀	3.27	2.93	7.33	1.93	4.47
7B60♀	6.87	8.73	7.93	5.07	6.67
7A91♀					
7A92♀	5.00	10.53	9.20	5.93	6.80
8B40♀	7.80	5.40	6.80	7.93	5.87
8B16♀	11.67	6.60	2.67	34.47	14.60
8B17♀	52.67	8.80	6.67	9.00	5.67
8B18♀	6.20	17.73	19.53	8.67	7.13
8B19♀	3.33	6.00	2.93	3.67	3.60
8B114♀	4.20	2.60	3.40	9.20	4.47
8B115♀	4.47	10.53	9.13	7.73	6.33
8B116♀	5.13	7.27	6.67	6.80	6.27
8A38♀	9.93	3.27	6.27	3.53	26.73
8B130♀	4.93	7.40	7.27	10.00	6.07
Average	7.440	6.707	6.416	6.775	6.987

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 36	Day 37	Day 38	Day 39	Day 40
7B56♂	3.07	6.73	5.20	7.00	5.00
7B57♂	4.13	4.27	3.40	4.33	3.13
7B58♂					
7B69♂					
7B70♂	2.80	7.00	7.27	4.80	5.47
7B71♂	8.53	2.27	4.67	5.67	9.27
7B72♂	5.27	5.27	4.80	4.00	4.07
7B73♂	8.07	2.20	3.27	6.07	7.67
7A86♂					
7A87♂					
7A88♂	4.67	6.20	4.47	9.20	3.07
8B36♂	5.60	5.27	2.40	3.67	3.73
8B37♂	5.60	4.47	5.40	6.87	5.13
8B39♂	4.27	6.00	6.00	4.67	4.93
8B10♂	7.27	10.60	6.13	9.27	9.93
8B11♂	6.73	6.80	11.33	5.13	11.47
7B59♀	6.27	3.20	5.87	5.33	4.33
7B60♀	3.53	5.67	5.73	4.33	8.53
7A01♀					
7A02♀	7.80	2.93	5.13	3.20	4.60
8B40♀	6.00	3.53	4.20	4.87	4.33
8B16♀	5.40	18.60	3.60	3.80	1.93
8B17♀	11.00	6.40	14.27	18.60	2.93
8B18♀	36.60	7.67	19.40	5.07	8.33
8B19♀	16.93	2.60	4.33	2.87	7.27
8B14♀	6.67	2.60	4.00	4.27	9.67
8B13♀	14.33	7.47	14.33	7.00	6.47
8B16♀	2.40	8.00	3.13	11.93	5.53
8A38♀	6.60	5.67	2.20	4.07	5.60
9B30♀	2.80	3.53	7.07	5.27	3.00
Average	6.957	5.334	5.689	5.479	5.289

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 41	Day 42	Day 43	Day 44	Day 45
7B56♂	4.93	3.93	3.33	6.20	3.40
7B57♂	3.07	5.27	4.27	5.87	7.00
7B58♂					
7B69♂					
7B70♂	5.87	4.93	2.33	4.13	5.13
7B71♂	6.47	7.40	10.67	7.47	5.27
7B72♂	4.33	5.67	7.67	5.00	7.87
7B73♂	4.47	4.53	5.07	5.67	4.40
7A86♂					
7A87♂					
7A88♂	2.73	3.20			
8B36♂	7.13	4.87	6.73	3.13	3.07
8B37♂	4.87	6.07	3.80	4.60	5.27
8B38♂	3.00	2.67	6.87	3.93	4.27
8B10♂	6.87	7.00	5.40	7.60	7.60
8B11♂	5.47	9.73	7.67	4.67	4.27
7B59♀	4.80	9.53	8.53	5.33	3.33
7B60♀	10.13	5.53	2.93	5.93	3.87
7A91♀					
7A92♀	10.13	3.67	5.07	3.20	3.67
8B40♀	4.53	9.93	4.13	7.13	11.00
8B16♀	2.60	3.00	7.87	2.47	2.60
8B17♀	2.27	4.13	3.53	3.07	2.53
8B18♀	3.40	2.27	12.93	4.27	5.67
8B19♀	3.07	2.07	3.93	3.67	2.60
8B114♀	7.27	8.53	4.20	11.20	6.71
8B115♀	10.80	7.53	5.27	7.80	12.47
8B116♀	6.60	6.60	7.53	5.73	5.20
8A38♀	5.27	3.20	3.33	3.20	4.33
8B130♀	3.80	3.60	4.67	5.33	3.00
Average	4.898	4.938	5.093	4.762	4.583

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 46	Day 47	Day 48	Day 49	Day 50
7B56♂	5.47	4.60	5.87	3.13	12.27
7B57♂	4.13	6.27	4.93	4.80	4.00
7B58♂					
7B69♂					
7B70♂	3.13	3.47	3.87	7.07	5.27
7B71♂	4.13	7.27	3.00	2.40	5.20
7B72♂	4.13	5.00	4.67	6.07	4.73
7B73♂	3.60	3.13	2.20	3.40	2.20
7A86♂					
7A87♂					
7A88♂					
8B36♂	3.07	3.87	3.40	3.60	6.00
8B37♂	3.67	5.53	4.60	3.60	7.47
8B39♂	5.60	3.00	3.60	3.47	6.40
8B10♂	5.67	4.27	4.73	6.73	3.67
8B11♂	3.07	7.07	2.60	6.27	3.73
7B50♀	3.73	5.87	2.20	2.80	4.27
7B60♀	3.80	6.73	7.73	8.53	7.27
7A91♀					
7A92♀	3.33	3.40	4.00	3.73	2.87
8B40♀	6.00	19.47	7.87	6.07	7.13
8B16♀	2.73	6.13	2.27	4.00	3.53
8B17♀	3.53	7.53	6.47	22.87	4.13
8B18♀	6.60	6.27	4.73	7.40	11.60
8B19♀	2.60	3.60	3.07	3.07	5.33
8B114♀	3.47	5.80	4.00	9.00	11.13
8B115♀	10.27	6.20	4.73	7.67	4.47
8B116♀	4.93	5.27	2.73	2.33	4.07
8A38♀	4.87	3.73	3.67	2.53	5.73
9B130♀	2.53	2.73	1.93	3.13	4.60
Average	4.011	5.076	3.831	4.991	5.105

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 51	Day 52	Day 53	Day 54	Day 55
7B56♂	6.60	5.40	6.40	7.47	4.87
7B57♂	5.40	4.47	5.80	3.80	6.00
7B58♂					
7B69♂					
7B70♂	4.47	4.53	6.87	3.20	1.93
7B71♂	3.20	4.53	7.53	12.80	7.00
7B72♂	9.00	2.67	5.60	5.53	3.00
7B73♂	4.67	3.37	2.67	2.33	2.27
7A86♂					
7A87♂					
7A88♂					
8B36♂	2.13	2.53	2.33		
8B37♂	5.07	6.60	6.53	5.80	7.40
8B39♂	4.13	7.00	8.67	4.40	4.40
8B10♂	10.60	5.87	3.93	9.07	3.87
8B11♂	4.13	3.73	4.13	3.47	4.73
7B59♀	4.40	3.20	5.07	13.93	4.93
7B60♀	7.53	6.53	4.40	6.53	5.47
7A91♀					
7A92♀	3.00	2.73			
8B40♀	10.40	7.87	7.73	10.00	5.40
8B16♀	1.93	7.93	3.33	5.33	6.73
8B17♀	2.87	2.27	4.93	2.13	3.00
8B18♀	4.60	8.13	11.67	5.60	4.73
8B19♀	3.00	3.60	3.07	2.67	7.80
8B114♀	12.07	3.33	4.53	7.33	4.87
8B115♀	6.93	6.73	8.67	6.33	5.80
8B116♀	2.80	3.73	2.47	2.40	3.07
8A38♀	4.13	4.07	2.73	2.93	2.93
9B130♀	3.73	5.00	2.60	5.87	4.27
Average	4.762	4.408	4.693	5.006	4.191

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 56	Day 57	Day 58	Day 59	Day 60
7B56♂	3.33	3.60	5.87	3.93	4.53
7B57♂	3.33	7.93	6.53	4.47	8.73
7B58♂					
7B69♂					
7B70♂	3.07	4.00	4.87	4.87	4.87
7B71♂	4.53	3.73	3.73	4.87	6.53
7B72♂	3.67	3.40	3.93	4.67	3.80
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	4.07	3.27	3.20	4.93	2.40
8B39♂	4.47	5.73	2.07	4.73	2.47
8B10♂	3.67	2.80	5.67	3.67	2.53
8B11♂	3.93	3.03	3.53	4.07	5.33
7B59♀	4.60	3.27	14.73	40.53	13.53
7B60♀	4.87	6.47	5.07	35.60	3.20
7A91♀					
7A92♀					
8B40♀	7.47	5.87	53.87	9.40	31.67
8B16♀	5.47	2.20	3.73	4.47	2.87
8B17♀	3.80	3.27	2.33	2.33	2.07
8B18♀	11.87	5.80	6.60	6.53	2.40
8B19♀	5.73	3.00	3.53	2.73	5.40
8B114♀	4.47	4.00	4.53	4.93	5.73
8B115♀	5.73	7.53	9.07	7.20	5.60
8B116♀					
8A38♀	2.27	3.00	4.40	2.33	3.53
9B130♀	5.47	5.33	3.67	6.00	6.73
Average	4.072	3.916	5.909	6.238	4.953

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 61	Day 62	Day 63	Day 64	Day 65
7B56♂	8.00	4.40	3.00	2.60	3.00
7B57♂	6.33	6.00	2.87	5.20	3.13
7B58♂					
7B69♂					
7B70♂	2.00	4.07	2.53	2.07	4.27
7B71♂	4.67	6.13	14.27	3.53	5.07
7B72♂	2.80	4.93	17.40	2.60	3.47
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	3.80	2.87	3.40	3.13	3.53
8B39♂	3.00	3.33	4.47	2.20	4.00
8B10♂	3.80	4.93	4.33	3.53	6.73
8B11♂	2.80	4.33	4.13	3.53	5.13
7B59♀	14.27	36.20	5.93	5.00	5.27
7B60♀	5.00	3.20	3.60	2.73	3.80
7A91♀					
7A92♀					
8B40♀	11.33	5.20	3.53	3.27	5.40
8B16♀	3.13	2.93	2.93	3.73	3.13
8B17♀					
8B18♀	7.13	4.47	9.40	2.73	4.20
8B19♀	2.00	3.67	3.73	3.73	3.60
8B114♀	3.07	3.07	6.13	8.47	3.13
8B115♀	3.93	5.33	6.67	4.27	5.40
8B116♀					
8A38♀	3.73	2.53	3.00	5.00	3.00
9B130♀	5.80	8.60	3.20	3.60	4.80
Average	4.172	5.026	4.437	3.317	3.741

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 66	Day 67	Day 68	Day 69	Day 70
7B56♂	6.00	3.87	3.73	4.80	5.13
7B57♂	3.27	3.07	4.20	7.80	9.13
7B58♂					
7B69♂					
7B70♂	3.07	3.87	3.80	4.20	1.93
7B71♂	3.07	3.87	4.40	27.27	5.53
7B72♂	2.80	3.93	4.20	3.07	13.27
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	2.60	2.40	5.07	3.80	3.13
8B39♂	3.67	2.00	1.93	2.13	
8B10♂	6.13	5.93	4.20	3.87	3.60
8B11♂	7.40	4.13	4.67	9.20	2.27
7B59♀	6.33	10.33	9.87	4.73	5.53
7B60♀	4.07	3.27	13.20	4.40	6.60
7A91♀					
7A92♀					
8B40♀	3.47	4.73	7.80	4.47	4.13
8B16♀	1.93	3.07	2.67	4.87	5.67
8B17♀					
8B18♀	11.33	9.67	53.00	10.20	7.93
8F19♀	4.27	4.73	3.47	3.27	5.20
8B114♀	5.73	7.73	5.47	2.33	4.20
8B115♀	13.60	9.00	6.87	6.27	7.80
8B116♀					
8A38♀	5.40	2.40	3.87	5.33	3.27
9B130♀	2.07	2.07	4.73	3.60	2.87
Average	4.160	3.955	5.858	4.806	4.260

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 71	Day 72	Day 73	Day 74	Day 75
7B56♂	6.67	6.00	7.40	8.97	8.80
7 B57♂	7.93	3.90	3.93	3.73	5.27
7B58♂					
7B60♀					
7B70♂	3.47	4.13	3.07	4.47	5.07
7B71♀	5.20	5.33	5.60	8.47	4.00
7B72♂	4.73	2.93	3.33	3.60	2.47
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	3.07	2.40	2.20	3.47	2.40
8B39♂					
8B10♂	6.67	3.13	3.07	4.73	2.33
8B11♂	12.07	6.13	8.27	2.03	3.80
7B59♀	5.20	5.47	3.73	6.13	2.53
7B60♀	6.47	6.73	2.40	3.87	4.80
7A91♀					
7A92♀					
8B40♀	3.40	8.27	3.00	3.27	3.93
8B16♀	3.93	1.80	2.87	6.53	2.60
8E17♀					
8D18♀	5.80	5.07	6.47	7.93	4.33
8E19♀	4.67	3.80	4.67	5.00	4.00
8E114♀	4.40	3.53	4.47	5.67	6.00
8B115♀	6.80	8.87	8.87	7.33	9.67
8B116♀					
8A38♀	3.20	2.20	3.40	3.47	2.47
9D130♀	1.80	3.67	2.47	3.33	4.40
Average	4.363	3.869	3.461	3.713	3.649

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 76	Day 77	Day 78	Day 79	Day 80
7B56♂	8.27	5.40	7.60	3.27	3.13
7B57♂	4.40	4.27	3.13	2.60	3.07
7B58♂					
7B69♂					
7B70♂	3.47	3.93	2.67	2.47	2.33
7B71♂	3.37	3.20	3.13	3.40	2.93
7B72♂	5.60	3.33	5.93	3.20	4.47
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	3.33	4.87	3.40	3.47	2.80
8B39♂					
8B10♂	4.00	2.53	2.40	2.07	
8B11♂	3.80	4.67	4.13	2.80	3.07
7B59♀	4.73	8.40	5.33	29.67	14.33
7B60♀	5.20	4.13	12.80	4.60	2.73
7A91♀					
7A92♀					
8B40♀	2.67	3.80	3.00	2.67	3.93
8B16♀	3.73	3.00	3.13	4.00	2.60
8B17♀					
8B18♀	2.53	3.67	4.93	4.07	10.53
8B19♀	3.40	6.73	4.00	3.47	4.80
8B114♀	6.27	3.60	3.33	4.33	2.40
8B115♀	5.73	8.33	4.80	6.00	5.27
8B116♀					
8A38♀	5.07	2.13	2.00	3.00	3.73
9B130♀	5.60	3.47	3.07	5.60	4.40
Average	3.726	3.669	3.646	4.043	3.648

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 81	Day 82	Day 83	Day 84	Day 85
7B56♂	3.87	2.67	3.40	3.00	6.00
7B57♂	5.87	4.13	6.13	4.27	2.47
7B58♂					
7B69♂					
7B70♂					
7B71♂	4.47	3.13	4.33	5.40	3.53
7B72♂	2.60	1.93	3.67	2.33	3.73
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	4.60	4.87	3.00	2.87	2.80
8L39♂					
8D10♂					
8B11♂	2.53	3.73	3.87	2.60	4.60
7B59♀	6.20	7.00	5.67	5.40	9.00
7B60♀	2.73	2.87			
7A91♀					
7A92♀					
8B40♀	4.60	3.73	2.73	4.33	8.87
8B16♀	2.47	3.33	6.40	4.20	3.27
8B17♀					
8B18♀	6.07	4.87	4.20	6.27	5.80
8B19♀	2.53	9.87	7.47	3.60	3.87
8B114♀	3.27	4.40	4.27	3.93	2.80
8B115♀	5.53	4.80	5.93	6.53	4.33
8B116♀					
8A38♀	2.73	1.80	4.07	2.07	2.20
9B130♀	5.07	5.40	3.40	2.67	2.67
Average	3.359	3.465	3.558	3.322	3.471

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 86	Day 87	Day 88	Day 89	Day 90
7B56♂	3.40	3.60	5.73	6.13	3.40
7B57♂	7.00	4.20	3.40	7.33	7.20
7B58♂					
7B69♂					
7B70♂					
7B71♂	4.73	3.67	5.07	3.60	3.53
7B72♂	2.60	3.53	2.80	3.53	2.33
7B73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	5.47	3.67	3.53	3.40	2.60
8B39♂					
8B10♂					
8B11♂	7.27	3.33	8.00	7.73	10.13
7B59♀	4.40	3.93	3.53	3.20	14.47
7B60♀					
7A91♀					
7A92♀					
8B40♀	4.33	4.60	4.80	5.33	8.33
8B16♀	3.73	3.00	7.73	2.13	4.73
8B17♀					
8B18♀	6.00	4.40	3.20	4.93	3.60
8B19♀	6.93	10.53	6.07	2.67	2.60
8B114♀	3.73	2.33	2.80	3.80	2.60
8B115♀	6.60	6.27	7.80	9.93	12.80
8B116♀					
8A38♀	3.07				
9B136♀	4.40	3.93	5.47	4.80	6.13
Average	3.729	3.388	3.686	3.639	4.170

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 91	Day 92	Day 93	Day 94	Day 95
7B56♂	2.60	3.80	2.33	3.53	2.80
7B57♂	4.73	3.33	8.33	2.47	2.40
7B58♂					
7B69♂					
7B70♂					
7B71♂	7.80	4.53	5.80	4.73	3.47
7B72♂	2.60	3.60	4.00	3.80	2.67
7B73♂					
7A66♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	2.33	3.00	7.13	5.40	3.27
8B39♂					
8B10♂					
8B11♂	7.00	2.80	3.53	5.60	2.80
7B59♀	3.80	5.47	2.00	2.53	2.00
7B60♀					
7A91♀					
7A92♀					
8B40♀	4.60	5.67	6.67	5.13	3.33
8B16♀	2.47	5.87	8.60	3.00	3.07
8B17♀					
8B18♀	4.80	4.67	9.00	5.93	18.73
8B19♀	6.33	4.40	5.67	3.00	3.53
8B114♀	4.80	4.07	4.20	2.73	3.07
8B115♀	6.53	6.13	12.40	9.47	7.00
8B116♀					
8A38♀					
9B130♀	4.00	3.80	3.40	5.93	4.73
Average	3.501	3.393	4.124	3.463	3.457

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Day 96	Day 97	Day 98	Day 99	Day 100
7B56♂	2.27	2.60	4.33	5.33	2.60
7B57♂	3.60	2.67	6.33	4.47	3.13
7B58♂					
7B69♂					
7B70♂					
7B71♂	3.87	2.67	4.00	4.93	9.13
7B72♂	2.33	2.80	2.80	4.47	2.33
7L73♂					
7A86♂					
7A87♂					
7A88♂					
8B36♂					
8B37♂	3.20	6.87	1.93	2.20	8.40
8B39♂					
8B10♂					
8B11♂	3.47	6.20	2.73	1.93	1.80
7D59♀					
7B60♀					
7A91♀					
7A92♀					
8B40♀	4.87	5.40	5.20	4.33	7.40
8B16♀	4.27	3.00	1.80	2.47	2.13
8B17♀					
8B18♀	4.47	12.73	4.27	3.87	6.00
8B19♀	2.27	1.87	6.07	2.53	5.60
8B114♀	2.47				
8B115♀	7.13	7.87	17.20	5.07	6.73
8B116♀					
8A38♀					
9B130♀	2.93	3.33	5.87	2.27	4.47
Average	2.999	3.460	3.604	2.982	3.510

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	Failed to learn.	Days required to learn.
7B56♂	1	100+
7B57♂	1	100+
7B58♂		20
7B69♂		12
7B70♂		90
7B71♂	1	100+
7B72♂	1	100+
7B73♂		55
7A86♂		28
7A87♂		16
7A88♂		42
8B36♂		53
8B37♂	1	100+
8D39♂		69
8D10♂		79
9D11♂	1	100+
7D59♀		95
7B60♀		82
7A91♀		12
7A92♀		52
8B40♀	1	100+
8B16♀		100
8B17♀		60
8B18♀	1	100+
8D19♀	1	100+
8D114♀		96
8B115♀	1	100+
8D116♀		85
8A38♀		86
9D130♀	1	100+
Total	11 : Average	73.70+

Table IXa. Inclined Plane Learning by Inbred Rats.

Rat #	First trial after 60 days' rest.
7D56♂	------
7D57♂	------
7D58♂	12.00
7B69♂	36.20
7B70♂	240.20
7B71♂	------
7B72♂	------
7B73♂	20.20
7A86♂	49.80
7A87♂	82.20
7A88♂	2.80
8B36♂	31.80
8B37♂	------
8B39♂	17.40
8B10♂	25.60
8B11♂	------
7B59♀	18.00
7B60♀	26.40
7A91♀	28.40
7A92♀	8.20
8B40♀	------
8B16♀	6.00
8B17♀	6.20
8B18♀	------
8B19♀	------
8B114♀	10.60
8B115♀	------
8B116♀	6.80
8A38♀	6.80
9B130♀	------
Average	31.842

Table IXb. Absolute Retention of Inbred Rats.
Inclined Plane.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
7B56♂	-----	-----	-----	-----	-----
7B57♂	-----	-----	-----	-----	-----
7B58♂	9.67	6.93	5.73	10.60	11.07
7B69♂	88.07	33.20	11.07	9.87	24.13
7B70♂	209.87	8.40	2.47		
7B71♂	-----	-----	-----	-----	-----
7B72♂	-----	-----	-----	-----	-----
7B73♂	73.13	6.73	16.20	16.00	5.53
7A86♂	266.33	7.13	3.00		
7A87♂	27.13	11.27	5.20	4.67	5.67
7A88♂	2.47				
8B36♂	13.73	12.67	4.93	2.80	5.07
8B37♂	-----	-----	-----	-----	-----
8B39♂	7.47	2.60			
8B10♂	11.53	3.87	6.47	6.53	6.73
8B11♂	-----	-----	-----	-----	-----
7D59♀	8.13	4.20	11.07	2.53	
8B60♀	20.20	9.13	3.40	2.73	
7A91♀	15.87	7.93	5.40	4.80	5.80
7A92♀	8.67	4.53	3.53	4.20	3.67
8B40♀	-----	-----	-----	-----	-----
8B16♀	4.93	3.33	1.93		
8B17♀	7.53	3.47	5.00	4.67	3.20
8B18♀	-----	-----	-----	-----	-----
8B19♀	-----	-----	-----	-----	-----
8B114♀	10.07	5.71	6.47	3.07	
8B115♀	-----	-----	-----	-----	-----
8B116♀	4.53	2.87	4.07	3.67	2.33
8A38♀	4.67	2.27			
9B130♀	-----	-----	-----	-----	-----
Average	41.789	7.301	5.436	4.783	5.067

Table IXc. Inclined Plane Relearning by Inbred Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
7B56♂	-----	-----	-----	-----	-----
7B57♂	-----	-----	-----	-----	-----
7B58♂	2.07				
7B69♂	34.87	12.40	11.47	9.27	2.80
7B70♂					
7B71♂	-----	-----	-----	-----	-----
7B72♂	-----	-----	-----	-----	-----
7B73♂	10.93	6.27	4.13	3.07	3.60
7A86♂					
7A87♂	7.40	6.53	6.47	5.33	6.60
7A88♂					
8B36♂	7.13	5.47	2.73		
8B37♂	-----	-----	-----	-----	-----
8B39♂					
8B10♂	5.53	8.80	2.60		
8B11♂	-----	-----	-----	-----	-----
7B59♀					
7B60♀					
7A91♀	6.33	2.60			
7A92♀	4.47	6.07	5.20	5.47	3.33
8B40♀	-----	-----	-----	-----	-----
8B16♀					
8B17♀	4.20	4.93	2.00		
8B18♀	-----	-----	-----	-----	-----
8B19♀	-----	-----	-----	-----	-----
8B114♀					
8B115♀	-----	-----	-----	-----	-----
8B116♀					
8A38♀					
9B130♀	-----	-----	-----	-----	-----
Average	5.175	4.239	3.404	3.186	2.828

Table IXc. Inclined Plane Relearning by Inbred Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
7B56♂	-----	-----	-----	-----	-----
7B57♂	-----	-----	-----	-----	-----
7B58♂					
7B69♂					
7B70♂					
7B71♂	-----	-----	-----	-----	-----
7B72♂	-----	-----	-----	-----	-----
7B73♂	2.93				
7A86♂					
7A87♂	3.93	4.27	4.93	4.93	7.47
7A88♂					
8B36♂					
8B37♂	-----	-----	-----	-----	-----
8B39♂					
8B10♂					
8B11♂	-----	-----	-----	-----	-----
7B59♀					
7B60♀					
7A91♀					
7A92♀	19.60	4.13	5.07	6.00	2.73
8B40♀	-----	-----	-----	-----	-----
8B16♀					
8B17♀					
8B18♀	-----	-----	-----	-----	-----
8B19♀	-----	-----	-----	-----	-----
8B114♀					
8B115♀	-----	-----	-----	-----	-----
8B116♀					
8A38♀					
9B130♀	-----	-----	-----	-----	-----
Average	3.508	2.712	2.796	2.845	2.807

Table IXc. Inclined Plane Learning by Inbred Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
7B56♂	-----	-----	-----	-----	-----
7B57♂	-----	-----	-----	-----	-----
7B58♂					
7B69♂					
7B70♂					
7B71♂	-----	-----	-----	-----	-----
7B72♂	-----	-----	-----	-----	-----
7B73♂					
7A86♂					
7A87♂	3.73	3.60	3.47	6.07	5.00
7A88♂					
8B36♂					
8B37♂	-----	-----	-----	-----	-----
8B39♂					
8B10♂					
8B11♂	-----	-----	-----	-----	-----
7B59♀					
7B60♀					
7A91♀					
7A92♀					
8B40♀	-----	-----	-----	-----	-----
8B16♀					
8B17♀					
8B18♀	-----	-----	-----	-----	-----
8B19♀	-----	-----	-----	-----	-----
8B114♀					
8B115♀	-----	-----	-----	-----	-----
8B116♀					
8A38♀					
9B136♀	-----	-----	-----	-----	-----
Average	2.610	2.603	2.596	2.733	2.677

Table IXc. Inclined Plane Relearning by Inbred Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25 to 50
7B56♂	-----	-----	-----	-----	-----
7B57♂	-----	-----	-----	-----	-----
7B58♂					
7B69♂					
7B70♂					
7B71♂	-----	-----	-----	-----	-----
7B72♂	-----	-----	-----	-----	-----
7B73♂					
7A66♂					
7A87♂	3.67	6.00	3.47	2.67	
7A88♂					
8B36♂					
8B37♂	-----	-----	-----	-----	-----
8B39♂					
8B10♂					
8B11♂	-----	-----	-----	-----	-----
7B59♀					
7B60♀					
7A91♀					
7A92♀					
8B40♀	-----	-----	-----	-----	-----
8B16♀					
8B17♀					
8B18♀	-----	-----	-----	-----	-----
8B19♀	-----	-----	-----	-----	-----
8B114♀					
8B115♀	-----	-----	-----	-----	-----
8B116♀					
8A38♀					
9B130♀	-----	-----	-----	-----	-----
Average	2.607	2.729	2.596	2.554	[illegible]

Table IXc. Inclined Plane Relearning by Inbred Rats.

Rat #	Failed to relearn.	Days required to relearn
7B56♂		--
7B57♂		--
7B58♂		6
7B69♂		10
7B70♂		3
7B71♂		--
7B72♂		--
7B73♂		11
7A86♂		3
7A87♂		24
7A88♂		1
8B36♂		8
8B37♂		--
8B39♂		2
8B10♂		8
8B11♂		--
7B59♀		4
7B60♀		4
7A91♀		7
7A92♀		15
8B40♀		--
8B16♀		3
8B17♀		8
8B18♀		--
8B19♀		--
8B114♀		4
8B115♀		--
8B116♀		5
8A38♀		2
9B130♀		--
Total	0 : Average	6.74

Table IXc. Inclined Plane Relearning by Inbred Rats.

Rat #	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
7B56♂	219.	244.8	1.7819	.5906	78.52
7B57♂	207.	226.1	1.7418	.5807	78.21
7B58♂	205.	218.1	1.7199	.5295	78.44
7B69♂	215.	241.3	1.8771	.5908	78.84
7B70♂	197.	184.0	1.7379	.5179	78.33
7B71♂	212.	240.6	1.8172	.5619	78.63
7B72♂	208.	237.7	1.8135	.5530	78.64
7B73♂	206.	230.0	1.7880	.5770	78.69
7A86♂	215.	221.6	1.7583	.5473	78.47
7A87♂	212.	247.2	1.7497	.5370	78.54
7A88♂	195.	168.8	1.5868	.5211	78.35
8B36♂	204.	205.7	1.7666	.5753	78.02
8B37♂	209.	232.4	1.9020	.5951	78.42
8B39♂	190.	186.0	1.7305	.5324	78.38
8B10♂	206.	229.3	1.8112	.5813	77.74
8B11♂	195.	188.0	1.8329	.5468	78.36
7B59♀	199.	148.6	1.6760	.5331	78.54
7B60♀	190.	163.7	1.6802	.5372	78.43
7A91♀	181.	99.4*	1.6030	.5317	79.00
7A92♀	181.	149.3	1.5989	.4823	78.50
8B40♀	180.	140.2	1.6710	.5059	78.62
8B15♀	196.	175.2	1.7477	.5771	77.80
8B17♀	191.	150.3	1.7009	.5556	77.95
8B18♀	184.	160.3	1.7144	.5002	78.18
8B19♀	182.	147.9	1.6720	.4850	78.33
8B114♀	185.	137.7	1.5945	.4793	78.07
8B115♀	182.	130.5	1.6040	.4914	78.11
8B116♀	173.	122.7	1.5606	.4924	77.83
8A38♀	189.	151.5	1.7154	.5363	78.70
9B130♀	180.	152.2	1.6711	.4910	78.26
Average	195.93	184.37	1.72083	.53787	78.363

Table IXd. Anatomical Data of Inbred Rats.

*The extremely light weight of this rat is accounted for by the fact that she was in the last stages of pneumonia when killed.

Rat #	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
7B56♂	71.32	.81365	.72790	234.
7B57♂	71.10	.84145	.77037	234.
7B58♂	70.77	.83898	.78858	165.
7B69♂	72.05	.87307	.77791	297.
7B70♂	71.37	.88218	.94451	231.
7B71♂	70.97	.85717	.75528	231.
7B72♂	71.10	.87188	.76294	231.
7B73♂	72.01	.86796	.77739	231.
7A86♂	71.79	.81781	.79346	206.
7A87♂	71.94	.82533	.70781	206.
7A88♂	71.00	.81374	.94005	206.
8B36♂	71.30	.86598	.85882	206.
8B37♂	71.45	.91024	.81842	203.
8B39♂	72.24	.91079	.93038	206.
8B10♂	70.36	.87922	.78988	239.
8B11♂	71.12	.93995	.97495	191.
7B59♀	70.98	.88677	1.12786	234.
7B60♀	71.63	.88432	1.02639	231.
7A91♀	73.89	.88564	1.61268*	206.
7A92♀	71.62	.88337	1.07093	206.
8B40♀	73.00	.92833	1.19187	200.
8B16♀	70.27	.89168	.99755	291.
8B17♀	71.38	.89052	1.13167	239.
8B18♀	71.21	.93174	1.06949	191.
8B19♀	71.38	.91868	1.13049	191.
8B114♀	70.54	.86190	1.15795	241.
8B115♀	71.37	.88132	1.22912	189.
8B116♀	70.57	.90208	1.27188	241.
8A38♀	71.68	.90762	1.13228	236.
9B130♀	71.69	.92833	1.09796	192.
Average	71.437	.87972	.97889	220.

Table IXd. Anatomical Data of Inbred Rats.

*The exceptional relative brain weight is due to the fact that when killed this rat was in the last stages of pneumonia.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(H)77♂	981.47	185.33	95.67	97.27	17.73
S(H)80♂	747.13	359.27	144.53	30.60	11.73
S(HW)114♂	830.93	4760.80	107.73	7.20	12.93
S(CW)126♂	3426.13	310.07	49.80	15.93	20.20
S(HW)130♂	2484.07	1854.00	149.80	65.67	38.20
S(HW)131♂	2724.53	1022.73	145.33	25.13	7.27
S(HW)132♂	3801.80	1020.00	54.73	7.60	6.33
S(HW)133♂	3530.47	913.07	71.87	29.67	6.40
S(HW)134♂	2581.33	291.20	15.07	16.07	7.13
S(CH)140♂	5504.13	562.40	487.13	82.53	30.13
S(W/HC)143♂	2218.73	138.93	13.00	22.47	22.00
S(CW)147♂	1922.47	375.73	64.87	11.80	57.47
S(CW)148♂	3032.40	191.73	50.07	8.20	3.27
S(CW)149♂	958.80	752.80	73.93	109.13	7.60
S(CH)155♂	4387.33	912.00	52.87	20.87	15.13
S(CH)156♂	1620.33	98.33	12.87	50.27	9.07
S(C/EB)73♀	3043.13	1916.33	132.87	39.47	9.13
S(C/EB)74♀	3573.40	1017.53	279.87	57.80	11.27
S(H)81♀	220.07	637.33	586.73	152.80	18.73
S(CW)128♀	196.73	1381.27	252.60	120.93	127.00
S(CW)129♀	2096.80	1347.80	287.40	549.40	129.47
S(CH)141♀	2482.27	299.87	42.87	14.20	8.67
S(CH)142♀	3296.67	256.07	24.60	12.27	20.73
S(W/HC)144♀	2775.33	576.53	237.07	102.67	28.53
S(W/HC)145♀	3789.60	373.60	208.47	38.13	11.00
S(W/HC)146♀	1431.80	298.93	24.60	4.87	11.07
S(CH)157♀	11791.33	8596.67	64.13	12.20	8.80
S(CH)159♀	2250.80	218.40	71.93	49.73	36.80
S(CH)160♀	656.47	973.80	175.47	69.53	10.67
S(W/HC)166♀	4742.13	129.13	20.73	23.60	15.40
Average	2769.953	1072.722	133.287	61.600	23.995

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
S(H)77♂	33.47	23.40	31.67	14.07	8.87
S(H)80♂	26.20	5.20	12.93	8.87	6.53
S(HW)114♂	17.80	13.47	6.33	12.13	10.60
S(CW)126♂	11.07	13.73	8.80	3.47	3.20
S(HW)130♂	13.87	7.27	9.67	7.13	9.40
S(HW)131♂	6.40	14.07	3.53	10.40	4.13
S(HW)132♂	2.87	4.20	4.73	3.33	2.07
S(HW)133♂	10.60	13.20	3.93	11.33	3.13
S(HW)134♂	4.00	2.73	2.67	2.73	
S(CH)140♂	7.93	8.80	11.93	10.07	3.93
S(W/HC)143♂	125.20	6.33	3.27	3.47	2.80
S(CW)147♂	43.07	2.87	3.00	3.60	6.33
S(CW)148♂	4.40	5.73	7.13	2.60	6.47
S(CW)149♂	28.87	5.60	14.67	4.47	4.60
S(CH)155♂	30.47	14.67	6.67	10.20	6.60
S(CH)156♂	12.67	35.27	9.47	23.60	11.00
S(C/EB)73♀	20.33	13.20	4.67	4.27	7.53
S(C/EB)74♀	13.73	8.93	14.13	51.60	3.93
S(H)81♀	12.80	27.20	9.00	26.40	10.87
S(CW)128♀	188.20	21.80	13.60	6.13	6.73
S(CW)129♀	10.93	26.53	20.53	9.07	6.53
S(CH)141♀	13.33	11.40	4.93	9.53	4.00
S(CH)142♀	11.80	4.53	14.40	8.73	8.40
S(W/HC)144♀	18.93	5.67	3.13	3.33	6.07
S(W/HC)145♀	27.93	12.80	59.67	14.80	5.40
S(W/HC)146♀	11.47	8.47	8.80	11.20	3.67
S(CH)157♀	5.00	8.47	14.87	28.67	18.67
S(CH)159♀	45.87	62.20	27.93	19.93	20.80
S(CH)160♀	8.60	4.87	8.87	6.33	5.60
S(W/HC)166♀	3.40	11.73	6.20	6.93	8.27
Average	25.874	13.478	11.704	11.280	6.961

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
S(H)77♂	5.47	5.53	13.87	3.27	4.60
S(H)80♂	6.73	8.27	9.33	9.13	9.67
S(HW)114♂	5.67	1.93	8.07	6.53	12.27
S(CW)126♂	3.00	5.80	2.93	2.80	11.80
S(HW)130♂	6.60	4.73	6.20	3.67	4.00
S(HW)131♂	8.60	7.73	6.07	6.00	7.53
S(HW)132♂	3.20	5.73	2.20	2.73	3.53
S(HW)133♂	2.40	2.00			
S(HW)134♂					
S(CH)140♂	17.27	14.27	4.87	6.07	2.67
S(W/HC)143♂					
S(CW)147♂	5.73	7.60	2.47	2.13	2.27
S(CW)148♂	7.20	4.47	3.73	5.40	3.80
S(CW)149♂	9.40	7.27	3.33	6.13	5.60
S(CH)155♂	7.00	6.33	4.87	10.13	3.27
S(CH)156♂	8.53	10.67	5.60	7.87	3.20
S(C/EB)73♀	7.33	8.33	8.13	9.87	5.87
S(C/EB)74♀	3.07	6.00	3.47	5.53	7.07
S(H)61♀	5.47	7.87	5.47	9.67	4.87
S(CW)128♀	3.47	3.73	4.60	10.47	4.07
S(CW)129♀	6.80	10.80	7.33	6.07	7.13
S(CH)141♀	2.13	2.07	5.93	3.07	5.13
S(CH)142♀	4.00	11.27	6.87	11.60	11.00
S(W/HC)144♀	6.27	9.00	4.13	9.00	8.13
S(W/HC)145♀	7.00	6.00	20.13	2.13	6.87
S(W/HC)146♀	5.47	5.33	7.00	3.07	7.20
S(CH)157♀	16.67	9.87	14.67	10.07	10.07
S(CH)159♀	21.13	12.13	5.80	39.80	19.07
S(CH)160♀	4.07	6.60	8.00	8.60	2.93
S(W/HC)166♀	7.20	8.33	6.93	2.13	9.47
Average	6.759	6.858	6.347	7.045	6.383

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20
S(H)77♂	3.13	4.60	5.80	10.20	7.97
S(H)80♂	6.93	6.13	7.73	4.67	3.67
S(HW)114♂	6.00	6.93	11.07	4.93	6.67
S(CW)126♂	5.53	6.33	7.93	9.20	6.40
S(HW)130♂	5.60	7.73	10.07	5.20	3.07
S(HW)131♂	3.20	4.87	5.67	4.60	3.13
S(HW)132♂	3.60	4.53	6.07	4.33	2.27
S(HW)133♂					
S(HW)134♂					
S(CW)140♂	2.73	2.73			
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	7.67	6.07	12.00	9.53	14.27
S(CW)149♂	3.07	3.33	4.73	6.67	3.80
S(CH)155♂	6.87	8.07	5.07	4.53	3.40
S(CH)156♂	3.47	4.87	2.73	3.20	2.80
S(C/EB)73♀	6.67	3.93	6.47	4.60	4.87
S(C/EB)74♀	6.80	11.93	6.93	13.53	9.07
S(H)81♀	4.93	7.27	10.87	10.67	9.27
S(CW)128♀	5.33	4.33	3.20	3.87	4.13
S(CW)129♀	5.53	6.00	8.40	5.47	8.27
S(CH)141♀	5.60	3.53	4.87	3.73	3.67
S(CH)142♀	7.47	5.13	6.67	7.80	4.67
S(W/HC)144♀	3.20	3.53	6.67	5.67	6.93
S(W/HC)145♀	11.40	10.93	5.80	4.80	5.73
S(W/HC)146♀	2.40	6.40	5.73	2.13	2.87
S(CH)157♀	4.47	3.13	6.53	2.60	3.87
S(CH)159♀	4.03	6.07	7.80	6.47	11.47
S(CH)160♀	3.27	8.93	3.93	3.60	4.20
S(W/HC)166♀	5.47	4.00	8.60	5.87	10.80
Average	5.069	5.400	6.158	5.376	5.382

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 21	Day 22	Day 23	Day 24	Day 25
S(H)77♂	2.93	3.07	8.40	8.67	17.47
S(H)80♂	4.00	2.33	9.80	4.73	8.87
S(HW)114♂	17.40	2.27	3.13	3.67	4.93
S(CW)126♂	8.80	5.73	5.27	6.00	3.47
S(HW)130♂	4.87	9.40	7.60	9.73	8.53
S(HW)131♂	2.93	4.93	9.73	4.47	6.40
S(HW)132♂	4.07	2.93	5.07	2.67	4.00
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	7.47	4.20	6.80	4.27	1.87
S(CW)149♂	6.80	5.53	5.20	6.00	4.00
S(CH)155♂	4.40	3.93	17.67	5.73	5.00
S(CH)156♂					
S(C/EB)73♀	5.27	6.47	4.93	5.80	2.67
S(C/EB)74♀	2.13	4.73	2.33	9.87	5.13
S(H)81♀	3.67	15.47	5.87	5.13	5.13
S(CW)125♀	3.73	2.13	9.20	3.53	5.13
S(CW)129♀	7.00	4.93	4.67	8.00	3.33
S(CH)141♀	3.13	2.13	2.27	2.20	
S(CH)142♀	2.93	5.60	5.07	6.67	3.87
S(W/HC)144♀	5.07	4.20	8.53	15.13	4.47
S(W/HC)145♀	6.67	3.13	2.40	7.53	7.53
S(W/HC)146♀	4.53	4.27	3.27	6.40	5.67
S(CH)157♀	3.07	3.13	2.67		
S(CH)159♀	19.67	6.13	3.13	5.33	12.20
S(CH)160♀	3.40	3.20	2.07	2.80	3.00
S(W/HC)166♀	8.27	5.20	3.80	4.80	6.60
Average	5.284	4.378	5.173	5.280	5.025

Table Xa. Inclined Plane Learning by Normal Rats.

Rat	Day 26	Day 27	Day 28	Day 29	Day 30
S(H)77♂	7.07	6.13	4.80	4.00	10.20
S(H)80♂	6.87	9.40	6.40	3.93	6.40
S(HW)114♂	4.47	3.60	4.60	5.80	5.33
S(CW)126♂	13.20	7.47	12.27	3.53	6.27
S(HW)130♂	4.40	6.87	4.47	7.47	5.80
S(HW)131♂	5.33	8.93	5.87	2.67	3.87
S(HW)132♂	9.53	3.27	5.87	3.47	2.87
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	2.00	5.20	4.00	4.27	4.20
S(CW)149♂	5.87	7.20	4.53	4.20	2.33
S(CH)155♂	2.87	2.00	2.60		
S(CH)156♂					
S(C/EB)73♀	3.33	4.67	7.73	2.20	5.80
S(C/EB)74♀	5.73	5.07	10.40	2.13	4.13
S(H)81♀	2.93	11.60	4.40	14.53	7.80
S(CW)128♀	8.13	7.47	5.40	5.87	3.00
S(CW)129♀	8.87	11.47	7.27	2.33	3.20
S(CH)141♀					
S(CH)142♀	3.27	6.87	3.20	8.40	5.00
S(W/HC)144♀	5.27	4.67	10.00	3.53	6.60
S(W/HC)145♀	2.73	2.93	2.40		
S(W/HC)146♀	4.87	3.73	8.53	4.40	6.40
S(CH)157♀					
S(CH)159♀	9.87	2.80	2.87	2.87	
S(CH)160♀	6.13	6.67	4.40	8.53	4.53
S(W/HC)156♀	4.53	4.67	14.80	8.27	5.87
Average	4.978	5.139	5.276	4.302	4.303

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 31	Day 32	Day 33	Day 34	Day 35
S(H)77♂	10.07	7.27	7.80	4.53	5.67
S(H)80♂	6.27	6.93	6.00	6.33	10.60
S(HW)114♂	4.40	9.93	3.27	4.07	2.20
S(CW)126♂	8.13	8.47	3.07	2.13	2.53
S(HW)130♂	4.13	4.47	2.80	11.40	3.47
S(HW)131♂	2.33	3.13	3.40	2.40	1.80
S(HW)132♂	3.53	4.80	3.60	2.53	2.93
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	4.13	4.93	2.73	3.00	3.27
S(CW)149♂	4.00	5.33	3.87	3.67	5.40
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀	4.47	10.47	4.93	3.33	8.13
S(C/EB)74♀	4.87	4.87	3.60	3.07	3.07
S(H)81♀	3.73	13.20	4.53	4.27	11.27
S(CW)128♀	2.33	4.27	2.80	4.13	2.13
S(CW)129♀	3.87	7.27	3.73	3.47	2.07
S(CH)141♀					
S(CH)142♀	5.87	4.20	2.87	6.67	3.87
S(W/HC)144♀	9.60	8.00	3.60	6.27	3.93
S(W/HC)145♀					
S(W/HC)146♀	10.27	6.20	5.40	3.53	5.67
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	6.93	3.93	4.47	7.53	8.53
S(W/HC)166♀	2.20	5.07	5.53	4.20	4.67
Average	4.354	5.075	3.583	3.868	4.024

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 36	Day 37	Day 38	Day 39	Day 40
S(H)77♂	4.47	6.60	6.53	9.40	2.80
S(H)80♂	7.53	5.07	4.53	5.27	6.80
S(HW)114♂	3.20	5.93	5.20	4.00	4.60
S(OW)126♂	2.60	1.67	2.40	4.40	1.87
S(HW)130♂	6.20	4.20	3.07	3.00	2.40
S(HW)131♂	7.20	3.47	3.53	4.60	2.67
S(HW)132♂	3.20	4.00	6.33	2.07	2.80
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(OW)147♂					
S(OW)148♂	4.27	3.20	3.60	5.00	3.27
S(OW)149♂	4.13	3.33	3.47	4.53	6.07
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀	4.13	3.13	4.27	2.67	3.47
S(C/EB)74♀	2.93				
S(H)81♀	8.73	14.20	9.07	10.87	8.33
S(OW)128♀	3.00	5.40	3.40	4.47	5.87
S(OW)129♀	5.33	5.13	3.27	5.80	5.73
S(CH)141♀					
S(CH)142♀	2.93	5.80	2.80	3.67	7.87
S(W/HC)144♀	3.13	5.73	3.47	4.73	5.73
S(W/HC)145♀					
S(W/HC)146♀	6.07	4.87	6.87	24.87	4.67
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	9.20	14.47	9.93	8.87	4.47
S(W/HC)156♀	5.87	5.00	4.47	6.40	3.93
Average	4.121	4.457	3.958	4.905	4.006

Table Xa. Inclined Plane Learning by Normal Rats.

Rat	Day 41	Day 42	Day 43	Day 44	Day 45
S(H)77♂	5.07	6.07	6.13	2.33	6.73
S(H)80♂	6.47	5.67	4.13	5.33	7.07
S(HW)114♂	3.47	7.73	3.27	6.20	6.93
S(CW)126♂	2.47	4.73	2.47	3.87	5.00
S(HW)130♂	3.73	5.27	2.53	3.53	2.87
S(HW)131♂	4.53	1.93	6.27	4.07	3.47
S(HW)132♂	2.80	1.73	3.33	3.00	3.07
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	3.73	3.93	4.00	3.33	2.73
S(CW)149♂	5.73	5.67	3.93	5.67	4.93
S(CH)155♂					
S(CH)156♂					
S(C/TE)73♀	3.40	6.60	3.80	8.20	2.00
S(C/TE)74♀					
S(H)81♀	3.07	4.53	2.47	2.67	2.53
S(CW)128♀	3.00	2.80	3.93	5.87	2.67
S(CW)129♀	4.93	5.80	5.73	2.07	7.00
S(CH)141♀					
S(CH)142♀	3.53	4.80	2.53	3.00	3.53
S(W/HC)144♀	3.53	4.87	4.93	6.67	2.53
S(W/HC)145♀					
S(W/HC)146♀	6.13	7.33	5.13	4.60	9.27
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	5.33	3.07	4.47	3.67	7.07
S(W/HC)166♀	9.00	5.73	2.80	3.27	3.80
Average	3.748	4.033	3.446	3.729	3.857

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 46	Day 47	Day 48	Day 49	Day 50
S(H)77♂	3.07	2.13	3.33	5.27	10.53
S(H)80♂	3.33	3.53	7.33	3.07	6.33
S(HW)114♂	4.73	2.33	3.67	1.87	1.67
S(CW)126♂	2.00	1.73	2.00		
S(HW)130♂	4.60	2.73	5.60	6.53	2.80
S(HW)131♂	5.33	2.47	2.13	2.47	
S(HW)132♂	2.27	2.87	3.80	2.27	4.67
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	2.07	3.60	3.20	4.07	2.07
S(CW)149♂	8.27	5.40	2.60	2.67	2.73
S(CH)155♂					
S(CH)156♂					
S(C/HB)73♀	2.13	2.73			
S(C/HB)74♀					
S(H)81♀					
S(CW)128♀	1.87	4.80	3.47	2.13	2.27
S(CW)129♀	3.07	5.47	3.87	5.93	3.20
S(CH)141♀					
S(CH)142♀	3.13	2.60	2.53		
S(W/HC)144♀	3.40	5.07	3.67	4.53	3.73
S(W/HC)145♀					
S(W/HC)146♀	8.87	3.20	2.93	2.40	2.40
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	4.73	3.13	3.20	3.13	4.87
S(W/HC)166♀	3.07	3.87	3.47	3.13	1.73
Average	3.367	3.091	3.159	3.050	3.113

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 51	Day 52	Day 53	Day 54	Day 55
S(H)77♂	3.67	4.93	3.33	4.80	6.47
S(H)80♂	5.80	10.80	8.67	6.93	8.87
S(HW)114♂	2.13				
S(CW)126♂					
S(HW)130♂	2.40	2.93			
S(HW)131♂					
S(HW)132♂	2.87	2.13	2.40	3.20	3.07
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂	3.27	2.27	1.73	1.73	
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/HB)73♀					
S(C/HB)74♀					
S(H)81♀					
S(CW)128♀	1.53	2.13			
S(CW)129♀	5.00	3.67	3.93	3.20	11.00
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	2.73	4.07	2.87	5.07	4.00
S(W/HC)145♀					
S(W/HC)146♀	3.93	5.53	4.07	3.47	17.87
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	5.47	3.73	2.53	3.60	4.07
S(W/HC)166♀	5.47	3.67	2.07	2.07	1.87
Average	3.044	3.160	2.841	2.924	3.759

Table Xa. Inclined Plane Learning by Normal Rats.

Rat	Day 56	Day 57	Day 58	Day 59	Day 60
S(H)77♂	4.87	4.27	3.87	3.53	2.53
S(H)80♂	8.13	6.53	5.53	8.27	17.33
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂	2.53	2.47	2.13		
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	2.73	6.47	9.60	6.47	5.00
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	2.33	5.27	3.47	3.67	4.20
S(W/HC)145♀					
S(W/HC)146♀	7.40	16.00	5.47	4.27	7.93
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	4.47	3.20	3.80	3.60	4.33
S(W/HC)166♀					
Average	3.000	3.392	3.047	2.991	3.375

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 61	Day 62	Day 63	Day 64	Day 65
S(H)77♂	8.07	7.13	4.73	19.67	2.53
S(H)80♂	5.60	9.33	7.73	7.27	11.60
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/WB)73♀					
S(C/WB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	5.60	5.73	3.53	16.53	4.27
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	10.67	5.00	2.87	4.27	5.00
S(W/HC)145♀					
S(W/HC)146♀	2.93	6.93	4.13	6.67	3.73
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	2.40	3.47	2.53	4.20	4.00
S(W/HC)166♀					
Average	3.173	3.251	2.648	3.951	3.035

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 66	Day 67	Day 68	Day 69	Day 70
S(H)77♂	5.07	3.40	9.67	12.13	5.27
S(H)80♂	8.40	7.00	8.00	7.80	9.47
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/TE)73♀					
S(C/TE)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	6.47	7.20	5.93	3.00	3.93
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	3.20	8.73	4.87	4.47	4.73
S(W/HC)145♀					
S(W/HC)146♀	4.33	4.33	4.33	4.73	2.33
S(CH)157♀					
S(CH)159♀					
S(CH)160♀	5.53	2.67	1.93	2.07	
S(W/HC)166♀					
Average	3.098	3.109	3.155	3.138	2.949

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 71	Day 72	Day 73	Day 74	Day 75
S(H)77♂	6.73	10.00	4.93	3.13	14.20
S(H)80♂	7.80	6.07	6.40	4.73	5.93
S(HW)114♂					
S(OW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(OH)140♂					
S(W/HC)143♂					
S(OW)147♂					
S(OW)148♂					
S(OW)149♂					
S(OH)155♂					
S(OH)156♂					
S(O/EE)73♀	L.				
S(O/EE)74♀					
S(H)81♀					
S(OW)128♀					
S(OW)129♀	5.13	6.87	5.20	4.73	5.07
S(OH)141♀					
S(OH)142♀					
S(W/HC)144♀	3.87	2.67	3.20	2.20	3.60
S(W/HC)145♀					
S(W/HC)146♀	3.60	4.40	13.00	2.27	2.93
S(OH)157♀					
S(OH)159♀					
S(OH)160♀					
S(W/HC)166♀					
Average	2.976	3.072	3.163	2.640	3.129

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 76	Day 77	Day 78	Day 79	Day 80
S(H)77♂	3.80	3.00	4.67	4.93	2.20
S(H)80♂	4.53	4.53	5.33	3.60	10.80
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	2.87	7.20	4.47	6.93	5.33
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	4.40	4.60	4.00	2.40	2.20
S(W/HC)145♀					
S(W/HC)146♀	2.27				
S(CH)157♀					
S(CH)159♀					
S(CH)160♀					
S(W/HC)166♀					
Average	2.667	2.799	2.770	2.750	2.839

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 81	Day 82	Day 83	Day 84	Day 85
S(H)77♂	13.93	2.93	1.93	4.00	5.27
S(H)80♂	5.53	4.73	5.87	5.93	6.00
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	6.40	5.27	5.20	2.67	6.47
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀	2.33				
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)159♀					
S(CH)160♀					
S(W/HC)166♀					
Average	3.994	2.663	2.665	2.652	2.803

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 86	Day 87	Day 88	Day 89	Day 90
S(H)77♂	5.20	6.67	4.73	3.07	2.67
S(H)80♂	5.20	4.53	4.20	5.60	5.33
S(NW)114♂					
S(CW)126♂					
S(NW)130♂					
S(NW)131♂					
S(NW)132♂					
S(NW)133♂					
S(NW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/TB)73♀					
S(C/TB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	5.53	6.87	4.20	4.80	4.93
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)159♀					
S(CH)160♀					
S(W/HC)166♀					
Average	2.763	2.834	2.669	2.681	2.663

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 91	Day 92	Day 93	Day 94	Day 95
S(H)77♂	4.87	4.47	2.93	5.00	7.20
S(H)80♂	5.93	5.87	6.13	7.33	8.53
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/HH)73♀					
S(C/HH)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀	3.73	2.67	2.67		
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)159♀					
S(CH)160♀					
S(W/HC)166♀					
Average	3.683	2.665	2.623	2.732	2.846

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	Day 96	Day 97	Day 98	Day 99	Day 100
S(H)77♂	4.53	2.87	2.13	9.67	2.13
S(H)80♂	9.00	7.20	6.47	9.07	7.33
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂					
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀					
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)159♀					
S(CH)160♀					
S(W/HC)166♀					
Average	2.772	2.657	2.608	2.946	2.637

Table Xa. Inclined Plane Learning by Normal Rats.

Rat	Failed to learn.	Days required to learn.
S(H)77♂	1	100-
S(H)80♂	1	100-
S(HW)114♂		31
S(CW)126♂		48
S(HW)130♂		52
S(HW)131♂		49
S(HW)132♂		58
S(HW)133♂		12
S(HW)134♂		9
S(CH)140♂		17
S(W/HC)143♂		10
S(CW)147♂		15
S(CW)148♂		54
S(CW)149♂		59
S(CH)155♂		28
S(CH)156♂		20
S(C/EB)73♀		47
S(C/EB)74♀		36
S(H)81♀		45
S(CW)128♀		52
S(CW)129♀		93
S(CH)141♀		24
S(CH)142♀		48
S(W/HC)144♀		81
S(W/HC)145♀		28
S(W/HC)146♀		76
S(CH)157♀		23
S(CH)159♀		29
S(CH)160♀		89
S(W/HC)166♀		55
Total	2 : Average	45.97

Table Xa. Inclined Plane Learning by Normal Rats.

Rat #	First trial after 60 days' rest.
S(H)??♂	-- --
S(H)80♂	------
S(HW)114♂	24.00
S(CW)126♂	7.00
S(HW)130♂	9.60
S(HW)131♂	7.60
S(HW)132♂	3.40
S(HW)133♂	8.80
S(HW)134♂	54.60
S(CH)140♂	33.80
S(W/HC)143♂	14.00
S(CW)147♂	12.40
S(CW)148♂	90.00
S(CW)149♂	25.40
S(CH)155♂	6.20
S(CH)156♂	6.40
S(C/EB)73♀	5.00
S(C/EB)74♀	5.80
S(H)81♀	8.80
S(CW)128♀	56.20
S(CW)129♀	15.20
S(CH)141♀	17.40
S(CH)142♀	33.80
S(W/HC)144♀	66.00
S(W/HC)145♀	2.40
S(W/HC)146♀	24.20
S(CH)157♀	105.00
S(CH)159♀	30.40
S(CH)160♀	2.20
S(W/HC)166♀	2.00
Average	22.587

Table No. Absolute Retention of Normal Rats.

Rat #	Day 1	Day 2	Day 3	Day 4	Day 5
S(H)77♂	-----	-----	-----	-----	-----
S(H)80♂	-----	-----	-----	-----	-----
S(HW)114♀	3.53	2.07			
S(CW)126♂	4.27	5.47	3.80	2.87	8.60
S(HW)130♂	5.27	3.27	4.00	2.20	
S(HW)131♂	5.67	2.87			
S(HW)132♂	2.60				
S(HW)133♂	4.87	3.33	3.60		
S(HW)134♂	32.93	4.53	3.47	18.00	2.73
S(CH)140♂	142.07	10.40	4.73	8.40	3.93
S(W/HC)143♂	13.60	5.33	3.07		
S(CW)147♂	7.60	3.93	4.20	5.80	9.60
S(CW)148♂	34.40	2.07			
S(CW)149♂	99.33	4.93	8.20	2.93	
S(CH)155♂	5.27	5.33	2.80		
S(CH)156♂	5.53	5.07	9.87	8.33	3.47
S(C/EB)73♀	8.80	5.20	3.27	4.27	3.73
S(C/EB)74♀	3.87	8.93	2.33		
S(H)81♀	14.33	7.93	2.80		
S(CW)128♀	23.13	12.87	3.40	2.93	10.27
S(CW)129♀	7.87	3.47	6.47	5.33	2.67
S(CH)141♀	8.00	2.60			
S(CH)142♀	12.60	4.40	9.33	2.20	
S(W/HC)144♀	26.13	6.80	2.73		
S(W/HC)145♀	2.53				
S(W/HC)146♀	34.27	8.27	2.53		
S(CH)157♀	100.73	21.73	4.47	5.33	4.07
S(CH)159♀	12.33	20.67	14.13	6.40	45.60
S(CH)160♀	2.60				
S(W/HC)166♀	3.60	4.33	3.27	2.40	
Average	22.598	6.198	4.279	3.985	5.021

Table Xc. Inclined Plane Relearning by Normal Rats.

Rat #	Day 6	Day 7	Day 8	Day 9	Day 10
S(H)77♂	-----	-----	-----	-----	-----
S(H)80♂	-----	-----	-----	-----	-----
S(HW)114♂					
S(CW)126♂	3.40	8.67	3.93	5.40	2.73
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂	4.07	5.60	2.40		
S(W/HC)143♂					
S(CW)147♂	7.73	4.33	10.73	4.53	5.07
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀	1.87				
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀	1.87				
S(CW)129♀	2.67				
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀	2.53				
S(CH)159♀	8.33	19.27	21.60	10.20	19.93
S(CH)160♀					
S(W/HC)166♀					
Average	3.057	3.569	3.598	3.021	3.293

Table Xc. Inclined Plane Relearning by Normal Rats.

Rat #	Day 11	Day 12	Day 13	Day 14	Day 15
S(H)77♂	-----	-----	-----	-----	-----
S(H)80♂	-----	-----	-----	-----	-----
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
C(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
C(W/HC)143♂					
S(CW)147♂	6.27	5.33	5.73	3.60	4.47
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
C(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀					
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)159♀	8.53	30.40	16.67	2.93	
S(CH)160♀					
C(CH)166♀					
Average	2.929	3.676	3.200	2.633	2.664

Table Xc. Inclined Plane Relearning by Normal Rats.

Rat #	Day 16	Day 17	Day 18	Day 19	Day 20 to 50
S(H)77♂	-----	-----	-----	-----	-----
S(H)80♂	-----	-----	-----	-----	-----
S(HW)114♂					
S(CW)126♂					
S(HW)130♂					
S(HW)131♂					
S(HW)132♂					
S(HW)133♂					
S(HW)134♂					
S(CH)140♂					
S(W/HC)143♂					
S(CW)147♂	7.60	2.27			
S(CW)148♂					
S(CW)149♂					
S(CH)155♂					
S(CH)156♂					
S(C/EB)73♀					
S(C/EB)74♀					
S(H)81♀					
S(CW)128♀					
S(CW)129♀					
S(CH)141♀					
S(CH)142♀					
S(W/HC)144♀					
S(W/HC)145♀					
S(W/HC)146♀					
S(CH)157♀					
S(CH)158♀					
S(CH)159♀					
S(W/HC)160♀					
Average	2.776	2.586	2.586	2.586	2.586

Table Xc. Inclined Plane Relearning by Normal Rats.

Rat #	Failed to relearn.	Days required to relearn.
S(H)77♂		--
S(H)80♂		--
S(HW)114♂		2
S(CW)126♂		10
S(HW)130♂		4
S(HW)131♂		2
S(HW)132♂		1
S(HW)133♂		3
S(HW)134♂		5
S(CH)140♂		8
S(W/HC)143♂		3
S(CW)147♂		17
S(CW)148♂		2
S(CW)149♂		4
S(CH)155♂		3
S(CH)156♂		5
S(C/EB)73♀		6
S(C/EB)74♀		3
S(H)81♀		3
S(CW)128♀		6
S(CW)129♀		6
S(CH)141♀		2
S(CH)142♀		4
S(W/HC)144♀		3
S(W/HC)145♀		1
S(W/HC)146♀		3
S(CH)157♀		8
S(CH)158♀		14
S(CH)160♀		1
S(CH)166♀		4
Total	0 : Average	4.68

Table Xo. Inclined Plane Relearning by Normal Rats.

Rat ♀	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms	Water in brain %
S(H)77♂	181.	140.1	1.7259	.5058	78.45
S(H)80♂	182.	156.9	1.7174	.4982	78.27
S(HW)114♂	197.	194.5	1.7595	.5488	78.27
S(OW)126♂	202.	203.2	1.7307	.5237	78.32
S(HW)130♂	193.	168.1	1.8946	.5564	78.33
S(HW)131♂	205.	224.8	1.9185	.5560	78.38
S(HW)132♂	205.	248.0	1.9762	.6208	78.52
S(HW)133♂	200.	187.9	1.8324	.5722	78.18
S(HW)134♂	215.	251.9	1.9471	.5695	78.24
S(OH)140♂	200.	202.2	1.9139	.5759	77.95
S(W/HC)143♂	220.	254.2	2.0346	.6359	78.00
S(OW)147♂	203.	253.3	1.7681	.5413	78.81
S(OW)148♂	205.	233.8	1.8092	.5590	78.44
S(OW)149♂	203.	238.5	1.7820	.5204	78.49
S(OH)155♂	207.	252.7	1.8954	.5816	78.23
S(OH)156♂	211.	242.0	1.9324	.5844	78.30
S(C/HB)73♀	181.	131.7	1.6775	.4930	78.32
S(C/HB)74♀	179.	128.3	1.6299	.4838	78.17
S(H)81♀	171.	119.1	1.5668	.4634	77.97
S(OW)138♀	192.	170.0	1.7815	.5151	78.45
S(OW)139♀	199.	196.1	1.7988	.5570	78.53
S(OH)141♀	182.	147.5	1.9036	.5316	78.41
S(OH)142♀	195.	189.5	1.9386	.5614	78.24
S(W/HC)144♀	158.	138.6	1.7628	.5200	77.91
S(W/HC)145♀	193.	177.7	1.7723	.5109	78.34
S(W/HC)146♀	192.	175.0	1.8434	.5541	77.98
S(OH)157♀	189.	183.8	1.8836	.5352	78.46
S(OH)159♀	178.	148.1	1.7347	.5021	78.44
S(OH)160♀	192.	179.3	1.8745	.5496	78.50
S(W/HC)156♀	176.	140.6	1.7760	.4497	78.87
Average	194.43	189.18	1.81840	.53922	78.319

Table Xd. Anatomical Data of Normal Rats.

Rat #	Water in cord %	Brain wt. in relation to body length.	Brain wt. in relation to body weight.	Age killed. Days.
S(H)77♂	72.40	.95365	1.13101	184.
S(H)80♂	71.68	.94363	1.09456	184.
S(HW)114♂	71.83	.89315	.90463	211.
S(OW)126♂	71.24	.85678	.85172	207.
S(HW)130♂	71.75	.98166	1.12707	197.
S(HW)131♂	71.56	.93585	.95343	197.
S(HW)132♂	71.12	.96400	.79685	250.
S(HW)133♂	71.39	.91620	.97520	197.
S(HW)134♂	70.76	.90563	.77297	197.
S(OH)140♂	70.45	.95695	.94654	168.
S(W/HC)143♂	69.43	.92482	.80039	196.
S(OW)147♂	71.61	.87099	.69803	174.
S(OW)148♂	71.15	.88254	.77382	185.
S(OW)149♂	70.98	.86395	.74080	185.
S(OH)155♂	70.56	.91565	.75006	177.
S(OH)156♂	71.42	.91583	.79851	166.
S(S/HB)73♀	71.74	.92680	1.27373	197.
S(C/HB)74♀	71.99	.91056	1.27038	197.
S(H)81♀	71.58	.91626	1.31553	184.
S(OW)128♀	70.47	.92792	1.04800	207.
S(OW)129♀	70.99	.90392	.91729	260.
S(OH)141♀	71.56	1.04593	1.29058	168.
S(OH)142♀	70.93	.99415	1.02301	221.
S(W/HC)144♀	69.96	.93766	1.27186	207.
S(W/HC)145♀	71.19	.91820	.99736	196.
S(W/HC)116♀	70.37	.96010	1.05337	207.
S(OH)157♀	71.60	.94370	1.02481	177.
S(OH)158♀	71.98	.99126	1.17130	177.
S(OH)160♀	71.47	.97630	1.04545	177.
S(W/HC)166♀	72.20	1.00909	1.26316	172.
Average	71.223	.93474	1.00275	194.

Table Xd. Anatomical Data of Normal Rats.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	4673.131	1218.976	166.997	56.576	22.926
Nor. Avg.	2769.953	1072.722	133.287	61.600	23.998

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
Inb. Avg.	36.878	12.402	11.061	10.751	8.137
Nor. Avg.	25.874	13.478	11.704	11.280	6.961

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
Inb. Avg.	9.383	7.876	8.625	7.188	9.586
Nor. Avg.	6.759	6.858	6.347	7.045	6.383

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
Inb. Avg.	8.710	8.060	7.364	9.191	6.717
Nor. Avg.	5.069	5.400	6.158	5.376	5.382

Learning	Day 21	Day 22	Day 23	Day 24	Day 25
Inb. Avg.	6.919	6.363	6.951	6.458	7.329
Nor. Avg.	5.284	4.378	5.173	5.280	5.025

Learning	Day 26	Day 27	Day 28	Day 29	Day 30
Inb. Avg.	5.674	6.262	6.627	5.514	27.502
Nor. Avg.	4.978	5.139	5.276	4.302	4.303

Learning	Day 31	Day 32	Day 33	Day 34	Day 35
Inb. Avg.	7.440	6.707	6.416	6.775	6.957
Nor. Avg.	4.354	5.075	3.883	3.868	4.024

Table XI. Comparative Summary of Inbred and Normal Inclined Plane Results.

Learning	Day 36	Day 37	Day 38	Day 39	Day 40
Inb. Avg.	6.957	5.334	5.689	5.479	5.289
Nor. Avg.	4.191	4.457	3.958	4.905	4.096

Learning	Day 41	Day 42	Day 43	Day 44	Day 45
Inb. Avg.	4.896	4.938	5.093	4.762	4.553
Nor. Avg.	3.748	4.033	3.446	3.729	3.857

Learning	Day 46	Day 47	Day 48	Day 49	Day 50
Inb. Avg.	4.011	5.076	3.831	4.991	5.105
Nor. Avg.	3.367	3.091	3.152	3.050	3.113

Learning	Day 51	Day 52	Day 53	Day 54	Day 55
Inb. Avg.	4.762	4.408	4.693	5.006	4.191
Nor. Avg.	3.044	3.160	2.841	2.924	3.759

Learning	Day 56	Day 57	Day 58	Day 59	Day 60
Inb. Avg.	4.072	3.916	5.909	6.236	4.953
Nor. Avg.	3.000	3.392	3.047	2.991	3.375

Learning	Day 61	Day 62	Day 63	Day 64	Day 65
Inb. Avg.	4.172	5.026	4.437	3.317	3.741
Nor. Avg.	3.173	3.251	2.848	3.081	3.035

Learning	Day 66	Day 67	Day 68	Day 69	Day 70
Inb. Avg.	4.160	3.955	5.858	4.806	4.260
Nor. Avg.	3.092	3.109	3.155	3.138	2.949

Table XI. Comparative Summary of Inbred and Normal Inclined Plane Results.

Learning	Day 71	Day 72	Day 73	Day 74	Day 75
Inb. Avg.	4.393	3.869	3.461	3.713	3.649
Nor. Avg.	2.976	3.072	3.163	2.649	3.129

Learning	Day 76	Day 77	Day 78	Day 79	Day 80
Inb. Avg.	3.726	3.669	3.646	4.043	3.648
Nor. Avg.	2.667	2.799	2.770	2.750	2.839

Learning	Day 81	Day 82	Day 83	Day 84	Day 85
Inb. Avg.	3.359	3.465	3.558	3.322	3.471
Nor. Avg.	3.094	2.663	2.665	2.652	2.823

Learning	Day 86	Day 87	Day 88	Day 89	Day 90
Inb. Avg.	3.729	3.388	3.686	3.639	4.179
Nor. Avg.	2.763	2.834	2.669	2.661	2.663

Learning	Day 91	Day 92	Day 93	Day 94	Day 95
Inb. Avg.	3.501	3.393	4.124	3.463	3.457
Nor. Avg.	2.693	2.665	2.623	2.732	2.846

Learning	Day 96	Day 97	Day 98	Day 99	Day 100
Inb. Avg.	2.999	3.460	3.604	2.982	3.519
Nor. Avg.	2.772	2.657	2.608	2.946	2.637

	Failed to learn.	Days required to learn.	Absolute retention.
Inb. Avg.	11	73.70+	31.842
Nor. Avg.	2	48.47+	22.987

Table XI. Comparative Summary of Inverse and Normal Inclined Plane Results.

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
Inb. Avg.	41.789	7.301	5.436	4.785	5.067
Nor. Avg.	22.598	6.198	4.279	3.985	5.021

Relearning	Day 6	Day 7	Day 8	Day 9	Day 10
Inb. Avg.	5.175	4.239	3.404	3.196	2.828
Nor. Avg.	3.057	3.569	3.598	3.021	3.293

Relearning	Day 11	Day 12	Day 13	Day 14	Day 15
Inb. Avg.	3.508	2.712	2.796	2.845	2.807
Nor. Avg.	2.929	3.676	3.200	2.633	2.664

Relearning	Day 16	Day 17	Day 18	Day 19	Day 20
Inb. Avg.	2.610	2.603	2.596	2.733	2.677
Nor. Avg.	2.776	2.886			

Relearning	Day 21	Day 22	Day 23	Day 24	Day 25 to 50
Inb. Avg.	2.607	2.729	2.596	2.554	
Nor. Avg.					

Table XI. Comparative Summary of Inbred and Normal Inclined Plane Results.

	Failed to relearn.	Days required to relearn.
Inb. Avg.	0	6.74
Nor. Avg.	0	4.68

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
Inb. Avg.	195.93	164.37	1.72063	.53787	78.363
Nor. Avg.	194.43	169.19	1.81840	.53932	78.319

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
Inb. Avg.	71.437	.87972	.97889	220.
Nor. Avg.	71.223	.93474	1.00275	194.

Table XI. Comparative Summary of Inbred and Normal Inclined Plane Results.

Learning	Day 1	Day 2	Day 3	Day 4	Day 5
7th Avg.	5656.546	1463.707	123.213	53.583	17.159
8th Avg.	3689.716	974.245	210.781	58.369	28.693

Learning	Day 6	Day 7	Day 8	Day 9	Day 10
7th Avg.	11.142	11.373	8.160	9.845	5.853
8th Avg.	62.613	13.471	13.961	12.657	10.419

Learning	Day 11	Day 12	Day 13	Day 14	Day 15
7th Avg.	10.855	5.459	6.037	5.197	6.367
8th Avg.	7.911	10.294	11.213	9.178	12.805

Learning	Day 16	Day 17	Day 18	Day 19	Day 20
7th Avg.	5.821	4.732	6.714	6.351	5.310
8th Avg.	11.599	11.407	8.013	12.030	8.124

Learning	Day 21	Day 22	Day 23	Day 24	Day 25
7th Avg.	5.592	5.538	4.934	6.116	5.481
8th Avg.	8.245	7.187	8.969	6.801	9.177

Learning	Day 26	Day 27	Day 28	Day 29	Day 30
7th Avg.	6.204	5.636	5.809	3.965	4.875
8th Avg.	5.143	6.889	7.445	7.063	50.729

Learning	Day 31	Day 32	Day 33	Day 34	Day 35
7th Avg.	4.085	5.884	4.733	4.195	4.526
8th Avg.	10.795	7.629	8.099	9.355	9.399

Table XII. Comparative Summary of 7th and 8th Generation Inbred Inclined Plane Results.

Learning	Day 36	Day 37	Day 38	Day 39	Day 40
7th Avg.	4.481	3.921	4.192	4.467	4.561
8th Avg.	9.433	6.747	7.186	6.491	6.017

Learning	Day 41	Day 42	Day 43	Day 44	Day 45
7th Avg.	4.667	4.462	4.396	4.339	3.734
8th Avg.	5.130	5.413	5.791	5.187	5.373

Learning	Day 46	Day 47	Day 48	Day 49	Day 50
7th Avg.	3.435	4.121	3.636	3.867	4.277
8th Avg.	4.587	6.031	4.027	6.116	5.933

Learning	Day 51	Day 52	Day 53	Day 54	Day 55
7th Avg.	4.289	3.591	4.219	4.969	3.627
8th Avg.	5.235	5.226	5.168	5.044	4.755

Learning	Day 56	Day 57	Day 58	Day 59	Day 60
7th Avg.	3.251	3.584	4.406	7.917	4.325
8th Avg.	4.893	4.247	7.412	4.553	5.581

Learning	Day 61	Day 62	Day 63	Day 64	Day 65
7th Avg.	4.295	5.753	4.731	3.006	3.331
8th Avg.	4.049	4.299	4.143	3.627	4.151

Learning	Day 66	Day 67	Day 68	Day 69	Day 70
7th Avg.	3.331	3.571	4.317	5.175	4.565
8th Avg.	4.988	4.339	7.398	4.437	3.954

Table XII. Comparative Summary of 7th and 8th Generation Inbred Inclined Plane Results.

Learning	Day 71	Day 72	Day 73	Day 74	Day 75
7th Avg.	4.415	3.717	3.388	3.233	3.620
8th Avg.	4.350	4.021	3.533	4.193	3.678

Learning	Day 76	Day 77	Day 78	Day 79	Day 80
7th Avg.	3.760	3.601	4.130	4.705	3.623
8th Avg.	3.691	3.736	3.162	3.381	3.673

Learning	Day 81	Day 82	Day 83	Day 84	Day 85
7th Avg.	3.319	3.039	3.322	3.135	3.424
8th Avg.	3.398	3.891	3.794	3.509	3.519

Learning	Day 86	Day 87	Day 88	Day 89	Day 90
7th Avg.	3.251	3.037	3.144	3.361	3.837
8th Avg.	4.207	3.739	4.228	3.916	4.503

Learning	Day 91	Day 92	Day 93	Day 94	Day 95
7th Avg.	3.211	3.157	3.273	2.913	2.678
8th Avg.	3.792	3.629	4.975	4.014	4.237

Learning	Day 96	Day 97	Day 98	Day 99	Day 100
7th Avg.	2.725	2.650	3.085	3.201	3.067
8th Avg.	3.273	4.270	4.133	2.763	3.954

	Failed to learn.	Days required to learn.	Absolute retention.
7th Avg.	4	59.69-	44.945
8th Avg.	7	86.53-	13.825

Table XII. Comparative Summary of 7th and 8th Generation Inbred Inclined Plane Results.

Relearning	Day 1	Day 2	Day 3	Day 4	Day 5
7th Avg.	66.322	9.265	6.322	5.758	6.279
8th Avg.	8.058	4.438	4.218	3.443	3.400

Relearning	Day 6	Day 7	Day 8	Day 9	Day 10
7th Avg.	6.297	4.467	5.879	3.728	3.109
8th Avg.	3.633	3.926	2.441		

Relearning	Day 11	Day 12	Day 13	Day 14	Day 15
7th Avg.	4.285	3.909	3.055	3.139	3.073
8th Avg.					

Relearning	Day 16	Day 17	Day 18	Day 19	Day 20
7th Avg.	2.733	2.721	2.709	2.945	2.845
8th Avg.					

Relearning	Day 21	Day 22	Day 23	Day 24	Day 25 to 50
7th Avg.	2.727	2.939	2.709	2.636	
8th Avg.					

Table XII. Comparative Summary of 7th and 8th Generation Inbred Inclined Plane Results.

	Failed to relearn.	Days required to relearn.
7th Avg.	0	8.00
8th Avg.	0	5.00

Anatomical Data	Body length in mm.	Body weight in grms.	Brain weight in grms.	Cord weight in grms.	Water in brain %
7th Avg.	202.13	201.44	1.72868	.54607	78.542
8th Avg.	189.73	167.33	1.71299	.52967	78.185

Anatomical Data	Water in cord %	% Brain wt. in relation to body length.	% Brain wt. in relation to body weight.	Age killed. Days.
7th Avg.	71.569	.85622	.90560	223
8th Avg.	71.304	.90323	1.05215	217

Table XII. Comparative Summary of 7th and 8th Generation Inbred Inclined Plane Results.

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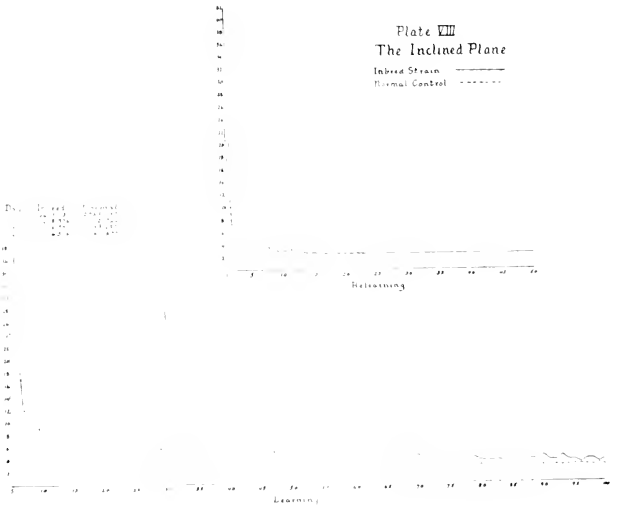
Plate VIII

The Inclined Plane

Inbred Strain ——————

Normal Control - - - - - - -



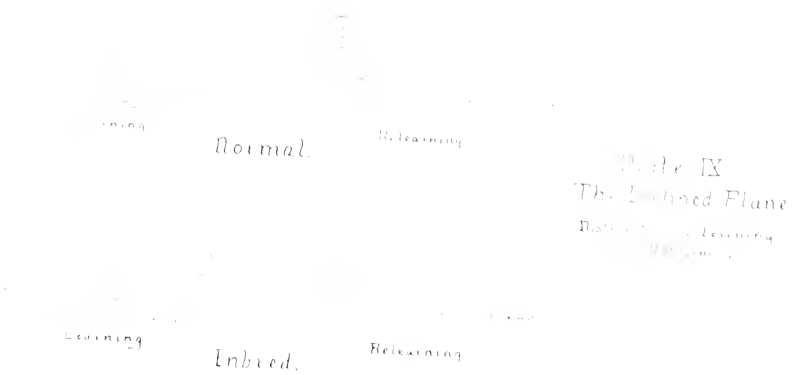
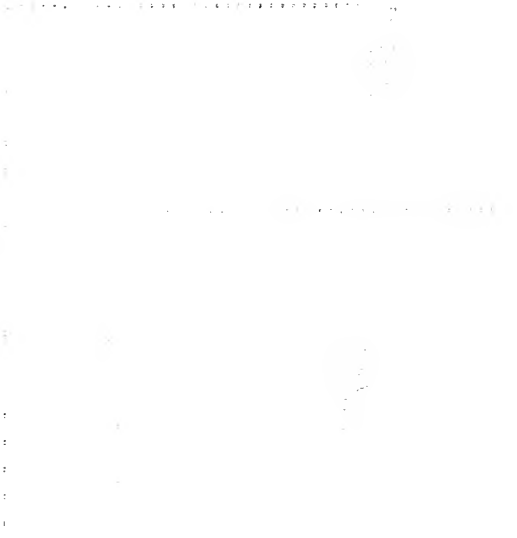


Plate IX
The Inclined Plane



VI. SUMMARY AND CONCLUSIONS.

During the long course of experimentation, the results of which are here set forth, the writer became convinced that the deterioration in brain weight and in the ability to form habits were due, primarily, to the inbreeding. I would not maintain that inbreeding, per se, is necessarily productive of deleterious results if the parent stock be perfect in every respect; but it is impossible, by any means at our command, to determine physical perfection in any organism. As only two strains of inbred rats were used it seems best to let the question of the effects of inbreeding remain open until many strains of inbred rats, raised under different conditions of nourishment, temperature, etc., have been subjected to parallel experiments. The two strains of rats used by me were the products of inbreeding, and their brains were absolutely and relatively less, on the average, in weight than those of the normal rats used as control. And, too, the ability of the inbred rats to form habits agreed with the lesser brain weight in that they were inferior in both these respects to the normal control series.

There were used in all the experiments one hundred and twenty-four rats: sixty-two inbreds and sixty-two normal controls. An equal number of males and females from inbreds and normals were used in each experiment. Table XI shows the distribution of relative brain weights (with reference to body length) of the inbred rats and of the normal control series. The inbred distribution is represented by the lower curve, that of the normal by the upper curve. The greatest frequency in the inbred curve occurs at .90%; in the normal curve at

.33%. The inbred distribution is from .70% to .76%; that of the normals from .64% to 1.0%. The average relative brain weight (with reference to body length) of the sixty-two normal rats is .93351%; that of the inbreds is .87335%, or 6.44% less than that of the normals.

In order to compare the ability of the rats of the lesser brain weight strain (inbred rats) with a normal control series three experiments were used:

1. The Maze, in which all the rats used were given five trials daily until they had learned perfectly, or, failing to learn, had worked one hundred days (500 trials). At the expiration of sixty days after perfect learning the rats, except those failing to learn, were tested for retention and relearning until relearning was perfect, or, failing relearning, for fifty days (250 trials).

2. The Preliminary Inclined Plane, in which all the rats used were given five trials daily for twenty days (100 trials); at the expiration of sixty days after this period they were all tested for retention and relearning for a period of five days (25 trials).

3. The Inclined Plane, in which all the rats used were given three trials daily until they had learned perfectly, or, failing to learn, had worked one hundred days (300 trials). At the expiration of sixty days after perfect learning the rats, except those failing to learn, were tested for retention and relearning until relearning was perfect.

In all these experiments the strain of rats of lesser relative brain weight (the inbreds) learned less well, on the average, than the normal control series. In the maze and inclined plane experiments the average number of days required to learn and relearn and the time of absolute retention was

for greater in the case of the inbred rats than in that of the normal control series. In the maze experiment two inbreds and one normal failed to learn; two inbreds failed to relearn. In the inclined plane experiment eleven inbreds and two normals failed to learn.

The behavior of the normal rats consisting partly of B strain, coupled with the fact of their lesser relative brain weight suggests the importance of crossing a strain of inbreds of lesser brain weight with normal rats, and carrying out a series of tests such as have been presented in this paper, with two controls, one normal rats and one inferior brain weight inbreds.

In the maze experiment the inbred rats of the 7th generation did a little less well than those of the 6th. In the inclined plane experiment the rats of the 8th generation did a little less well than those of the 7th. It would seem (although deterioration of brain weight ceased after the 4th generation of inbreds) that the ability to form habits deteriorated progressively with successive generations.

The writer had intended to attempt a correlation, if any existed, between the number of days to learn a habit and the number required to relearn after sixty days. But almost all the rats relearned very quickly, without reference to the number of days required for learning; in numbers, too, the rats were too few. An investigation along such a line should consist of but one relatively simple experiment, two or three hundred rats of one sex only should be used; and the period of time between the completion of learning and the beginning of relearning should be lengthened to, at the least, ninety days.

The general result of the experiments here set forth

may be summed up as follows: On the average, the strain of inbred rats having an inferior brain weight did less well in learning to form habits than did the normal control series. From these results the following may be formulated:

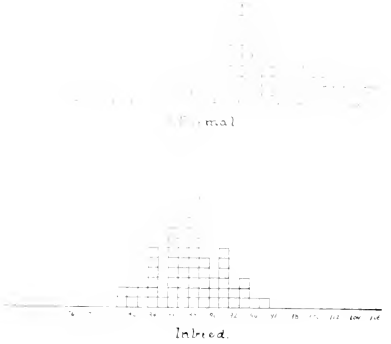
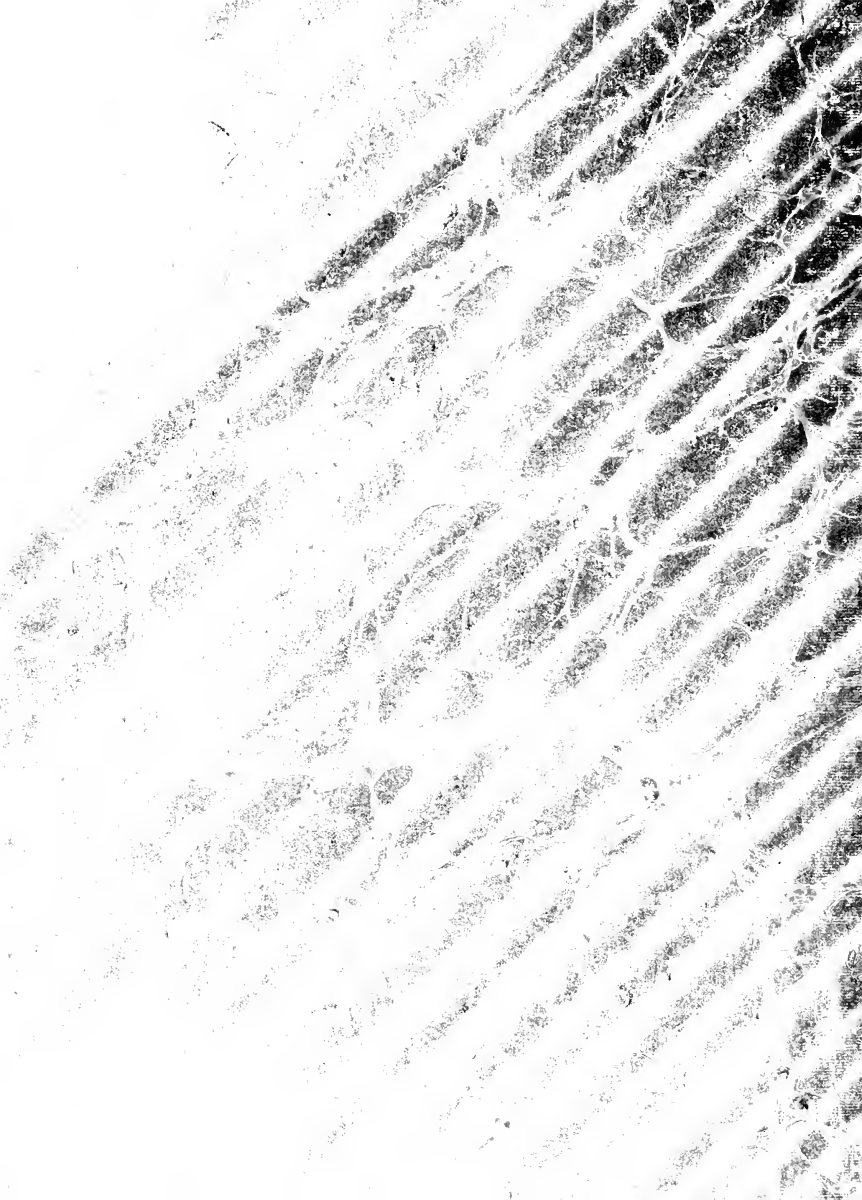
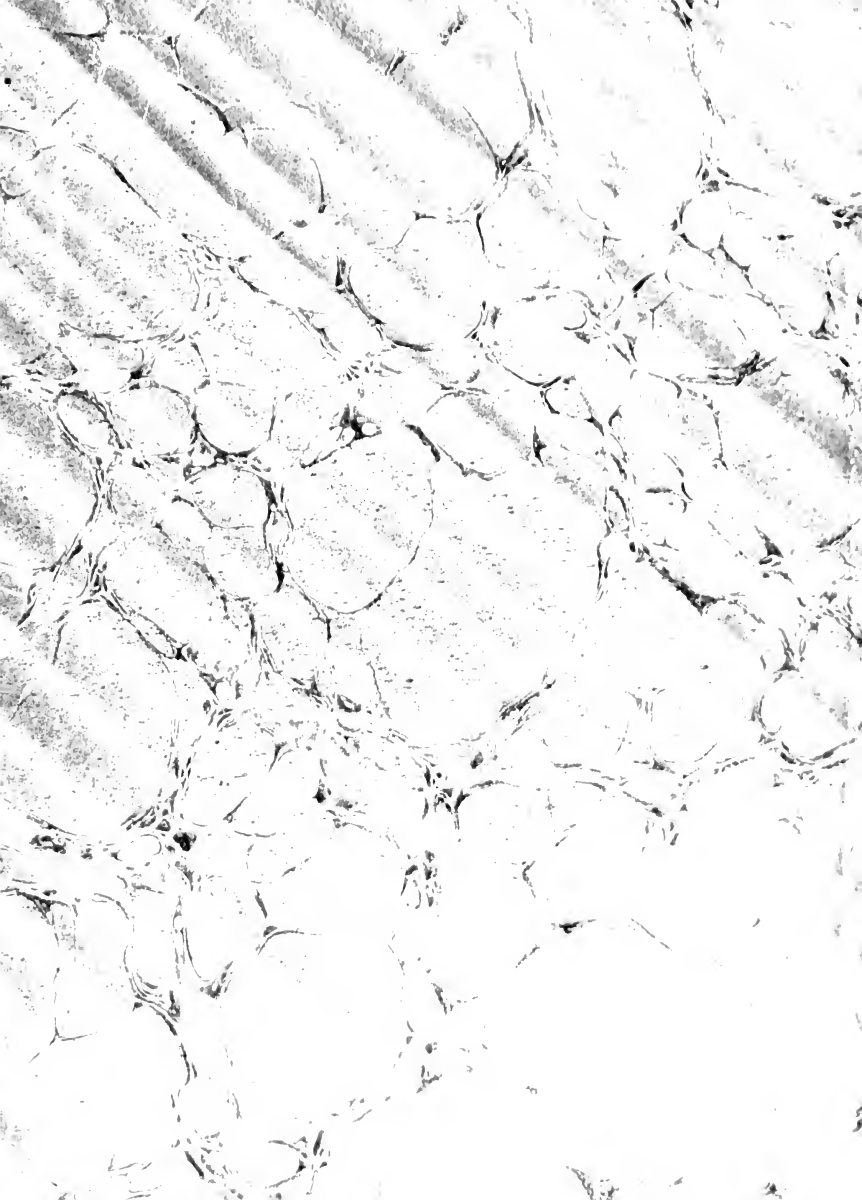


Plate XI

Distribution of Relative Brain Weights
(with reference to body length)

62 Inbred Rats
62 Normal Rats

VITA.

Warner Cheney Bassett was born in Boston, Massachusetts, June 17, 1873. He received his elementary and secondary education in the public schools of Boston and Newton, Massachusetts. From the year 1890 to the year 1906 he was in the wholesale shoe business, serving successively as receiving clerk, buyer, traveling salesman and superintendent. He entered the Collegiate Department of Clark University in 1906; was assistant in Biology during the year 1909-1910; assistant in Psychology during the year 1910-1911; and in 1911 he received the degree of Bachelor of Arts with highest honor. He spent the summer of 1910 at Cornell University in the study of Experimental Psychology. In October, 1911, he entered the Johns Hopkins University, and was appointed University Fellow in that institution for the year 1912-1913.

While at the Johns Hopkins University, Dr. Bassett studied psychology under Drs. Watson and Smith, Experimental under Dr. Meyer, Genetics under Dr. Jennings, and Neurology under Drs. Hall and Sabin.