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THE CONTENTS OF

Children's Minds

ON ENTERING SCHOOL.

G. STANLEY HALL.

THE CONTENTS OF
CHILDREN'S MINDS
ON ENTERING SCHOOL.

BY
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THE CONTENTS OF CHILDREN'S MINDS ON ENTERING SCHOOL.

Individuality of Children as Influenced by Surroundings.—In October, 1869, the Berlin Pedagogical *Verein* issued a circular inviting teachers to investigate the individuality of children on entering the city schools so far as it was represented by ideas of their environment. Individuality in children, it was said, differed in Berlin not only from that of children in smaller cities or in the country, but surroundings caused marked differences in culture-capacity in different wards. Although concepts from the environment were only one important cause of diversity of individuality, this cause once determined, inferences could be drawn to other causes.

How Concepts of City and Country Children Differ.—It was expected that, although city children would have an experience of moving things much larger than country children, they would have noticed very little of things at rest; that to names like *forest*, e.g., they, with an experience only with parks, would attach a very

Vorstellungskreis der Berliner Kinder beim Eintritt in die Schule. Berlin Städtisches Jahrbuch 1870, pp. 59-77.

different set of concepts from those of the country child. The fact that country children who entered city schools behind city children caught up with them so readily was due to the fact that early school methods as well as matter of instruction were better adapted to country children. Conversation with children in collecting the statistical materials would, it was predicted, tend to interesting and surprising results. When asked what mountain (*Berg*) they had ever seen, all the girls in an upper class of a grammar-school said *Pfefferberg*, the name of a beer-house near by; and, for all, *Berg* was a place of amusement. This would cause an entire group of geographical ideas to miscarry. Others, knowing the words *pond* or *lake* only from artificial ponds or lakes in the park, thought these words designated water holders, which might or might not have water in them. A preliminary survey showed that many children in each city school had never seen important monuments, squares, gardens, etc., near their own home and school-house, and few knew the important features of their city at large. With the method of geographical instruction in vogue that begins with the most immediate surroundings and widens in concentric circles to city, county, fatherland, etc., these gaps in knowledge made havoc. School-walks and excursions, object-lesson material, as well as the subject-matter of reading, writing, etc., should be regulated by the results of such inquiry.

The Tests Wanting in Completeness and Accuracy.—This circular, which was accompanied by a list of points for inquiry, ended by invoking general and hearty personal co-operation. It was not sufficient to have seen a hare, a squirrel, etc., but the hare must have been seen running wild, the squirrel in a tree, sheep grazing, the

stork on its nest, the swan swimming, chickens with the hen, the lark must be singing, the butterfly, snail, lark, etc., must be in a natural environment. The returns for 13 of the 84 schools of Berlin were worthless. Other tests suggested, but not reported on, were colors, knowledge of money, weights and measures ; how many have seen a soldier, sailor, peasant, Jew, Moor, or a shoemaker, carpenter, plasterer, watchmaker, printer, painter, etc., *at work* ; how many knew how bread was made out of grain ; where stockings came from ; how many could repeat correctly a spoken sentence, say a poem by heart, sing something, repeat a musical note, have attended a concert, have a cat, dog, or bird, etc. As an essential object of these inquiries was to distinguish the concepts which children brought to school from those acquired there, returns made some weeks or months after the children entered school had little value, yet were worked up with the rest. The very slight interest shown by teachers in making these inquiries was also remarked. As only about one third of a minute for each question to each child was the time taken, there could be no collateral questioning, so that confusion and misunderstanding no doubt invalidated many returns.

The Basis for the Following Tables 10,000 Children.—

The sources of error to be constantly guarded against are errors in counting, imagination, or embarrassment of the children. When the answers were taken in class nearly twice as many children asserted knowledge of the concept as when they were taken in groups of 8 to 10. Nearly half the boys and more than half the girls on entering school had never seen to know by name any one of the following conspicuous objects in

Berlin : Lustgarten, Unter den Linden, Wilhelm's Platz, Gensdarmenmarkt, or the Brandenburg Gate. From the large number of returns, those from 2238 children just entering school seem to have been pretty complete for 75 questions ; but other returns were usable for a part of the questions, and some for other questions, so that in the tables the number of children is recorded on the uniform basis of 10,000. Arranged in the order of frequency, the first Berlin table is as follows:

What Number of Children Out of 10,000 have Various Ideas ?

| | | | |
|---------------------------------|------|-----------------------------------|------|
| 1. Dwelling, | 9026 | 32. Zoölogical Gardens, | 4075 |
| 2. Father's business, | 8945 | 33. Frederick's Grove, | 3887 |
| 3. Name of father, | 8517 | 34. Herd of sheep, | 3870 |
| 4. Firmament, | 8145 | 35. Pleasure Garden, | 3861 |
| 5. Tempest (day), | 7873 | 36. Forest, | 3646 |
| 6. Rainbow, | 7770 | 37. City Hall, | 3615 |
| 7. Sphere, | 7623 | 38. Morning sky, | 3592 |
| 8. Two, | 7435 | 39. Squirrel, | 3579 |
| 9. Three, | 7399 | 40. Brandenburg Gate, | 3467 |
| 10. Four, | 7265 | 41. Kreuzberg, | 3454 |
| 11. Hail, | 7015 | 42. Castle of King, | 3423 |
| 12. Cube, | 6957 | 43. Village, | 3374 |
| 13. Potato-field, | 6323 | 44. Tempest (night), | 3347 |
| 14. Moon, | 6215 | 45. Mountain, | 3248 |
| 15. Swan, | 6175 | 46. Museum, | 3222 |
| 16. Butterfly, | 6028 | 47. Cuckoo, | 3137 |
| 17. Clouds, | 5925 | 48. Treptow, | 3065 |
| 18. Fish, | 5853 | 49. Sunrise, | 3052 |
| 19. Unter den Linden, | 5590 | 50. Gensdarmenmarkt, | 2909 |
| 20. Menagerie, | 5496 | 51. Stork, | 2887 |
| 21. Square, | 5474 | 52. Palace of King, | 2886 |
| 22. Evening sky, | 5384 | 53. Mushroom, | 2855 |
| 23. Hasenheide, | 5121 | 54. Oak, | 2641 |
| 24. Frog, | 5085 | 55. Plough, | 2636 |
| 25. Circle, | 4991 | 56. Sleet, | 2493 |
| 26. Snail, | 4750 | 57. Moss, | 2484 |
| 27. Sunset, | 4625 | 58. Hare, | 2466 |
| 28. Meadow, | 4607 | 59. Stralau, | 2453 |
| 29. Alexander Sq., | 4366 | 60. Harvest, | 2368 |
| 30. Triangle, | 4182 | 61. Dew, | 2364 |
| 31. Corn-field, | 4062 | 62. Wilhelm's Platz, | 2158 |

| | | | |
|-----------------------------|------|----------------------------------|------|
| 63. Lake, | 2078 | 70. Birch, | 1318 |
| 64. Arsenal, | 1957 | 71. Rummelsberg, | 1242 |
| 65. Scotch fir, | 1828 | 72. Park for Invalids, | 1135 |
| 66. Lark, | 1796 | 73. River, | 1122 |
| 67. Reed, | 1702 | 74. Hazel shrub, | 907 |
| 68. Willow, | 1667 | 75. Botanical Garden, | 527 |
| 69. Whortleberry, | 1640 | | |

Thus, e.g., out of 10,000 children, 9026 had the idea of dwellings, while but 527 had any idea of the Botanical Garden. The same returns otherwise presented are as follows:

Classification of above with Reference to Sex and Origin.

| | Boys. | Girls. | Children from Families. | Children from Kinderg'n. | Children from Refuges. | Children alto-gether. |
|-------------------------------|-------|--------|-------------------------|--------------------------|------------------------|-----------------------|
| 1. Two, | 7478 | 7380 | 7436 | 8223 | 7113 | 7435 |
| 2. Three, | 7478 | 7298 | 7418 | 7355 | 7344 | 7399 |
| 3. Four, | 7279 | 7247 | 7224 | 8258 | 7067 | 7265 |
| 4. Triangle, | 4274 | 4036 | 4078 | 5484 | 4111 | 4182 |
| 5. Square, | 5424 | 5537 | 5230 | 7484 | 5681 | 5474 |
| 6. Area of circle, | 4750 | 5312 | 4818 | 6645 | 5081 | 4991 |
| 7. Sphere, | 7684 | 7544 | 7576 | 8516 | 7483 | 7623 |
| 8. Cube, | 6971 | 6970 | 6800 | 8064 | 7159 | 6957 |
| 9. Moon, | 6043 | 6438 | 6067 | 8000 | 6144 | 6215 |
| 10. Sunrise, | 3410 | 2590 | 3194 | 2710 | 2633 | 3052 |
| 11. Sunset, | 4925 | 4237 | 4739 | 4516 | 4226 | 4635 |
| 12. Firmament, | 8382 | 7840 | 8012 | 8645 | 8476 | 8145 |
| 13. Tempest (day), | 7613 | 8209 | 7776 | 9226 | 7760 | 7873 |
| 14. Tempest(night), | 3188 | 3509 | 3224 | 4194 | 3510 | 3347 |
| 15. Dew, | 2331 | 2395 | 2455 | 2323 | 2032 | 2364 |
| 16. Clouds, | 6090 | 5711 | 5727 | 6581 | 6443 | 5925 |
| 17. Hail, | 6606 | 7544 | 7055 | 7677 | 6628 | 7015 |
| 18. Sleet, | 2847 | 2037 | 2332 | 2194 | 3025 | 2493 |
| 19. Rainbow, | 7708 | 7851 | 7667 | 9355 | 7598 | 7770 |
| 20. Evening sky, | 5567 | 5148 | 5303 | 6065 | 5450 | 5384 |
| 21. Morning sky, | 3497 | 3715 | 3545 | 4128 | 3580 | 3592 |
| 22. Hare, | 2482 | 2446 | 2473 | 3097 | 2217 | 2466 |
| 23. Squirrel, | 3878 | 3193 | 3170 | 4903 | 4665 | 3579 |
| 24. Stork, | 3212 | 2467 | 2897 | 3290 | 2702 | 2887 |
| 25. Swan, | 6757 | 5425 | 5976 | 7032 | 6628 | 6175 |
| 26. Cuckoo, | 3545 | 2610 | 3048 | 4129 | 3118 | 3137 |
| 27. Lark, | 2220 | 1249 | 1739 | 2258 | 1848 | 1796 |

| | Boys. | Girls. | Children from Families. | Children from Kinderg'n. | Children from Refuges. | Children alto- gether. |
|--------------------------------------|-------|--------|-------------------------------|--------------------------------|------------------------------|------------------------------|
| 28. Frog, | 5551 | 4482 | 4879 | 6323 | 5427 | 5085 |
| 29. Fish, | 6852 | 4565 | 5691 | 6968 | 6074 | 5853 |
| 30. Butterfly, | 7128 | 4606 | 5503 | 8258 | 7229 | 6028 |
| 31. Snail, | 4877 | 4585 | 4612 | 5484 | 5012 | 4750 |
| 32. Birch, | 1531 | 1044 | 1339 | 1355 | 1229 | 1318 |
| 33. Scotch fir, | 2205 | 1341 | 1770 | 2065 | 1963 | 1828 |
| 34. Oak, | 2625 | 2661 | 2776 | 2451 | 2194 | 2641 |
| 35. Willow, | 2157 | 1034 | 1703 | 1742 | 1501 | 1667 |
| 36. Hazel shrub, | 1055 | 706 | 927 | 1032 | 762 | 907 |
| 37. Whortleberry, | 1792 | 1443 | 1564 | 2645 | 1570 | 1640 |
| 38. Sedge (reed), | 1840 | 1525 | 1655 | 2581 | 1570 | 1702 |
| 39. Mushroom, | 3204 | 2405 | 2539 | 3419 | 2610 | 2855 |
| 40. Moss, | 2688 | 2221 | 2867 | 3355 | 1963 | 2484 |
| 41. Pleasure Gar- den, | 4021 | 3654 | 3800 | 5032 | 3672 | 3861 |
| 42. Unter den Lin- den, | 6122 | 4993 | 5436 | 6129 | 5982 | 5590 |
| 43. Wilhelm's Platz, | 2696 | 1464 | 2345 | 1935 | 1524 | 2158 |
| 44. Alexander Platz, | 4084 | 4729 | 4515 | 3935 | 3946 | 4366 |
| 45. Gensdarmen- markt, | 3450 | 2221 | 2915 | 3032 | 2841 | 2909 |
| 46. Brandenburg Gate, | 3885 | 2968 | 3388 | 4774 | 3303 | 3467 |
| 47. Castle, | 3465 | 3367 | 3333 | 4192 | 3510 | 3423 |
| 48. King's Palace, | 3180 | 2508 | 2788 | 3613 | 3002 | 2886 |
| 49. Museum, | 3450 | 2927 | 2982 | 3935 | 3880 | 3222 |
| 50. Arsenal, | 2165 | 1689 | 1855 | 2839 | 2032 | 1957 |
| 51. City Hall, | 3703 | 3501 | 3412 | 5935 | 3557 | 3615 |
| 52. Frederick's Grove, | 3600 | 4258 | 3915 | 2710 | 4203 | 3887 |
| 53. Menagerie, | 5964 | 4893 | 5261 | 6516 | 6028 | 5496 |
| 54. Zoölogical G., | 4346 | 3685 | 3727 | 6323 | 4503 | 4057 |
| 55. Botanical G., | 452 | 624 | 497 | 1161 | 416 | 527 |
| 56. Kreuzberg, | 4179 | 2518 | 3479 | 4065 | 3141 | 3454 |
| 57. Hasenheide, | 5780 | 4258 | 5121 | 6194 | 4734 | 5121 |
| 58. Park, | 1301 | 922 | 964 | 1355 | 1709 | 1135 |
| 59. Treptow, | 3196 | 2897 | 3127 | 4065 | 2469 | 3065 |
| 60. Stralau, | 2840 | 1955 | 2515 | 2387 | 2240 | 2453 |
| 61. Rummelsberg, | 1459 | 963 | 1248 | 903 | 1330 | 1242 |
| 62. Drove of sheep, | 4005 | 3695 | 3739 | 4323 | 4203 | 3870 |
| 63. Corn-field, | 4322 | 3726 | 4012 | 4194 | 4203 | 4062 |
| 64. Potato-field, | 6265 | 6397 | 6303 | 6323 | 6397 | 6323 |
| 65. Village, | 3672 | 2989 | 3364 | 3419 | 3395 | 3374 |

| | Boys. | Girls. | Children from Families. | Children from Kinderg'n. | Children from Refuges. | Children alto-gether. |
|----------------------|-------|--------|-------------------------|--------------------------|------------------------|-----------------------|
| 66. Plough, . . . | 3283 | 1801 | 2570 | 3290 | 2656 | 2636 |
| 67. Harvests, . . . | 2744 | 1883 | 2315 | 2323 | 2587 | 2368 |
| 68. Dwelling, . . . | 9120 | 8905 | 9103 | 9355 | 8612 | 9026 |
| 69. Name of father, | 8136 | 9007 | 8830 | 8065 | 7483 | 8517 |
| 70. Position " . . . | 8652 | 9324 | 9194 | 8968 | 7991 | 8945 |
| 71. Mountain, . . . | 3402 | 3050 | 3067 | 4645 | 3441 | 3248 |
| 72. Forest, . . . | 4036 | 3142 | 3555 | 4194 | 3418 | 3646 |
| 73. Meadow, . . . | 5004 | 4096 | 4467 | 4645 | 5127 | 4607 |
| 74. Lake, . . . | 2451 | 1586 | 2055 | 2000 | 2171 | 2078 |
| 75. River, . . . | 1126 | 1115 | 1194 | 968 | 901 | 1122 |

Comparison of Concepts of Boys and Girls.—This table shows that out of 10,000 boys 7478 on entering the Berlin schools have an idea of the number two; out of 10,000 girls 7380 have it; out of 10,000 children of both sexes, indiscriminately, 7436 have it, etc. Here the concepts are arranged in systematic order. Mathematics, 1-8; astronomical, 9-13; meteorological, 13-21; animals, 22-31; plants, 32-40; local geography, 41-61; and miscellaneous. Of three fourths of these concepts as objects more girls are ignorant than boys, and those who had not been in the kindergarten were more ignorant than those who had. Some of these objects were doubtless known, but had not acquired a name for the child; others they had seen, but had not had their attention called to. It is often said that girls are more likely to excel boys in learning concepts the more general these concepts are. Perhaps we may also assume that the most common concepts are acquired before those possessed by a few individuals only. The greater the number of concepts in the test-lists the more boys seemed to excel girls. The easy and widely diffused concepts are commonest among girls; the harder and more special or exceptional ones are commonest among boys. The girls clearly excelled only in the following concepts: name and calling of the father,

thunder-shower, rainbow, hail, potato-field, moon, square, circle, Alexander Square, Frederick's Woods, morning-red, oak, dew, and Botanical Garden. Of all the children the sphere was known to 76 per cent, the cube to 69 per cent, the square to 54 per cent, the circle to 49 per cent, the triangle to 41 per cent. The girls excel in space concepts and boys in numbers. Girls excel in ideas of family, house, and thunderstorms; children from houses of refuge had more concepts than children from families, and those from kindergartens excelled both. The child's characteristic question, "What is that?" is so poorly answered at home that he comes to school so poor in concepts that instruction must either operate with words, or use pictures, or go back to nature. Thus text-books and other means of instruction assume a knowledge which the child does not possess, and it is hard to find those well adapted to a given population. Thus object-lessons, excursions, etc., are suggested as first steps to fill the gaps in the child's knowledge.

Comparison between Knowledge of Bible and of Fairy Stories.—The following table shows the relative number of children who knew four Bible stories and four of Grimm's favorite fairy tales.

| | Boys. | Girls. | From Families. | Kindergarten. | Refuges. | All. | Per Cent. | |
|---------------------------------|-------|--------|----------------|---------------|----------|------|-----------|--------|
| | | | | | | | Boys. | Girls. |
| God, | 7827 | 5067 | 6927 | 5935 | 5704 | 6633 | 60.7 | 39.3 |
| Christ, | 6757 | 4217 | 5818 | 5355 | 5104 | 5648 | 61.6 | 38.4 |
| Bible stories, | 3743 | 1453 | 2727 | 2258 | 2979 | 2744 | 72 | 28 |
| Prayers and Songs, | 5400 | 4647 | 5078 | 5613 | 4850 | 5041 | 53.7 | 46.6 |
| Schneewittchen, | 2173 | 3009 | 2436 | 4387 | 2263 | 2538 | 41.9 | 58.1 |
| Rothkäppchen, | 2427 | 3664 | 2800 | 4581 | 3025 | 2967 | 39.8 | 60.2 |
| Dornröschen, | 563 | 1044 | 661 | 1871 | 808 | 773 | 35 | 65 |
| Aschenbrödel, | 1784 | 2897 | 2182 | 3871 | 2032 | 2270 | 38 | 61.9 |
| Average. | | | | | | | | |
| Religious, | 5852 | 3346 | 5138 | 4790 | 4659 | 5021 | 60.3 | 39.7 |
| Fairy tales, | 1734 | 2654 | 2020 | 3677 | 2032 | 2137 | 39.5 | 60.5 |

Thus girls excel in fairy tales and boys in religious concepts. As the opportunities to learn both would not probably differ much, there seems here a difference of disposition. God and Christ were better learned at home and the tales best in the kindergarten. Roth-käppchen was better known than God, and Schneewittchen than Christ.

Other Comparisons.—More boys could repeat sentences said to them, or sing musical phrases sung to them, or sing a song, than girls. Kindergarten children came from the richer, refuge children from the poorer class, while parents between these extremes occupy themselves most with their children. The better off the parents the stiller and less imitative the child, is a law suggested by the statistics of abilities. Not only method, but choice and arrangement of the material of instruction, depend on the knowledge the child has. Further investigations on narrower and more closely related subjects should be chosen. Six to twelve closely related points is suggested as the best method, and every teacher could occasionally complete such inventories in his or her room.

How the Locality of a School in Germany Affects the Instruction.—In Germany it is more common than in our country to connect songs, poetry, reading and object-lessons, instruction in history, geography, botany, geology, and other elementary branches with the immediate locality. A school geography of Leipzig, e.g., begins with the schoolhouse and yard, the street, with cross-sections of it to show drainage, gas, etc., and then widens out into the world by concentric circles. Stated holiday walks conducted by teachers for educational purposes and for making collections for the school-rooms are more common. The psychic peculiarities of different

school districts of Berlin seemed to be influenced surprisingly by locality.

Lange's Conclusions from Similar Experiments.—In 1879 Dr. K. Lange urged that a six-years child has learned already far more than a student learns in his entire university course. "These six years have been full of advancement like the six days of creation." Concrete conceptions have been accumulated in vast numbers and the teacher must not assume that a *tabula rasa* is before him. Both this and the presumption of too much knowledge would be to build upon sand. Children have experienced and learned far more than they can put into words; hence again the need of cross-questioning.* Lange's table below was based on 500 children entering the city schools of Planen, and 300 entering 21 country schools in outlying districts, and the figures represent the per cents of those having the concept.

| Questions or Concept. | City Children. | Country Children. |
|-------------------------------------------------|----------------|-------------------|
| 1. Seen the sun rise, | 18 | 42 |
| 2. Seen the sun set, | 23 | 58 |
| 3. Seen the moon and stars, | 84 | 82 |
| 4. Seen and heard lark, | 20 | 70 |
| 5. Fish swimming wild, | 72 | 83 |
| 6. Been to a pond, | 51 | 86 |
| 7. Been to a brook or river, | 71 | 82 |
| 8. Been on high hill or mountain, | 48 | 74 |
| 9. Been in a forest, | 63 | 86 |
| 10. Knows an oak, | 18 | 57 |
| 11. Seen a corn or wheat field, | 64 | 92 |
| 12. Knows how bread comes from grain, | 28 | 63 |
| 13. Seen a shoemaker at work, | 79 | 80 |
| 14. Seen a carpenter at work, | 55 | 62 |
| 15. Seen a mason at work, | 86 | 92 |
| 16. Been in a church, | 50 | 49 |
| 17. Knows aught of the dear God, | 51 | 66 |

* See Der Vorstellungskreis unserer sechsjährigen Kleinen. Allg. Schul-Zeitung. Jena, 1879, p. 327 *et seq.*

Only 43 per cent of the city children had ever been to any other town or village, only 18 per cent had seen the castle near by, and knowledge of colors was as follows, beginning with those best known and ending with the least known: black, white, red, green, blue, yellow. The ignorance of city children shows the utility of school excursions. Girls had seen, heard, and experienced less than boys of all the seventeen subjects of inquiry save the "dear God," of whom they knew more than the boys. Little is told of Lange's methods, or whether or how far they led to a modification of the elementary curriculum.

Conditions of the Experiment in Boston.—It was with the advantages of many suggestions and not a few warnings from these attempts that the writer undertook, soon after the opening of the Boston schools in September, 1880, to make out a list of questions suitable for obtaining an inventory of the contents of the minds of children of average intelligence on entering the primary schools of that city. This was made possible by the liberality of Mrs. Quincy Shaw, who detailed four excellent teachers from her comprehensive system of kindergartens to act as special questioners under the writer's direction, and by the co-operation of Miss L. B. Pingree, their superintendent. All the local and many other of the German questions were not suitable to children here; and the task of selecting those that should be so, though perhaps not involving quite so many perplexing considerations as choosing an equally long list of "normal words," was by no means easy. They must not be too familiar nor too hard and remote, but must give free and easy play to thought and memory. But especially, to yield most practical results, they

should lie within the range of what children are commonly supposed or at least desired or expected, by teachers and by those who write primary text-books and prescribe courses of instruction, to know. Many preliminary half-days of questioning small groups of children and receiving suggestions from many sources, and the use of many primers, object-lesson courses, etc., now in use in this country, were necessary before the first provisional list of one hundred and thirty-four questions was printed. The problem first had in mind was strictly practical; viz., what may Boston children be, by their teachers, assumed to know and have seen when they enter school; although other purposes more psychological shaped other questions used later.

What the Sources of Errors are in such Tests.—The difficulties and sources of possible error in the use of such questions are many. Not only are children prone to imitate others in their answers without stopping to think and give an independent answer of their own, but they often love to seem wise, and, to make themselves interesting, state what seems to interest us without reference to truth, divining the lines of our interest with a subtlety we do not suspect: if absurdities are doubted by the questioner, they are sometimes only the more protested by the children; the faculties of some are benumbed and perhaps their tongues tied by bashfulness, while others are careless, listless, inattentive, and answer at random. Again, many questioners are brusque, lacking in sympathy or tact, or real interest or patience in the work, or perhaps regard it as trivial or fruitless. These and many other difficulties seemed best minimized by the following method, which was finally settled upon, and, with the co-operation of Mr. E.

P. Seaver, superintendent of the Boston schools, put into operation.

Means taken to Obtain the Exact Facts concerning Children's Ideas.—The four trained and experienced kindergarten teachers were employed by the hour to question three children at a time in the dressing-room of the school by themselves alone, so as not to interrupt the school-work. No constraint was used, and, as several hours were necessary to finish each set, changes and rests were often needful, while by frequent correspondence and by meetings with the writer to discuss details and compare results uniformity of method was sought. The most honest and unembarrassed child's first answer to a direct question, e.g., whether it has seen a cow, sheep, etc., must rarely or never be taken without careful cross-questioning—a stated method of which was developed respecting many objects. If the child says it has seen a cow, but when asked its size points to its own finger-nail or hand and says, *so big*, as not unfrequently occurs, the inference is that it has at most only seen a picture of a cow, and thinks its size reproduced therein, and accordingly he is set down as deficient on that question. If, however, he is correct in size, but calls the color blue, does not know it as the source of milk, or that it has horns or hoofs,—several errors of the latter order were allowed. A worm may be said to *swim* on the ground, butchers to kill only the bad animals, etc.; but when hams are said to grow on trees or in the ground, or a hill is described as a *lump* of dirt or wool as growing on hens, as sometimes occurs, deficiency is obvious. Thus many other visual and other notions that seem to adults so simple that they must be

present to the mind with some completeness or not at all, are in a process of gradual acquisition, element by element, in the mind of a child, so that there must sometimes be confessedly a certain degree of arbitrariness in saying, as, except in cases of peculiar uncertainty, the questioners attempted to do, that the child has the concept or does not have it. Men's first names seemed to have designated single striking qualities; but, once applied, they become general or specific names according to circumstances. Again, very few children knew that a tree has bark, leaves, trunk, and roots; but very few indeed had not noticed a tree enough for our "pass." Without specifying further details, it may suffice here to say that the child was given the benefit of every doubt and credited with knowledge wherever its ignorance was not so radical as to make a chaos of what instruction and most primary text-books are wont to assume. It is important also to add that the questioners were requested to report manifest gaps in the child's knowledge *in its own words*, reproducing its syntax, pronunciation, etc.

200 Average Children the Basis of the Following Tables.—About sixty teachers besides the four examiners made returns from three or more children each. Many of their returns, however, are incomplete, careless, or show internal contradictions, and can be used only indirectly to control results from the other sources. From more than twice that number two hundred of the Boston children were selected as the basis of the following table. For certain questions and for many statistical purposes this number is much too small to yield very valuable results; but where, as in the majority of cases,

the averages of these children taken by fifties have varied less than ten per cent, it is safe to infer that the figures have considerable representative worth and far more than they could have if the percentage was small. The precautions that were taken to avoid schools where the children come from homes representing extremes of either culture or ignorance, or to balance deviations from a preliminary conjecture averaged in one direction by like deviations in the other, and also to select from each school-room with the teacher's aid only children of average capacity and to dismiss each child found unresponsive or not acquainted with the English language, give to the percentages, it is believed, a worth which without these and other precautions to this end only far larger numbers could yield.

Percentage of Ignorance Given.—The following table shows the general results for a number of those questions which admit of categorical answers, only negative results being recorded; the italicized questions in the "miscellaneous" class being based on only from forty to seventy-five children, the rest on two hundred, or, in a few cases, on two hundred and fifty.

Tests Made upon 678 Children in Kansas City.—In 1883, shortly after my own tables, as below, were published, Superintendent I. M. Greenwood, of Kansas City, tested 678 children of the lowest primary class in that city, of whom 47 were colored, with some of my questions. I here print his percentages in the last two columns. In his State children are admitted to school at six; but his tests were made in March, April, May, or after some seven months more of school life, and probably at greater age.

Comparison of Boston and Kansas City Results.

| NAME OF THE OBJECT OF CONCEPTION. | PER CENT OF CHILDREN IGNORANT OF IT. | | |
|--------------------------------------|-----------------------------------------|---------------------|-------------------|
| | In Boston. | In Kansas White. | City. Colored. |
| Beehive, | 80 | 59.4 | 66 |
| Crow, | 77 | 47.3 | 59 |
| Bluebird, | 72.5 | | |
| Ant, | 65.5 | 21.5 | 19.1 |
| Squirrel, | 63 | 15 | 4.2 |
| Snail, | 62 | | |
| Robin, | 60.5 | 30.6 | 10.6 |
| Sparrow, | 57.5 | | |
| Sheep, | 54 | 3.5 | |
| Bee, | 52 | 7.27 | 4.2 |
| Frog, | 50 | 2.7 | |
| Pig, | 47.5 | 1.7 | |
| Chicken, | 33.5 | .5 | |
| Worm, | 22 | .5 | |
| Butterfly, | 20.5 | .5 | |
| Hen, | 19 | .1 | |
| Cow, | 18.5 | 5.2 | |
| | | | |
| Growing wheat, | 92.5 | 23.4 | 66 |
| Elm-tree, | 91.5 | 52.4 | 89.8 |
| Poplar-tree, | 89 | | |
| Willow, | 89 | | |
| Growing oats, | 87.5 | | |
| Oak-tree, | 87 | 62.2 | 58.6 |
| Pine, | 87 | 65.6 | 87.2 |
| Maple, | 83 | 31.2 | 80.8 |
| Growing moss, | 81.5 | 30.7 | 42.5 |
| " strawberries, | 78.5 | 26.5 | 1.1 |
| " clover, | 74 | | |
| " beans, | 71.5 | | |
| " blueberries, | 67.5 | | |
| " blackberries, | 66 | | |
| " corn, | 65.5 | | |
| Chestnut-tree, | 64 | | |
| Planted a seed, | 63 | | |
| Peaches on a tree, | 61 | | |
| Growing potatoes, | 61 | | |
| " buttercup, | 55.5 | | |
| " rose, | 54 | | |
| " grapes, | 53 | | |
| " dandelion, | 52 | | |

| NAME OF THE OBJECT OF CONCEPTION. | PER CENT OF CHILDREN IGNOBANT OF IT. | | |
|---------------------------------------|-----------------------------------------|---------------------|-------------------|
| | In Boston. | In Kansas White. | City. Colored. |
| Growing cherries, | 46 | | |
| “ pears, | 32 | | |
| “ apples, | 21 | | |
| Where are the child's ribs, | 90.5 | 13.6 | 6.4 |
| “ “ “ lungs, | 81 | 26 | 44.6 |
| “ “ “ heart, | 80 | 18.5 | 18.1 |
| “ “ “ wrist, | 70.5 | 3 | |
| “ “ ankles, | 65.5 | 14.1 | |
| “ “ waist, | 52.5 | 14 | 4.2 |
| “ “ hips, | 45 | 14 | 4.2 |
| “ “ knuckles, | 36 | 2.9 | 8.5 |
| “ “ elbows, | 25 | 1.5 | |
| Knows right and left hand, | 21.5 | 1 | 10.2 |
| “ check, | 18.5 | .5 | |
| “ forehead, | 15 | .5 | |
| “ throat, | 13.5 | 1.1 | |
| “ knee, | 7 | 1.6 | |
| “ stomach, | 6 | 27.2 | 45.9 |
| Dew, | 78 | 39.1 | 70.2 |
| What season it is, | 75.5 | 31.8 | 56.1 |
| Seen hail, | 73 | 13.6 | 18.1 |
| “ rainbow, | 65 | 10.3 | 2.1 |
| “ sunrise, | 56.5 | 16.6 | |
| “ sunset, | 53.5 | 19.5 | |
| “ clouds, | 35 | 7.3 | |
| “ stars, | 14 | 3 | |
| “ moon, | 7 | 26 | 53 |
| Conception of an island, | 87.5 | | |
| “ “ a beach, | 55.5 | | |
| “ “ woods, | 53.5 | | |
| “ “ river, | 48 | | |
| “ “ pond, | 40 | | |
| “ “ hill, | 28 | | |
| “ “ brook, | 15 | | |
| “ “ triangle, | 92 | | |
| “ “ square, | 56 | | |
| “ “ circle, | 35 | | |
| The number five, | 28.5 | | |
| “ “ four, | 17 | | |
| “ “ three, | 8 | | |

The Contents of Children's Minds

| NAME OF THE OBJECT OF CONCEPTION. | PER CENT OF CHILDREN IGNORANT OF IT. | | |
|-----------------------------------------------|-----------------------------------------|---------------------|-------------------|
| | In Boston. | In Kansas White. | City. Colored. |
| Seen watchmaker at work, | 68 | 30.1 | 49.7 |
| “ file, | 65 | 20.8 | 36.1 |
| “ plough, | 64.5 | 13.9 | 8.5 |
| “ spade, | 62 | 7.3 | 15 |
| “ hoc, | 61 | 5 | 10.6 |
| “ bricklayer at work, | 44.5 | 10.1 | 2.1 |
| “ shoemaker at work, | 25 | 8.7 | |
| “ axe, | 12 | 18.4 | 53 |
| Knows green by name, | 15 | | |
| “ blue by name, | 14 | | |
| “ yellow by name, | 13.5 | | |
| “ red by name, | 9 | | |
| That leathern things come from | | | |
| animals, | 93.4 | 50.8 | 72.3 |
| Maxim or proverb, | 91.5 | | |
| Origin of cotton things, | 90 | 35.7 | 15 |
| What flour is made of, | 89 | 34.7 | 57.4 |
| Ability to knit, | 88 | | |
| What bricks are made of, | 81.1 | 33.1 | 53 |
| Shape of the world, | 70.3 | 46 | 47 |
| Origin of woollen things, | 69 | 55 | 44 |
| Never attended kindergarten, | 67.5 | | |
| Never been in bathing, | 64.5 | 13.4 | |
| Can tell no rudiment of a story, | 58 | 23.6 | 12.7 |
| Not know wooden things are from | | | |
| trees, | 55 | 19.3 | 6.4 |
| Origin of butter, | 50.5 | 6.7 | |
| Origin of meat (from animals), | 48 | 8.3 | 12.7 |
| Cannot sew, | 47.5 | 23.4 | |
| Cannot strike a given musical tone, | 40 | | |
| Cannot beat time regularly, | 39 | | |
| Have never saved cents at home, | 36 | 8.2 | 12.7 |
| Never been in the country, | 35.5 | 13.1 | 19 |
| Can repeat no verse, | 28 | 20 | 42.5 |
| Source of milk, | 20.5 | 4 | |

Classification with Reference to Sex and Nationality.

| NAME OF THE OBJECT OF CONCEPT. | Per Cent of Ignorance in 150 Girls. | Per Cent of Ignorance in 150 Boys. | Per Cent of Ignorance in 50 Irish Children. | Per Cent of Ignorance in 50 American Children. | Per Cent of Ignorance in 64 kin- dergarten Children. |
|-----------------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------|
| Beehive, | 81 | 75 | 86 | 70 | 61 |
| Ant, | 59 | 60 | 74 | 38 | 26 |
| Squirrel, | 69 | 50 | 66 | 42 | 43 |
| Snail, | 69 | 73 | 92 | 72 | 62 |
| Robin, | 69 | 44 | 64 | 36 | 29 |
| Sheep, | 67 | 47 | 62 | 40 | 40 |
| Bee, | 46 | 32 | 52 | 32 | 26 |
| Frog, | 53 | 38 | 54 | 35 | 35 |
| Pig, | 45 | 27 | 38 | 26 | 22 |
| Chicken, | 35 | 21 | 32 | 16 | 22 |
| Worm, | 21 | 17 | 26 | 16 | 9 |
| Butterfly, | 14 | 16 | 26 | 8 | 9 |
| Hen, | 15 | 14 | 18 | 2 | 14 |
| Cow, | 18 | 12 | 20 | 6 | 10 |
| | | | | | |
| Growing clover, | 59 | 68 | 84 | 42 | 29 |
| “ corn, | 58 | 50 | 60 | 68 | 32 |
| “ potatoes, | 55 | 54 | 62 | 44 | 34 |
| “ buttercup, | 50 | 51 | 66 | 40 | 31 |
| “ rose, | 48 | 48 | 60 | 42 | 33 |
| “ dandelion, | 44 | 42 | 62 | 34 | 31 |
| “ apples, | 16 | 16 | 18 | 12 | 5 |
| | | | | | |
| Ribs, | 88 | 92 | 98 | 82 | 68 |
| Ankles, | 58 | 52 | 62 | 40 | 38 |
| Waist, | 53 | 52 | 64 | 32 | 36 |
| Hips, | 50 | 47 | 72 | 31 | 24 |
| Knuckles, | 27 | 27 | 34 | 12 | 23 |
| Elbow, | 19 | 32 | 36 | 16 | 12 |
| Right from left hand, | 20 | 8 | 14 | 20 | 4 |
| Wrist, | 21 | 34 | 44 | 9 | 19 |
| Cheek, | 10 | 12 | 14 | 14 | 4 |
| Forehead, | 10 | 11 | 12 | 10 | 7 |
| Throat, | 10 | 18 | 14 | 16 | 14 |
| Knee, | 4 | 5 | 2 | 10 | 2 |
| | | | | | |
| Dew, | 64 | 63 | 92 | 52 | 57 |
| What season it is, | 59 | 50 | 68 | 48 | 41 |
| Hail, | 75 | 61 | 84 | 52 | 53 |
| Rainbow, | 59 | 61 | 70 | 38 | 38 |

The Contents of Children's Minds

| NAME OF THE OBJECT OF CONCEPT. | Per Cent of Ignorance in 150 Girls. | Per Cent of Ignorance in 150 Boys. | Per Cent of Ignorance in 50 Irish Children. | Per Cent of Ignorance in 50 American Children. | Per Cent of Ignorance in 64 kin- dergarten Children. |
|-----------------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------|
| Sunrise, | 71 | 53 | 70 | 36 | 53 |
| Sunset, | 47 | 49 | 52 | 32 | 29 |
| Star, | 15 | 10 | 12 | 4 | 7 |
| Island, | 74 | 78 | 84 | 64 | 55 |
| Beach, | 82 | 49 | 60 | 34 | 32 |
| Woods, | 46 | 36 | 46 | 32 | 27 |
| River, | 38 | 44 | 62 | 12 | 13 |
| Pond, | 31 | 34 | 42 | 24 | 28 |
| Hill, | 23 | 22 | 30 | 12 | 19 |
| The number five, | 26 | 16 | 22 | 24 | 12 |
| “ “ four, | 15 | 10 | 16 | 14 | 7 |
| “ “ three, | 7 | 6 | 12 | 8 | 0 |

What Children were Examined in Boston.—The first Boston table is based upon about equal numbers of boys and girls, and children of Irish and American parentage greatly predominate. There are 21 Germans, and 19 are divided between 8 other nationalities; 14 per cent of all examined did not know their age; 6 per cent were four, 37 per cent were five, 25 per cent were six, 12 per cent were seven, and 2 per cent were eight years old. The returns were carefully tabulated to determine the influence of age, which seems surprisingly unpronounced, indicating, so far as the small numbers go, a slight value of age *per se* as an index of ripeness for school.

The Returns Indicate Little Difference between the Sexes.—In the second table which is based on Boston children, only columns 2 and 3 are based upon larger numbers, and upon less carefully restricted selections from the aggregate returns. In 34 representative questions out of 49 the boys surpass the girls, as the German boys did in 75 per cent of the Berlin questions. The girls excel in knowledge of the parts of the body, home

and family life, thunder, rainbows, in knowledge of square, circle, and triangle, but not in that of cube, sphere, and pyramid, which is harder and later. Their stories are more imaginative, while their knowledge of things outward and remote, their power to sing and articulate correctly from dictation, their acquaintance with number and animals, is distinctly less than that of the boys. The Berlin report infers that the more common, near, or easy a notion is the more likely are the girls to excel the boys, and *vice versa*. Save possibly in the knowledge of the parts of the body, our returns do not indicate difference between the sexes. Boys do seem, however, more likely than girls to be ignorant of common things right about them; where knowledge is wont to be assumed. Column 5 shows that the Irish children tested were behind others on nearly all topics. The Irish girls decidedly outrank the Irish boys, the advantage to the sex being outweighed by the wider knowledge of the boys of other nationalities. Whether, however, the five and six-year old Irish boys are not after all so constituted as to surpass their precocious American playmates later in school or adult life, as since Sigismund many think "slow" children generally do, is one of the most serious questions for the philosophical educator.

The Advantage of the Kindergarten Shown.—Column 6 shows in a striking way the advantage of the kindergarten children, without regard to nationality, over all others. Most of the latter tested were from the charity kindergartens, so that superior intelligence of home surroundings can hardly be assumed. Many of them had attended kindergarten but a short time, and the questions were so ordered that the questioners who had a

special interest in the kindergarten should not know till near the end of their tests whether or not they had ever attended it. On the other hand, a somewhat larger proportion of the children from the kindergarten had been in the country. Yet on the whole we seem to have here an illustration of the law that we really see not what is near or impresses the retina, but what the attention is called and held to, and what interests are awakened and words found for. Of nearly thirty primary teachers questioned as to the difference between children from kindergartens and others, four saw no difference, and all the rest thought them better fitted for school-work, instancing superior use of language, skill with the hand and slate, quickness, power of observation, singing, number, love of work, neatness, politeness, freedom from the benumbing school-bashfulness, or power to draw from dictation. Many thought them at first more restless and talkative.

Important Educational Conclusions may be Derived.— There are many other details and more or less probable inferences, but the above are the chief. The work was laborious, involving about fifty thousand items in all. These results are, it is believed, to be in some degree the first opening of a field which should be specialized, and in which single concept-groups should be subjected to more detailed study with larger numbers of children. One difficulty is to get essential points to test for. If these are not characteristic and typical, all such work is worthless. We believe that not only practical educational conclusions of great scope and importance may be based on or illustrated by such results, but, though many sources of inaccuracy may limit their value, that they are of great importance for anthropology and psychology.

It is characteristic of an educated man, says Aristotle in substance, not to require a degree of scientific exactness on any subject greater than that which the subject admits. As scientific methods advance, not only are increasingly complex matters subjected to them, but probabilities (which guide nearly all our acts) more and more remote from mathematical certainty are valued.

Knowledge of Children's Ideas Essential as Basis of Right Instruction.—Steinthal tells an opposite story of six German gentlemen riding socially in a coupé all day, and as they approached the station where they were to separate, one proposed to tell the vocation of each of the others, who were strangers to him, if they would write without hesitation an answer to the question, "What destroys its own offspring?" One wrote, Vital force. "You," said the questioner, "are a biologist." Another wrote, War. "You," he said, "are a soldier." Another wrote, Kronos, and was correctly pronounced a philologist; while the publicist revealed himself by writing, Revolution, and the farmer by writing, She-bear. This fable teaches the law of apperception. As Don Quixote saw an army in a flock of sheep and a giant in a wind-mill, as some see all things in the light of politics, others in that of religion, education, etc., so the Aryan races apperceived the clouds as cows and the rain as their milk, the sun as a horse, the lightning as an arrow; and so the children apperceive rain as God pouring down water; thunder as barrels, boards falling, or cannon; heaven as a well-appointed nursery, etc. They bring more or less developed apperceiving organs with them into school, each older and more familiar concept gaining more apperceptive power over the newer concepts and percepts by use. The older impressions are on the

lurch, as it were, for the new ones, and mental freedom and all-sidedness depend on the number and strength of these appropriating concepts. If there are very few, as with children, teaching is like pouring water from a big tub into a small narrow-necked bottle. A teacher who acts upon the now everywhere admitted fallacy that knowledge of the subject is all that is needed in teaching children pours at random onto more than into the children, talking to rather than with them, and gauging what he gives rather than what they receive. All now agree that the mind can learn only what is related to other things learned before, and that we must start from the knowledge that the children really have and develop this as germs, otherwise we are showing objects that require close scrutiny only to indirect vision, or talking to the blind about color. Alas for the teacher who does not learn more from his children than he can ever hope to teach them! Just in proportion as teachers do this do they cease to be merely mechanical, and acquire interest, perhaps enthusiasm, and surely an all-compensating sense of growth, in their work and life.

Four Inferences from above Tables.—From the above tables it seems not too much also to infer—I. That there is next to nothing of pedagogic value the knowledge of which it is safe to assume at the outset of school-life. Hence the need of objects and the danger of books and word-cram. Hence many of the best primary teachers in Germany spend from two to four or even six months in talking of objects and drawing them before any beginning of what we till lately have regarded as primary-school work. II. The best preparation parents can give their children for good school-training is to make them acquainted with natural objects, especially with the

sights and sounds of the country, and to send them to good and hygienic, as distinct from the most fashionable, kindergartens. III. Every teacher on starting with a new class or in a new locality, to make sure that his efforts along some lines are not utterly lost, should undertake to explore carefully section by section children's minds with all the tact and ingenuity he can command and acquire, to determine exactly what is already shown; and every normal-school pupil should undertake work of the same kind as an essential part of his training. IV. The concepts that are most common in the children of a given locality are the earliest to be acquired, while the rarer ones are later. This order may in teaching generally be assumed as a natural one, e.g., apples first and wheat last (cf. the first Boston table above). This order, however, varies very greatly with every change of environment, so that the results of explorations of children's minds in one place cannot be assumed to be valid for those of another save within comparatively few concept-spheres.

The Common Notion of what Children Know Erroneous.—The high rate of ignorance indicated in the table may surprise most persons who will be likely to read this report, because the childhood they know will be much above the average of intelligence here sought, and because the few memories of childhood which survive in adult life necessarily bear but slight traces of imperfections, and are from many causes illusory. Skeins and spools of thread were said to grow on the sheep's back or on bushes, stockings on trees, butter to come from buttereups, flour to be made of beans, oats to grow on oaks, bread to be swelled yeast, trees to be stuck in the ground by God and to be rootless, meat to

be dug from the ground, and potatoes to be picked from the trees. Cheese is squeezed butter, the cow says "bow-wow," the pig purrs or burrows, worms are not distinguished from snakes, moss from the "toad's umbrella," bricks from stones, etc. An oak may be known only as an acorn-tree or a button-tree, a pine only as a needle-tree, a bird's nest only as its bed, etc. So that while no one child has all these misconceptions, none are free from them, and thus the liabilities are great that, in this chaos of half-assimilated impressions, half-right, half-wrong, some lost link may make utter nonsense or mere verbal cram of the most careful instruction, as in the cases of children referred to above who knew much by rote about a cow, its milk, horns, leather, meat, etc., but yet were sure from the picture-book that it was no bigger than a small mouse.

City Life is Unnatural.—For 86 per cent of the above questions the average intelligence of thirty-six country children who were tested ranks higher than that of the city children of the table, and in many items very greatly. The subject-matter of primers for the latter is in great part still traditionally of country life; hence the danger of unwarranted presupposition is considerable. As our methods of teaching grow natural we realize that city life is unnatural, and that those who grow up without knowing the country are defrauded of that without which childhood can never be complete or normal. On the whole, the material of the city is no doubt inferior in pedagogic value to country experience. A few days in the country at this age has raised the level of many a city child's intelligence more than a term or two of school-training could do without it. It

is there, too, that the qualities of a love of natural science are best laid

Country Life and its Educational Value.—We cannot as yet give any definite indications the evolutionary dictum that the present development should repeat that of the past. In primitive man, the child has a feeble body, and is influenced by a higher culture about him. Yet from the primeval intimacy with the qualities and habits of plants, with the instincts of animals—so like those of children—with which hawking and trapping, the riding on instead of some distance behind horses, etc., made men familiar ; from primitive industries and tools as first freshly suggested, if we believe Geiger, from the normal activities of the human organism, especially of the tool of tools, the hand ; from primitive shelter, cooking and clothing, with which anthropological researches make us familiar, it is certain that not a few educational elements of great value can be selected and systematized for children—an increasing number of them in fact being already in use for juvenile games and recreations and for the vacation pastimes of adults. A country-barn, a forest with its gloom and awe, its vague fears and indefinite sounds, is a great school at this age. The making of butter, of which some teachers, after hearing so often that it grew inside eggs, or on ice, or was made from buttermilk, think it worth while to make a thimbleful in a toy churn at school as an object-lesson ; more acquaintance with birds, which, as having the most perfect senses, most constant motion in several elements, even Leopardi could panegyrize as the only real things of joy in the universe, and which the strange power of flight makes ideal beings with children, and

whose nests were sometimes said to *grow* on trees ; more knowledge of kitchen-chemistry, of foods, their preparation and origin ; wide prospects for the eyes—these elements constitute a more pedagogic industrial training for *young* children, because more free and play-like, than sewing, or cooking, or whittling, or special trade-schools can, and are besides more hygienic.

What Advantages the City Child Has, and what He Lacks.—Many children locate all that is good and imperfectly known in the country, and nearly a dozen volunteered the statement that good people when they die go to the country—even from Boston. It is things that live, and, as it were, detach themselves from their background by moving that catch the eye and with it the attention, and the subjects which occupy and interest the city child are mainly in motion and therefore transient, while the country child comes to know objects at rest better. The country child has more solitude, is likely to develop more independence, and is less likely to be prematurely caught up into the absorbing activities and throbbing passions of manhood, and becomes more familiar with the experiences of primitive man. The city child knows a little of many more things, and so is more liable to superficiality, and has a wider field of error. At the same time it has two great advantages over the country child, in knowing more of human nature and in entering school with a much better developed sense of rhythm, and all its important implications. On the whole, however, additional force seems thus given to the argument for excursions, by rail or otherwise, regularly provided for the poorer children who are causing the race to degenerate in the

great centres of population, unfavorable enough for those with good homes or even for adults.

Words often Produce Distorted Ideas through Resemblance in Sound.—Words, in connection with rhyme, rhythm, alliteration, cadence, etc., or even without these, simply as sound-pictures, often absorb the attention of children, and yield them a really æsthetic pleasure either quite independently of their meaning or to the utter bewilderment of it. They hear fancied words in noises and sounds of nature and animals, and are persistent punners. As butterflies make butter or eat it or give it by squeezing, so grasshoppers give grass, bees give beads and beans, kittens grow on the pussy-willow, and all honey is from honeysuckles, and even a poplin dress is made of poplar-trees. When the cow lows it somehow blows its own horn; crows and scarecrows are confounded; ant has some subtle relationship to aunt; angle-worm suggests angle, or triangle, or ankle; Martie eats “tomarties;” a holiday is a day to “holler” on; Harry O’Neil is nicknamed Harry Oatmeal; isosceles is somehow related to sausages; October suggests knocked over; “I never saw a hawk, but I can hawk and spit too;” “I will not sing do re mi, but do re *you* ;” “Miss Eaton will eat us”—these and many more from the questioners’ notes; the story of the child who, puzzled by the unfamiliar reflexive use of the verb, came to associate “Now I lay me,” etc., with a *lama*; of the child who wondered what kind of a bear was the consecrated cross-eyed bear as he understood the hymn “The consecrated cross I’d bear;” or of another who was for years stultified as against a dead blank wall whenever the phrase “answer sought” occurred, suggest to us how, more or less con-

sciously and more or less seriously, a child may be led, in the absence of corrective experience, to the most fantastic and otherwise unaccountable distortions of facts by shadowy word-spectres or husks.

Danger that Knowledge May be Verbal Rather than Real.—In many of the expressions quoted the child seems playing with relations once seriously held, and its "fun" to be joy over but lately broken mental fetters. Some at least of the not infrequently quite unintelligible statements or answers may perhaps be thus accounted for. Again, the child more than the adult thinks in pictures, gestures, and inarticulate sounds. The distinction between real and verbal knowledge has been carefully and constantly kept in mind by the questioners. Yet of the objects in the above table, except a very few, like triangle and sparrow, a child may be said to know almost nothing, at least for school purposes, if he has no generally recognized name for them. The far greater danger is the converse, that only the name and not the thing itself will be known. To test for this danger was, with the exceptions presently to be noted, our constant aim, as it is that of true education to obviate it. The danger, however, is after all quite limited here; for the linguistic imperfections of children are far more often shown in combining words than in naming the concrete things they know or do not know. To name an object is a passion with them, for it is to put their own mark upon it, to appropriate it. From the talk which most children hear and use to book language is again an immense step. Words *live* only in the ear and mouth, and are pale and corpse-like when addressed to the eye. What we want, and indeed are likely soon to have, are carefully arranged child vocabu-

laries and dictionaries of both verbal forms and meanings, to show teachers just the phonic elements and vocal combinations children have most trouble with,—the words they most readily and surely acquire, their number and order in each thought-sphere,—and the attributes and connotations most liable to confuse them. To that work it is believed the method here employed has already furnished valuable material in protocol, soon to be augmented and digested.

The Color Test Designed to Determine Power of Using Color-names.—To specify a few items more fully, the four color-questions were designed to test, not color-blindness, but the power to use color-names. The Holmgren worsteds were used, from which the child was asked to pick out, not colors like others to which its attention is directed without naming them, but the color named, to which he has no clue but the name. It did not seem safe to complicate the objects of the latter educational test with the former, so that some of those marked defective in the table may or may not have been color-blind. Excluding colored and Jewish children, both of whom seem to show exceptional percentages, and averaging the sexes, both Magnus and Jeffries found a little over two per cent of many thousand children color-blind. The children they tested, however, were much older than these; and two or three hundred is far too small a number to warrant us, were it otherwise allowable, in simply subtracting two per cent and inferring that the remainder were deficient only in knowledge of the color-word. Our figures, then, do not bear upon the question whether the color-sense itself is fully developed before the age of five or six or not.

Also in Number Tests, the Number-name was Sought.—Again, number cannot be developed to any practical extent without knowledge of the number-name. Moreover, as Wundt's careful experiments show, the eye can apprehend but three of the smallest and simplest objects, unless they are arranged in some geometrical order, without taking additional time to count. As the chromatic scale grades musical intervals, or the names we count by graduate the vague sense of more or less, and later, as visible notes change all musical ideas and possibilities, so figures or number-signs almost create arithmetic. A child who seriously says a cat has three or five legs will pick out its own, e.g., the fourth seat in the fifth row in an empty school-room almost every time by happy guessing, and hold up "so many" fingers or blocks, when, if the number-name five or six were called for and nothing shown, it would be quite confused. In our tests the number-name was sought, because it is that which is mainly serviceable for educational purposes.

Physical Self-consciousness and Knowledge of the Earth Small.—As to the physiological and geographical questions little need be said. Joint, flesh, and vein are often unknown terms, or joint is where the bone is broken, and there are stones in the knees. Within the skin is blood and something hard, perhaps wood. Physical self-consciousness, which is in little danger of becoming morbid at this age, begins with recognition of the hand, then of the foot, because these are the most mobile parts, but has not often reached the face at this age, and blushing is rare; while psychic self-consciousness is commonly only of pain, either internal, as of stomach-ache, or peripheral, of cuts, bruises, etc. The world is square, straight, or flat, and if the other side has been thought of it is all

woods or water or ice, or where saved people or Protestants, or anything much heard of but little seen, are; if we go to the edge of the world we come to water or may fall off, or it may be like a house and we live on top. The first notion of a hill may be of some particular pile of sand, perhaps on the moulding-board, three inches high, or a rubbish-heap in the back-yard, or a slant where a sled will run alone; but a comprehensive idea of hill with opposite sides, though simpler and easier than most geographical categories, is by no means to be assumed.

There is a Region of Fancy in Children's Minds Hard to be Reached.—If children are pressed to answer questions somewhat beyond their ken, they often reply confusedly and at random, while if others beside them are questioned they can answer well; some are bolder and invent things on the spot if they seem to interest the questioner, while others catch quick subtle suggestions from the form of the question, accent, gesture, feature, etc., so that what seems originality is really mind-reading, giving back our very thought, and is sometimes only a direct reproduction, with but little distortion, because little apprehension, of what parents or teachers have lately told them. But there are certain elements which every tactful and experienced friend of children learns to distinguish from each of these with considerable accuracy—elements which, from whatever source, spring from deep roots in the childish heart, as distinct from all these as are Grimm's tales from those of some of our weakly juvenile weeklies. These are generally not easily accessible. I could not persuade an old nurse to repeat to me a nonsensical song I half-overheard that delighted a two-year-old child, and the brothers Grimm experienced a similar difficulty in making their collections. As many workingmen

nail a horseshoe over their door for luck, and many people really prefer to begin nothing important on Friday, who will not confess to a trace of superstition in either case, so children cling to their "old credulities to nature dear," refusing every attempt to gain their full confidence or explore secret tracts in their minds, as a well-developed system of insane illusions may escape the scrutiny of the most skilful alienist. As a reasoning electric light might honestly doubt the existence of such things as shadows, because, however near or numerous, they are always hidden from it, so the most intelligent adults quite commonly fail to recognize sides of their own children's souls which can be seen only by strategy. A boy and girl often play under my window as I write, and when either is quite alone unconscious words often reveal what is passing in their own minds, and it is often very absurd or else meaningless, but they run away with shame and even blushes if they chance to look up suddenly and catch me listening. Yet who of us has not secret regions of soul to which no friend is ever admitted, and which we ourselves shrink from full consciousness of? Many children half-believe the doll feels cold or blows, that it pains flowers to tear or burn them, or that in summer when the tree is alive it makes it ache to pound or chop it. Of 48 children questioned 20 believed sun, moon, or stars to live, 15 thought a doll, and 16 thought flowers would suffer pain if burned. Children who are accounted dull in school-work are more apt to be imaginative and animistic.

Children's Fancies—The Sky.—The chief field for such fond and often secret childish fancies is the sky. About three fourths of all questioned thought the world a plain, and many described it as round like a dollar, while the sky is like a flattened bowl turned over it. The sky is

often *thin*, one might *easily break through*; half the moon may be seen through it, while the other half is this side; it may be *made of snow*, but is so large that there is *much floor-sweeping* to be done in heaven.

The Sun.—Some thought *the sun went down at night into the ground* or just behind certain houses, and went across, on, or under the ground to *go up, out of, or off the water* in the morning; but 48 per cent of all thought that at night it *goes or rolls or flies, is blown or walks, or God pulls it up* higher out of sight. He *takes it into heaven*, and perhaps *puts it to bed*, and even *takes off its clothes* and puts them on in the morning, or again it *lies under the trees*, where the angels *mind it*, or goes through and *shines on the upper side of the sky*, or goes *into or behind the moon*, as the moon is behind it in the day. It may *stay where it is*, only we *cannot see it; for it is dark*, or the *dark rains down so*, and it *comes out when it gets light so it can see*. More than half the children questioned conceived the sun as never more than 40 degrees from the zenith, and, naturally enough, city children knew little of the horizon.

The Moon.—So the moon (still italicizing where the exact words of the children are given) *comes around when it is a bright night* and people *want to walk, or forget to light some lamps*; it *follows us about* and has nose and eyes, while it *calls the stars into, under, or behind it* at night, and they may be *made of bits of it*. Sometimes the moon is *round a month or two*; then it is a *rim*, or a *piece is cut off*, or it is *half-stuck or half-buttoned into the sky*. The stars may be *sparks from fire-engines* or houses, or with higher intelligence, they are silver, or *God lights them with matches* and *blows them out or opens the door* and calls them in in the morning. Only in a single

case were any of the heavenly bodies conceived as openings in the sky to let light or glory through, or as eyes of supernatural beings—a fancy so often ascribed to children and so often found in juvenile literature.

Thunder and Lightning.—Thunder, which, anthropologists tell us, is or represents the highest God to most savage races, was apperceived as God *groaning* or *kicking*, or *rolling barrels about*, or *turning a big handle*, or *grinding snow*, *walking loud*, *breaking something*, *throwing logs*, *having coal run in*, *pounding about with a big hammer*, *rattling houses*, *hitting the clouds*, or clouds *bumping* or *clapping together* or *bursting*, or else it was merely *ice sliding off lots of houses*, or *cannon in the city* or sky, *hard rain down the chimney*, or *big rocks pounding*, or *piles of boards falling down*, or very hard rain, hail or wind. Lightning is God *putting out His finger* or *opening a door*, or *turning a gas quick*, or (very common) *striking many matches at once*, *throwing stones and iron for sparks*, *setting paper afire*, or it is light going outside and inside the sky, or stars falling.

Clouds and Rain.—God keeps rain in heaven in a *big sink*, *rows of buckets*, a *big tub* or *barrels*, and they *run over* or he *lets it down* with a *water-hose*, through a *siere*, a *dipper with holes*, or *sprinkles* or *tips* it down or *turns a faucet*. God makes it in heaven out of nothing or out of water, or gets it up by *splashing up*, or he *dips it up off the roof*, or it *rains up off the ground when we don't see it*. The clouds are *close to the sky*; they move because the *earth moves and makes them*. They are *dirty*, *muddy things*, or *blankets*, or *doors of heaven*, and are made of *fog*, of *steam that makes the sun go*, of *smoke*, of *white wool* or *feathers and birds*, or *lace* or *cloth*. In their changing forms very many children, whose very life

is fancy, think they see veritable men, or more commonly, because they have so many more forms, animals' faces, and very often God, Santa Claus, angels, etc., are also seen. Closely connected with the above are the religious concepts so common with children.

God and Heaven.—God is a *big*, perhaps *blue man*, very often seen in the sky, on or in the clouds, in the church, or even street. He *came in our gate, comes to see us sometimes*. He lives in a *big palace*, or a *big brick or stone house on the sky*. He makes lamps, babies, dogs, trees, money, etc., and the angels *work for him*. He looks like the priest, Fröbel, papa, etc., and they like to look at him, and a few would like to be God. He *lights the stars so he can see to go on the sidewalk or into the church*. Birds, children, Santa Claus, live with him, and most but not all like him better than they do the latter. When people die they just *go*, or are *put in a hole*, or a box or a *black wagon that goes to heaven*, or they *fly up* or are *drawn or slung up* into the sky where God *catches* them. They *never can get out of the hole*, and yet all good people somehow get where God is. He *lifts* them up, they *go up on a ladder or rope*, or they carry them up, but *keep their eyes shut so they do not know the way*, or they are *shoved up through a hole*. When children get there they have candy, rocking-horses, guns, and everything in the toy-shop or picture-book, play marbles, top, ball, cards, hookey, hear brass bands, have nice clothes, gold watches, and pets, ice-cream and soda-water, and no school. There are men who died in the war made into angels, and dolls with broken heads go there. Some think they must go through the church to get there; a few thought the horse-cars run there, and one said that the *birds that grow on apple-trees are drawn up there by the moon*. The bad

place is like an *oven* or a *police-station*, where it burns yet is all dark, and folks want to get back, and God *kills* people or *beats them with a cane*. God makes babies in heaven, though the holy mother and even Santa Claus make some. He *lets them down or drops them*, and the women or doctors *catch* them, or he leaves them on the sidewalk, or *brings them down a wooden ladder backwards and pulls it up again*, or mamma or the doctor or the nurse *go up and fetch them* sometimes in a balloon, or they *fly down and lose off their wings in some place or other and forget it*, or *jump down to Jesus*, who *gives them around*. They were also often said to be found in flour-barrels, and the *flour sticks ever so long you know*, or they *grow in cabbages*, or God *puts them in water*, perhaps *in the sewer*, and the doctor gets them out and *takes them to sick folks that want them*, or the milkman brings them early in the morning, they are dug out of the ground, or bought at the baby-store. Sometimes God *puts on a few things* or else *sends them along if he don't forget it*; this shows that no one since Basedow believes in telling children the truth in all things.

Such Fancies Dim, Timid, and Changing.—Not many children have or can be made to disclose many such ideas as the above, and indeed they seem to be generally already on the ebb of this age, and are sometimes timidly introduced by, *as if, some say, it is like, or I used to think*. Clear and confident notions on the above topics are the exception and not the rule, yet most have some of them, while some are common to many, indeed to most, children. They represent a drift of consentient infantile philosophy about the universe not without systematic coherence, although intimidated and broken through at every point by fragmentary truths, often

only verbal indeed, without insight or realization of a higher order, so that the most diametrical contradictions often subsist peacefully side by side, and yet they are ever forming again at lower levels of age and intelligence. In all that is remote the real and ideal fade into each other like clouds and mountains in the horizon, or as poetry, which keeps alive the standpoints of an earlier culture, coexists with science. Children are often hardly conscious of them at all, and the very questions that bring them to mind and invite them to words at the same time often abash the child to the first disquieting self-consciousness of the absurdity of his fond fancies that have felt not only life but character in natural objects. Between the products of childish spontaneity, where the unmistakable child's mark is seen, and those of really *happy* suggestion by parents, etc., the distinction is as hard as anywhere along the line between heredity and tradition. It is enough that these fancies are like Galton's composite portraits, resultants in form and shading of the manifold deepest impressions which what is within and what is without have together made upon the child's soul in these spheres of ideas.

They Represent Ever-changing Grades of Culture.—Those indicated above represent many strata of intelligence up through which the mind is passing very rapidly and with quite radical transformations. Each stratum was once, with but a little elaboration, or is now somewhere, the highest culture, relegated to and arrested in an earlier stage as civilization and educational methods advance. Belief in the false is as necessary as it is inevitable in children for the proper balance of head and heart, and happy the child who has believed or loved only healthy, unaffected, platonic lies like the

above, which will be shed with its milk-teeth when more solid mental pabulum can be digested. It is possible that the present shall be so attractive and preoccupying that the child never once sends his thoughts to the remote in time and place, and these baby-fancies—ever ready to form at a touch, which make the impartation of truth, however carefully put, on these themes impossible before its time; which, when long forgotten, yet often reverberate, if their old chords be struck in adults, to the intensity of fanaticism or even delusion—shall be quite repressed. If so, one of the best elements of education which comes from long experience in laying aside a lower for a higher phase of culture by doubting opportunely, judiciously, and temperately, is lost.

Childish Thought Largely in Terms of Sight.—De Quincey's pseudopia is thought by Dr. E. H. Clarke (*Visions*, p. 212) to be common with children; but although about 40 were asked to describe what they saw with their eyes shut, it is impossible to judge whether they visualize in any such distinctive sense as Mr. Galton has described, or only imagine and remember, often with Homeric circumstance, but with less picturesque vividness. Childish thought is very largely in visual terms; hence the need of object (*Anschauungs*) lessons, and hence, too, it comes that most of the above questions address the eye without any such intent. If phonic symbols could be made pictorial, as they were originally, and as illustrated primers made them in a third and still remoter sense, the irrational elements in learning to read would be largely obviated.

Sensations of Sound Referred to Color.—Again, out of 53 children 21 described the tones of certain instruments

as colored. The colors, or "photisms," thus suggested, though so far as tested constant from week to week in the same child, had no agreement for different instruments, a drum, e.g., suggesting yellow (the favorite color of children) to one child and black or red to another, and the tone of a fife being described as pale or bright, light or dark colored, intensity and saturation varying greatly with different children. For this and other forms of association or analogies of sensations of a large and not yet explored class so common in children, many data for future study were gathered. This was also the case with their powers of time and tone reproduction, and their common errors in articulation, which have suggested other and more detailed researches, some of which are already in progress.

Ideas of Right and Wrong—The Latter much more Distinct.—Each child was asked to name three things right and three things wrong to do, and nearly half could do so. In no case were the two confused, indicating not necessarily intuitive perception, but a general consensus in what is allowed and forbidden children at home, and how much better and more surely they learn to do than to know. Wrong things were specified much more readily and by more children than right things, and also in much greater variety. In about 450 answers 53 wrong acts are specified, while in over 350 answers only 34 different good acts are named. The more frequent answers are to mind and be good, or to disobey, be naughty, lie, and say bad words; but the answers

¹In the sense of Bleuler and Lehmann. See their treatise "Zwangmässige Lichtempfindung durch Schall," Leipzig, 1881. Also, Lazarus' "Leben der Seele," II., p. 131.

of the girls differ from the boys in two marked ways; they more often name specific acts and nearly twice as often conventional ones, the former difference being most common in naming right, the latter in naming wrong things. Boys say it is wrong to steal, fight, kick, break windows, get drunk, stick pins into others, or to "sass," "cuss," shoot them, while girls are more apt to say it is wrong not to comb the hair, to get butter on the dress, climb trees, unfold the hands, cry, catch flies, etc. The right things seem, it must be confessed, comparatively very tame and unattractive, and while the genius of an Aristotle could hardly extract categories or infer intuitions by classifications from either list, it is very manifest that the lower strata of conscience are dislike of dirt and fear. Pure intuitionists may like to know that over a dozen children were found who convinced their questioners that they thought they ought not to say bad words if no one heard them, or lie if not found out, etc., or who felt sick at the stomach when they had been bad, but the soap and water or sand with which their mouths are sometimes washed after bad words in kindergartens, or the red pepper administered at home after lies, may possibly have something to do with the latter phenomenon.

Drawings Illustrating Development of Observation and of Sense of Form.—From several hundred drawings, with the name given them by the child written by the teacher, the chief difference inferred is in concentration. Some make faint, hasty lines representing all the furniture of a room, or sky and stars, or all the objects they can think of, while others concentrate upon a single object. It is a girl *with buttons*, a house *with a keyhole* or steps, a man *with a pipe* or heels or ring grotesquely promi-

ment. The development of observation and sense of form is best seen in the pictures of men. The earliest and simplest representation is a round head, two eyes and legs. Later comes mouth, then nose, then hair, then ears. Arms like legs first grow directly from the head, rarely from the legs, and are seldom fingerless, though sometimes it is doubtful whether several arms or fingers from head and legs without arms are meant. Of 44 human heads only 9 are in profile. This is one of the many analogies with the rock and cave drawings of primitive man, and suggests how Catlin came to nearly lose his life by "leaving out the other half" in drawing a profile portrait of an Indian chief. Last, as least mobile and thus attracting least attention, comes the body; first round like the head, then elongated, sometimes prodigiously, and sometimes articulated into several compartments, and in three cases divided, the upper part of the figure being in one place and the lower in another. The mind, and not the eye alone, is addressed, for the body is drawn and then the clothes are drawn on it (as the child dresses), diaphanous and only in outline. Most draw living objects except the kindergarten children, who draw their patterns. More than two thirds of all objects are decidedly in action, and under 18 per cent are added word-pictures or scribbles called the *name* of the objects and made to imitate writing or letters, as children who cannot talk often make gibbering, sputtering sounds to imitate talking. The very earliest pencillings, commonly of three-year-old children, are mere marks to and fro, often nearly in the same line. Of 13 of these most were *nearly* in the angle described by Javal as corresponding to the earliest combination of

finger and fore-arm movements and not far from the regulation slant of 52° taught in school penmanship.

Reproduction of Stories, Showing Considerable Power of Abstraction.—Each child was asked to tell a verse or story to be recorded verbatim, and nearly half could do so. Children of this age are no longer interested in mere animal noises or rhymes or nonsense-words of the "Mother Goose" order, but everything to interest them deeply must have a cat, dog, bird, baby, another child, or possibly parent or teacher in it; must be dramatic and full of action, appeal to the eye as a "chalk-talk" or an object-lesson, and be copious of details, which need be varied but slightly to make the story as good as new for the twentieth time. A long gradation of abstractions culminates here. First, it is a great lesson for the child to eliminate touch and recognize objects by the eye alone. The first good pictures mentally seen are felt of, turned over with much confusion to find the surface smooth. To abstract from visual terms to words is still harder. Eyes and tongue must work together a long time before the former can be eliminated and stories told of objects first absent, then remote, then before unknown. Children must be far beyond this before they can be interested, e. g., in fairy tales, and stories told interest them far more than if read to them, no matter how apt the language. They are reproduced about as imperfectly as objects are drawn, only a few salient and disconnected points being seized at first, and sentence and sequence coming very slowly after many repetitions. Their own little faults may be woven in or ascribed to animals or even plants in a remote way which they themselves will feel at each stage, and the selfish birdie or the

runaway squirrel or flowers as kind words may be referred to in case of need as a reserve moral capital. Why do we never teach maxims and proverbs which, when carefully selected, are found so effective at this age and teach the best morality embodied in the briefest and most impressive way?

Ideas of Money.—Of the 36 per cent or 72 children of the table who never saved their pennies, 52 spend them for candy, which growing children need, but the adulterations of which are often noxious. Of toys, big things please them best. A recent writer in Austria fears that school savings-banks tend to call attention too early to money matters, and to cause its value to be dangerously overrated; but to pass the candy by and drop the cents where they are beyond their control for years is much less pedagogic than to save them till a larger and more costly toy can be bought.

Tests to Find Basis of First School Instruction—Development, not Acquisition.—The next experimental inquiry¹ in the field was also made in quest of a natural basis of the first school instruction. If we look at the developing effect upon the person of the pupil, progress in the upper gymnasial classes is perhaps less than in the first year of school, although, if we regard the quantity of acquisition or its importance, it is much greater. That the matter of instruction is preferred to the development of the person of the pupil is the cause of the memory-cram and neglect of pedagogy, which often makes school-keeping, as Grimm called it, lower than the work of the day laborer. Herbart, Ziller, and Stoy, however,

¹ Die Analyse des Kindlichen Gedankenkreises, Dr. B. Hartmann. Annaberg, 1890, p. 116.

plead for "educating instruction," and showed will to be rooted in the sphere of thought, which should first be moral and religious. Many-sided interest is the root and key of all. Interest may be of knowledge or of perception, and statistical inquiry might seek to determine which class of interests predominate, and whether reproduction was slow, confused, partial, or the reverse. The Berlin tables showed what ideas were lacking, but Lange sought the ideas that were not lacking as a basis of school knowledge. The child's soul is no *tabula rasa*, and very suggestive are papers on the best methods of excursions for city schools, on the educational value and use of home and its environment and apperception.

Tests in Annaberg Schools to Determine Natural Basis of Two First Years' Course.—Hartmann's tests were made solely, he says, in the interests of the Annaberg schools, to determine the natural basis of the course of study there for the first year or two of school. The 14 plainer questions were not enough, and he had not heard of the Boston tests, and so those of Berlin were largely his model. His tests were better than all others in one respect, viz., they were repeated five years, 1880-84, on as many groups of children entering school, and they have given rise to analogous tests in other cities, best perhaps in Döbeln. For Hartmann's purpose a large number of questions were needed, and interests of knowledge must be regarded more than those of sympathy or participation. To an Herbartian the former seems earlier and richer, but the ideal of normalizing a sphere of thought is evident. Concepts likely to be wanting in children of that town were excluded in favor of those easily accessible to every child, yet those chosen were not model

or normal in the sense that often others as good might not have been chosen. The flying, singing lark may be seen every day in spring at Annaberg, and if it has not been noticed, the child may be inert and indifferent, or its senses dull or defective, and this would also be the inference had the swallow been chosen. By this method each locality will find objects especially prominent and peculiar to it. A book by E. Piltz, entitled "School-children's Observation of Nature," and Sigismund's "The Family as a School of Nature," contain good lists of topics (the former 700 of them) and reports from similar tests. As a manufacturing centre of passementerie, and a shire town and retail centre, Annaberg has rich and poor, and its prosperity depends on changes in fashions, so that the 265 children entering its schools yearly differ greatly. Some children were very bashful on first entering school, used to only the local dialect, which most teachers did not speak, but by beginning with the easiest questions and talking of parents and toys, these difficulties were minimized. Thus answers were often enigmatical, and much cross and indirect questioning was required before the dash which signified knowledge on the point, or the plus sign which signified its absence, could be made. In all 1312 children, 660 boys and 652 girls, were tested, all between $6\frac{3}{4}$ and $5\frac{1}{4}$ years old, the tests being made before and after regular school-hours, by the teacher, who worked with small groups and made them answer individually when possible.

The table below reads as follows: out of 660 boys entering schools in Annaberg, 1881-4, 126, or 19 per cent, had seen a wild hare, etc.

**Percentage of Knowledge of 100 Familiar Objects
Arranged in Groups.**

| NO. OBJECT. | | | | PERCENTAGES. | | |
|-------------------------------|--------------|---------------|-----------------|--------------|--------|------|
| | 660 Boys. | 652 Girls. | 1312 in all. | Boys. | Girls. | Sum. |
| 1. Hare, | 126 | 81 | 207 | 19 | 12 | 16 |
| 2. Squirrel, | 99 | 69 | 168 | 15 | 10 | 13 |
| 3. Flock of sheep, | 235 | 198 | 433 | 36 | 30 | 33 |
| 4. Starling, | 85 | 68 | 153 | 13 | 10 | 12 |
| 5. Goose, | 272 | 250 | 522 | 41 | 38 | 40 |
| 6. Hen, | 195 | 178 | 373 | 30 | 27 | 28 |
| 7. Cuckoo, | 69 | 88 | 157 | 10 | 13 | 12 |
| 8. Lark, | 75 | 83 | 159 | 12 | 13 | 12 |
| 9. Frog, | 188 | 126 | 314 | 29 | 19 | 24 |
| 10. Fish, | 141 | 122 | 263 | 21 | 19 | 20 |
| 11. Bee, | 75 | 46 | 121 | 11 | 7 | 9 |
| 12. Butterfly, | 287 | 362 | 649 | 44 | 55 | 49 |
| 13. Snail, | 210 | 201 | 411 | 32 | 31 | 31 |
| 14. Birch, | 33 | 10 | 43 | 5 | 2 | 3 |
| 15. Pine, | 145 | 148 | 293 | 22 | 23 | 22 |
| 16. Acorn, | 17 | 11 | 28 | 3 | 2 | 2 |
| 17. Cherry-tree, | 83 | 138 | 221 | 13 | 21 | 17 |
| 18. Apple-tree, | 208 | 219 | 427 | 31 | 34 | 33 |
| 19. Hazel-nut, | 78 | 42 | 120 | 12 | 6 | 9 |
| 20. Flowers, | 322 | 317 | 639 | 49 | 49 | 49 |
| 21. Whortleberry, | 158 | 193 | 351 | 24 | 29 | 27 |
| 22. Moss, | 130 | 107 | 237 | 20 | 16 | 18 |
| 23. Mushroom, | 113 | 165 | 278 | 17 | 25 | 21 |
| 24. Sandpit, | 58 | 37 | 95 | 9 | 6 | 7 |
| 25. Quarry, | 121 | 105 | 226 | 18 | 16 | 17 |
| 26. Mine, | 41 | 33 | 74 | 6 | 5 | 6 |
| 27. Tempest, | 363 | 424 | 787 | 55 | 65 | 59 |
| 28. Fog, | 186 | 246 | 432 | 28 | 38 | 33 |
| 29. Clouds, | 266 | 293 | 559 | 40 | 45 | 42 |
| 30. Hailstones, | 307 | 315 | 622 | 46 | 48 | 47 |
| 31. Rainbow, | 226 | 264 | 490 | 34 | 40 | 37 |
| 32. Evening sky, | 119 | 166 | 285 | 18 | 25 | 22 |
| 33. Sunset, | 82 | 77 | 159 | 12 | 12 | 12 |
| 34. Phases of moon, | 148 | 223 | 371 | 22 | 34 | 28 |
| 35. Starry sky, | 349 | 466 | 815 | 53 | 71 | 62 |
| 36. Clock (time), | 27 | 18 | 45 | 4 | 3 | 3 |
| 37. Days of week, | 54 | 92 | 146 | 8 | 14 | 11 |
| 38. Seasons, | 37 | 64 | 101 | 6 | 10 | 8 |
| 39. Constellations, | 4 | 1 | 5 | 1 | 0 | 1 |
| 40. Dwelling, | 543 | 503 | 1046 | 82 | 77 | 80 |
| 41. Zürcher Sq., | 346 | 328 | 674 | 52 | 50 | 51 |
| 42. Chief market, | 471 | 452 | 923 | 71 | 69 | 70 |

| No. | OBJECT. | 660 | 652 | 1312 | PERCENTAGES. | | |
|-----|--------------------------------------------|-------|--------|---------|--------------|--------|------|
| | | Boys. | Girls. | in all. | Boys. | Girls. | Sum. |
| 43. | Buchholzer St., . . . | 278 | 281 | 559 | 42 | 43 | 43 |
| 44. | Real Gymnasium, . . . | 133 | 164 | 297 | 20 | 25 | 23 |
| 45. | Berg church, . . . | 210 | 220 | 430 | 32 | 34 | 33 |
| 46. | Catholic church, . . . | 231 | 237 | 468 | 35 | 36 | 36 |
| 47. | Town Hall, | 430 | 403 | 833 | 65 | 62 | 63 |
| 48. | Post-office, | 297 | 344 | 641 | 45 | 53 | 49 |
| 49. | R. R. station, | 418 | 433 | 851 | 63 | 66 | 65 |
| 50. | Bahls Restaurant, . . . | 167 | 189 | 356 | 25 | 29 | 27 |
| 51. | Nursery-tree, | 163 | 180 | 343 | 25 | 27 | 26 |
| 52. | Markus-Röhling (an old mine), | 193 | 267 | 460 | 29 | 41 | 35 |
| 53. | Promenade, | 228 | 292 | 520 | 35 | 45 | 40 |
| 54. | Grove, | 172 | 253 | 425 | 26 | 39 | 32 |
| 55. | Church-yard, | 394 | 469 | 863 | 60 | 72 | 66 |
| 56. | Pöhlberg, | 217 | 244 | 461 | 33 | 37 | 35 |
| 57. | Galgenberg, | 89 | 89 | 178 | 13 | 13 | 13 |
| 58. | Schreckenbergl, | 117 | 112 | 229 | 18 | 17 | 17 |
| 59. | Buchholtz, | 282 | 329 | 611 | 43 | 50 | 47 |
| 60. | Frohnau, | 164 | 226 | 390 | 25 | 35 | 30 |
| 61. | Wiesenbad, | 121 | 159 | 280 | 18 | 24 | 21 |
| 62. | Geyersdorf, | 139 | 200 | 339 | 21 | 31 | 26 |
| 63. | Valley, | 51 | 59 | 110 | 8 | 9 | 8 |
| 64. | River, | 150 | 157 | 307 | 23 | 24 | 23 |
| 65. | Bridge, | 282 | 258 | 540 | 43 | 39 | 41 |
| 66. | Water-mills, | 152 | 151 | 303 | 23 | 23 | 23 |
| 67. | Pond, | 434 | 490 | 924 | 66 | 75 | 70 |
| 68. | Meadow, | 250 | 218 | 468 | 38 | 33 | 36 |
| 69. | Corn-field, | 183 | 111 | 294 | 28 | 17 | 22 |
| 70. | Potato-field, | 345 | 358 | 703 | 52 | 55 | 54 |
| 71. | Snow landscape, | 289 | 262 | 551 | 44 | 40 | 42 |
| 72. | Village, | 158 | 175 | 333 | 24 | 27 | 25 |
| 73. | Soldiers' monument, . . | 180 | 136 | 316 | 27 | 21 | 24 |
| 74. | Fountain, | 397 | 394 | 791 | 60 | 60 | 60 |
| 75. | Carriage driving, | 332 | 362 | 694 | 50 | 55 | 53 |
| 76. | Road, | 300 | 346 | 646 | 45 | 53 | 49 |
| 77. | Field-works, | 250 | 181 | 431 | 38 | 28 | 33 |
| 78. | Garden-works, | 213 | 211 | 424 | 32 | 32 | 32 |
| 79. | Acute-angled triangle, . | 62 | 66 | 128 | 9 | 10 | 10 |
| 80. | Square, | 101 | 90 | 191 | 15 | 14 | 15 |
| 81. | Cube, | 214 | 293 | 507 | 32 | 45 | 39 |
| 82. | Circle, | 280 | 284 | 564 | 42 | 43 | 43 |
| 83. | Sphere or globe, | 546 | 510 | 1056 | 83 | 78 | 80 |
| 84. | Counting from 1 to 10, . | 456 | 405 | 861 | 69 | 62 | 66 |
| 85. | God, | 370 | 401 | 771 | 56 | 61 | 59 |
| 85. | Jesus, | 68 | 142 | 210 | 10 | 22 | 16 |

| No. OBJECT. | | | | PERCENTAGES. | | |
|-----------------------------------------------|--------------|---------------|-----------------|--------------|--------|------|
| | 660 Boys. | 652 Girls. | 1312 In all. | Boys. | Girls. | Sum. |
| 87. Bible history, | 7 | 14 | 21 | 1 | 2 | 2 |
| 88. Prayers and Songs, . . | 122 | 184 | 306 | 28 | 28 | 23 |
| 89. Divine service, | 192 | 223 | 415 | 19 | 34 | 32 |
| 90. Baptism, | 118 | 228 | 346 | 18 | 35 | 26 |
| 91. Wedding, | 70 | 227 | 297 | 11 | 35 | 23 |
| 92. Father's name and sta- tion, | 425 | 370 | 795 | 64 | 57 | 61 |
| 93. King, | 52 | 42 | 94 | 8 | 6 | 7 |
| 94. Coins, | 450 | 398 | 848 | 68 | 61 | 65 |
| 95. Sickness, | 356 | 406 | 762 | 54 | 62 | 58 |
| 96. Fairy tales, | 32 | 39 | 71 | 5 | 6 | 5 |
| 97. Repetition in speaking, | 480 | 426 | 906 | 73 | 65 | 69 |
| 98. Recitation, | 68 | 62 | 130 | 10 | 9 | 10 |
| 99. Repetition in singing, | 226 | 243 | 469 | 34 | 37 | 36 |
| 100. To sing songs, | 102 | 161 | 263 | 15 | 25 | 20 |

By Inspection of Results, the Mental Ability of Each Child can be Predicted.—The objects, it will be observed, are here arranged in groups as follows: Animals 1–13, plants 14–23, mineral 24–26, events in nature 27–35, time 36–39, localities 40–51, the home landscape 52–78, mathematical 79–84, religious 85–91, social 94–94, miscellaneous 95–100. Of the children tested the first year the individual record of a few was followed and given with detail. A boy who passed on 75 out of the 100 showed an excellent record each year. He had a large vocabulary, yet would repeat a story with fidelity to the words it was told in that was almost servile. He was better in sharp thought than in fantasy. A girl was deficient in all groups and almost zero in some, having only 41 per cent of the questions, and a boy had but 12 of the 100 usable concepts. The school-marks and the carefully kept individuality-books in these and other cases corresponded very nearly to the efficiency shown in the preliminary tests. Not only do the latter harmonize with following school-years, but Hartmann thinks that from a careful inspection of the results of

each group into which the 100 questions fall the mental ability if not the future career of the child can be predicted. What shall be said, he adds, of the waste of the general public school in which all three of these children are taught side by side in the same class?

Proofs of the Value of these Tests to Determine Individuality.—In this inventory great stress was laid upon the natural setting of each object. The questioners were told that it was not sufficient to have seen, but they must have ridden on the cars, the apple-tree must have had apples on it, the butterfly must have been on the flower, the sheep grazing, the frog springing, etc. One of these concepts was known to but five, and one to 1056 of the 1312 children, and the others were between these extremes. In animals, minerals, and the social group only did boys excel. Girls excelled in 56 and boys in 38 objects. Girls excelled the boys in their marks also in the first, second, and third school-year, but less and less, till in the sixth year the boys were distinctly ahead. Again, on entering the usual elementary school, each boy had on the average 30.7 of the 100 concepts, and each girl 36.7. At the end of the first school-year the boys had an average mark of progress of 3.03, and each girl 2.53. Thus we can form the proportion, $36.7 : 30.7 = 30.3 : x$, which gives, as the value of its fourth term, 2.535, which varies only 0.005 from the actual mark of the girls. For each of the next three years the deviation is hardly greater. The product of the number of concepts multiplied by the chief school-mark in Germany which designates progress comes out about the same in girls' as in boys' classes. Out of the 100 usable concepts the average girl had 32.9, the average boy 30.8. The average Annaberg number, 31.9, is

thus small. So valuable were these tests for determining the individuality of the child, for the program and for the teachers that at Easter either the entire hundred, or at least the best 30 questions, are tested each year. These are the following: hare, hen, frog, butterfly, fir-tree, flower, thunderstorm, rainbow, moon-phases, days of the week, child's home, city-hall, railway station, potato-field, snow landscape, cube, numbers, work in the field, baptism, coins, sickness, God, Jesus, and localities. In the practice school of the Pedagogical Seminary at Jena, each school-year begins with this analysis of the children's sphere of thought.

The Use of Stories to Develop Apperception.—The complete course of study for the first and second school-year based upon his inquest the author reserves for a later pamphlet, and gives here only an outline of his ideas. Nothing fulfils all the conditions of Herbartian interest at first better than Bible stories; but only 25 per cent of the children have usable Bible concepts, and their apperceptive organs are hardly developed enough to make this fruitful. *Genuine* child stories, according to Willmann, must have five marks, viz., they must be really child-like or simple and full of fancy, they must excite and educate the mental judgment, must be instructive and of permanent worth, they must make a deep unitary impression which shall be a centre of future interest. It must thus be popular and classical. Hartmann thanks God that this demand can be met by the Grimm *Märchen*. Since Ziller's first plea for *Märchen* in school nearly a quarter of a century ago, the battle about them has raged. Hartmann disagrees with Ziller and Rein in thinking that four of these are enough for the first school-year, and feed all the Herbartian in-

terests. The *Star Dollars*, which teaches that although all desert the child there is *One* that does not, comes last. Rein is charged with selecting his twelve tales arbitrarily, without the justification which only such a preliminary inquest can give, or else for external reasons, as basis for instruction in natural history, etc. Hartmann's limited use of *Märchen* should not only educate religious and other sentiments, but it should teach to apprehend and to tell again.

Bible Stories Best.—After this practice for half a year Bible stories should come. The New Testament should precede the Old, and all should centre about the Jesus child. To fail of insuring close intimacy with Bible tales in early childhood is, we are told, one of the gravest of all pedagogical errors. The topic of this half-year should be the nativity, the visit of the three wise men, Jesus in the temple, the wedding at Cana, the boy at Nain, the entrance to Jerusalem, the arrest of Jesus, his condemnation, death, and burial. This plan has been followed in close connection with the church-year in Annaberg, and with the best results. Even for narrative and educational values this has excelled all other material. This matter must be so treated as to evoke the greatest interest and participation, and never at the same part of the year as the *Märchen*. Religious instruction should thus be the chief and central. It should select the matter and all it requires without reference to other branches, and in this sense only they should all be subordinate to it. The last sixteen pages are given to an outline or program for each of the 40 full school-weeks of the German school-year. This is divided as narrative matter and object-lesson matter. The first begins with a brief prayer and song, the first

Märchen in the third week, and new and longer songs, prayers and tales, then proverbs and poems with Bible tales the last half-year. The second begins with name, place in school, time, school-days, movements, with use of slate, sponge and pencil in the second week, each child's home, street, parents' name, home-life, fence, hedge, flowers, animals and birds seen on the way, garden tools, planting and sowing, riddles, drawing, then writing and reckoning, etc. Every object in the table is gone over with detail and many more. They draw dog-houses, bird-cages, mouse-trap, spider's web, hat, lamp, stove, moon, star, cat, dish, sled, church, altar, Christmas-tree, knife and fork, wine-bottle and glass, bed, tea-cup and pot, hat, cap, gravestone, street-lamp, city-hall, book-case, slate, etc.

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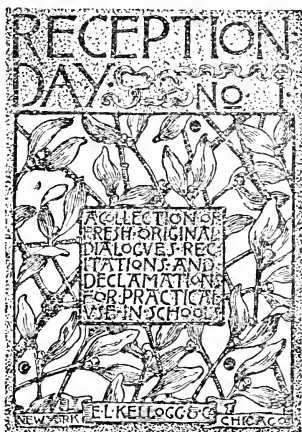
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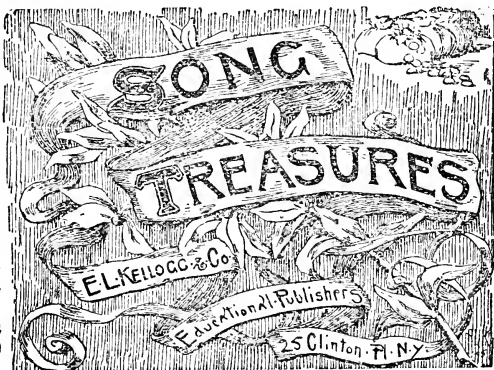
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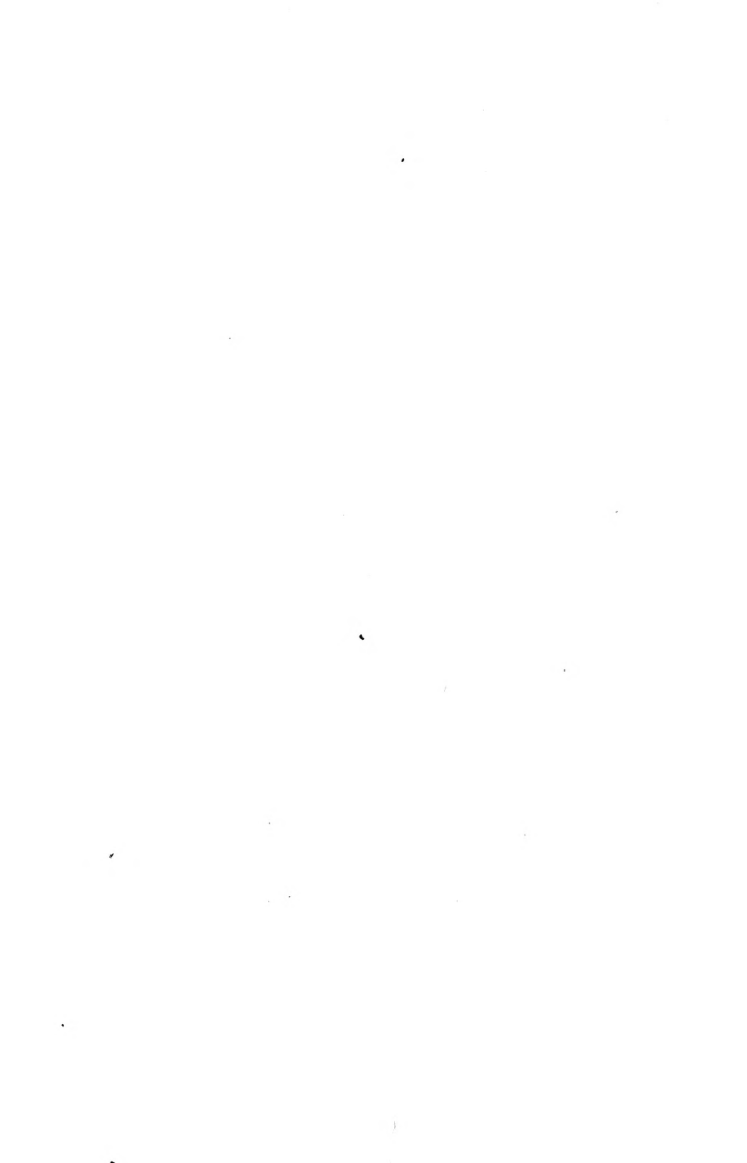
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