"THE BINET TESTS AS APPLIED

to

PUPILS IN THE EIGHTH GRADE."

A Thesis Submitted to the Faculty of the

Graduate School of the University of Minnesota

by

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the

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--CONTENTS--*

TABLE No. 1.

Public School Children of St. Paul.

Binet Tests with Individual Results.

				1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	2	33	34
	Tests.			13	1	2	3	a	12	1	a	b	2	a	3	a	4	a	b	11	1	2	3	4	a	b	c	5	a	b	c					
1	B	15^2	11	F	F	P	F	1	F	F	f	f	P	3	F	f	F	f	f	P	P	P	P	F	f	f	p	P	p	p	f		45	16
2	B	13^2	13	P	F	P	P	8	P	P	p	f	P	3	F	f	P	p	p															35	10
3	B	13^2	13	P	F	P	P	7	P	P	p	f	P	5	F	f	P	p	p															25	16
4	G	13_2	12	F	F	F	P	9	P	P	p	p	P	4	F	p	P	p	p															25	16
5	B	12^2	13	P	P	P	P	9	F	P	p	f	P	8	F	p	F	f	p															20	16
6	G	15^3	11	F	F	F	F	6	F	P	p	p	P	5	F	f	F	f	p	P	P	P	P	P	p	p	p	P	p	f	p		40	16
7	G	14^2	13	P	P	P	F	7	F	P	p	p	P	4	F	f	F	f	p															35	16
8	B	16^2	12	F	P	F	F	4	P	P	p	p	P	4	F	f	P	p	p															70	12
9	G	13^2	12	F	F	F	P	8	P	P	p	f	P	5	F	f	P	p	p	P	P	P	P	P	p	f	p	P	p	f	p			50	17
10	B	15_2	13	P	P	P	F	7	F	P	p	p	P	6	F	f	F	f	p															20	17
11	B	16^2	12	F	P	P	F	7	P	P	p	f	P	5	P	f	P	p	p															20	17
12	B	16	11	F	F	F	F	7	F	F	f	f	P	6	F	f	P	p	p	P	F	P	P	P	p	p	f	P	p	f	p			45	17
13	G	16_2	11	F	F	F	P	8	F	F	f	f	P	6	F	f	P	p	p	P	F	P	P	P	p	p	p	P	f	p	p			70	17
14	B	14^2	11	F	F	P	F	4	F	F	f	f	F	0	F	f	F	f	p	P	P	F	P	P	p	p	f	P	p	f	p			40	17
15	B	13	12	F	P	F	F	7	P	P	p	f	P	5	F	f	P	p	p															20	17
16	G	14^2	11	F	P	F	F	5	F	P	p	p	P	3	F	f	F	f	p	P	P	P	P	P	p	f	p	P	p	P	p	f		50	18
17	G	15_2	11	F	P	F	F	7	F	F	p	p	P	5	F	f	P	p	p	P	P	P	P	P	p	p	p	P	p	P	p	f		45	18
18	G	14^2	12	F	P	F	F	4	P	P	p	f	P	5	F	f	P	p	p															25	18
19	G	15_2	11	F	P	F	F	5	F	P	p	p	P	3	F	p	F	f	p	P	P	P	P	P	p	f	p	P	p	P	p	f	p	40	18
20	G	13^2	13	P	P	P	F	5	P	P	p	p	P	6	F	f	P	p	p															25	18
21	G	15	11	F	P	P	F	7	F	P	p	p	P	4	F	f	F	f	p	P	P	P	P	P	p	p	p	F	p	f	f			40	18
22	G	16	11	F	F	F	F	6	F	P	p	p	P	5	F	f	F	f	p	P	P	P	P	P	p	f	p	F	p	f	f			45	19
23	G	14^2	12	F	F	F	P	8	P	P	p	f	P	4	F	f	P	p	p															60	19
24	G	14^2	12	F	F	P	F	7	P	P	p	f	P	4	F	p	P	p	p															35	19
25	G	13^2	11	F	P	F	P	8	F	P	p	f	P	5	F	f	P	f	p	P	P	P	P	P	p	f	p	P	p	f	p			40	19
26	G	15^2	12	F	F	F	F	5	F	P	p	f	P	6	F	f	P	p	p															45	1
27	G	13^2	13	P	P	P	F	7	F	P	p	f	P	5	F	f	P	p	p															35	19
28	G	14	13	P	P	P	F	7	P	P	p	p	P	5	F	f	P	p	p															30	1
29	G	13	11	F	P	F	P	8	F	P	p	p	P	7	F	f	P	p	p	P	P	P	P	P	p	p	p	P	p	f	p			35	1
30	B	14	11	F	F	F	F	5	F	F	p	f	P	4	F	f	P	p	p	P	P	P	P	P	p	f	p	F	p	f	f			45	1
31	G	15	11	F	P	F	F	7	F	F	p	f	P	4	F	f	P	p	p	P	P	P	P	P	p	f	p	P	p	p	p			45	20
32	G	13^2	11	F	P	F	F	6	F	F	p	f	P	4	F	f	P	p	p	P	P	P	P	F	p	f	p	P	p	p	p			40	1
33	G	14	11	F	F	F	P	8	F	P	p	f	P	5	F	f	F	p	p	P	P	P	P	P	p	f	p	P	p	f	p			45	2
34	G	13^2	13	P	F	P	P	8	F	P	p	f	P	5	F	f	P	p	p															30	2
35	G	13^2	12	F	F	F	P	8	P	P	p	p	P	5	F	f	P	p	p															30	2
36	B	13^2	13	P	P	P	P	8	P	P	p	p	P	5	F	f	P	p	p															25	2
37	B	14^2	12	F	F	P	F	6	P	P	p	p	P	5	F	f	P	p	p															30	3
38	G	13	13	P	P	F	P	8	P	P	p	f	P	5	F	f	P	p	p															25	3
39	G	14	13	P	P	P	F	7	P	P	p	p	P	4	F	f	P	p	p															30	3
40	G	16_2	13	P	F	P	P	8	F	P	p	f	P	6	F	f	P	f	p															30	4
41	G	14^2	11	F	F	F	P	8	F	F	f	f	P	5	F	f	P	p	p	P	P	P	P	P	p	p	p	P	p	f	p			45	6
42	B	14^2	13	P	P	P	P	9	P	P	p	p	P	5	F	p	P	p	p															30	6
43	G	15	13	P	P	P	F	6	F	P	p	p	P	5	F	f	P	p	p															35	6
44	G	14^2	11	F	F	F	P	8	F	P	p	f	P	5	F	f	P	f	p	P	P	P	P	P	p	f	p	P	p	f	p			50	7
45	G	14^2	13	P	P	P	F	7	P	P	p	p	P	4	F	f	P	p	p															35	7
46	G	15_2	13	P	F	P	P	7	F	P	p	f	P	5	F	f	P	p	p															65	8
47	G	13^3	13	P	P	P	P	8	F	P	p	p	P	5	F	f	F	p	p															40	26
48	B	14^2	13	P	P	P	P	9	F	P	p	p	P	4	F	p	P	p	p															45	9
49	B	13	12	F	P	F	P	8	F	P	p	p	P	5	F	f	P	f	p															30	9
50	G	14	13	P	P	P	P	8	F	P	p	p	P	4	F	f	P	f	p															25	10
51	B	15_2	13	P	P	F	P	8	P	P	p	p	P	4	F	f	P	p	p															35	10
52	B	15^2	11	F	F	P	F	7	F	F	p	p	P	5	F	f	P	p	p	P	P	P	P	P	p	p	p	P	F	f	f			45	10
53	G	13^2	11						F	P	p	p	P	6	F	f	F	f	f	P	P	P	P	P	p	p	p	F	f	f	f			40	0
54	G	14_2	11	F	F	F	F	7	F	P	p	p	P	5	F	f	F	f	p	P	P	P	P	P	p	p	p	F	f	f	f			65	0
55	B	14^2	13	P	P	P	F	4	F	F	f	f	P	4	F	f	P	p	p	P	P	P	P	P	p	f	p	F	p	f	f			55	0

NOTES ON TABLE NO. 1.

Col. 1. is the no. of subjects in order of examination.

" 2 is the sex. B for Boy and G for Girl.

" 3 is the age to nearest ½ year.

" 4 is the Mental age by Binet Measure.

" 6 or Fp is the 1st. problem correct.

" 9 is the no. of words defined.

" 12 is with inflection.

" 13 is visual.

" 15 is the no. of rhyme words.

"17 those with 24 syllables.

" 33 no. of min. in the examination.

" 34 no. of weeks in my room, when examined.

P - pass in year test.

p - pass in single test.

F - fail in year test.

f - fail in simple test.

TABLE No. 2.

Public School Children of St. Paul, Minn.

Detailed tabulation of test passed & failed.

	BOYS.									GIRLS								B	G	
Age.	12^2	13	13^2	14	14^2	15	15^2	16	16^2	12^2	13	13^2	14	14^2	15	15^2	16	145	143	144
No.	1	2	3	1	5	2	2	1	2	1	3	8	5	8	6	2	3	19	36	55
	1		3		3	2					1	4	3	2	2		1	9	13	22
13		2		1	2		2	1	2		2	4	2	6	4	2	2	10	22	32
	1		1		3	2			1		1	4	3	4	2	1	1	8	15	23
1		2	2	1	2		2	1	1		2	4	2	4	4	1	3	11	20	31
	1		3		5	1	1		1			4	3	3	3		1	12	14	26
2	1	2		1		1	1	1	1		3	4	2	5	3	2	2	7	21	28
	1	1	3		2	1					3	5	2	3	1		2	8	16	24
3		1		1	3	1	2	1	2			3	3	5	5	2	1	11	19	30
		2	3		3	1			2		2	3	2	4		1		11	12	23
12	1			1	2	1	2	1		1	1	5	3	4	6	1	3	8	24	32
	1	2	3		3	2	1		2	1	3	6	4	7	3	2	2	14	28	42
1				1	2		1	1				2	1	1	3		1	5	8	13
2	1	2	3	1	4	2	2	1	2	1	3	8	5	8	6	2	3	18	36	54
					1													1		1
									1									1		1
3	1	2	3	1	5	2	2	1	1	1	3	8	5	8	6	2	3	18	36	54
		2	3	1	4	1	2	1	2		2	5	2	4	3	1	1	16	18	34
4	1				1	1				1	1	3	3	4	3	1	2	3	18	21
				1	2		2	1		1	1	3	3	3	4	1	2	6	18	24
11																				
				1	2		2			1	1	3	3	3	4	1	1	5	17	22
1								1									1	1	1	2
				1	1		2	1		1	1	3	3	3	4	1	2	5	18	23
2					1													1		1
				1	2		1	1		1	1	3	3	3	4	1	2	5	18	23
3							1											1		1
				1	2		1	1		1	1	2	3	3	4	1	2	5	17	22
4							1					1						1	1	2
5					1		1	1			1	3	1	3	3	1	1	3	13	16
				1	1		1			1			2		1		1	3	5	8
	3	1	7		10	4	1		2		4	13	8	10	6	1	3	28	45	73
13		5	2	3	5	2	3	3	4		5	11	7	14	12	5	6	29	60	89
12	2	6	9	2	11	6	5	2	7	2	8	19	11	19	12	5	6	49	82	131
	2	2	3	2	9	3	3	2	1	2	4	13	9	13	12	3	6	27	62	89
				4	8		7	4		4	5	14	13	15	19	5	8	23	83	106
11				1	2		3	1		1		1	2		1		2	7	7	14
																				510
																				193

*Of the two spaces belonging to each test level, the number passing is placed above and the number failing placed below.

TABLE No. 3.

Arranged from tables 1 and 2, showing the number of children at each Mental-age level thru the different ages.

BOYS.

Age		12^2	13	13^2	14	14^2	15	15^2	16	16^2	
Mental age Level	13	1		3		3	2				9
	12		2			1				2	5
	11				1	1		2	1		5
Total		1	2	3	1	5	2	2	1	2	19
Regular				3		3	2				8
Advanced		1									1
Retarded			2		1.	2		2	1	2	10

GIRLS.

	13		1	4	3	2	2		1		13
	12		1	2		3		1			7
	11	1	1	2	2	3	4	1	2		16
Total		1	3	8	5	8	6	2	3		36
Regular			1	4	3	2	2		1		13
Advanced											
Retarded		1	2	4	2	6	4	2	2		23

* Those 15 years of age or older are retarded in school attainment.

-**:TABLE NO. 4:**-

CHILDREN OF UNIVERSITY PRACTICE SCHOOL.

NO	Sex	Grade	Age Near est $\frac{1}{2}$ Yr.	Binet's Mental age	Binet Tests with Individual Results.															
					13	1	2	3	2	1	2	3	4	1	1	2	3	4	5	10
1	G	7	12	12	F	f	p	f	P	p	p	p	p	P	p	p	p	p	p	
2	B	7	12	13	P	p	p	p	P	f	p	p	p	P	p	p	p	p	p	
3	B	7	12	12	F	f	f	p	P	p	p	p	p							
4	G	6	12	11					F	p	p	f	f	P	p	p	p	p	f	
5	B	7	13	13	P	p	f	p	P	p	p	f	p							
6	G	8	13	13	P	p	f	p	P	p	p	p	p							
7	G	8	14	13	F	f	p	f	F	f	f	p	f	P	p	p	p	f	p	
8	B	7	14	13	P	p	p	p	F	p	p	f	f							
9	G	7	14	11	F	f	f	f	F	p	p	f	f	P	p	p	p	p	f	
10	B	8	14	13	P	p	p	p												
11	B	7	14	12	F	f	f	f	P	p	p	p	p							
12	B	8	14	13	P	p	p	f	F	f	p	f	p	P	p	p	p	p	f	
13	G	7	14	13	P	p	p	p												
14	B	7	15	12	F	f	p	f	P	p	p	p	f							
15	B	7	15	13	P	p	p	f	P	p	p	f	p							
16	G	8	15	11	F	f	p	f	F	p	p	f	f	P	p	p	p	f	p	
17	B	7	15	13	P	p	p	p												
18	B	7	15	12	F	f	p	f	P	p	p	p	f							
19	B	7	15	12	F	f	f	f	P	p	p	p	f							
20	B	8	15	12	F	f	f	f	P	p	p	p	p							
21	B	8	15	13	P	p	p	p												
22	B	8	15	13	P	p	p	p												
23	B	8	16	13	P	p	p	p												
24	B	7	16	13	P	f	p	p	P	p	p	p	p							
25	G	7	16	12	F	f	f	f	P	f	p	p	p							
26	B	8	16	13	P	p	p	p												
27	B	7	16	10	F	f	p	f	F	p	p	f	f	F	p	p	f	p	f	P
28	B	8	17	13	P	p	p	p												
29	B	10	18	11	F	p	f	f	F	f	p	f	p	P	p	p	p	p	p	

P - passed

F - failed

TABLE No 5.

Arranged from tables 4 and 5 showing the number of children at each mental - age level, at the different ages.

Chronological age.	12	12^2	13	13	14	14^2	15	15^2	16	17^2	18^2	
Mental age level 13	1			1	1	3	2	2	3	1		15
12	1	1				1	1	3	1			8
11		1			2		1				1	5
10												1
Totals	2	2	1		3	4	4	5	5	1	1	29
Regular	1	1	1	1	1	3	2	2	3	1		16
Advanced	1											1
Retarded		1			2	1	2	3	2		1	12
	2	2	1	1	3	4	4	5	5	1	1	29

Those 15 years of age or older are retarded in school attainment..

University Practice School.

Detailed tabulation of tests passed and failed.

Age of	12	12^2	13	13^2	14	14^2	15	15^2	16	17^2	18^2	-	14.7
No. of	2	2	1	1	3	4	4	5	5	1	1	-	29
	1		1	1	1	3	2	2	3	1			15
13 test.	1	1			2	1	2	3	2		1	-	13
	1		1	1	1	3	2	2	2	1	1		15
1	1	1			2	1	2	3	3			-	13
	2				2	3	4	3	4	1			19
2		1	1	1	1	1		2	1		1	-	9
	1	1	1	1	1	2	1	2	3	1			14
.3.....	1...	.....	.....	.....	2...	2...	3...	3...	2.....	.....	1...	-	14....
	2	1	1	1		1	2	3	2				13
12		1			3	1	1		1		1		8
	1	2	1	1	2	1	3	3	2		1	-	16
1	1				1	1			1		1	-	5
	2	2		1	2	2	3	3	3		1		20
2			1		1								1
	2	1		1	1	1	1	3	2				12
3		1	1		2	1	2		1		1		9
	2	1	1	1		2	1	1	2		1		12
4		1			3		2	2	1				9
	2				2	1	1				1		7
11		1							1				2
	2	1			2	1	1		1		1		9
1													
	2	1			2	1	1		1		1		9
2													
	2	1			2	1	1				1		8
3									1				1
	2	1			1	1			1		1		7
4					1		1						2
	2				1		1				1		5
5		1			1	1			1				4
									1				1
LO													
	4	1	2	2	4	8	7	7	9	3	1		48
13	2	2	1	1	5	4	5	8	6		2		36
	7	6	3	4	5	6	8	10	9		2		60
12	1	2	1		7	2	4	2	3		2		24
	10	4			8	4	4		3		5		38
LL		1			2	1	1		2				7
									1				1
LO													

Totals: 147 / 67

*Of the two spaces belonging to each test level, the number passing are placed above and the number failing, below.

TABLE. No. 6.

TABLe No. 7.

Tabulated results of work done on Binet definition tests by Miss Lawrence, Professor in the Normal School at St. Cloud, Minn. From a paper read at the last meeting of the American Psychological Association.

Age in years.	.6	7	8	9	10	11	12	13	14	15	16	17	17+	
Grade.	I II	I II III IV	I II III IV	I II III IV V	I II III IV V VI	I II III	IV V VI VII VIII	III IV V VI VII VIII	IV V VI VII VIII	II III IV V VI VII VIII	III IV V VK VII VIII	VI VII VIII	VIII	VIII	
Regular	12 1	5 10	12 15 12	16 17 2	1 3 17 12		1 10 14				1 2 13	1 9	5	3	278
Retarded 1 year?			5 7 11	5 8 8 7	1 3 6 16		9 7 5 1	2 9 7 4			1 2 8	1	1		182
" 2 " s.			5 2	1 2 1 1	2 1	3	1 3 4	5 9 7 4		1 6 6 14	5 2 1 8	5			74
" 3 "			1	1 2		2 1	1 4	4 5 4 3		1 1 1 3	1 3	1 1 7			50
" 4 " s.					1 3		1 3 2 1	4 3 1		1 2 4 3		1 4	2		29
" 5 "					1 1 5		1			1 6 1	1 8				26
" 6 "							1	3 1		1 1	5		2		6
" 7 "										1	2		4		6
Advanced 1 "	1	21 22 2 1	11		2 8					1					82
" 2 "	37	1		1 1 4				7 1		1					49
" 3 "		1			3 1					1					6
" 4 "		1	1	2											4
Regular	20	15	62	63	59	47	46	49		60	18	6	3		460
Retarded			8	8	14	30	18	30		26	39	4	8		191
Advanced	38	49	15	8	15	6	8	2		86	57	10	11		141
	58	64	85	79	88	73	72	81							792

* The dots above the grades indicate in which grades the children of each age would be counted regular.

TABLE No. 8.

Results obtained by Goddard.

Binet tests tried out on 1547

Children.

No. "at age"		554
No. "above age	1-yr.	329
	2-yr.	49
	3-yr.	14
	4-yr.	2
No. "below age	1-yr.	312
	2-yr.	156
	3-yr.	79
	4-yr.	37
	5-yr.	8
	6-yr.	6
	7-yr.	1

*Goddard counted as "at age" those one year retarded and those one year advanced, since the age of the child was taken from his last birthday.

TABLE No. 9.

Published by Binet in 1908 edition
Of his tests showing record of 203
Children.

Ages	3	4	5	6	7	8	9	10	11	12	Totaux.
Réguliers	3	9	13	5	7	16	11	14	13	2	103
Avances de 1 an	3	2	6	8	7	5	9	2			42
Retardés 1 an	4	4	4	6	3	1	2	9	5	5	44
Avancés 2 ans		1				1					2
Retardés 2 ans		1		1	1			3	2	4	12
											203

** THE BINET TESTS AS APPLIED ** TO ** PUPILS IN THE EIGHT GRADE**

THE BINET - SIMON TESTS:

This thesis embodies a report of the results obtained by the application of Binet's"Measuring Scale of Intelligence," to over fifty normal children in the eight grade.

MM. Binet and Simon, both of France, have worked out this series of tests, in which they have fixed the norms of intelligence in children ranging from the age of three years to thirteen years inclusive.

These tests were determined by experiments applied to about two hundred children, gathered from the poorer districts of Paris. The first series, published in the L'Annee Psychologique of 1905 consisted of 38 ungraded tests. A revised series, graduated according to different ages was arranged from this and published

in the same periodical of 1908. It is upon this so-called 1908 series that the work of this paper is based. Binet has made a still later revision of these tests which is to appear in 1911.

The author's purpose was to discover a measure of intelligence as naturally developed in a given environment, rather than of intelligence resulting from school training. The problems as stated by Binet are first, to try to find the law of intellactual development in children; second, to study the differences in the intellectual capabilities of children of the same age. Since children are different from adults not only in degree of knowledge but in form of intelligence, it is evident there must be marked changes in the process of development. He contrasts the pedagogical method, which grades according to knowledge gained by means of special training, e.g., in arithmetic and spelling, with the psychological method, which measures the intelligence as naturally developed and more or less independent of

special training.

In this "Measuring Scale of Intelligence", the tests arranged for each year are presumed to contain what the average normal child of the age, would know. One of the best signs of the awakening of intelligence is the comprehension of spoken words, which is a step in advance of comprehending gestures or intonation of voice. Thus in the three-year tests, the child is to point out familiar objects, as the parts of his face, or familiar objects in a picture. The next step in language consists in passing from the object to the word and is placed at the fourth-year level. The child is shown a familiar object, as a key, and asked, "What is it?"

Defining words by use, is the next advance, e.g., "A fork is to eat with." This is part of the six-year tests.

In the seventh-year tests, the description of the picture involves the relation of parts, whereas in the three-year tests there was only enumeration of ob-

jects. The picture test, Binet considers the best single test in his system and if there were but one test to be given this would be the most valuable. The three stages of intelligence tested by theis are:--

1. Enumeration of objects, as man, boy, cart.
2. Description, by relation and association, as "The man and the boy are pulling the cart.
3. Interpretation, consisting of an idea gained, beyond the visual image, something of meaning added by the individual, as, "The unhappy man and boy are pulling the cart."

Even enumeration shows different degrees of intelligence, as, use of connections, "man and boy", or an increase in the number of things observed, and the order in which they are mentioned. Backward children give more details because they are older and thus have more experience and a larger vocabulary. Altho children early appreciate the traits and emotions of persons, they differ markedly in ability to express these ideas.

This becomes another indication of the child's mental progress.

The eight-year test involves reading and writing. The nine-year requires definitions by classification, which is better than definitions by use. At ten years, the child is required to compose a sentence using three given words. At eleven, the definitions of abstract terms, and at thirteen years the distinctions between rather difficult words are supposed to be given.

This has merely been an attempt to illustrate how the author grades one quality of intelligence, that of the understanding and use of language. In a similar manner, might be traced development in power of comprehension and comparison, as in, length of lines, discrimination of weights, characteristic differences in similar objects, etc.

Other developments, involve repitition of figures and syllables, memory for facts, judgement, imagination, and the like.

These tests have been the subject of much discussion within the past year, and have received adverse as well as favorable criticism. Altho they have been roughly tried out in many places, only a few reports as yet have been published. None of these give sufficient detailed reports to determine the reliability of the tests for American children.

Binet, himself, is even less certain of their value than some of his followers. He maintains there is much that can be done along this line, and offers his system as a crude beginning rather than a finished product. None, however, deny, that Binet has made a most valuable contribution to the work being done in psychological clinics.

The most elaborate publications made upon these tests have been by Decroly and Degand of Brussels, Miss Johnstone of England, and Whipple and Goddard of this country. Since these are discussed in another part of this paper, it will suffice here, to mention

that the Goddard version of these tests was the one used in my work.

--:DISCUSSION OF GROUP IN TABLE I:--

The subjects as shown in table 1, with the exception of the last three, were my pupils at the time examined, and were in attendance in the B-8th grade at a large public grade school near the business district of St. Paul. The children came from families, ranging from the poverty class up to the fairly well-to-do, consisting largely of day laborers and the small-shop keepers.

On the whole, the enviornment is unwholesome both to health and morals, and the children give evidence of being susceptible to both the influences. On one side is the city, market on the other, the wholesale and rail-road section while the retail district is less than ten minutes walk.

There are no public play grounds, and the street affords about the only means of outdoor recreation.

A large number of the bdder children find their chief amusement in walking the streets, wandering thru the stores, and frequenting the cheaper theaters, especially the moving picture shows. As soon as the boys are old enough to earn money they are put to work selling papers, or as delivery and messenger boys.

As to nationality, fully one third of the children reported in table 1, were of Jewish parents, many of whom could not write English altho they could write some other language, usually Russian or Hebrew. One by, No. 8, had been over from Russia one year, and a girl, No 26, about three years, but since their records seemed in no way to disturb the balance in the stastics, there was no need of eliminating them. No other nationality showed any predominance in numbers.

With so small a group consisting of representatives from so many nationalities, it would be futile to attempt any classification on the basis of nationality. However, from personal observation, I

should say that, as a pupil, the Russian Jew is shrewder than the Scandanavian and much more responsive than the German child.

The examinations were conducted in the school room outside of school hours when the child could be taken alone. The giving of the tests was managed in such a way as to excite very little curiosity about them. The children were quite accustomed to my giving them tests unconnected with their studies, and were not unused to private friendly interviews with me where we would talk over things that would be of interest to them. When taking the test, the children were not informed it would be given to the whole school. Most of the examinations were given in February and March, a season when there is little chance for general intercourse among the children.

Table I, col gives the subjects arranged in the order in which they were examined, and the reader may use his own judgment, on the results obtained,

as to whether the continued use of these tests had any variable bearing either upon the experimenter or the subjects.

The interviews were arranged suitable to the convenience of the child and in all cases I found the children willing and anxious to do their best. Nothing was neglected which might remove the feeling of restraint and make the child feel perfectly at ease. Where encouragement was needed it was given either by words or personal attitude, but suggestions, in any form were carefully avoided. Tactful devices were often found useful in recalling a distracted or wandering attention.

Children talked freely, so it was not difficult to get at what they meant, tho their form of expression was generally poor. To prevent the too rapid answering of questions demanding more deliberate thought, it became necessary to tell the children to think awhile before answering. The child was seated at a desk near mine, where I could easily note down any observations.

If he became self conscious to the degree of hindering steady thinkimg, I could apparently busy myself about the desk, to relieve his embarassment.

For the thirteen-year tests a blank paper eight inches by ten inches was placed on the child's desk. Then another blank paper four inches by five inches, was shown to the child, telling him to watch closely just how I folded it, which I did slowly, first in half with the crease crosswise, then again making four layers. Then I cut a small triangle from the closed edges on the longest side, kept the piece cut out and laid the paper on the desk with the scissors across the open corners, to keep it from unfolding. I then told the child to study it carefully, and as soon as he was certain he knew how it would look if unfolded, to draw a picture of the paper as it first looked and then change it, showing how it would look after the triangle had been cut out. This instruction with the exception

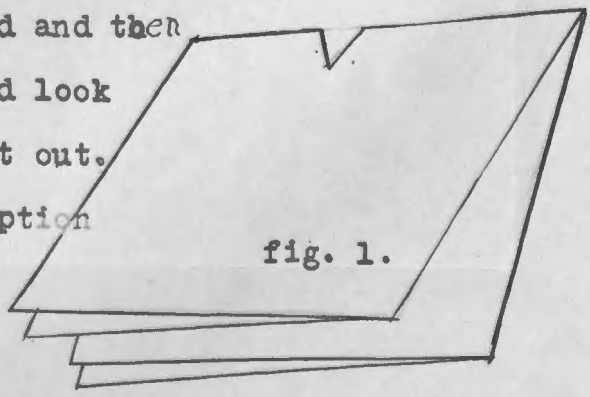

fig. 1.

of the size of the paper (not mentioned), follows closely Binet's original treatise and the figure 1 is an exact copy of the figure given in the 1908 series of Binet's Tests. If the paper is an oblong, this test involves two problems 1st, two diamonds separated by a space; 2nd, they must be on the right creese of the paper.

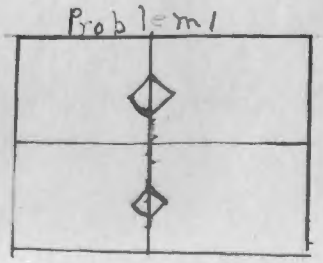

Fig. 2.

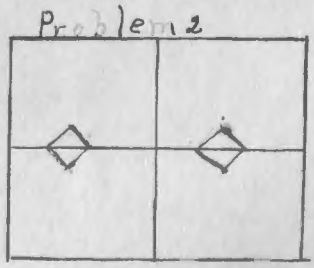

Fig. 3.

In the table No 1 the test was not marked passed unless both problems were solved. Out of the ten who got only problem one correct, five would have passed the thirteen-year test, had they been marded passed on that score. Table 3, shows 23 passed and 31 failed, on this test

The first thought ofthe child, like many

adults I have tried, was to draw a diamond in the center of the paper. There were numerous attempts to partly fold the other sheet of paper. I even found one girl studying her kerchief, which she had folded in four. According to the test no other paper is to be folded after the first one.

It was interesting to watch the first confident manner of the child, gradually change to the thoughful, then puzzled look, as he proceeded to study. This test more than any other, had a fascination for the child which made him persistent in trying to get it correct.

In test 13 - 2, a visiting card was cut in two diagonally and placed before the child, telling him to notice everything about it as form, length of lines etc. He was then told to try to think how the figure would look, if the lower triangle

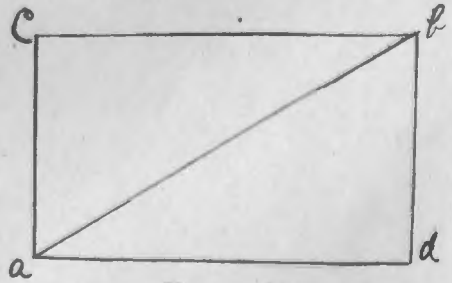

Fig. 4.

remained in the same position and the top one moved around so that the corner C would be at the lower angle "a" and the end "ac" be along the center line. The children were slow to grasp the situation, even when simple words like end, top, center, corner, etc., were used and everything pointed out with the finger. If the child did not seem to grasp what was wanted, I would have him tell what was to be done, I was careful in the explanation not to indicate the solution of the problem, but gave only the two points, that, without the turning over either part the right angle Acb was to join the acute angle Dab and the end line Ac to lie along the hypothenuse of the lower triangle.

Often after a child would study on this for a while he would become confused as to what was wanted and again explanation was given.

In scoring this test passed, I considered that it was necessary for the right angle Acb to be preserved and that the side Ac of the upper triangle be kept shorter than the hypothenuse Ab of the lower

triangle. The principal difficulty seemed to lie in preserving the right angle.

Children seem to quickly lose interest in this problem and demanded more encouragement than on the 13 - 1 test. Table 2, shows that 26 passed this test and 28 failed, and that the boys excelled the girls. Twelve boys out of 19, and 14 girls out of 35 passed.

I believe that most of those who passed, so did by means of mechanical devices, such as measurement of lines and angles, rather than by any form of imagery. Many would shift their heads about so as to look at the card in a certain position, or would make sample drawings and erase them, measure lines with the pencil, and so on.

The 13 - 3 test consisted in five pairs of abstract words, each pair being similar in form or meaning. The words given by Binet are, (1) plaiser et honheur (2) évolution et révolution (3) evénement et avénement (4) panvreté et misére (5) orgueil et prétention.

The equivalent English words were adopted by Goddard and were also used in these examinations. The children were asked the difference in meaning between (1) pleasure and honor, (2) evolution and revolution, (3) event and advent, (4) poverty and misery, (5) pride and pretention.

This test, unless marked leniently is very unsatisfactory. It calls for differences, which materally presuppose a knowledge ofthe meaning of the words. Even where children were familiar with the use of the words they were unable to give the essential difference. since this proved to be little more than a definition test, I arranged column 9 of table 1, showning the number of words out of ten with which each was familiar. Column 8, marks as passed, those who succeeded in defining three pairs of words out of the five.

"Evolution" was scarcely heard of and only a few even attempted an answer, and those apparently were guessing or had it confused with some other word.

"Advent" was known, only by those who had become acquainted with it in some church calendar. "Pleasure" was defined without exception, and event nearly always. "Poverty" was quite familiar but much less so than might be expected. "Misery" was sometimes confused with miserly, and was often known only in a vague way. Some who failed on "poverty" and "misery" were able to explain the meanings of "poor and "miserable". "Event" was sometimes confused with invent, and "advent" with " adventure."

Where children did not try to give the meanings, I would ask to have them use the word in a sentence, and explain what it meamt there.

The following are types of answers. (1) Pleasure is having a good time. When you do something great you get honor. (2) Evolution ..... (3) Revolution is war; also means something turning around. (3) Event is a happening. Advent ..... (4) Pover ty is when you're poor and haven't enough to eat or clothes to wear. Misery is when you are sick

or unhappy, don't feel right. (5) Pride is proud, stuck up, think yourself better than other people. Pride is to take a delight in something as, He was the pride of the team. She took pride in being the best speller in the class.

Pretention is to pretend,-to make off, to pretend you're studying when you "ar'nt".

The following are a few answers containing a human touch, unsavored by the dictionary.

"Pleasure is the opposite of studying."

"poverty is when you're poor and your clothes all raggy."

"When a circus comes to town, that is an event."

"Misery's when a man's all mixed up and don't know what to do. It is something aginst you always."

"Event is not a banquet exactly, but something happening."

"Pride is when you're always pretending."

Passing two out of these three tests places the child at the 13-year level. As shown in table 2, 22 out of 54 passed; 9 boys out of 19; and 13 girls out

The results of the 12-year tests are enumerated in column 10 of table 1. Table 2 shows little differences between the percent passing the 13-year and the 12-yeat tests, 22 out of 54 passing the 13-year and 23 out of 55 the 12-year tests. Out of the 22 passing the 13-year tests, 11 failed on the 12-year tests.

Test 12 - 1, the repetition of seven figures was given three ways, but the Binet method as shown in Column 11 of table 1, is the one which determined the grading. In this the figures were given at even intervals, at the rate of two per second, as nearly as could be estimated. The figures were those taken form the Gaddard text. Fourty-two out of fifty-five passed.

Column 12 of table 1, shows the same three series of seven figures as in Column 11, repeated after a different series of figures had been given visually, the difference being, that they were now given with an inflectional grouping, as, 2', 9,-4', 6,-3,'7,5.

Only five out of fifty-five failed on this. The difference in the results obtained was due to the method of giving rather than to the fact of using the same number series.

Column 13 shows the results when visual stimuli were used. The figures were shown to the child in as rapid succession as they could be seen. The figure was a black gummed number, half an inch in length set in the center of a white card two inches square. The three groups of figures used in this series were (a) 5,8,3,2,7,1,4. (b) 4,7,8,2,3,1,5. (c) 5,8, 1,2,3,7,4. I asked the child if he could see the figures clearly or if I was changing them too rapidly, but there seemed to be no difficulty in this particular. This test seemed harder than either of the other ways. Twenty-six out of 55 passed, and most of these whispered the numbers or moved their lips, as each appeared. One girl said every time a new number appeared she repeated the others up to it, adding the new one to each re-

petition.

Practice seemed to make no difference. The last of each three series of figures was missed as often as the first. There was a tendency, of which Binet spoke, of giving numbers in their regular order, as 1,4, 6, instead of 1,6,4. The results of the three methods were for the Binet method 75% correct, for the inflectional 89%; and for the visual 47% passed. The Visual is more objection but more difficult.

Tests 12 - 2 and 12 - 3, give singularly contrasting results, one child out of 55 failing in the first and one out of 55 passing in the second. In 12 -2 the child was required to give three rhymes to a given word within one minute, but the whole minute was seldom needed.

Column 15 of table 1 shows the number of rhyme words given by each. The meaning of rhyme was commonly known, so that a simple illustration was all that was necessary. I illustrated with the word "mill"

and then gave the word day, and supplemented when necessary with the word "go". Only five out of 55 gave three words or less. As many as eight words were given without hesitation.

Test 12-3, the repetition of 26 syllables, "tolerating no error" whatever, was the least satisfactory of all the tests given. The sentences were those of the Goddard text, as translated freely from Binet. The child was told to listen carefully to what I would read and then, without waiting, to repeat exactly what was read. I gave some signal word as "ready", before beginning. I read clearly, at an ordinary rate, giving only enough inflection to seem natural. No practicing was given on any other sentences. First the 24 syllable sentences were read (only once) then the 26 syllable. Of those who tried the 28 syllable sentences they did little more than put the meaning in their own words and those who tried the 30 syllables did not even get the meaning correct. Should one or two errors

be tolerated, a goodly percent would have gotten the 24 syllables. There is no doubt that every syllable added increased the difficulty of repitition.

The children usual recognized after giving the sentences whether they were right or wrong, and often laughed at their own mistakes. As might be expected most of the mistakes were due to misplaced or omitted words and many to the substitution of similar expressions. A few of the typical errors were, "very necessary" for "very hard", "every day", for "every morning", "yesterday" or "a few days ago", for "the other day", "a pretty little dog" for a pretty young dog", "dirt on apron" for "spots on apron"., "a spotted dog" for "spots on apron". "go to your school every morning," for "go every morning to your school." Only one child out of 55 got 26 syllables without an error and ten got the 24 syllables.

Test 12-4. Consists in solving two problems, containing various facts, both of which must be

correctly solved to pass the tests. To avoid the chance effect of any emotional tone being imparted in the reading, these statements were cut from the Goddard copy and pasted on separate slips of card board and handed to the child. Column 19 of table 1, shows the results of the first problem and column 20, the results of the second. Thirty-four out of 55 passed. Only three failed on the second problem.

Problem "a" of this test seemed to strike the children as amusing rather than serious. Even for those who saw the corpse of a human being. Some of the answers were ; "Some one climbed up to scare people", "A robber trying to hide", " Some one climbing the tree fell and got caught in the branches," and "Some one chased up by a wild animal." A great variety of animals were seen, the monkey and bear, dividing on first preference. The snake too, was popular. The children seemed to think of "hanging" as implying "holding on to rather than "being fastened to". For child-

ren reared in the heart of a city, some problem containing more familiar circumstances better be substituted.

In problem (b) of this test, the word clergyman, frequently required explanation. This problem is a good one for City children, since all of the facts are of common knowledge or experience.

The 11-year tests were the lowest, required by this group of children. Out of the 24 taking this test, two had passed higher tests, having 22 at the 11-year level. These tests were passed readily and with a high per cent of correct answers. In 11-1, altho the recognition of three out of five absurdities passed the test most of the children got them all and only two out of 24 failed on the test.

Most of the sentences of 11-2, contained the idea of some one in St. Paul, making a fortune by means of, or because of the Mississippi river. One out of the 24 failed.

In 11-3, as might be exspected, words were

given rapidly at first and gradually the speed was lessened. The names of surrounding objects were given first then qualities of the objects, then words associated indirectly. One girl asked if numbers were permissible, and when answered yes, she began at once with one and was going up at an almost breathless speed when I stopped her at 21 and told her she was repeating the same words. One out of 24 failed on the test.

Test 11-4 requires abstract words to be defined, and the directors suggest that the answers be graded with leniency. If the idea is correct it should be considered passed no matter how badly it may be expressed. The words used were "charity, "justice", "goodness", and two correct out of three is sufficient. Whipple explains that "charity" must contain the idea os someone giving and someone needing, "justice" either the notion of law or treating persons according to their merits, and "kindness" (which he substitutes for "goodness") the notion of affection, sentiment, assistance, etc.

I agree with Whipple that"kindness"would be a better word than "goodness". Out of 24 , 16 failed on justice, 10 on goodness and 4 on charity. Two out of 24 failed on the test as a whole.

Test 11-5 seemed more difficult than the others of the 11-year tests, 8 out of 24 failing. The three groups of misplaced words, were cut from the Goddard copy and pasted on separate cards, and one at a time shown the child.

CRITICISMS BASED UPON RESULTS OF THE GROUP IN TABLE I.

In test 13, I suggest that the test be counted passed if, problem 1, is solved. In test 13-3 that substitutes be found for the words "advent" and "evolution". In test 12-3, that the sentences, in some way, be simplified or a certain number of errors be tolerated. In 12-4, that the first problem be substituted by one within the range of the child's experience. Since those taking the eleven year tests

were all above that age, I could not be justified in saying that the tests were too easy, altho they proved very simple for those taking. However, I believe "kindness" would be better than "goodness" in test 11-4, and in test 11-5, that "early" be used for "good" in the first sentence and that "bravely" be used for "courageously" in the third sentence.

Decroly and Degand are quite emphatic in declaring all of the 13-year tests too difficult, and the results of these examinations would seem to strengthen their statement, especially when we observe that out of the 55 children, 37 were over 13 years old. Of the 13 year children 8 passed the 13-year tests and 8 failed.

Binet's own results, as reproduced here in table 9 show no record of any children above 12 years of age. The same is true concerning the 45 children reported by Decroly and Degand in Archives de Psychologie of 1910. In the articles published by Goddard, I have been unable to locate any material bearing upon the ages

of the children at the 13-year level. The results of his most recent and most extensive work are shown briefly in table 9.

There seems to be no justifiable way of determining the amount of retardation with children above 13 years of age. For instance, if one 16-year old passed the 13-year tests and another the same age only the 12-year tests, it would not be fair to call the first regular and the second, 4 years retarded when the tests showed only that their mental levels were at least a year apart.

Little further can be said concerning the examination upon this group of children except what can be readily seen in tables 1, 2, and 3. Table 2 gives the totals of tests passed and failed at all the ages by half years, girls and boys separate. Table 3, condensed from tables 1 and 2, shows the number of subjects at each "Mental Age Level", grouped according to chronological ages; also the number regular, advanced and retarded.

I found no satisfactory method of measuring the amount of retardation, due to the fact there are no equivalent tests corresponding to the ages above 13 years, which forms the largest group of these examined.

Binet considers every five tests passed above the year-level of the child as equivalent to one year higher. A child at the eight year level, passing any five tests above that level would be placed at the nine year level or passing any ten tests above, at the ten year level, and so on. This provision cannot be applied to the eleven, twelve or thirteen year levels and so children at any of these levels do not receive a fair chance on the scoring of results.

Prof. J. B. Miner of the Minn. University under whose directions, I carried on this work, re-examined five of the children of table 1, using where necessary supplementary tests, and as a result placed at the thirteen-year level, Nos. 5, 25 and 34, and at the

twelve-year level, Nos, 10 and 29. Altho there are reasons why these results would likely vary slightly from my own, with the same children, I believe it also shows that the difference in personality of the examiners even tho qualified for the work, may have a direct bearing upon results obtained.

THE UNIVERSITY PRACTICE SCHOOL GROUP.

Tables, 4, 5 and 6 are compiled from the results of examinations made upon the pupils, in the Practice School, affiliated with the State University of Minnesota. The work was done by a class in the University who were studying mental retardation, each student taking a child or two. The class had studied the Goddard translation of the tests and were instructed how to give them.

I feel unqualified to pass judgment on the value of this work and am too uncertain of its efficiency, to make any comparisons between the results and those obtained by myself, as described in the foregoing pages.

A few variations were made in the tests when given to this group from the group of table 1, "a" the methods used with table 1. In 13-1 if problem as already described was correct the test was marked passed. In 13-3, "prevent" was used instead of "advent". In test 12-3 the children were drilled on the 24 syllables several times before giving them the 26 syllables. Nos. 4, 9 and 12 of this group were examined by myself, but it made no difference in their results whether or not the above changes were made.

SUMMARY OF TABLES ", 2, 5 and 7.

Comparing tables 2 and 5, it will be noticed that on the whole, the children of the Practice School rank higher than the group of St. Paul children, examined by myself, yet I am of the opinion that if all of those children were examined by myself, this difference would not have resulted. Of the three children I examined in this group one was regular and two retarded.

A few changes were made in the tests which

simplified them or changed the scoring.

Those giving the tests were unused to them and possibly many unused to dealing with children.

The tests were given on two successive days, and during the second day when I was present, there was more or less excitement among the children about the tests which they knew were being given to all of the children. Whether there was any exchange of ideas or not would be difficult to say.

However, I believe tests given by so many unexperienced examiners to so small a group can scarcely be of any value as statistics.

Table 7, summarizes an extensive piece of work, on the Binet definition test, done by Miss Laurence, Professor ih the Normal School at St. Cloud, Minn. These tests differ from others in that they were written by the children. Goddard's version of tests were used with the exception of substitution in 13-3, of "prevent" for "advent" and "welfare" for "honor."

As there were no tests for 7, 10, 12 and 14 or over, the children had to be given the benefit of the doubt. Children of these ages were marked regular if they passed the test just below. A seven-year-old was marked regular if he passed the six-year old test, a ten-year-old regular if he passed the nine-year-old test etc. If an eight-year-old failed in the eight-year old test, he was marked one year retarded if he passed the six-year-old test, for he might have passed the seven - year - old, had there been one and so for other ages." Children one year retarded were marked regular as the difference might be small, due to the nearness of the birthday to the time of examination.

Table 8, of Goddard, includes only children in first five grades. The remainder of the 2,000 children were above these grade and were given supplemented tests. These examination were made by five assistants trained for the work.

Table 9, of Binet, has only 11 children 12

years old, and none above that age so in either case the children are much younger than those of tables 1 and 4.

THE LITERATURE ON THE BINET TESTS.

The best literature on these tests is found in (1) the original article of Binet and Simon, published in the L'Annee Psychologique of 1908, the principal part of which has been reviewed at the beginning of the paper. (2) A criticism of the tests by Decroly and Degand, including an elaborate description of application of these tests upon 45 children from well-to-do families in Brussels, ranging in ages from two years seven months to 12 years 8 months inclusive. The original article is published in Archives de Psychologie of 1910, a translation of the main parts of which is to be found in Whipple's Manual of Mental and Physical tests. In the original the record of each child is published in full, but nothing is arranged in tabular form. Their main criticisms are that all of the 13-year tests are too

difficult, (2) many tests are too easy for the year assigned, (3) some tests are too mechanical, (4) several are the result of special training. Apart from their numerous criticisms, they regard the series as a whole to be valuable.

(3) H.H.Goddard has applied these tests very extensively and is an enthusiastic supporter of the Binet system of diagnosis of mental development. Most of his results are published in the Training School, of which he is an editor.

(4) G.M.Whipple in his Manual of Mental and Physical tests, give the best all-around discussion of these tests that has as yet been published.

(5) Binet's first series of thirty tests, published in the L'Année Psychologique of 1905, are graded according to intelligence but not arranged to correspond to ages. Most of these are found in the 1908 series, either the same form or slightly revised.

(6) E.B.Huey, altho he has published no results from the use of the tests, has written some good articles on the subject and read a paper at the recent meeting of the American Psychological Association.

(7) Miss Johnstone of London has done exhaustive work with these tests which are published in the London Training School Record, which at present is not available.

OTHER ARTICLES:

Goddard H.H. -- "Four Hundred Feeble - Minded children tested by Binet Method"
Journal of Psycho-Aesthenics, 1910, Nos.1-2.

Goddard H.H. -- "2000 Normal Children tested by the Binet Scale."
Tr. Sch. 1911. No 81.

Huey, E.B. -- "Retardation and the Mental Examination of retarded children".
Jr. Psycho. Aesthenics, 1910. Nos. 1-2.

Huey, E.B. -- "Binet Scale for Measuring Intelligence and Retardation".
Jr. Ed. Psy., 1910, Oct.

Wallin, J.E. -- "The New Clinical Psy. and the Psychc. Clinicist".
Jr. Ed. Psy. 1911., April.